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49th INTERNATIONAL CONGRESS ON SCIENCE TECHNOLOGY AND TECHNOLOGY-BASED INNOVATION

“SDGS FOR THE BENEFIT OF MANKIND”

~PROGRAM BOOK~





ทรงพระเจริญ



PROGRAM BOOK

The 49th International Congress on Science,
Technology and Technology-based Innovation
(STT49)

SDGs for the Benefit of Mankind

January 23rd-25th, 2024

Faculty of Science, Prince of Songkla University,
Hatyai campus, Songkhla, Thailand

Organized by:

The Science Society of Thailand under
the Patronage of His Majesty the King
in Association with
Faculty of Science, Prince of Songkla University,
Hatyai campus

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WELCOME MESSAGE FROM THE PRESIDENT OF THE SCIENCE SOCIETY OF THAILAND UNDER THE PATRONAGE OF HIS MAJESTY THE KING



On behalf of the Science Society of Thailand under the Patronage of His Majesty the King, I am delighted to invite you to the 49th International Congress on Science, Technology and Technology-based Innovation or STT49, which will be held during January 23 - 25, 2024 at Hat Yai, Songkhla Province, Thailand. This event is our landmark and annual congress, jointly organized by Faculty of Science, Prince of Songkla University.

The significance of this year congress's theme, "SDGs for the benefit of mankind," cannot be overstated—it calls upon every individual to recognize and actively pursue the objectives of sustainable development. I am confident that this congress will not only facilitate global and regional networking, but also offer an unparalleled platform for scientists worldwide, especially in Asia, to collectively understand the pivotal role of science and technology in addressing global hurdles. By doing so, we can forge sustainable solutions that will serve the greater good of humanity.

Furthermore, you will have the opportunity to immerse yourselves in the breathtaking charm of a southern Thai city.

With utmost warmth, I extend a heartfelt invitation to all of you to participate in our captivating journey of scientific exploration and research aligned with the Sustainable Development Goals (SDGs).

Your collaboration is deeply appreciated, and I eagerly anticipate the privilege of your presence at this congress. Your active participation would be invaluable in shaping the future of science for the betterment of society.

Associate Professor Thanuttkhul Mongkolaussavarat, Ph.D.

The President of the Science Society of Thailand Under the Patronage of His Majesty the King



WELCOME MESSAGE FROM THE CHAIRPERSON OF THE 49TH INTERNATIONAL CONGRESS ON SCIENCE, TECHNOLOGY AND TECHNOLOGY-BASED INNOVATION



It is my great pleasure to welcome you to the 49th International Congress on Science, Technology and Technology-based Innovation (STT49). As the Chair of this remarkable gathering, I am thrilled to see individuals from diverse scientific backgrounds coming together to explore and champion the theme of this year congress.

In a world where the importance of sustainable practices has become more evident than ever, STT49 serves as a platform to foster innovative ideas, insightful discussions, and collaborative initiatives that can pave the way for a brighter and greener future. Our theme for this year, SDGs for the benefit of mankind, encapsulates the urgency and promise that underlie our shared endeavors.

Throughout the conference, there will be the opportunity to engage with leading experts, scholars, practitioners, and visionaries who have dedicated their efforts to shaping sustainable solutions across various and integrated disciplines. Our congress is carefully designed to inspire thought-provoking conversations, exchange of cutting-edge research, and the exploration of practical strategies that can drive positive change on a global scale. Your participation, insights, and passion will be instrumental in charting a course towards a more harmonious coexistence with our planet for the benefit of mankind. Together, we can catalyze a transformation that ensures the well-being of both our planet and its inhabitants.

Thank you for being a part of STT49 and for your commitment to driving sustainability forward. Let us embark on this journey and be ready to embrace the challenges and opportunities that lie ahead.

Wishing you an enriching and inspiring experience at STT49.

Professor Pranut Potiyaraj, Ph.D.

Chairperson STT49



WELCOME MESSAGE FROM THE HOST OF THE 49TH INTERNATIONAL CONGRESS ON SCIENCE, TECHNOLOGY AND TECHNOLOGY-BASED INNOVATION



Welcome to the 49th International Congress on Science, Technology and Technology-Based Innovation! In the name of the Faculty of Science, Prince of Songkla University, it is my pleasure to extend our heartfelt welcoming regards to all participants of the STT49 from 23rd to 25th January 2024 at the 60th Anniversary of His Majesty the King's Accession to the Throne International Convention Center, Prince of Songkla University, Hat Yai.

The United Nations set up the 2030 Agenda for Sustainable Development Goals (SDGs) as a call to action to treat poverty and protect the environment, as well as to improve the lives and prospects of everyone. Through these agreements, the academic community has been provided with a unique framework for transforming society and creating a more sustainable future. As we all know, Science plays a crucial role in building the knowledge necessary to realize this vision of sustainability, the 49th International Congress on Science, Technology, and Technology-based Innovation is themed on the "SDGs for the benefit of mankind", which was inspired by the motto of His Royal Highness

Prince Mahidol Adulyadej, the Prince of Songkla: "Our Soul is for the Benefit of Mankind." We believe that the STT49 conference is an excellent platform to share the latest contributions in science for securing the future of humanity and the planet.

We aligned the motto with the arrangements for this meeting and aim for carbon neutrality, another goal for sustainability future. To achieve a carbon neutral event or at least a low carbon event, I invite you all to act now, try to cut down the carbon footprint for this event and also in everyday life. Everyone could help and we need to act now...as we often heard there is no Planet B.

On behalf of the Faculty of Science, Prince of Songkla University, I am looking forward to an outstanding meeting that enhances sharing research through all the benefits that a conference provides: learning about the latest advances, engaging in discussions that lead to refining ideas, meeting top academic experts in the field, and the opportunity of networking while enjoying our Southern cultures.

We hope you enjoy the 49th International Congress on Science, Technology and Technology-Based Innovation at Prince of Songkla University.

Sawaddee ka

Professor Anchana Prathep, Ph.D.

Dean, Faculty of Science, Prince of Songkla University



HISTORY OF THE CONGRESS ON SCIENCE AND TECHNOLOGY OF THAILAND

International Congress on Science, Technology and Technology-based Innovation (STT), originally named “The Congress on Science and Technology of Thailand” with the same abbreviation of STT, is one of the most important scientific meetings in Thailand. It was firstly organized in 1974 by the Science Society of Thailand (SST) and Chulalongkorn University. Since then, the alternative Universities in Thailand have gone through the bidding for co-organizing the STT in the following years. It is the annual national congress for 45 years. To mark the 72nd Anniversary of the Science Society of Thailand in 2020, the congress has been changed to the international meeting.

The aim is to create scientific forum for national and international scientists and technologists as well as young Thai scientists from diversified fields of science and technology to meet and to provide them the opportunity to share and exchange their knowledge and experiences. It is our annual congress, which originally was the national meeting since 1971, but this year, it is its first time to be held as the international meeting.

Typically, the Congress Plenary Lecture is given by a Nobel Laureate in Science and Technology, followed by an honorable lecture of the Outstanding Scientist of Thailand in that particular year. During the Congress, lectures by several renowned invited speakers, panel discussions and hundreds of contributed papers from various areas of Science and Technology are presented orally or in the form of posters. In addition, the outstanding teacher awards, the young scientist awards, as well as the innovation awards and the national winners of high school student science projects are awarded in the Congress. An exhibition of advanced scientific and technological instruments and appliances from suppliers and enterprises are also the attractive event of the Congress.

ครั้งที่ ปี / วันที่ เดือน	ชื่อการประชุม	สถาบันเจ้าภาพร่วม	ประธาน (จำนวนผลงานวิจัย)	ประธานในพิธีเปิด
1. พ.ศ. 2514 26-27 พฤศจิกายน	การวิจัยทางวิทยาศาสตร์ กรุงเทพฯ 2514	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	ศ.ดร.ประชุมสุข อาชวอำรุง (83 เรื่อง)	-
2. พ.ศ. 2516 30 พฤศจิกายน - 2 ธันวาคม	การวิจัยทางวิทยาศาสตร์ กรุงเทพฯ 2516	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	ศ.ดร.ประชุมสุข อาชวอำรุง (219 เรื่อง)	-
3. พ.ศ. 2518 12-13 ธันวาคม	การวิจัยทางวิทยาศาสตร์ กรุงเทพฯ 2518	คณะวิทยาศาสตร์ คณะแพทยศาสตร์ มหาวิทยาลัยมหิดล	ศ.ดร.กำจร มนูญปัจจุ (249 เรื่อง)	-
4. พ.ศ. 2520 16-17 ธันวาคม	การวิจัยทางวิทยาศาสตร์ กรุงเทพฯ 2520	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	รศ.ดร.กำจัด มงคลกุล (344 เรื่อง)	-
5. พ.ศ. 2521 22-24 ธันวาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาภาคเหนือ	คณะวิทยาศาสตร์ มหาวิทยาลัยเชียงใหม่	ศ.ดร.พรชัย มาตังคสมบัติ (232 เรื่อง)	-
6. พ.ศ. 2522 21-23 ธันวาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาประเทศ	คณะวิทยาศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ บางแสน	ศ.ดร.พรชัย มาตังคสมบัติ (232 เรื่อง)	-
7. พ.ศ. 2523 4-6 ธันวาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาประเทศ	คณะวิทยาศาสตร์ คณะแพทยศาสตร์ มหาวิทยาลัยมหิดล	รศ.ดร.นัยพินิจ คชภักดี (233 เรื่อง)	สมเด็จพระเจ้าลูกเธอเจ้าฟ้าจุฬาภรณวลัยลักษณ์
8. พ.ศ. 2525 28-30 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาประเทศ	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	รศ.ดร.สันต์ พณิชยกุล (245 เรื่อง)	-



ครั้งที่ ปี / วันที่ เดือน	ชื่อการประชุม	สถาบันเจ้าภาพร่วม	ประธาน (จำนวนผลงานวิจัย)	ประธานในพิธีเปิด
9. พ.ศ. 2526 27-29 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาภาค ตะวันออกเฉียงเหนือ	คณะวิทยาศาสตร์ มหาวิทยาลัยขอนแก่น	รศ.ดร.สัณฑ์ พณิชยกุล (174 เรื่อง)	รัฐมนตรีว่าการ กระทรวงวิทยาศาสตร์ เทคโนโลยีและการพลังงาน (ฯพณฯ ดำรง ลัทธพิพัฒน์) นายกรัฐมนตรี (พลเอก เปรม ติณสูลานนท์)
10. พ.ศ. 2527 25-27 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีแห่ง ประเทศไทย	คณะวิทยาศาสตร์ มหาวิทยาลัยเชียงใหม่	ศ.ดร.มนตรี จุฬาวังนวล (280 เรื่อง)	สมเด็จพระเจ้าลูกเธอเจ้าฟ้าจุฬา ภรณวลัยลักษณ์
11. พ.ศ. 2528 24-26 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีแห่ง ประเทศไทย	คณะวิทยาศาสตร์ มหาวิทยาลัยเกษตรศาสตร์	ศ.ดร.มนตรี จุฬาวังนวล (251 เรื่อง)	สมเด็จพระบรมโอรสาธิราชฯ สยามมกุฎราชกุมาร
12. พ.ศ. 2529 20-22 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีแห่ง ประเทศไทย	คณะวิทยาศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ ประสานมิตร	รศ.ดร.กัญญา พานิชพันธ์ (277 เรื่อง)	สมเด็จพระเจ้าลูกเธอเจ้าฟ้าจุฬา ภรณวลัยลักษณ์
13. พ.ศ. 2530 20-22 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีแห่ง ประเทศไทย	คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตหาดใหญ่	รศ.ดร.กัญญา พานิชพันธ์ (420 เรื่อง)	สมเด็จพระเจ้าลูกเธอเจ้าฟ้าจุฬา ภรณวลัยลักษณ์
14. พ.ศ. 2531 19-21 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีแห่ง ประเทศไทย	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย	ศ.ดร.จรรยา บรอกเคอแมน (259 เรื่อง)	นายกรัฐมนตรี (พลเอกชาติชาย ชุณหะวัณ)
15. พ.ศ. 2532 18-20 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อ การพัฒนาทรัพยากรภาคเหนือ	คณะวิทยาศาสตร์ มหาวิทยาลัยเชียงใหม่	ศ.ดร.จรรยา บรอกเคอแมน (394 เรื่อง)	ผู้แทนสมเด็จพระเจ้าลูกเธอเจ้า ฟ้าจุฬาภรณวลัยลักษณ์
16. พ.ศ. 2533 25-27 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาประเทศ	คณะวิทยาศาสตร์ สถาบันเทคโนโลยี พระจอมเกล้า เจ้าคุณทหารลาดกระบัง	ศ.ดร.วิชัย รั้วตระกูล (369 เรื่อง)	-
17. พ.ศ. 2534 24-26 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาทรัพยากร ภาคเหนือ	คณะวิทยาศาสตร์ มหาวิทยาลัยขอนแก่น	ศ.ดร.วิชัย รั้วตระกูล (349 เรื่อง)	-
18. พ.ศ. 2535 27-29 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาประเทศ	คณะวิทยาศาสตร์ มหาวิทยาลัยเกษตรศาสตร์ ณ ศูนย์การประชุมแห่งชาติสิริกิติ์	ศ.ดร.สุชาติ อูปถัมภ์ (297 เรื่อง)	-
19. พ.ศ. 2536 27-29 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาชายฝั่ง	คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ณ โรงแรมดุสิต เจ.บี.หาดใหญ่	ศ.ดร.สุชาติ อูปถัมภ์ (438 เรื่อง)	-
20. พ.ศ. 2537 19-21 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อ การพัฒนาเศรษฐกิจ สังคม และ สิ่งแวดล้อม	คณะวิทยาศาสตร์และเทคโนโลยี มหาวิทยาลัยธรรมศาสตร์ ณ เซ็นทรัลพลาซ่า	ศ.ดร.สมศักดิ์ พันธุ์วัฒนา (252 เรื่อง)	นายกรัฐมนตรี (นายชวน หลีกภัย)
21. พ.ศ. 2538 25-27 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาอุตสาหกรรม	คณะวิทยาศาสตร์ มหาวิทยาลัยบูรพา ณ โรงแรมแอมบาสซาเออร์ซิตี จอมเทียน ชลบุรี	ศ.ดร.สมศักดิ์ พันธุ์วัฒนา (354 เรื่อง)	นายกสภามหาวิทยาลัยบูรพา (นายเกษม จาติกวณิช)
22. พ.ศ. 2539 16-18 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อพัฒนาทรัพยากรมนุษย์	คณะวิทยาศาสตร์ มหาวิทยาลัยรามคำแหง ณ บางกอกคอนเวนชันเซ็นเตอร์ เซ็นทรัลพลาซ่า ลาดพร้าว	รศ.ดร.พิณทิพย์ รื่นวงษา (333 เรื่อง)	ผู้ว่าราชการกรุงเทพมหานคร (ดร.พิจิตต์ รัตกุล)
23. พ.ศ. 2540 20-22 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อพัฒนาคุณภาพชีวิตใน ภูมิภาค	คณะวิทยาศาสตร์ มหาวิทยาลัยเชียงใหม่ ณ โรงแรมโลดิส ปางสวนแก้ว	รศ.ดร.พิณทิพย์ รื่นวงษา (495 เรื่อง)	รัฐมนตรีว่าการ กระทรวงวิทยาศาสตร์ เทคโนโลยีและสิ่งแวดล้อม (นายยิ่งพันธ์ มนะสิการ)
24. พ.ศ. 2541 19-21 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาเศรษฐกิจที่มั่นคง	คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล ณ ศูนย์การประชุมแห่งชาติสิริกิติ์	ผศ.ดร.ทิพาพร ลิ้มปเสนีย์ (463 เรื่อง)	นายกรัฐมนตรี (นายชวน หลีกภัย)
25. พ.ศ. 2542 20-22 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อ การพัฒนาทรัพยากรท้องถิ่น	คณะวิทยาศาสตร์ มหาวิทยาลัยนครสวรรค์ ณ โรงแรมอมรินทร์ลากูน พิษณุโลก	ผศ.ดร.ทิพาพร ลิ้มปเสนีย์ (581 เรื่อง)	รัฐมนตรีว่าการ กระทรวงวิทยาศาสตร์ เทคโนโลยีและสิ่งแวดล้อม (ดร.อาทิตย์ อุไรรัตน์)
26. พ.ศ. 2543 18-20 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีสู่ สหัสวรรษใหม่	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ณ ศูนย์การประชุมแห่งชาติสิริกิติ์	รศ.ดร.ศุภวรรณ ตันตยานนท์ (739 เรื่อง)	-
27. พ.ศ. 2544 16-18 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาเศรษฐกิจไทย	มหาวิทยาลัยสงขลานครินทร์ โรงแรม ลี การ์เดนส์ พลาซ่า	รศ.ดร.ศุภวรรณ ตันตยานนท์ (921 เรื่อง)	ผู้ว่าราชการจังหวัดสงขลา
28. พ.ศ. 2545 24-26 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาเศรษฐกิจที่ยั่งยืน	คณะวิทยาศาสตร์ประยุกต์ สถาบันเทคโนโลยี พระจอมเกล้าพระนครเหนือ ณ ศูนย์การประชุมแห่งชาติสิริกิติ์	รศ.ดร.สุรินทร์ เหล่าสุขสถิตย์ (834 เรื่อง)	สมเด็จพระเจ้าพี่นางเธอ เจ้าฟ้ากัลยาณิวัฒนา กรมหลวง นราธิวาสราชนครินทร์



ครั้งที่ ปี / วันที่ เดือน	ชื่อการประชุม	สถาบันเจ้าภาพร่วม	ประธาน (จำนวนผลงานวิจัย)	ประธานในพิธีเปิด
29. พ.ศ. 2546 20-22 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาท้องถิ่น	คณะวิทยาศาสตร์ มหาวิทยาลัยขอนแก่น ณ ศูนย์ประชุมเนกประสงค์กาญจนาภิเษก	รศ.ดร.สุรินทร์ เหล่าสุขสถิตย์ (1039 เรื่อง)	รองนายกรัฐมนตรี (นายสุวิทย์ คุณกิตติ)
30. พ.ศ. 2547 19-21 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อสังคมและเศรษฐกิจ ฐานความรู้	คณะวิทยาศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ ณ ศูนย์แสดงสินค้าและ การประชุมอิมแพ็ค เมืองทองธานี	รศ.ดร.สุรินทร์ เหล่าสุขสถิตย์ (854 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
31. พ.ศ. 2548 18-20 ตุลาคม	วิทยาศาสตร์และเทคโนโลยี เพื่อการพัฒนาที่ยั่งยืน	เทคโนโลยีธานี มหาวิทยาลัยเทคโนโลยีสุรนารี	รศ.ดร.สุรินทร์ เหล่าสุขสถิตย์ (1021 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
32. พ.ศ. 2549 10-12 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีเพื่อ การเศรษฐกิจพอเพียง เฉลิมฉลองการครองสิริราช สมบัติ ครบ 60 ปี ของ พระบาทสมเด็จพระเจ้าอยู่หัว	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ศูนย์การประชุมแห่งชาติสิริกิติ์	รศ.ดร.นภาพร นพรัตน์ภรณ์ (927 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
33. พ.ศ. 2550 18-20 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีเพื่อ โลกยั่งยืน เฉลิมฉลองมหามงคล เฉลิมพระชนมพรรษาครบ 80 พรรษาของพระบาทสมเด็จพระ เจ้าอยู่หัว	มหาวิทยาลัยวลัยลักษณ์ จังหวัดนครศรีธรรมราช	รศ.ดร.นภาพร นพรัตน์ภรณ์ (802 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
34. พ.ศ. 2551 31 ตุลาคม - 2 พฤศจิกายน	วิทยาศาสตร์และเทคโนโลยี สำหรับโลกแห่งความท้าทาย	คณะวิทยาศาสตร์ สถาบันเทคโนโลยี พระจอมเกล้าเจ้าคุณทหารลาดกระบัง	รศ.ดร.นภาพร นพรัตน์ภรณ์ (777 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
35. พ.ศ. 2552 15-17 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีเพื่อ อนาคตที่ดีขึ้น	คณะวิทยาศาสตร์ มหาวิทยาลัยบูรพา	รศ.ดร.นภาพร นพรัตน์ภรณ์ (854 เรื่อง)	ฯพณฯ องคมนตรี นายอำพล เสนาณรงค์
36. พ.ศ. 2553 26-28 ตุลาคม	วิทยาศาสตร์และเทคโนโลยีเพื่อ สังคมที่ดีขึ้น	คณะวิทยาศาสตร์และเทคโนโลยี มหาวิทยาลัยธรรมศาสตร์	รศ.ดร.ธรรารัตน์ ศุภศิริ (582 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
37. พ.ศ. 2554 10-12 ตุลาคม	วิทยาศาสตร์สร้างสรรค์ เพื่อ สรรค์สร้างอนาคต	คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล	รศ.ดร.ธรรารัตน์ ศุภศิริ (699 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
38. พ.ศ. 2555 17-19 ตุลาคม	วิทยาศาสตร์เพื่อนาคตของมวล มนุษยชาติ	คณะวิทยาศาสตร์ มหาวิทยาลัยเชียงใหม่	รศ.ดร.ธรรารัตน์ ศุภศิริ (690 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
39. พ.ศ. 2556 21-23 ตุลาคม	นวัตกรรมวิทยาศาสตร์ เพื่อชีวิต ที่ดีขึ้น	คณะวิทยาศาสตร์ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี	รศ.ดร.ธรรารัตน์ ศุภศิริ (495 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
40. พ.ศ. 2557 2-4 ธันวาคม	วิทยาศาสตร์และเทคโนโลยีสู่วิถี พัฒนาอาเซียน	คณะวิทยาศาสตร์ มหาวิทยาลัยขอนแก่น	ศ.ดร. เปี่ยมสุข พงษ์สวัสดิ์ (543 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
41. พ.ศ. 2558 6-8 พฤศจิกายน	ประตูอาเซียนด้วยวิทยาศาสตร์ และเทคโนโลยี	มหาวิทยาลัยเทคโนโลยีสุรนารี	ศ.ดร. เปี่ยมสุข พงษ์สวัสดิ์ (384 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
42. พ.ศ. 2559 30 พฤศจิกายน - 2 ธันวาคม	ศาสตร์แห่งแผ่นดิน สู่นวัตกรรม เพื่ออนาคตที่ยั่งยืน	คณะวิทยาศาสตร์มหาวิทยาลัยเกษตรศาสตร์ ณ เซ็นทาราแกรนด์ แอท เซ็นทรัลพลาซ่า ลาดพร้าว	ศ.ดร. เปี่ยมสุข พงษ์สวัสดิ์ (290 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
43. พ.ศ. 2560 17-19 ตุลาคม	เข้าใจวิทยาศาสตร์ เข้าถึง เทคโนโลยี สร้างนวัตกรรม นำ สังคมยั่งยืน	คณะวิทยาศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ณ อาคารจามจรี 10 จุฬาลงกรณ์มหาวิทยาลัย	ศ.ดร. เปี่ยมสุข พงษ์สวัสดิ์ (327 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
44. พ.ศ. 2561 29-31 ตุลาคม	วิทยาศาสตร์ และเทคโนโลยีใน ยุคพลิกผัน	สมาคมวิทยาศาสตร์แห่งประเทศไทยในพระ บรมราชูปถัมภ์ ณ ศูนย์นิทรรศการและการ ประชุมไบเทค	รศ.ดร.สายวรุฬ ชัยวานิชศิริ (270 เรื่อง)	สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
45. พ.ศ. 2562 7-9 ตุลาคม	ต้นกล้านวัตกรรมสู่การพัฒนาที่ ยั่งยืน	สำนักวิชาวิทยาศาสตร์ มหาวิทยาลัยแม่ฟ้าหลวง	รศ.ดร.สายวรุฬ ชัยวานิชศิริ (338 เรื่อง)	สมเด็จพระกนิษฐาธิราชเจ้า กรม สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
46. พ.ศ. 2563 5-7 ตุลาคม	Power of Science to Achieve SDGs	คณะวิทยาศาสตร์ มหาวิทยาลัยรามคำแหง	ศ.ดร.สมเกียรติ งามประเสริฐสิทธิ์ (426 เรื่อง)	สมเด็จพระกนิษฐาธิราชเจ้า กรม สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี
47. พ.ศ. 2564 5-7 ตุลาคม	Sciences For SDGs: Challenges And Solutions	คณะศิลปศาสตร์และวิทยาศาสตร์ มหาวิทยาลัยเกษตรศาสตร์	ศ.ดร.สมเกียรติ งามประเสริฐสิทธิ์ (340 เรื่อง)	สมเด็จพระกนิษฐาธิราชเจ้า กรม สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี



ครั้งที่ ปี / วันที่ เดือน	ชื่อการประชุม	สถาบันเจ้าภาพร่วม	ประธาน (จำนวนผลงานวิจัย)	ประธานในพิธีเปิด
48. พ.ศ. 2565 29 พฤศจิกายน-1 ธันวาคม	Science and Technology for Advancing Towards SDGs	สำนักวิทยาศาสตร์ มหาวิทยาลัยวลัยลักษณ์	ศ.ดร.ประจักษ์ โปธิยะราช (483 เรื่อง)	-

PROGRAM OVERVIEW

A program for STT49 Congress @ ICC Hatyai, Prince of Songkla University

Code	Session/Symposium	January 23 rd , 2024		January 24 th , 2024		January 25 th , 2024	
		AM	PM	AM	PM	AM	PM
GO	GRAND OPENING CEREMONY + KEYNOTE SPEAKER		CONVENTION HALL				
P	POSTER SESSION-SESSION / SYMPOSIUM / YRSS / JYRSS			HALLWAY, CONVENTION HALL			
PN	PLENARY SPEAKER	CONFERENCE HALL ROOM 1, ROOM 2 and ROOM 6			CONFERENCE HALL, ROOM 5		CONVENTION HALL
	AWARDING CEREMONY- BEST ORAL & POSTER PRESENTATIONS						
	AWARDING CEREMONY-YRSS/JYRSS						
A	SESSION A-PHYSICS / APPLIED PHYSICS	CONFERENCE HALL, ROOM 1					
B	SESSION B-BIOLOGICAL SCIENCES	CONFERENCE HALL, ROOM 2 and CONFERENCE HALL, ROOM 6			CONFERENCE HALL, ROOM 1 and EXHIBITION HALL B1		
C	SESSION C-CHEMISTRY	CONFERENCE HALL, ROOM 3			CONFERENCE HALL, ROOM 3		
D	SESSION D-MATHEMATICS / STATISTICS / COMPUTER SCIENCE / DATA SCIENCE / AI	CONFERENCE HALL, ROOM 4			CONFERENCE HALL, ROOM 4		
E	SESSION E-ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY	CONFERENCE HALL, ROOM 5			CONFERENCE HALL, ROOM 5 and SEMINAR ROOM A3		
F	SESSION F-FOOD SCIENCE AND TECHNOLOGY/AGRICULTURAL SCIENCE				CONFERENCE HALL, ROOM 6		
SP1	SP1-FOOD SAFETY AND PRECISION AGRICULTURE				EXHIBITION HALL B3 and HALLWAY, CONVENTION HALL		
SP2	SP2-THAI TRADITIONAL MEDICINE				HALLWAY, CONVENTION HALL		
SP3	SP3-TRANSFORMING SCIENCE EDUCATION IN THE PANDEMIC ERA				HALLWAY, CONVENTION HALL		
SP4	SP4-ENERGY FOR THAILAND – FOR TOMORROW AND BEYOND				Bsc.0705 ภาาษาไทยและนวัตกรรมด้านวิทยาศาสตร์ และนวัตกรรมศาสตร์		
SP5	SP5-ENVIRONMENTALLY FRIENDLY RUBBER AND ITS FUTURE				SEMINAR ROOM A1		
SP6	SP6-IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND ENVIRONMENT INCLUDING THE STRATEGIES TO TACKLE SUCH ISSUES				SEMINAR ROOM A4		
SP7	SP7-FORENSIC SCIENCE: THE ROLE OF FORENSIC CURRICULA IN SUPPORTING FORENSIC PROFESSIONS AND CREATING INNOVATION				EXHIBITION HALL B4 and HALLWAY, CONVENTION HALL		
SP8	SP8-X-RAY CRYSTALLOGRAPHY				HALLWAY, CONVENTION HALL		
SP9	SP9-RADIOECOTOLOGY AND ENVIRONMENTAL RADIOACTIVITY				SEMINAR ROOM A2		
SP10	SP10-YOUNG RISING STARS OF SCIENCE 2023 (YRSS) & JUNIOR YOUNG RISING STARS OF SCIENCE AWARD 2023 (JYRSS)				SEMINAR ROOM A3		
	PSU EXHIBITION						CONFERENCE HALL ROOM 1 to ROOM 6
	SCI ALUMINI: DISCUSSION PANEL				HALLWAY, CONVENTION HALL		
	BCG ECONOMY WITH SUSTAINABLE MATERIALS				SEMINAR ROOM A4		
	MEETING OF THE STT50 COMMITTEE						
	SCIENCE DEANS & CHAIR & KEYNOTE/PLENARY/INVITED SPEAKER RECEPTION		RACHAWADEE, BURI SRIPHU HOTEL		SEMINAR ROOM A8		
	STT49 CONGRESS BANQUET						GRAND BALLROOM, BURI SRIPHU HOTEL

NOTE SC50C BOARDROOM SEMINAR ROOM A5-A6



PRINCE OF SONGKLA UNIVERSITY





CONFERENCE ACCESS



**THE 60TH ANNIVERSARY OF HIS MAJESTY THE KING'S ACCESSION TO
THE THRONE INTERNATIONAL CONVENTION CENTER (ICC HAT YAI),
PRINCE OF SONGKLA UNIVERSITY, HATYAI CAMPUS**



CONFERENCE HALL

Room / Date	23Jan2024		24Jan2024		25Jan2024	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
Conference Hall 1	Session A		Session A		SP10	
Conference Hall 2	Session B		Session B			
Conference Hall 3	Session C		Session C			
Conference Hall 4	Session D		Session D			
Conference Hall 5	Session E		Session E			
Conference Hall 6	Session B		Session F			

SEMINAR ROOM

Room / Date	23Jan2024		24Jan2024		25Jan2024	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
Seminar Room - A1			SP4 Zoom	SP4 onsite		
Seminar Room - A2			SP8	Free		
Seminar Room - A3	BCG Economy with Sustainable Materials		SP9	Session E		
Seminar Room - A4			SP5	Sci Alumni		

SEMINAR ROOM

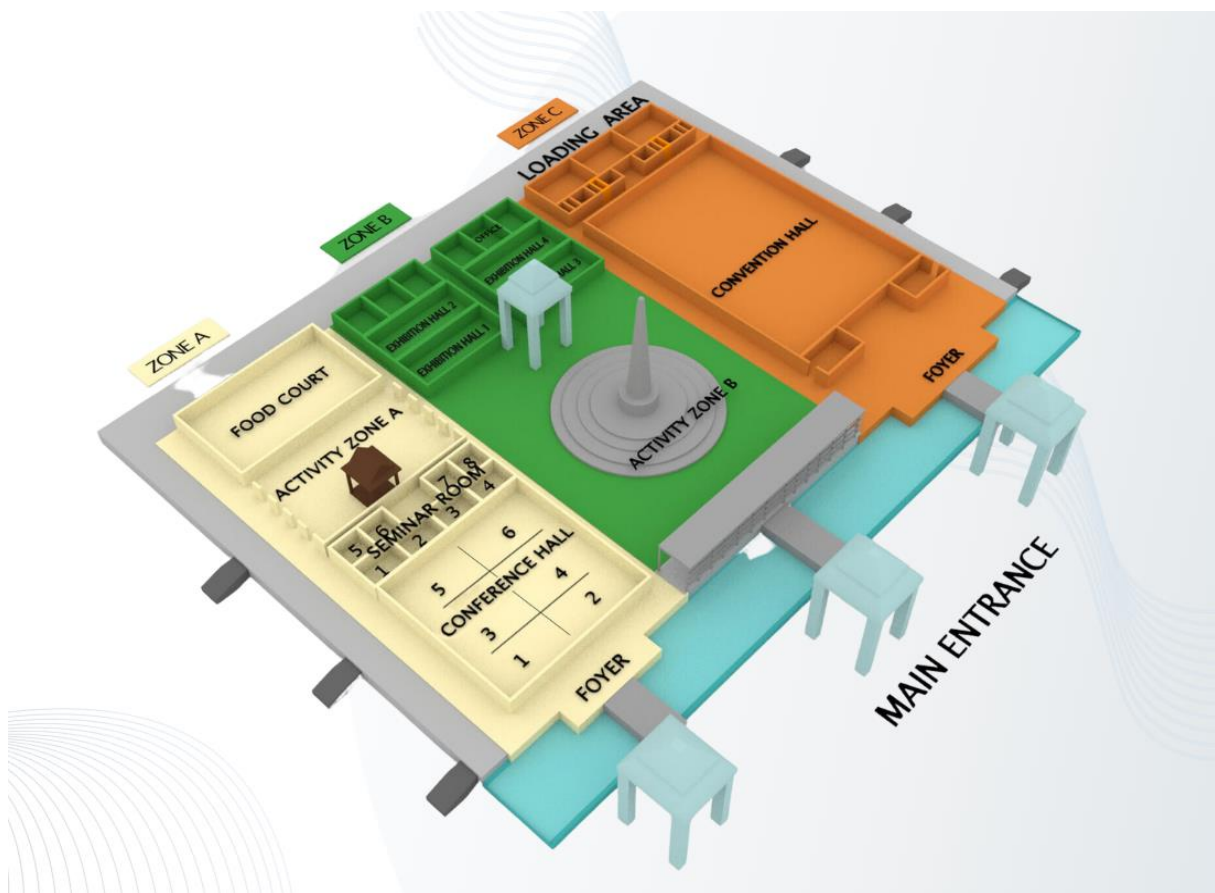
Room / Date	23Jan2024		24Jan2024		25Jan2024	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
Seminar Room - A5						
Seminar Room - A6						
Seminar Room - A7						
Seminar Room - A8			STT50 Meeting 16 Seats			

EXHIBITION HALL

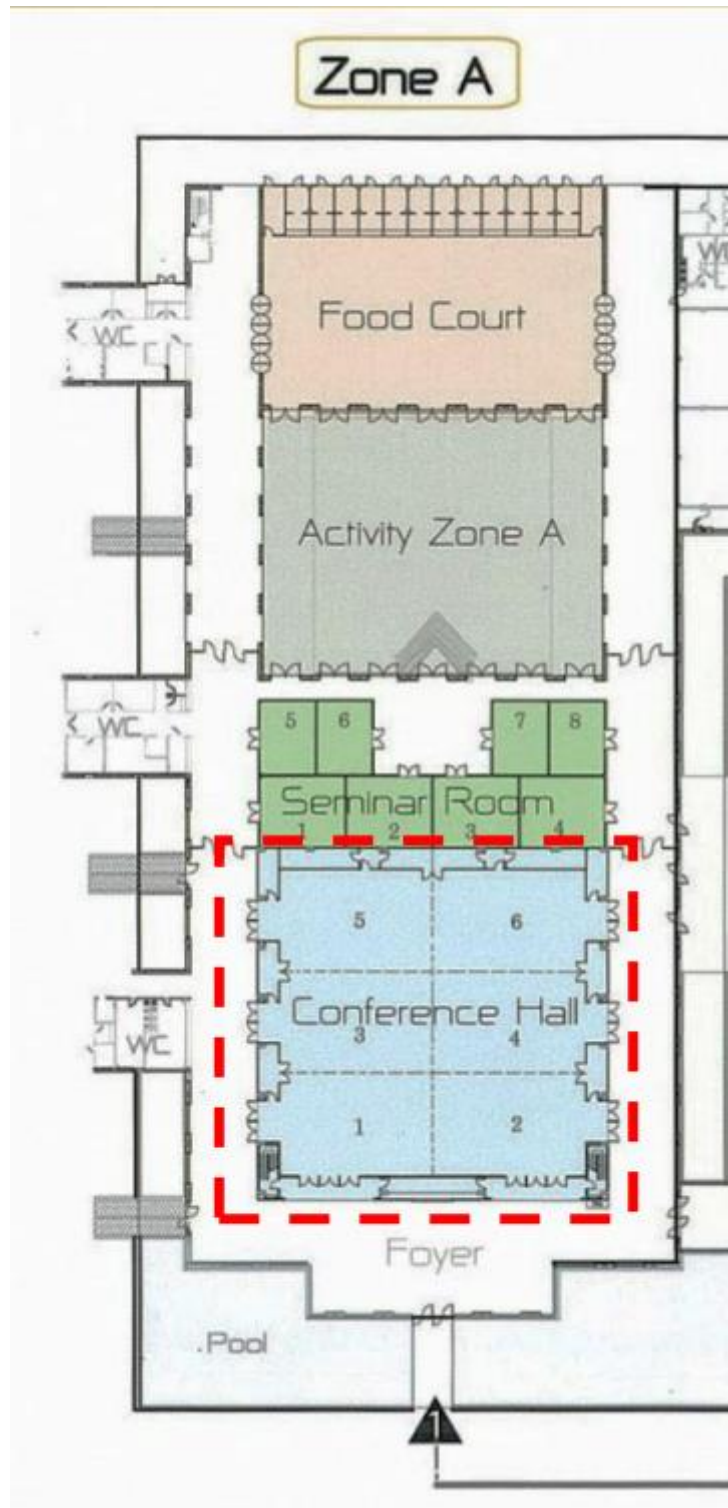
Room / Date	23Jan2024		24Jan2024		25Jan2024	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
Exhibition hall - B1			Session B			
Exhibition hall - B2			ARDA (๓๓) Zoom	Meeting YRSS&JYRSS Committees (9 Group)		
Exhibition hall - B3			SP1			
Exhibition hall - B4			SP6			

CONVENTION HALL

Room / Date	23Jan2024		24Jan2024		25Jan2024	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
Convention hall	Grand Opening/Receive His Majesty/ Exhibition in honor / Research Exhibition -- SP1, SP2, SP6, SP7, Exploring the Human Body, Quantum Technology, Asian Phytochemicals Public Company				Awarding & Closing	
			Session Poster			



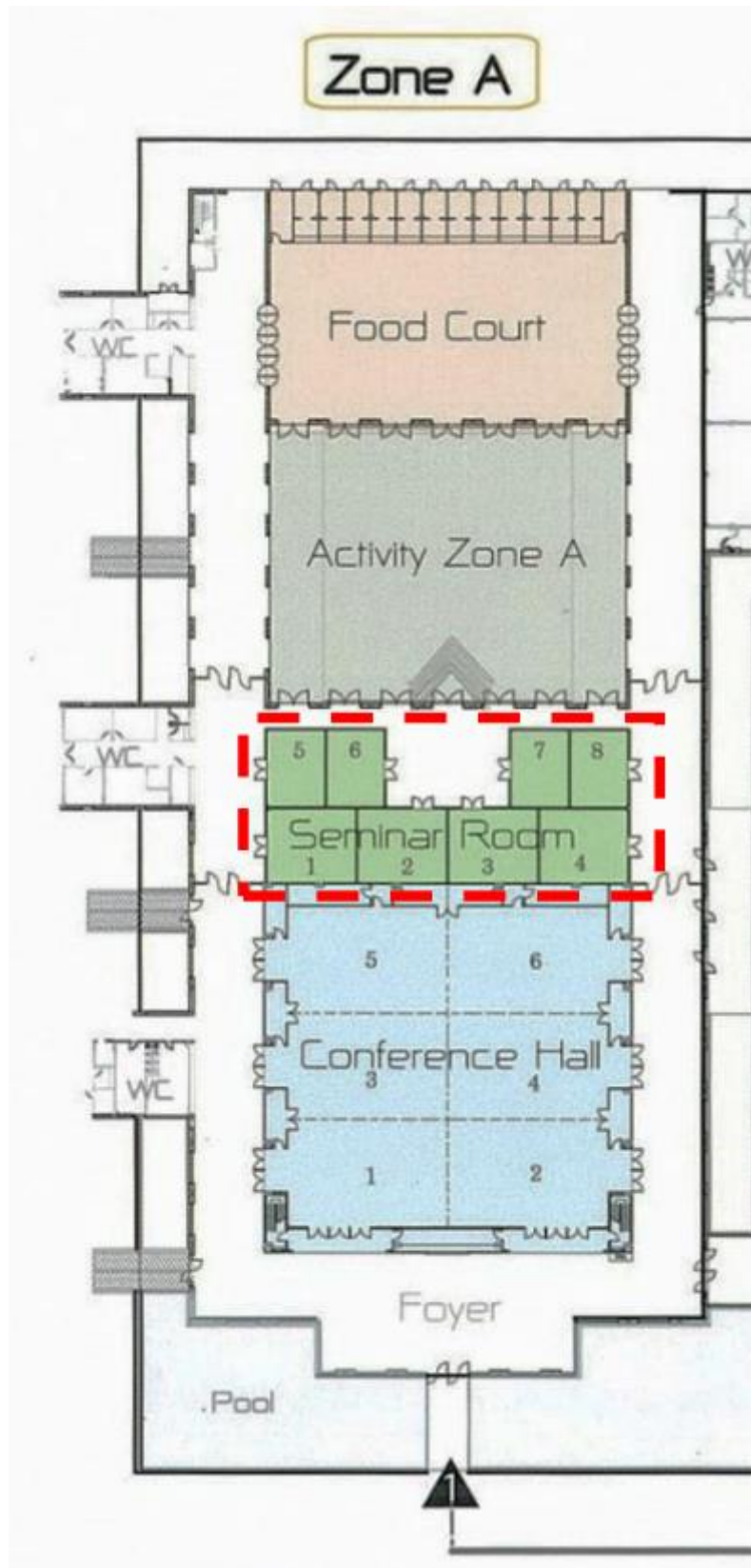
ICC HATYAI OVERALL FUNCTION AREA



ZONE A – CONFERENCE HALL



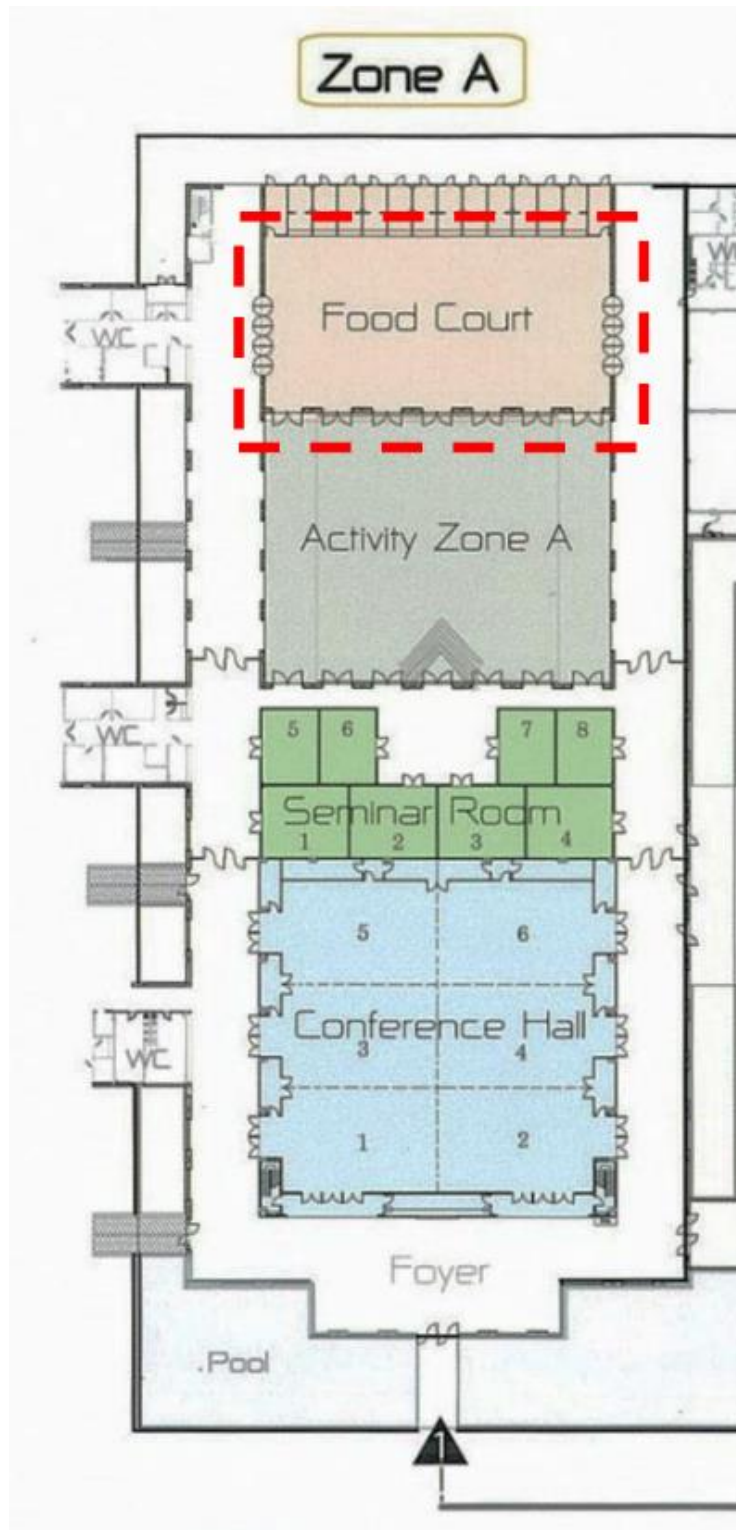
ZONE A – CONFERENCE HALL



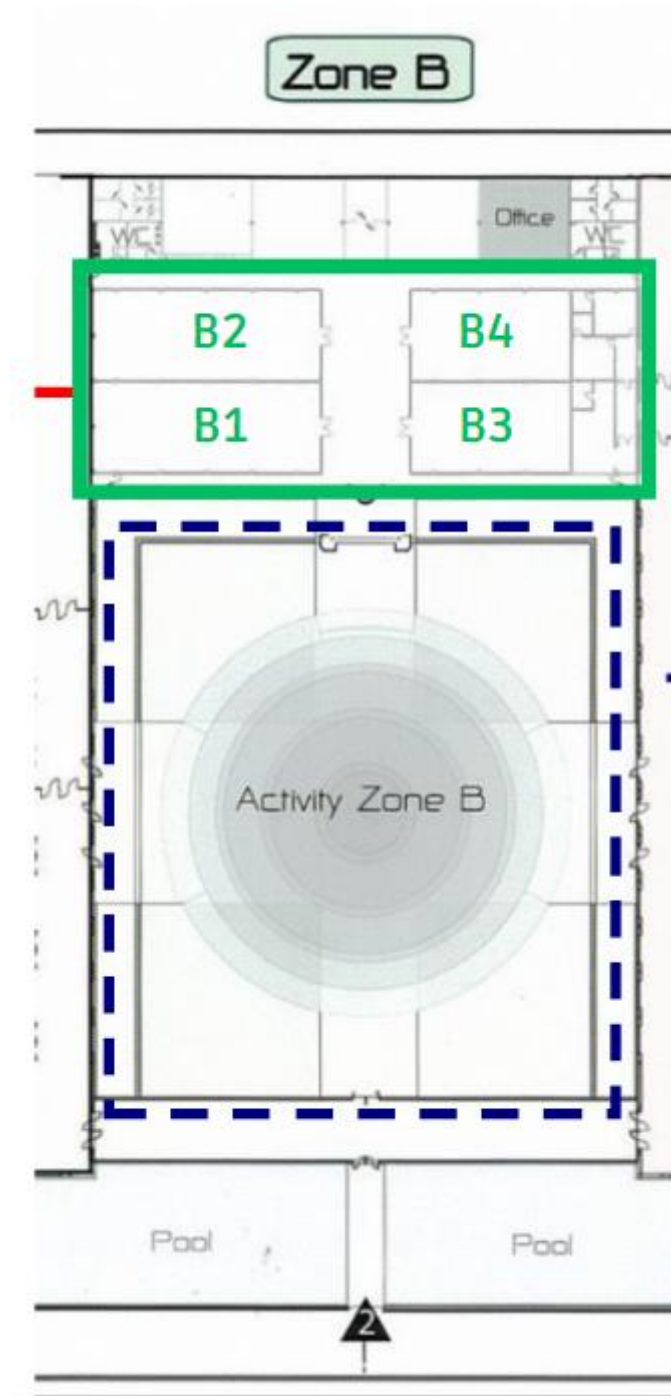
ZONE A – SEMINAR ROOM



ZONE A – SEMINAR ROOM



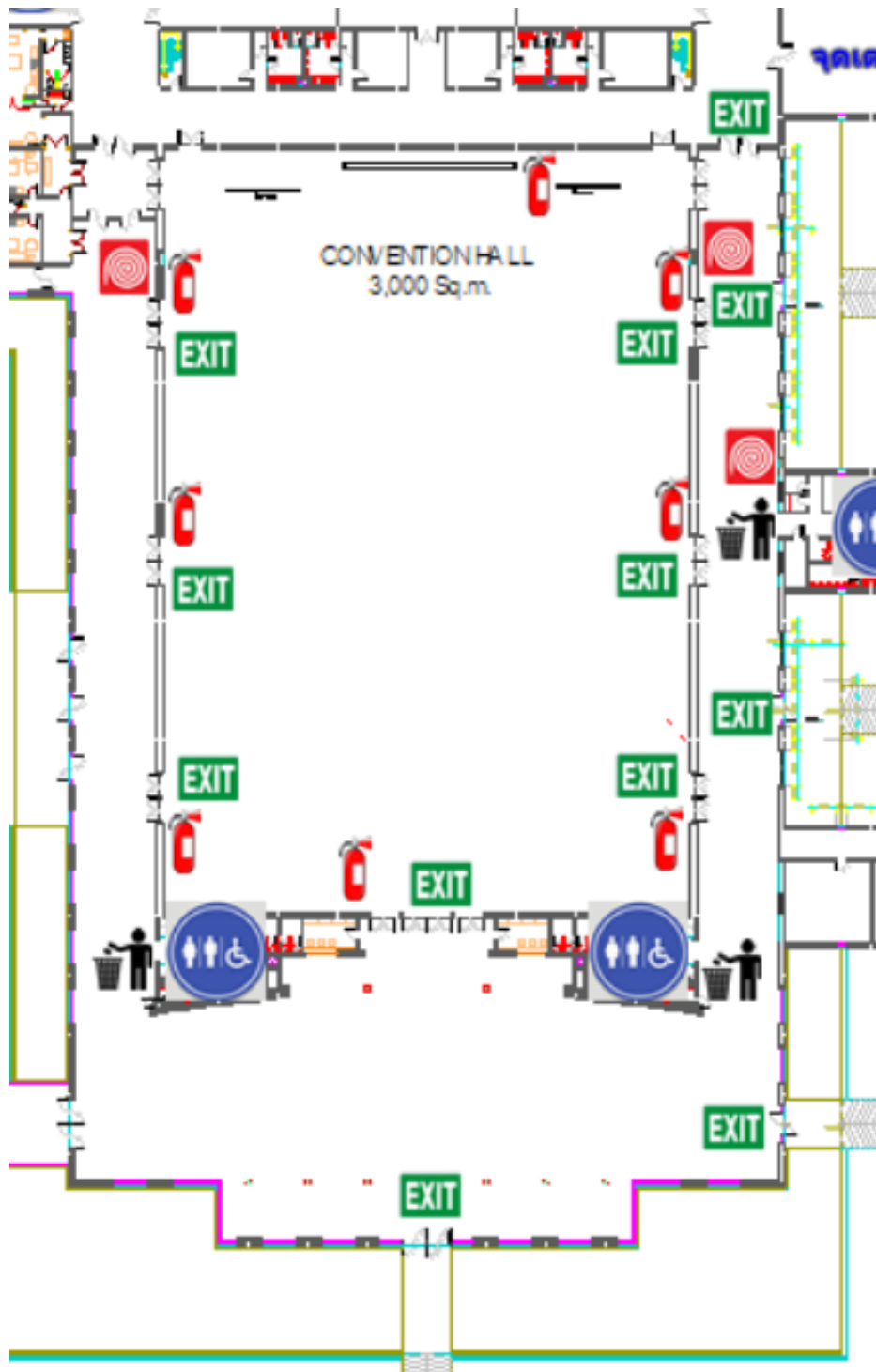
ZONE A – FOOD COURT



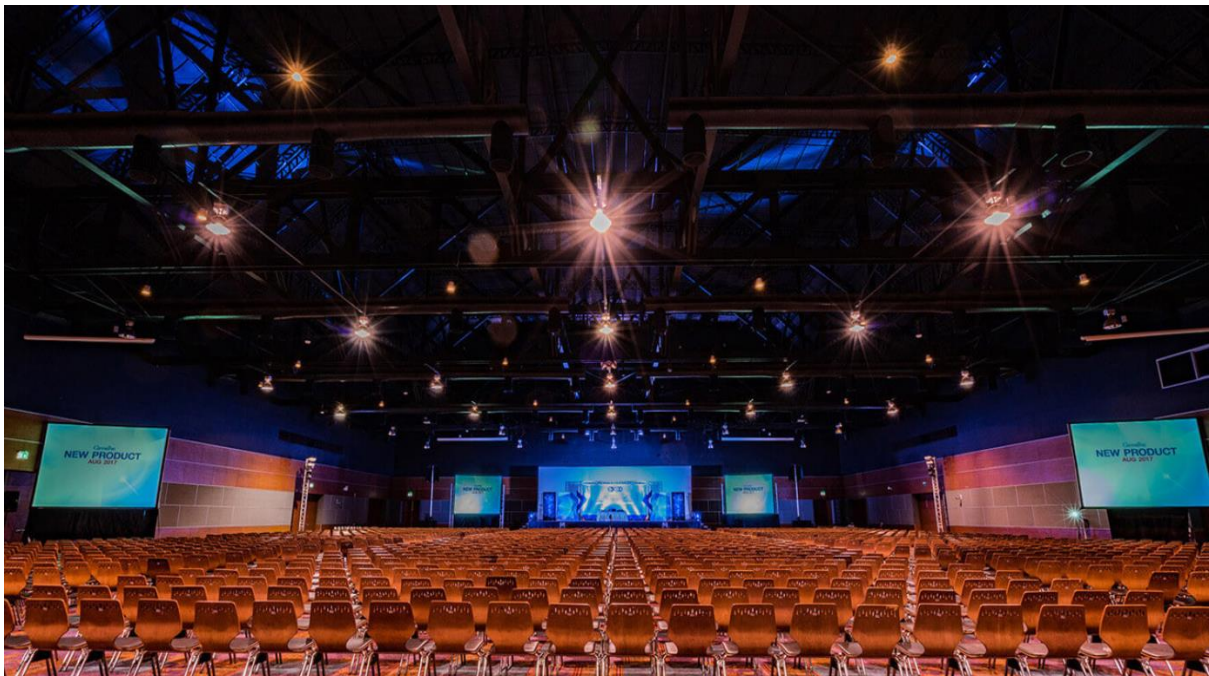
ZONE B – EXHIBITION HALL + ACTIVITY ZONE



ZONE B – EXHIBITION HALL + ACTIVITY ZONE



ZONE C – CONVENTION HALL



ZONE C – CONVENTION HALL



PROGRAM FOR GRAND OPENING CEREMONY OF STT49

January 23rd, 2024

THE 60TH ANNIVERSARY OF HIS MAJESTY THE KING'S ACCESSION TO THE THRONE INTERNATIONAL CONVENTION CENTER (ICC HAT YAI), PRINCE OF SONGKLA UNIVERSITY, HATYAI CAMPUS, THAILAND

Time	Events
11:00	All guests register and have ATK test
13:30	All guests are seated in the Convention Hall, Prince of Songkla University International Convention Center Hat Yai
14:30	<ul style="list-style-type: none"> - Arrival of Her Royal Highness Princess Maha Chakri Sirindhorn - Presentation of Program Book and Souvenirs from Professor Dr. Pranut Potiyaraj (Chairperson of STT49), Associate Professor Dr. Thanuttkhul Mongkolaussavarat (President of The Science Society of Thailand under the Patronage of His Majesty the King), and Assistant Professor Dr. Niwat Kaewpradup (President of Prince of Songkla University) - Report on STT49 by Associate Professor Dr. Thanuttkhul Mongkolaussavarat (President of The Science Society of Thailand) - Her Royal Highness Princess Maha Chakri Sirindhorn graciously presents plaques to the Keynote Speaker, 2023 Senior Scientists, 2023 Thailand Outstanding Scientist, 2023 Outstanding Technologist, 2023 Young Scientists, 2023 Outstanding Science Teachers, and the winners of 2022 National Science Projects Competition - Grand Opening Address by Her Royal Highness Princess Maha Chakri Sirindhorn
14:50	<ul style="list-style-type: none"> - Brief introduction of the Keynote Speaker, Professor Dr. Mounji G. Bawendi, Nobel Prize 2023 in Chemistry “for the discovery and synthesis of quantum dots” by Professor Dr. Pranut Potiyaraj (Chairperson of STT49) - Keynote Lecture: “Quantum Dots: Discovery and Synthesis” by Professor Dr. Mounji G. Bawendi
15:20	<ul style="list-style-type: none"> - Brief introduction of the Keynote Speaker, Professor Dr. Vatcharin Rukachaisirikul, 2023 Thailand Outstanding Scientist by Professor Dr. Anchana Prathep (Dean of Faculty of Science, Prince of Songkla University) - Keynote Lecture: “Discovery and development of lead compounds from Thai fungal resources in drug discovery” by Professor Dr. Vatcharin Rukachaisirikul
15:40	Her Royal Highness Princess Maha Chakri Sirindhorn visits Prince of Songkla University Exhibition
16:45	<ul style="list-style-type: none"> - Her Royal Highness Princess Maha Chakri Sirindhorn presides at photo sessions with <ul style="list-style-type: none"> - Administrative Committee of the Science Society of Thailand under the Patronage of His Majesty the King - The Council of Science Dean of Thailand - Administrative and STT49 Organizing Committees of Prince of Songkla University
17:00	Her Royal Highness Princess Maha Chakri Sirindhorn departs from Prince of Songkla University International Convention Center Hat Yai



KEYNOTE SPEAKER: Prof. Dr. Mounji G. Bawendi

QUANTUM DOTS: DISCOVERY AND SYNTHESIS

Mounji G. Bawendi*

Department of Chemistry
Massachusetts Institute of Technology
*e-mail: mgb@mit.edu (2023 Nobel Prize in Chemistry)



Abstract:

The discovery of quantum dots, nanoparticles of semiconductors, in the 1980s has proven the quantum confinement phenomena' existence in small crystallites; however, synthesis methods to obtain these materials on a large scale and high quality were later established in the 1990s. In this talk, attempts to find the methodology to get these nanoscale materials and the reason behind the successful preparation are explained. Hot-injection method that was experimented with in Professor Bawendi Lab has overcome the strict requirements, including high crystallinity, uniform size distribution, scalability, size tunability, and single-step process, for further studies and utilizations of quantum dots. The more complex quantum dot structures such as core-shell quantum dots and self-assembly of superparticles were also demonstrated. These high-quality quantum dots led to the utilization of quantum dots in applications such as two-photon coalescence spectroscopy, biomedical imaging, and color downshifting for lighting, displays, and concentrators. The discovery and synthesis of quantum dots are truly the breakthrough for modern functional nanoparticles and open to astonishing applications of nanoparticles currently and in the near future.

Professor Mounji G. Bawendi was born in Paris, France in 1961. He is a professor of chemistry at MIT (Massachusetts Institute of Technology) in Cambridge, USA. He earned a bachelor's degree in 1982 and a master's degree in 1983 from Harvard University. He attended the University of Chicago for graduate studies and received a Ph.D. degree in 1988. After obtaining his Ph.D., he spent two years as a postdoctoral researcher at Bell Laboratories, under the supervision of Louis Brus, where he began his studies on nanomaterials. In 1990, he accepted a position at MIT, where he later became a full professor in chemistry (1996). In 1993, he "revolutionized the chemical production of quantum dots, making it possible to obtain near-perfect particles". Now "this high quality was necessary to be able to use them in applications". In addition, he has set up his own laboratory focusing on the science and applications of nanocrystals, in particular semiconductor nanocrystals.



KEYNOTE SPEAKER: Prof. Dr. Vatcharin Rukachaisirikul

DISCOVERY AND DEVELOPMENT OF LEAD COMPOUNDS FROM THAI FUNGAL RESOURCES IN DRUG DISCOVERY

Vatcharin Rukachaisirikul,^{1,*} Souwalak Phongpaichit,² Chatchai Muanprasart,³ Chutima S. Vaddhanaphuti,⁴ Jariya Sakayaroj,⁵ Wilaiwan Chotigeat,² Kwanruthai Tadpetch,¹ Chittreeya Tansakul,¹ Jutarut Iewkittayakorn,² Wararat Chiangjong⁶

¹ Division of Physical Science and Center of Excellence for Innovation in Chemistry, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla 90110, Thailand

² Division of Biological Science, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla 90110, Thailand

³ Chakri Naruebodindra Medical Institute, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bang Phli, Samut Prakarn 10540, Thailand

⁴ Department of Physiology, Faculty of Medicine, Chiang Mai University, Muang, Chiang Mai 50200, Thailand

⁵ School of Science, Walailak University, Thasala, Nakhonsithammarat 80161, Thailand

⁶ Department of Pediatrics, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok 10400, Thailand

*e-mail: vatcharin.r@psu.ac.th (Thailand Outstanding Scientist Award 2023)



Abstract:

Fungi are an important source of novel bioactive secondary metabolites that can be excellent new starting points for the development of novel pharmaceuticals. Our research group has focused on the investigation of lead compounds from Thai fungi since 2007. Fungi were isolated from a wide variety of substrates including plants, marine organisms and soil. Chemical investigation of 113 fungal isolates has resulted in the isolation of more than 1,100 secondary metabolites of which 30% are new natural products with diverse structures. Some of them are promising anti-MRSA (methicillin-resistant *Staphylococcus aureus*), anti-MCF7 (breast cancer), lipid-lowering, cystic fibrosis transmembrane conductance regulator (CFTR) inhibitory and transmembrane protein 16A (TMEM16A) inhibitory lead compounds. In addition, synthesis, structural modification, and mechanism of action of selected lead compounds have been performed. Identification of their target proteins is now being conducted using proteomics approach. This presentation will focus on the discovery and potential of lead compounds from Thai fungi for drug development.

Professor Emeritus Dr. Vatcharin Rukachaisirikul received a Bachelor of Science degree (1st Class Honors) in Chemistry from Prince of Songkla University, a Master of Science degree in Organic chemistry from Mahidol University, and a Ph.D. degree in Chemistry from Australian National University, Australia. She was an Alexander von Humboldt fellow at Philips University, Germany, and a visiting fellow at the Nagoya University, Japan. Her research interest focusses on fungal secondary metabolites for the treatment of drug-resistant bacteria and non-communicable diseases. She received national recognitions including the TRF Senior Research Scholars (2008-2014), the Outstanding Researcher Award (2015) from the National Research Council of Thailand, the NSTDA Chair Professor (2015), and the Outstanding Scientist Award from the Thailand Toray Science Foundation (2017). Recently, she has been awarded the 2023 Outstanding Scientist Award from the Foundation for the Promotion of Science and Technology under the Patronage of H.M. the King. In addition, she has been listed as the World's Top 2% Scientists in the field of Medicinal and Biomolecular Chemistry by Stanford University, United States of America, since 2021.

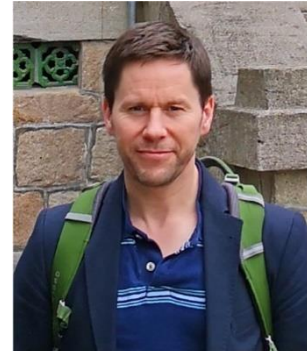


PLENARY SPEAKER: Prof. Dr. Anthony Laing

THE FIRST QUANTUM COMPUTERS AND THEIR APPLICATIONS

Anthony Laing*

Quantum Engineering and Technology Labs,
University of Bristol, UK
*e-mail: anthony.laing@bristol.ac.uk



Abstract:

Remarkable progress has been made in the development of quantum computing hardware. As a platform for quantum computing, integrated photonics has enabled significant leaps for integrating many components, including programmable circuitry, photon sources and detectors. However, fault tolerant digital quantum computing still appears to be a long way off for all platforms, including photonics. Yet there are reasons to be optimistic that intermediate scale photonic devices can achieve quantum advantage in solving certain interesting problems. We discuss these advances, including work to sharpen our understanding of where the boundary for quantum advantage lies. We also touch upon some of the fundamental hardware advances that could deliver fault tolerant quantum computing with photonics.

Anthony Laing is Professor of Physics at the University of Bristol and co-Director of its Quantum Engineering and Technology Labs. He held a 5-year EPSRC Fellowship in Quantum Technologies and currently leads the Photonics Work Package for the UK's Quantum Computing and Simulation Hub. He has pioneered photonic quantum technologies and their application to real world problems. In 2020 he co-founded *Duality Quantum Photonics* to industrialise photonic quantum technologies



PLENARY SPEAKER: Prof. Dr. John J. Mekalanos

CELL DENSITY-DEPENDENT DEATH TRIGGERED BY VIRAL PALINDROMIC DNA SEQUENCES

William P. Robins,* Bradley T. Meader, Jonida Toska,
John J. Mekalanos*

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john_mekalanos@hms.harvard.edu



Abstract:

Defense systems that recognize viruses have provided not only the tools of molecular biology but also important insights into other mechanisms that can induce immunity to these or other infectious agents including transmissible plasmids and chromosomal genetic elements. Several systems that trigger cell death upon viral infection have recently been recognized but the signals that activate these abortive infection systems remain largely unknown. Here we characterize one such system in *Vibrio cholerae* that we found was responsible for triggering cell-density dependent death (CDD) of bacterial cells in response to the presence of certain genetic elements. The key components of the CDD system include quorum-regulated components DdmABC and the host factor PriA. Our analysis indicates that the plasmid and phage signals that trigger CDD were palindromic DNA sequences that are predicted to form stem-loop hairpin structures from single-stranded DNA during stalled replication. Our results further suggest that other agents that generate damaged DNA can also trigger DdmABC/PriA activation and cell death probably through activation of a nuclease domain present in the DdmA protein. Thus, any infectious process that results in damaged DNA, particularly during DNA replication, can in theory trigger cell death through the DdmABC/PriA abortive infection system.

Professor John Mekalanos is the Adele H. Lehman Professor of the Department of Microbiology and Immunobiology at Harvard Medical School, Boston, MA, USA. He received the BA (Bacteriology) and Ph.D. (Microbiology) in 1974 and 1978, respectively from University of California, Los Angeles, USA. He has received many honors and elected to the National Academy of Sciences and the American Academy of Microbiology. His research interests include the genetic basis for microbial pathogenesis, virulence regulation, functional genomics, vaccine and drug development. His research group was among the first to apply genetic methods to the analysis of bacterial pathogenesis of diverse Gram-negative bacterial species. Although he has worked on a half a dozen different bacterial species, *Vibrio cholerae* has remained his passion and pleasure. He has been a member of the FDA Advisory Committee on Vaccines and Related Biologics and has consulted for numerous governmental and private agencies including the National Institutes of Health, the World Health Organization, The International Vaccine Institute, the National Academy of Sciences, Massachusetts Public Health Biological Laboratories, and the U.S.-Japan Cooperative Medical Science Program.

PLENARY SPEAKER: Dr. Dindo Campilan

NURTURING NATURE FOR A SUSTAINABLE FUTURE: CRITICAL CHALLENGES FOR BIODIVERSITY, CLIMATE AND THE ENVIRONMENT

Dindo Campilan*

International Union for Conservation of Nature (IUCN)

*e-mail: dindo.campilan@iucn.org



Abstract:

Our planet's sustainable future now demands urgent and decisive action for nature conservation. Biodiversity loss, climate change and environmental degradation are critical threats to human security in the next decades.

This presentation

1. Provides an overview on the triple planetary crisis of the environment, and why these need to be urgently addressed through integrated, holistic approaches.
2. Introduces goals and targets of global environmental agreements to frame national policy and practice.
3. Examines the scientific and empirical bases for nature-based solutions (NbS) in driving environmental change.
4. Identifies the strategic roles of research, academe and other knowledge stakeholders in facilitating partnerships among public, private and civil society sectors towards more informed decision-making and action.

IUCN, the world's largest and oldest environment organization, convenes and facilitates collaborative platforms in nurturing nature -- by promoting global environmental standards, assisting countries in setting targets and formulating action plans, and mobilizing capacities and resources to deliver outcomes -- for a sustainable future.

Dr. Campilan leads *IUCN in Asia and Oceania*, in serving 48 statutory countries through science-based knowledge, tools and solutions for the conservation and sustainable use of natural resources. IUCN is the world's largest, oldest and most diverse environment organization. (see [Asia | IUCN](#))

He manages a network of 15 regional and country offices for field implementation, capacity building and policy engagement covering: 1) biodiversity and ecosystem conservation, 2) nature-based solutions and climate action, 3) business and finance, and 4) environmental and natural resource management. Prior to joining IUCN in 2021, he served as:

- Asia Regional Director for the *CGIAR International Center for Tropical Agriculture/ Centro Internacional de Agricultura Tropical (CIAT)* based in Hanoi, Vietnam leading a program on climate-resilient agri-food systems, natural resource landscapes and commodity value chains, and
- Chief Technical Adviser/Manager for the *UN International Labour Organization (ILO)* based in Yangon, Myanmar leading a program on business continuity under climate, conflict and Covid-19 risks.

Dr. Campilan, a Philippine national, holds a PhD in Agriculture and Environment from Wageningen University, The Netherlands.



PLENARY SPEAKER: Prof. Dr. Pichaet Wiriyachitra

ByeByeHIV WITH THAI INNOVATION

Pichaet Wiriyachitra,^{1,*} Sirithip Wiriyachitra,¹ Siriporn Wonghiranyingyot,¹ Ampai Panthong,² Ganigah Ruanjahn,³ Souwalak Phongpaichit,⁴ Wilawan Mahabusarakam,⁴

¹ Asian Phytoceuticals Public Company Limited. Thailand

² Chiang Mai University, Thailand

³ Boromarajonani College of Nursing, Chiang Mai Thailand

⁴ Prince of Songkla University, Thailand

*e-mail: pw@apco.co.th and pwapco@gmail.com



Abstract:

ByeByeHIV is defined as the condition in which HIV/AIDS-infected individuals can reduce their HIV load to undetectable levels without the consumption of antiviral drugs and enjoy healthy living. It also refers to the condition where HIV infected individuals, who have consumed antiviral drugs as the treatment but can no longer tolerate the drugs' side effects, can stop taking the drugs and enjoy living a healthy life with undetectable HIV. *ByeByeHIV* innovation is composed of synergistic extracts from 5 types of edible plants, namely mangosteen, black sesame, soybean, guava and *Centella asiatica*. It has been proven effective in stimulating Th1 and Th17 cells which boosts the potency of Killer T cells to eliminate HIV-infected cells. It has also been proven to repair the telomere damage caused by HIV and the side effects of antiviral drugs. The innovation has successfully helped over 6,000 HIV/AIDS-infected individuals increase their CD4 count, decrease viral load, and improve their quality of life. In 2015, the first HIV-infected person volunteered to take the innovation instead of antiviral drugs. His HIV load dropped to an undetectable levels within 12 months and he remained in good health with undetectable HIV for the past 8 years. In 2022, the standard procedure to help HIV/AIDS-infected individuals achieve *ByeByeHIV* was established. In October 2023, 23 HIV-infected individuals have achieved *ByeByeHIV* without taking antiviral drugs. 25 HIV/AIDS patients who had taken antiviral drugs for 3-30 years have been able to stop taking antiviral drugs and still enjoy good health, the first person in the group has been off antiviral drugs for 36 months. The number of HIV/AIDS patients who have achieved *ByeByeHIV* continues to increase in Thailand. We are now advocating this *ByeByeHIV* innovation as the first safe and effective plant-based immunotherapy to benefit HIV/AIDS-infected individuals globally. In the presentation, there will be additional information on the mode of action of the innovation, the blood profiles both before and after and the time spent to achieve *ByeByeHIV* of the 48 infected individuals.

Professor Pichaet Wiriyachitra is the CEO of Asian Phytoceuticals Public Company Limited, a company listed in Stock Exchange of Thailand, to engage in research, development and commercialization of health products derived natural extracts. Dr. Pichaet received the BSc. Hons (Organic Chemistry) from University of Western Australia in 1970 and Ph.D. (Organic Chemistry) from University of Tasmania in 1972. He was a NIH Post-doctoral Fellow at University of Connecticut, America in 1974 and a NSF Post-doctoral Fellow at University of Pennsylvania, America in 1976. His research interests in the Prince of Songkla University and Chiang Mai University in Thailand include the development of Balancing Immunity (BIM) products for autoimmune symptoms and immune-deficient symptoms.

PLENARY SPEAKER: Prof. Dr. Gangasalam Arthanareeswaran

CARBON CAPTURE UTILIZATION AND STORAGE: PROGRESSING APPROACH, DEVELOPMENTS AND PROMISING ISSUES IN COMMERCIAL

Gangasalam Arthanareeswaran*

Membrane Research Laboratory, Department of Chemical Engineering, National Institute of Technology, Tiruchirappalli - 620015, Tamil Nadu, India

*e-mail: arthanaree10@yahoo.com



Abstract:

Carbon capture, utilization and storage (CCUS) is the technologies that permit the extenuation of carbon dioxide (CO₂) emissions from various sources such as refineries, power plants and industries, or the complete removal of CO₂ from the atmosphere. CO₂ removal helps for mitigation of climate change by removing CO₂ pollution directly from the atmosphere. Carbon removal technologies are direct air capture, scrubbing and membrane separation. The technologies for carbon capture are post-combustion; pre-combustion; and oxy-fuel combustion. The CO₂ can be captured and converted to ethanol, which can then be upgraded to gasoline. CO₂ can stored as structural and mineral storage, and the process is called 'dissolution storage'. According to the Global CCS Institute's 2022 report [1], there were 194 large-scale CCUS facilities globally and 30 of projects are in operation.

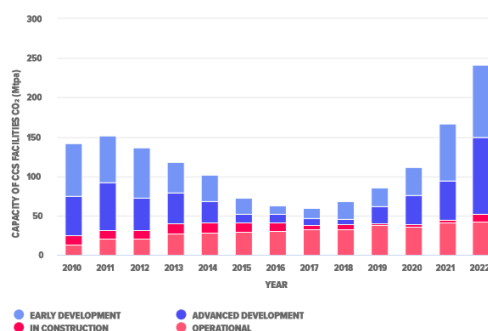


Figure 1: Pipeline of commercial facilities since 2010 by capture capacity (MTPA) [1]

Membrane Technology as an enabling solution with a key focus in dramatically increasing the permeability. This has been an active area of R&D for a long time but is now reaching the early-stage commercial trials. Amine scrubbing is the most typically employed which have many benchmark against, metal-organic frameworks (MOFs) and (COFs) are gaining significant force in the industry. Currently, advanced membranes are ready to deploy at scale, the necessary landscape may look very different. Hence, this plenary talk will discuss about CCUS in progressing approach, developments and promising issues in commercial

References

[1] <https://status22.globalccsinstitute.com>

Professor Gangasalam Arthanareeswaran was born in Jayankondam, India in 1973. He received the bachelor's degree in Engineering from Department of Chemical Technology, Bharathiyar University, India in 1997. He received the M.Tech. in Chemical engineering and Doctorate in Chemical Engineering, in 1999 and 2005, respectively from Anna University, India. From 2007 to present, he worked at Membrane Research Laboratory, Department of Chemical Engineering, National Institute of Technology, Tiruchirappalli, Tamil Nadu. India. His research interests in membrane materials and membrane process development for CO₂ removal, fuel cell, desalination, membrane distillation and membrane sensors



PROGRAM FOR SESSIONS, SYMPOSIUMS AND MEETINGS

JANUARY 23rd, 2024

MORNING PROGRAM

Session:	PLENARY SPEAKER		
Room:	CONFERENCE HALL, ROOM 1		
Chairperson:	Asst. Prof. Dr. Pruet Kalasuwan		
Time	ID	Speaker	Title
8:45-9:30	-	Anthony Laing	THE FIRST QUANTUM COMPUTERS AND THEIR APPLICATIONS

Session:	PLENARY SPEAKER		
Room:	CONFERENCE HALL, ROOM 2		
Chairperson:	Assoc. Prof. Dr. Pimonsri Mittraparp-arthorn		
Time	ID	Speaker	Title
8:45-9:30	-	John J. Mekalanos	CELL DENSITY-DEPENDENT DEATH TRIGGERED BY VIRAL PALINDROMIC DNA SEQUENCES

Session:	PLENARY SPEAKER		
Room:	CONFERENCE HALL, ROOM 6		
Chairperson:	Dr. Milica Stankovic		
Time	ID	Speaker	Title
8:45-9:30	-	Dindo Campilan	NURTURING NATURE FOR A SUSTAINABLE FUTURE: CRITICAL CHALLENGES FOR BIODIVERSITY, CLIMATE AND THE ENVIRONMENT



Session:	A - PHYSICS / APPLIED PHYSICS		
Room:	CONFERENCE HALL, ROOM 1		
Chairperson:	Dr. Suparek Aukkaravittayapun / Asst. Prof. Dr. Pruet Kalasuwan		
Time	ID	Speaker	Title
9:30-9:45	A_001	Poramat Chianvichai	OPTIMIZATION OF LINK-LEVEL QUANTUM NETWORK USING GENETIC ALGORITHM
9:45-10:00	A_002	Joewono Widjaja	DESIGN OF DIVERGENT BEAM-BASED SURFACE PLASMON RESONANCE SENSOR FOR MONITORING BACTERIAL BIOFILM FORMATIONS
10:00-10:15	A_003	Jeerasak Phu-arphit	MODIFICATION OF THE PUMP FIELD FOR ENHANCED SPONTANEOUS PARAMETRIC DOWN CONVERSION IN QUANTUM KEY DISTRIBUTION
10:15-10:30	A_004	Thanapat Phenvongsakul	SIMPLE PROTOCOL TO CREATE A SINGLE PHOTON SOURCE BY USING BBO FROM SPONTANEOUS PARAMETRIC DOWN-CONVERSION PROCESS IN BBO
BREAK			
10:45-11:00	A_005	Punthep Rattananupong	CHARACTERIZATION OF HYBRID WAVEGUIDE FOR THZ GUIDANCE
11:00-11:15	A_006	Pakin Tasee	EVALUATION OF ELIASHBERG GAP EQUATIONS FROM ANALYTIC SUMMATIONS AND BIG DATA FROM INDEPENDENT DFT WORKS
11:15-11:30	A_007	Sitthichok Samutchaiyakit	LOW-COST FIBER POLARIZATION CONTROLLERS BY 3D PRINTER
11:30-11:45	A_008	Thanchanok Lincharoen	ASSESSING THE INFLUENCE OF PHYSICAL DISTANCING AND FACE MASK USAGE ON RESPIRATORY VIRUS TRANSMISSION: A MATHEMATICAL MODELING STUDY
11:45-12:00	A_009	Thanyanan Somnam	SCIENTIFIC LITERACY LEARNING ACTIVITIES IN THE MODULUS OF ELASTICITY FOR SCIENCE HIGH SCHOOL STUDENTS USING AN EXPERIMENTAL SETUP TO MEASURE TENSILE STRESS AND STRAIN OF SOLID WIRES WITH A DIAL GAUGE



Session:	B - BIOLOGICAL SCIENCES		
Room:	CONFERENCE HALL, ROOM 2		
Chairperson:	Prof. Dr. Tavan Janvilisri		
Time	ID	Speaker	Title
9:30-10:00	B_INV01	Prasopchai Patrojanasophon	BIOADHESIVE MATERIALS FOR DRUG DELIVERY
10:00-10:15	B_001	Pattaree Payomhom	STUDY THE COMBINATION EFFECTS OF URSOLIC ACID ENCAPSULATION IN PLGA/CS NANOPARTICLES IN BREAST CANCER CELLS
10:15-10:30	B_002	Sopon Nuchpun	SYNTHESIS, CHARACTERIZATION, AND IN VITRO STUDY OF RIBOFLAVIN-FUNCTIONALIZED SUPERPARAMAGNETIC IRON OXIDE NANOPARTICLES IN BREAST CANCER CELLS
BREAK			
10:45-11:00	B_003	Tanyarath Utaipan	ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF ENCAPSULATED ANTHROCYANIN-RICH EXTRACT FROM SILK OF <i>Zea mays L.</i> CULTIVAR SIAM RUBY QUEEN CORN
11:00-11:15	B_004	Pemi Perisnawati	THE EFFECT OF CINNAMON (<i>Cinnamomum burmannii</i>) BARK EXTRACT ON MALONDIALDEHYDE LEVELS, CATHALASE ACTIVITY AND HISTOPATHOLOGICAL FEATURES OF THE PANCREATIC IN HYPERGLYCEMIA RATS
11:15-11:30	B_005	Sara Shoaib	IN VITRO ANTI-CANCER EFFECTS OF PHARMACOLOGICAL ASCORBATE AGAINST GLIOBLASTOMA



Session:	B - BIOLOGICAL SCIENCES		
Room:	CONFERENCE HALL, ROOM 6		
Chairperson:	Assoc. Prof. Dr. Oramas Suttinun Co-chair: Dr. Yadarat Suwanmanee		
Time	ID	Speaker	Title
9:30-10:00	B_INV02	Benjamas Cheirsilp	ZERO-WASTE BIOREFINERY OF AGRO-INDUSTRIAL WASTES INTO BIOFUELS THROUGH OLEAGINOUS MICROORGANISMS AND EFFICIENT TECHNIQUES
10:00-10:15	B_006	Chanokporn Muangchinda	ENHANCED BIODEGRADATION OF LOW-DENSITY POLYETHYLENE USING THEMOPHILIC BACTERIA WITH THE ADDITION OF CO-SUBSTRATE
10:15-10:30	B_007	Lela Susilawati	COMPOSITION OF CULTIVABLE BACTERIAL COMMUNITY ON JAPANESE SPECIES OF FROG <i>Buergeria buergeri</i> SKIN DURING DEVELOPMENTAL LIFE-STAGES
BREAK			
10:45-11:00	B_008	Kanok-Orn Mayer	EFFICACY OF ROYAL JELLY FOR INHIBITION OF FREE RADICAL AND HERPES SIMPLEX VIRUS TYPE 1 INFECTION
11:00-11:15	B_009	Ploy Nantapisit	THE EXPRESSION OF WUHAN AND XBB.1.5 N-TERMINAL DOMAIN (NTD) AND RECEPTOR BINDING DOMAIN (RBD) PROTEINS IN <i>Escherichia coli</i> (<i>E. coli</i>)
11:15-11:30	B_010	Maturin Natesungnoen	EVALUATING THE ANTIOXIDANT CAPACITY AND ANTICANCER ACTIVITY OF CAROTENOID EXTRACTS FROM THE <i>Cyanobacteria Synechocystis</i> sp. PCC 6803 OVEREXPRESSING CAROTENOID BIOSYNTHETIC GENES



Session:	C - CHEMISTRY		
Room:	CONFERENCE HALL, ROOM 3		
Chairperson:	Assoc. Prof. Dr. Weena Siangproh / Assoc. Prof. Dr. Ekasith Somsook Co-Chair: Assoc. Prof. Dr. Apon Numnuam / Dr. Teerapong Pirojsirikul		
Time	Title	Speaker	Title
9:30-10:00	C_INV01	Rodjana Burakham	BIOBASED MOLECULARLY IMPRINTED POLYMERS: DESIGN, SYNTHESIS AND APPLICATIONS FOR SELECTIVE ENRICHMENT OF PESTICIDES FROM REAL SAMPLES
10:00-10:30	C_INV02	Nopporn Thasana	LC-MS AND NMR-BASED METABOLOMICS ANALYSIS OF SELAGINELLA PLANTS: DISCOVERY OF BIOACTIVE BIFLAVONOIDS AND CHEMOTAXONOMIC MARKERS
BREAK			
10:45-11:15	C_INV03	Thanyada Rungrotmongkol	RENOLUTIONIZING ANTI-CANCER DRUG DESIGN AND SCREENING
11:15-11:30	C_001	Yuki Akaba	DEVELOPMENT OF MINIATURIZED BIOSENSOR FOR A SWEAT CONTENT MONITORING SYSTEM
11:30-11:45	C_002	Toyin Ayandokun	STRUCTURAL MODIFICATION OF CHRYSIN AND THEIR α -GLUCOSIDASE INHIBITORY ACTIVITY
11:45-12:00	C_003	Jonas Karl Christopher Agutaya	ELUCIDATION OF THE ETHANOL GAS SENSING MECHANISM OF ZnO USING A COMBINED DRIFTS AND DFT APPROACH
12:00-12:15	C_004	Nuttakorn Junlapak	AN AMPEROMETRIC SENSOR BASED ON NANODENDRITRIC POROUS COPPER DECORATED ON AN ORDERED MESOPOROUS CARBON MODIFIED ELECTRODE FOR SENSITIVE DETECTION OF NO ₃ ⁻
12:15-12:30	C_005	Phanumas Yomthiangthae	UNMODIFIED SCREEN-PRINTED CARBON ELECTRODE FOR DETECTION OF PROLINE IN HONEY



Session:	D - MATHEMATICS / STATISTICS / COMPUTER SCIENCE / DATA SCIENCE / AI		
Room:	CONFERENCE HALL, ROOM 4		
Chairperson:	Assoc. Prof. Dr. Chartchai Leenawong		
Time	ID	Speaker	Title
9:30-10:00	D_INV01	Piyapatr Busababodhin	PREDICTING THE UNPREDICTABLE: EXTREME VALUE THEORY AT THE NEXUS OF CLIMATE ACTION, SUSTAINABLE INFRASTRUCTURE, AND TECHNOLOGICAL INNOVATION
10:00-10:30	D_INV02	Chadaporn Keatmanee	AN ENHANCED THYROID CANCER ASSESSMENT USING ULTRASOUND IMAGES BASED ON CLINICAL PRACTICE IN THAILAND
BREAK			
10:45-11:15	D_INV03	Porawat Visutsak	DEEP LEARNING APPLICATIONS TO TANGIBLE CULTURAL HERITAGE
11:15-11:30	D_001	Kittimasak Najjit	UTILIZING CLOUD COMPUTING FOR EFFICIENT MANAGEMENT OF BLOCKCHAIN-BASED JUDGING COMPETITIONS IN TAEKWONDO POOMSAE
11:30-11:45	D_002	Patitta Suksomboon	APPLICATION OF LINE CHATBOTS TO SUPPORT IT MAINTENANCE TASKS



Session:	E - ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY		
Room:	CONFERENCE HALL, ROOM 5		
Chairperson:	Assoc. Prof. Dr. Chanatip Samart Co-Chair: Asst. Prof. Dr. Pungtip Kaewtubtim		
Time	ID	Speaker	Title
9:30-10:00	E_INV01	Guoqing Guan	DEVELOPMENT OF HOLLOW STRUCTURED HZSM-5 BASED CATALYSTS FOR BIO-OIL UPGRADING
10:00-10:30	E_INV02	Seiji Yamazoe	CO ₂ CAPTURE FROM AIR AND CATALYTIC CO ₂ CONVERSIONS USING METAL OXIDE CLUSTERS
BREAK			
10:45-11:00	E_001	Naphatsorn Udompala	NANOPOROUS CORE SHELL ACTIVATED CARBON PRODUCED FROM PALMYRA PALM FIBER WASTE AS SORBENT FOR CAPTURING CARBON DIOXIDE
11:00-11:15	E_002	Krit Nopparee	NANOPOROUS CARBON DERIVED FROM DURIAN HUSK WASTE VIA HYDROTHERMAL CARBONIZATION
11:15-11:30	E_003	Monthakan Chanthip	CO-HYDROTHERMAL CARBONIZATION OF BREWERY WASTE AND POLYSTYRENE PACKING WASTE FOR HIGH-QUALITY SOLID BIOFUEL PRODUCTION
11:30-11:45	E_004	Nureeyah Madbinhead	POSSIBILITY STUDY OF DRIED SAMANEA (BENTH.) MERR. AS ALTERNATIVE SOLID BIOFUEL TO REDUCE WASTE DISPOSAL
11:45-12:00	E_005	Samsudeen Naina Mohamed	MOS ₂ -IMPREGNATED FeO-BIOCHAR COMPOSITE AS A NOVEL ANODE CATALYST IN MICROBIAL ELECTROLYSIS CELL FOR H ₂ PRODUCTION
12:00-12:15	E_006	Ghina Putri	HYDROGEN SEPARATION USING ASYMMETRIC MIXED PROTON-ELECTRON CONDUCTING GRAPHENE OXIDE MEMBRANE
12:15-12:30	E_007	Udomphan Nacksriphod	A COMPARISON OF ATMOSPHERIC CARBON DIOXIDE CONCENTRATIONS BETWEEN GROUND - AND SATELLITE - BASED MEASUREMENTS AT LULIN ATMOSPHERIC BACKGROUND STATION (LABs), TAIWAN



Symposium:	BCG ECONOMY WITH SUSTAINABLE MATERIALS		
Room:	SEMINAR ROOM A3		
Chairperson:	TBA		
Time	ID	Speaker	Title
10:00-11:40	-	-	BCG ECONOMY WITH SUSTAINABLE MATERIALS
BREAK			



AFTERNOON PROGRAM

Session:	SCIENCE DEANS & CHAIR & KEYNOTE/PLENARY/INVITED SPEAKER RECEPTION		
Room:	RACHAWADEE, BURI SRIPHU HOTEL		
Time	ID	Speaker	Title
17:30-19:00	-	-	RECEPTION



JANUARY 24th, 2024

MORNING PROGRAM

Session:	PLENARY SPEAKER		
Room:	CONFERENCE HALL, ROOM 2		
Chairperson:	Assoc. Prof. Dr. Suda Chakthong		
Time	ID	Speaker	Title
8:45-9:30	-	Pichaet Wiriyachitra	<i>ByeByeHIV</i> WITH THAI INNOVATION

Session:	POSTER PRESENTATION – SESSION / SYMPOSIUM / YRSS / JYRSS		
Room:	HALLWAY, CONVENTION HALL		
Time	ID	Speaker	Title
10:00-12:00	-	-	POSTER PRESENTATION



Session:	A - PHYSICS / APPLIED PHYSICS		
Room:	CONFERENCE HALL, ROOM 1		
Chairperson:	Assoc. Prof. Dr. Chatchai Putson / Asst. Prof. Dr. Narakorn Kaewkhao		
Time	ID	Speaker	Title
9:30-10:00	A_INV01	Viyada Harnchana	CEMENT BASED TRIBOELECTRIC NANOGENERATOR FOR LARGE SCALE ENERGY HARVESTING
10:00-10:30	A_INV02	Pongsakorn Kanjanaboos	THIN FILMS FOR SUSTAINABLE DEVELOPMENTS: SOLAR CELL, LIGHT EMITTING DIODE, PHOTODETECTOR, AND RADIATIVE COOLING FILM
BREAK			
10:45-11:15	A_INV03	Salinporn Kittiwatanakul	INTERESTING OXIDE THIN FILMS: FROM ELECTRONICS TO SPINTRONICS
11:15-11:30	A_010	Kittitee Ketma	THE DESIGN OF HOLLOW CORE WITH NESTED ANTI-RESONANCE TUBE FOR CARBON DIOXIDE DETECTION
11:30-11:45	A_011	Kanokwan Homdee	A TONER-PRINT REMOVAL FROM PAPER USING LONG PULSED LASERS
11:45-12:00	A_012	Jidapa Lumpapiwat	APPLICATION OF LOW COST AND LOW PRECISION LASER-SCRIBED CAPACITOR SENSORS
12:00-12:15	A_013	Khanittha Sawaddee	A STUDY OF POST-WELD LASER CLEANING ON 304 STAINLESS STEEL
12:15-12:30	A_014	Rosmamuhamadani Ramli	THE EFFECT OF POURING TEMPERATURE AND STIRRING SPEED ONTO MECHANICAL BEHAVIOUR OF Al-MMCs COMPOSITE ALLOYS



Session:	B - BIOLOGICAL SCIENCES		
Room:	CONFERENCE HALL, ROOM 2		
Chairperson:	Dr. Rujira Deewatthanawong		
Time	ID	Speaker	Title
9:30-10:00	B_INV03	Sumate Chairapat	IMPROVING ORGANIC BIOCONVERSION TO BIOFUEL BY PHYSICOCHEMICAL PRETREATMENTS
10:00-10:15	B_011	Ekawan Luepromchai	ENHANCED BIODEGRADATION OF PLA PLASTIC BY PRETREATMENT AND BIOAUGMENTATION
10:15-10:30	B_012	Katakrit Chaisuwan	CHARACTERIZATION OF NUCLEUS ACCUMBENS' LOCAL FIELD POTENTIAL AND PHASE-AMPLITUDE COUPLINGS OF MICE IN RESPONSE TO HIGH-PLATFORM INDUCED ACUTE STRESS
BREAK			
10:45-11:00	B_013	Ryan Rasoarahona	IMPROVING MICROSATELLITE MARKER PANELS FOR GENETIC DIVERSITY AND POPULATION STUDIES USING AN ANT COLONY ALGORITHM AND POLYMORPHIC INFORMATION CONTENT
11:00-11:15	B_014	Rauza Sukma Rita	PROTECTIVE EFFECTS OF ASCORBIC ACID AND JAMBLANG (<i>Syzygium cumini</i>) LEFT EXTRACT ON BLOOD BIOCHEMICAL PARAMETERS IN LEAD-ACETATE-EXPOSED RATS
11:15-11:30	B_015	Sorawit Tongyib	DEVELOPING PREDICTION MODEL FOR THE PREOPERATIVE DIAGNOSIS OF OVARIAN CANCER USING TUMOR MARKER, COMPLETE BLOOD COUNT AND LIVER FUNCTION TESTS



Session:	B - BIOLOGICAL SCIENCES		
Room:	EXHIBITION HALL B1		
Chairperson:	Asst. Prof. Dr. Kringpaka Wangkulangkul		
Time	ID	Speaker	Title
9:30-10:00	B_INV04	Zulfigar Yasin	EMPOWERING COASTAL COMMUNITIES THROUGH SOCIAL INNOVATION FOR SUSTAINABLE DEVELOPMENT
10:00-10:15	B_016	Imran Parvez	DETECTION OF F1 FISH HYBRIDS USING MITOCHONDRIAL DNA MARKERS: APPROACH FOR GENETIC MANAGEMENT OF AQUACULTURE IN BANGLADESH
10:15-10:30	B_017	Thitipong Panthum	IMPLICATION OF REDUCED GENETIC DIVERSITY ON NORTH AFRICAN CATFISH IN THAILAND
BREAK			
10:45-11:00	B_018	Phurich Boonsanit	INVESTIGATING THE ENVIRONMENTAL PHYSIOLOGY OF THE SESARMID CRAB <i>Episesarma mederi</i> (H. MILNE EDWARDS, 1853): WHAT HAVE WE LEARNT? AND FURTHER DIRECTIONS
11:00-11:15	B_019	Anh Huynh Luu	SIGNATURE OF SELECTION ANALYSIS PROVIDE INSIGHT INTO THERMAL STRESS, PURINE CONTENT, AND IMMUNITY SELECTION IN THAI FIGHTING CHICKEN BREEDS: A CONSEQUENCES FROM HUMAN-MADE SELECTION
11:15-11:30	B_020	Dominic Kwesi Quainoo	GENETIC INSIGHTS FOR THAI ASIAN ELEPHANTS (<i>Elephas maximus</i>): ENHANCING INDIVIDUAL IDENTIFICATION FOR EFFECTIVE PROTECTION AGAINST ILLEGAL TRADE
11:30-11:45	B_021	Dawn Cook	THE FIRST RECORD OF MULTI-MALE MATING BEHAVIOR OF ORNATE FLYING SNAKE, <i>Chrysopelea ornate</i> AT PHA-GNAN AND SAMUI ISLANDS, THAILAND



Session:	C - CHEMISTRY		
Room:	CONFERENCE HALL, ROOM 3		
Chair person:	Assoc. Prof. Dr. Thanyada Rungrotmongkol / Assoc. Prof. Dr. Rodjana Burakham Co-Chair: Asst. Prof. Dr. Nararak Leesakul/ Assoc. Prof. Dr. Apon Numnuam		
Time	ID	Speaker	Title
9:30-10:00	C_INV04	Ekasith Somsook	OXIDATION OF HMF AND FURFURAL
10:00-10:15	C_006	Boosayarat Tomapatanaget	FLUOROGENIC SENSING MATERIALS FOR DETECTION OF LONG-CHAIN ALDEHYDES
10:15-10:30	C_007	Natthakit Singhanatkaisi	DENSITY FUNCTIONAL THEORY INVESTIGATION ON DYE ADSORPTIVITY OF MCM-41 MESOPOROUS MATERIALS
BREAK			
10:45-11:15	C_INV05	Weena Siangproh	NOVEL SENSING APPROACH AND MATERIALS BASED ON GRAPHENE-AMINO ACID THIN FILM: POTENTIAL FOR ELECTROANALYSIS
11:15-11:30	C_008	Supapich Romportong	FLOW INJECTION AMPEROMETRIC SENSOR BASED ON REDUCED GRAPHINE OXIDE MODIFIED ON A SCREEN-PRINTED CARBON ELECTRODE FOR CONTINUOUS SALICYLIC ACID DETECTION IN COSMETIC AND PHARMACEUTICAL SAMPLES
11:30-11:45	C_009	Pichamon Masnguluem	DESIGN AND SYHTHESIS OF NOVEL BENZIMIDAZOLE-TRIAZOLE DERIVATIVES FOR EVALUATION OF ANTIOXIDANT ACTIVITY



Session:	D - MATHEMATICS / STATISTICS / COMPUTER SCIENCE / DATA SCIENCE / AI		
Room:	CONFERENCE HALL, ROOM 4		
Chairperson:	Assoc. Prof. Dr. Klairung Samart / Dr. Kittimasak Naijit		
Time	ID	Speaker	Title
9:30-10:00	D_INV04	Detchat Samart	DYNAMICS IN NUMBER THEORY
10:00-10:15	D_003	Tammarat Kleebmek	OPTIMIZATION METHODS FOR SOLVING VEHICLE ROUTING PROBLEMS WITH UNIFORMLY DISTRIBUTED CUSTOMER DEMAND
10:15-10:30	D_004	Prarinwaris Pangprasertgul	THE DEVELOPMENT OF PROGRAM FOR DETERMINING THE OPTIMAL ROUTE FOR TAKING THE PHOTHONG BUS IN PHUKET
BREAK			
10:45-11:00	D_005	Chinnapong Angsuchotmetee	A CLOSENESS CENTRALITY BASED GRAPH CLUSTERING METHOD : APPLICATION IN URBAN TOURISM PLANNING
11:00-11:15	D_006	Pentham Yothawut	A MODIFIED PROJECTIVE BI-INERTIAL FORWARD-BACKWARD SPLITTING ALGORITHM FOR DETECTING BONE MINERAL DENSITY
11:15-11:30	D_007	Sathit Prasomphan	USING AUGMENTED REALITY TECHNOLOGY IN LEARNING STATUES DEPICTING A THAI MASSAGE (NUAD BORAN) IN WAT PHO
11:30-11:45	D_008	Chakarach Mekkrua	SCREENING OSTEOPOROSIS IN ELDERLY USING A NEW TWO INERTIAL PROJECTIVE FORWARD-BACKWARD SPLITTING ALGORITHM



Session:	E - ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY		
Room:	CONFERENCE HALL, ROOM 5		
Chairperson:	Prof. Dr. Pitsanupong Kanjanapayont Co-Chair: Assoc. Prof. Dr. Prasert Reubroycharoen / Dr. Mati Horprathum		
Time	ID	Speaker	Title
9:30-10:00	E_INV03	Chinnathan Areeprasert	BIOCOAL PRODUCTION FROM WASTE AND BIOMASS BY HYDROTHERMAL CARBONIZATION
10:00-10:30	E_INV04	Supareak Prasertthdam	COMPUTATIONAL CATALYSIS ENGINEERING FOR HETEROGENEOUS CATALYST DESIGN AND CATALYTIC PROCESS OPTIMIZATION
BREAK			
10:45-11:00	E_008	Piyakorn Preedeesanith	PETROGRAPHY AND GEOCHEMISTRY CHARACTERISTICS OF LIMESTONE, BAN DAN CHANG SUB-DISTRICT, NA KLANG DISTRICT, NONG BUA LAMPHU PROVINCE
11:00-11:15	E_009	Kanokpon Suriyamorn	APPLICATION OF THE XRF CORE SCANNER TO ASSESS THE ENVIRONMENTAL CHANGES IN SOUTHERN THAILAND
11:15-11:30	E_010	Panus Hong	PETROLEUM SOURCE ROCK ASSESSMENT OF THE WANG SAPHUNG FORMATION, LOEI PROVINCE, NORTHEASTERN THAILAND
11:30-11:45	E_011	Sirirat Khamsaeng	STRUCTURAL EVOLUTION OF STRIKE-SLIP FAULTS IN A TRIASSIC FOLD-THRUST BELT IN THE BOWEN BASIN, EASTERN QUEENSLAND, AUSTRALIA
11.45-12.00	E_012	Kriengkri Ridpet	ASSESSMENT AND FORECASTING OF MONTHLY AVERAGE SOLAR RADIATION IN SONGKHLA PROVINCE USING ARTIFICIAL NEURAL NETWORK



Session:	F - FOOD SCIENCE AND TECHNOLOGY / AGRICULTURAL SCIENCE		
Room:	CONFERENCE HALL, ROOM 6		
Chairperson:	Assoc. Prof. Dr. Yuthana Phimolsiripol Co-Chair: Assoc. Prof. Dr. Jutarut Iewkittayakorn		
Time	ID	Speaker	Title
9:30-10:00	F_INV01	Mohamad Suffian bin Mohamad Annuar	ENZYME-LINKED CARBON NANOTUBES COMPOSITE FOR CATALYTIC AMPLIFICATION OF ANTIOXIDATIVE POTENTIAL IN GREEN TEA EXTRACT
10:00-10:30	F_INV02	Kornsorn Srikulnath	SIAM CHICKEN: BUILDING RESILIENT COMMUNITIES THROUGH GENETIC WEALTH
BREAK			
10:45-11:00	F_001	Jaruwan Maneesri	USING OF <i>Lactobacillus plantarum</i> TISTR 2084 STARTER POWDER TO MAKING CURD MILK WITH PREBIOTIC
11:00-11:15	F_002	Nasreen Zahedeng	EFFECT OF COCONUT PROTEIN POWDER ADDITION ON SOYMILK YOGURT USING <i>Lactobacillus plantarum</i> TISTR 2084: EVALUATION OF PHYSICOCHEMICAL
11:15-11:30	F_003	Aysha Akhtar	EVALUATION OF LACTIC AND FORMIC ACIDS IN SILAGE PRODUCTION FROM VISCERA OF ATLANTIC REDFISH (<i>Sebastes norvegicus</i> ; Ascanius, 1772)
11:30-11:45	F_004	Janice C. Laforteza	DEVELOPMENT OF INNOVATIVE MANGO- BASED FUNCTIONAL PRODUCTS
11:45-12:00	F_005	Lamai Maikaeo	TISSUE CULTURE OF CANNABIS 'MANGO HYBRID' VARIETY



Symposium:	SP1 – FOOD SAFETY AND PRECISION AGRICULTURE		
Room:	EXHIBITION HALL B3		
Chairperson:	Asst. Prof. Dr. Jongdee Nopparat		
Time	ID	Speaker	Title
9:00-9:10	-	-	OPENING REMARK
9:10-9:40	SP1_INV01	Kittiya Shearman	METROLOGY IN FOOD SAFETY
9:40-10:10	SP1_INV02	Vanicha Vichai	FROM MICROBIAL DIVERSITY TO SUSTAINABLE SOLUTIONS IN AGRICULTURE
BREAK			
10:30-11:00	SP1_INV03	Warakorn Limbut	SMART NITRITE SENSOR FOR FOOD SAFETY AND PRECISION AGRICULTURE
11:00-11:30	SP1_INV04	Wanilada Rungrassamee	EXPLOITING THE POWER OF THE GUT MICROBIOME TO IMPROVE SHRIMP HEALTH AND PRODUCTIVITY
11:30-12:00	SP1_INV05	Maysaya Thitisaksakul	DECIPHERING RICE GROWTH AND PRODUCTIVITY UNDER SALINITY STRESS – FROM METABOLIC PROGRAMMING TO POSTHARVEST GRAIN QUALITY

Symposium:	SP3 - TRANSFORMING SCIENCE EDUCATION IN THE PANDEMIC ERA		
Room:	Bsc.0705, FACULTY OF SCIENCE		
Chairperson:	Assoc. Prof. Dr. Suttida Rakkapao		
Time	ID	Speaker	Title
09:00-09:15	SP3_001	Sheau Huey Chong	POST-PANDEMIC IMPACT ON A PRIVATE UNIVERSITY IN MALAYSIA: ADAPTING STRATEGIES FOR SUSTAINABLE EDUCATION IN CHEMISTRY
09:15-12:00	SP3_INV01	Panu Thainirarnit Wissarut Phayphung	Workshop (TH) มาตามหาความเร็วเสียงในอากาศด้วยอาร์ดุยโน



Symposium:	SP4 - ENERGY FOR THAILAND - FOR TOMORROW AND BEYOND		
Room:	SEMINAR ROOM A1		
Link ZOOM:	https://zoom.us/j/9990018102 (Zoom ID: 9990018102)		
Chairperson:	Asst. Prof. Dr. Boonyarit Chatthong		
Time	ID	Speaker	Title
9:30-9:45	SP4_001	Nopporn Poolyarat	THAILAND TOKAMAK-1 OPERATION AND RESULTS FROM THE FIRST COMMISSIONING PERIOD
9:45-10:00	SP4_002	Arlee Tamman	HCN INTERFEROMETER: ADVANCED TECHNIQUE FOR PLASMA DENSITY MEASUREMENT IN TT-1 AND EARLY RESULTS
10:00-10:15	SP4_003	Danis Klanurak	EFFECTS OF NEOCLASSICAL AND ANOMALOUS TRANSPORTS ON ELMs DYNAMICS BASED ON THREE-FIELD BIFURCATION MODEL
BREAK			
10:30-11:00	SP4_INV01	Yasuhiro Suzuki	PERSPECTIVES OF FUSION ENERGY DEVELOPMENT FROM UNIVERSITY-SCALE DEVICE
11:00-11:15	SP4_004	Rahul Chakraborty	ETB FORMATION AND L-H TRANSITION IN TURBULENT MAGNETO-CONFINED PLASMA
11:15-11:30	SP4_005	Thiti Aungcharoen	THE EFFECTS OF ZONAL FLOW DAMPING ON LIMIT-CYCLE OSCILLATIONS DURING L-I-H TRANSITION
11:30-11:45	SP4_006	Rattacha Boonchoo	EXPLORING THE IMPACT OF MAGNETIC POLYWELL CONFIGURATIONS ON ELECTRON CONFINEMENT
11.45-12.00	SP4_007	Jintana Pakdeewanich	SIMULATION STUDY OF STREAMER MODEL OF AN ATMOSPHERIC PRESSURE NITROGEN DIELECTRIC BARRIER DISCHARGE (DBD) AT BODY TEMPERATURE TO GENERATE AMINE GROUPS ON POLYSTYRENE



Symposium:	SP5 - ENVIRONMENTALLY FRIENDLY RUBBER AND ITS FUTURE		
Room:	SEMINAR ROOM A4		
Chairperson:	Assoc. Prof. Dr. Nitinart Saetung Co-Chair: Assoc. Prof. Dr. Ekwipoo Kalkornsurapranee Co-Chair: Assoc. Prof. Dr. Anoma Thitithammawong Co-Chair: Assoc. Prof. Dr. Skulrat Pichaiyut Co-Chair: Asst. Prof. Dr. Tulyapong Tulyapita		
Time	ID	Speaker	Title
9:00-9:40	SP5_INV01	Kannika Sahakaro	SCIENCE AND TECHNOLOGY BEHIND THE SILICA-BASED LOW ROLLING RESISTANCE TIRES
9:40-10:00	SP5_001	Nathapong Sukhawipat	NATURAL RUBBER-MODIFIED POLY(ETHYLENE GLYCOL) METHYL ETHER METHACRYLATE ELASTOMERIC SEMI-IPN FOR METHYLENE BLUE DYE ADSORPTION
10:00-10:20	SP5_002	Rawiporn Promsung	PIEZORESISTIVE BEHAVIOR OF FLEXIBLE STRAIN SENSORS BASED ON NATURAL RUBBER COMPOSITES: EFFECTS OF SENSOR SHAPES AND DIMENSIONS
BREAK			
10:40-12:00	SEMINAR DISCUSSION ON THE TOPIC OF "THE IMPORTANCE OF USING KNOWLEDGE IN NATURAL RUBBER SCIENCE AND TECHNOLOGY FOR THE FUTURE EARTH"		
	Moderator >	Mr. Iyaporn Kajornchaiyakul	
	Speaker >	Wannee Putkaew Director, Industrial Promotion Center Region 11 Rungroat Boonsom R&D Manager, Plan Creation Co.th Kannika Sahkaro Dean, Faculty of Science and Technology, Prince of Songkla University Sakulrat Pichaiyut Lecturer, Faculty of Science and Industrial Technology, Prince of Songkla University Akarapong Tuljitrarnorn Ph.D student, Faculty of Science, Prince of Songkla University	



Symposium:	SP6 - IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND ENVIRONMENT INCLUDING THE STRATEGIES TO TACKLE SUCH ISSUES		
Room:	EXHIBITION HALL B4		
Chairperson:	Assoc. Prof. Dr. Anchana Prathep		
Time	ID	Speaker	Title
9:30-10:00	SP6_INV01	Natapol Thongplew	DEVELOPING A STUDY SITE FOR TEAL CARBON - A FRESHWATER ECOSYSTEM
10:00-10:30	SP6_INV02	Sapit Diloksumpun	IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND ENVIRONMENT
BREAK			
10:45-11:15	SP6_INV03	Milica Stankovic	COASTAL ECOSYSTEMS AS NATURE-BASED SOLUTIONS
11:15-11:45	-	Anchana Prathep	DISCUSSION

Symposium:	SP8 - X-RAY CRYSTALLOGRAPHY		
Room:	SEMINAR ROOM A2		
Chairperson:	Prof. Dr. Nongnuj Muangsin Co-Chair: Assoc. Prof. Dr. Kuakarun Krusong Co-Chair: Assoc. Prof. Dr. Kittipong Chainok		
Time	ID	Speaker	Title
9:30-10:00	SP8_INV01	Christoph Janiak	SPECIAL PROBLEMS IN METAL-ORGANIC FRAMEWORK (MOF) CRYSTALLOGRAPHY
10:00-10:30	SP8_INV02	Yudhi Nugraha	COMPARATIVE ANALYSIS OF X-RAY CRYSTALLOGRAPHY AND CRYO-ELECTRON MICROSCOPY (CRYO-EM) IN PROTEIN STRUCTURE DETERMINATION
BREAK			
10:45-11:15	SP8_INV03	Yee Seng Tan	REVERSIBLE STRUCTURAL TRANSFORMATION BETWEEN SUPRAMOLECULAR ISOMER AND RESPECTIVE [2+2] CYCLOADDITION
11:15-11:30	SP8_001	Nanthawat Wannarit	SYNTHESIS, CHARACTERIZATION, CRYSTAL STRUCTURES AND PHOTOCATALYSIS OF NEW CADMIUM(II) COORDINATION POLYMERS CONSTRUCTED FROM PSEUDOHALIDE AND IMIDAZOLE-CONTAINING LIGANDS
11:30-11:45	SP8_002	Chien Ing Yeo	UNVEILING HALOGEN BOND IN THE PLAY: CO-CRYSTALS OF 1,4-DIIODOTETRAFLUOROBENZENE
11:45-12:00	SP8_003	Mr. Pacharapon Jearanaiwivat	X-RAY CRYSTALLOGRAPHIC STRUCTURE OF COPPER(II)-SQUARATE FRAMEWORK



Symposium:	SP9 – RADIOECOLOGY AND ENVIRONMENTAL RADIOACTIVITY		
Room:	SEMINAR ROOM A3		
Chairperson:	Dr. Yutthana Tumnoi Co-Chair: Dr. Wipada Ngansom		
Time	ID	Speaker	Title
9:00-9:30	SP9_INV01	Kiattipong Kamdee	APPLICATION OF ISOTOPE TECHNIQUES FOR GROUNDWATER STUDIES IN THAILAND
9:30-10:00	SP9_INV02	Shinji Tokonami	UPDATES OF DOSE CONVERSION FACTORS FOR RADON ISOTOPES (^{222}Rn and ^{220}Rn) AND THEIR HISTORICAL OVERVIEW
10:00-10:30	SP9_INV03	Rawiwan Kritsananuwat	A SURVEY OF NATURALLY OCCURRING RADIOACTIVE MATERIALS IN ENVIRONMENTAL SAMPLES AND PROCESSED MATERIALS FROM THAI MINERAL INDUSTRIES
BREAK			
10:45-11:00	SP9_001	Saroh Niyomdecha	RADIOLOGICAL RISK ASSESSMENT OF ABANDONED TIN MINES IN PHUKET AND SONGKHLA PROVINCES
11:00-11:15	SP9_002	Thawatchai Itthipoonthanakorn	DEPOSITION OF Cs-137 IN FOREST SOIL OF THAILAND
11:15-11:30	SP9_003	Varalee Kongcharoen	RADIOACTIVITY MEASUREMENT IN JAPAN-IMPORTED SEAFOOD BEFORE AND AFTER THE RELEASE OF THE ALPS-TREATED WATER
11:30-11:45	SP9_004	Pimchanok Nakchuai	MEASUREMENT OF EXTERNAL GAMMA DOSE RATES AND ASSESSMENT OF SEASONAL VARIATION AND ANNUAL EFFECTIVE DOSE AROUND THE RADIATION MONITORING STATIONS IN THAILAND
11.45-12.00	SP9_005	Dumrongsak Rodphothong	THE COMPUTATIONAL FLUID DYNAMICS (CFD) MODELING FOR NUMERICAL STUDY ON RADON CONCENTRATION AND VENTILATION EFFECTS IN LIVING AREAS WITHIN A SINGLE-STORY HOUSE

Session:	MEETING OF THE STT50 COMMITTEE		
Room:	SEMINAR ROOM A8		
Time	ID	Speaker	Title
10:00-12:00	-	-	MEETING



AFTERNOON PROGRAM

Session:	PLENARY SPEAKER		
Room:	CONFERENCE HALL, ROOM 5		
Chairperson:	Asst. Prof. Dr. Wirach Taweepreda		
Time	ID	Speaker	Title
13:15-14:00	-	Gangasalam Arthanareeswaran	CARBON CAPTURE UTILIZATION AND STORAGE: PROGRESSING APPROACH, DEVELOPMENTS AND PROMISING ISSUES IN COMMERCIAL

Session:	POSTER PRESENTATION – SESSION / SYMPOSIUM / YRSS / JYRSS		
Room:	HALLWAY, CONVENTION HALL		
Time	ID	Speaker	Title
14:00-17:30	-	-	POSTER PRESENTATION
14:00-17:00	-	-	POSTER PRESENTATION (YRSS / JYRSS'S COMMITTEE)
15:30-17:30	-	-	POSTER PRESENTATION (B C E F SESSION'S COMMITTEE)
16:00-17:30	-	-	POSTER PRESENTATION (A D SESSION / SYMPOSIUM'S COMMITTEE)

Session:	A - PHYSICS / APPLIED PHYSICS		
Room:	CONFERENCE HALL, ROOM 1		
Chairperson:	Assoc. Prof. Dr. Chatchai Putson / Asst. Prof. Dr. Narakorn Kaewkhao		
Time	ID	Speaker	Title
14:00-14:30	A_INV04	Worawat Meevasana	QUANTUM TECHNOLOGY FOR ENERGY STORAGE AND ELECTRICITY GRID OPTIMIZATION
14:30-14:45	A_015	Thanakrit Trivuth	INVESTIGATION OF STYROFOAM BALL STABILITY IN ACOUSTIC FIELD
14:45-15:00	A_016	Korakrit Tonpongphan	EFFECT OF GEOMETRY AND ALIGNMENT OF THE TRIANGULAR-SHAPED VIBRATING STRUCTURE ON ACOUSTIC STREAMING
15:00-15:15	A_017	Ou-aukwan Charoenkul	INVENTION OF BONE DENSITY MEASURING INSTRUMENT USING STRESS WAVES FOR ASSISTING IN OSTEOPOROSIS DIAGNOSIS
15:15-15:30	A_018	Apinat Ngampanpaisan	PERSONALIZED HUMAN SPEECH CANCELLATION USING SYNTHESIZED VOICE
BREAK			



Session:	B - BIOLOGICAL SCIENCES		
Room:	CONFERENCE HALL, ROOM 2		
Chairperson:	Asst. Prof. Dr. Wandee Udomuksorn		
Time	ID	Speaker	Title
14:00-14:30	B_INV05	Rujira Deewatthanawong	ARBUSCULAR MYCORRHIZAL FUNGI INOCULATION TO IMPROVE GROWTH AND TOLERANCE TO PHYTOPHTHORA ROOT ROT IN DURIAN SEEDLINGS
14:30-14:45	B_022	Gregorius Nico Setiawan	THE INVESTIGATION OF 'PHATUMTHANI 1' RICE RHIZOSPHERE-FUNGAL COMPOSITION UNDER COMMERCIAL ORGANIC FERTILIZER AND CHEMICAL FERTILIZER TREATMENTS
14:45-15:00	B_023	Nattapol Rattanachart	THE PREBIOTIC PROPERTY OF FLOUR FROM THE GERMINATED RICEBERRY RICE (<i>Oryza sativa L.</i>) FERMENTED WITH <i>Pleurotus ostreatus</i> MYCELIUM AFTER THE IN VITRO DIGESTION
15:00-15:15	B_024	Pattaradol Leerojanaprapa	NEUROPROTECTIVE EFFECT OF <i>Centella asiatica</i> ETHANOLIC EXTRACT ON TOLUENE-LED NEURODEGENERATION IN <i>Caenorhabditis elegans</i>
15:15-15:30	B_025	Annissa Delfira	THE EFFECT OF CINNAMON (<i>Cinnamomum burmannii</i>) BARK EXTRACT ON HISTOPATHOLOGICAL FEATURES AND KIDNEY Mn-SOD (MANGANESE SUPEROXIDE DISMUTASE) EXPRESSION IN HYPERGLYCEMIA RATS
BREAK			



Session:	B - BIOLOGICAL SCIENCES		
Room:	EXHIBITION HALL B1		
Chairperson:	Assoc. Prof. Dr. Prasopchai Patrojanasophon		
Time	ID	Speaker	Title
14:00-14:30	B_INV06	Surang Chankhamhaengdecha	EXPLORING PHAGE-HOST INTERACTIONS FOR ENHANCED THERAPEUTICS AGAINST <i>Clostridioides difficile</i> INFECTIONS
14:30-14:45	B_026	Chompoonik Kanchanabanca	EFFECT OF HIGH-INTENSITY GREEN LIGHT ON <i>Streptomyces</i> spp. PHYSIOLOGY
14:45-15:00	B_027	Kanlaya Katewongsa	SYNTHESIS OF QUANTUM DOTS FOR LEPTOSPIRA LABELING
15:00-15:15	B_028	Bhuvit Charoenpanich	ANTIBIOFILM EFFECTS OF BIOSURFACTANTS FROM <i>Lactobacillus fermentum</i> ON <i>Escherichia coli</i> BIOFILM AND REMINERALIZATION OF HYDROXYAPATITE
15.15-15.30	B_029	Rungnapa Pichaikarn	ISOLATION AND SCREENING OF YEASTS FROM FERMENTED FOODS FOR EFFECTIVE ANTIBACTERIAL ACTIVITIES
BREAK			



Session:	C – CHEMISTRY		
Room:	CONFERENCE HALL, ROOM 3		
Chairperson:	Assoc. Prof. Dr.Nopporn Thasana Co-Chair: Asst. Prof. Dr.Chittreeya Tansakul		
Time	ID	Speaker	Title
14:00-14:30	C_INV06	Kwanruthai Tadpetch	TOTAL SYNTHESSES AND BIOLOGICAL EVALUATION OF SELECTED 14-MEMBERED MACROLIDES
14:30-14:45	C_010	Felicitas Ene	SYNTHESIS OF RHINACANTHIN RELATED DERIVATIVES AS α -GLUCOSIDASE INHIBITORS
14:45-15:00	C_011	Chanida Jakkrawhad	FLOW-BASED AMPEROMETRIC SENSOR FOR DEXAMETHASONE DETECTION USING Fe-MOF/GRAPHENE OXIDE COMPOSITES MATERIAL MODIFIED PENCIL GRAPHITE ELECTRODE
15:00-15:15	C_012	Narongrit Sosa	OPTIMIZATION OF AMORPHOUS SILICA PRODUCTION FROM PALM KERNEL SHELL USING SOL-GEL METHOD



Session:	D - MATHEMATICS / STATISTICS / COMPUTER SCIENCE / DATA SCIENCE / AI		
Room:	CONFERENCE HALL, ROOM 4		
Chairperson:	Assoc. Prof. Dr. Apiradee Saelim / Assoc. Prof. Dr. Kamthorn Chailuek		
Time	ID	Speaker	Title
14:00-14:15	D_009	Thitiwat Kosolpattanadurong	MODELING PERTURBED PATTERN FORMATION IN LOGISTIC PROBABILISTIC CELLULAR AUTOMATON (LCPA) FOR VEGETATION
14:15-14:30	D_010	Youreesa Samah	FACTOR ASSOCIATED WITH JUVENILE RECIDIVISM IN THE OBSERVATION AND PROTECTION CENTRE IN NARATHIWAT PROVINCE
14:30-14:45	D_011	Kamonpan Junlat	THE PROBABILITY DISTRIBUTION OF FLIGHT DEPARTURE DELAYS AT CHIANG MAI INTERNATIONAL AIRPORT
14:45-15:00	D_012	Sawanya Suwannawong	THE STUDY OF AWARENESS OF CHILD CAR RESTRAINT COMPLIANCE AND THE PREDICTION OF PARENTS' INTENTION TO USE IN THAILAND
15:00-15:15	D_013	Rukchart Prasertpong	A NOTE ON FUZZY SEMIBIPOLAR SOFT IDEALS IN ORDERED GROUPOIDS
15:15-15:30	D_014	Perawit Boonsomchua	THE INVESTIGATION OF THE EQUILIBRIUM DISTRIBUTION MASS-POINT WITHIN FRACTAL TRIANGLES
15:30-16:00	D_015	Narongrid Rorsena	MATHEMATICAL MODEL FOR HEAT TRANSFER IN CORRUGATED BOX WITH BC FLUTE



Session:	E - ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY		
Room:	CONFERENCE HALL, ROOM 5		
Chairperson:	Prof. Dr. Suttichai Assabumrungrat Co-Chair: Prof. Dr. Tetsuya Kida / Assoc. Prof. Dr. Neeranuch Phusunti		
Time	ID	Speaker	Title
14:00-14:30	E_INV05	Armando Quitain	PROGRESS ON MICROWAVE-CARBOCATALYSIS FOR GLYCEROL VALORIZATION UNDER SOLVOTHERMAL CONDITIONS
14:30-15:00	E_INV06	Ong Hwai Chyuan	THE PROSPECTIVE OF BIOFUEL AND BIOENERGY
15:00-15:15	E_013	Wikanda Thongnueakhaeng	SURVEY OF INFORMATION ON THE MANAGEMENT OF AGRICULTURAL WASTE FROM OIL PALM GARDENT AND THE USE OF PALM OIL BRANCH AS AN ALTERNATIVE FUEL FOR CLAY BRICK BURNING
15:15-15:30	E_014	Jakaria Rambli	CHARACTERIZATION OF HYDROCHAR OBTAINED BY MICROWAVE ASSISTED HYDROTHERMAL CARBONIZATION OF SAGO (<i>Metroxylon</i> spp.)
BREAK			
15:45-16:00	E_015	Siwaporn Smith	WASTE-DERIVED CATALYSTS FOR BIODIESEL PRODUCTION
16:00-16:15	E_016	Ratchayol Sornvoratlop	SYNTHESIS OF BIO-BASED TRANSFORMER OIL FROM POLYHYDRIC ALCOHOLS AND VEGETABLE OIL METHYL ESTERS
16:15-16:30	E_017	Panai Sakuncasareewan	PREPARATION AND CHARACTERIZATION OF <i>Pennisetum Purpureum Schumach</i> AND <i>Chrysopogon Zizanioides (L.) Roberty</i> BIOBRIQUETTE WITH TAPIOCA AS ADHESIVES
16:30-16:45	E_018	Nichakorn Khondee	LIGNOCELLULOSIC WASTE BIOREFINERY TO BIOSURFACTANT-BASED MICROEMULSIONS FOR AGRICULTURAL ENHANCEMENT AND ENVIRONMENTAL REMEDIATION



Session:	E - ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY		
Room:	SEMINAR ROOM A3		
Chairperson:	Assoc. Prof. Dr. Chantip Samart Co-Chair: Asst. Prof. Dr. Yutthapong Pianroj		
Time	ID	Speaker	Title
14:00-14:30	E_INV07	Haibo Zhang	NBT-BASED TEXTURED PIEZOELECTRIC CERAMICS AND MULTILAYER PIEZOELECTRIC ACTUATOR
14:30-15:00	E_INV08	Zuo-Guang Ye	CRYSTAL CHEMICAL AND PHYSICAL PROPERTIES OF <i>HALIDE PEROVSKITES</i> BEYOND PHOTOVOLTAIC EFFECTS
15:00-15:15	E_019	Patcharawat Charoen-amornkitt	MODIFIED TRASATTI'S AND DUNN'S METHODS ON CHARACTERIZING CHARGE STORAGE MECHANISM USING SINUSOIDAL POTENTIAL SCANS
15:15-15:30	E_020	Matheswaran Manickam	FABRICATION OF A BCN/ZNFE ₂ O ₄ COMPOSITE: AN IMPROVED PHOTOCATALYST FOR INDIGO CARMINE DEGRADATION UNDER DIRECT SUNLIGHT
BREAK			
15:45-16:00	E_021	Sutatch Ratanaphan	DEVELOPMENT OF NANOCRYSTALLINE TUNGSTEN FOR THAILAND TOKOMAK X (TT-X): GRAIN BOUNDARY ENERGIES AND POPULATIONS
16:00-16:15	E_022	Sasiprapa Radchatawin	CAFFEINE REMOVAL FROM WASTEWATER USING COPPER/CARBON/ SILICA NANOCOMPOSITE AS ADSORBENT
16:15-16:30	E_023	Chonticha Suwan	STRENGTH REDUCTION FACTOR OF BLOCK IN MATRIX AND WEATHERED SANDSTONE SLOPES
16:30-16:45	E_024	Sittinon Sanor	ENHANCING OCEAN LITERACY THROUGH WHALE WATCHING: A CASE STUDY OF THE GULF OF THAILAND



Session:	F - FOOD SCIENCE AND TECHNOLOGY / AGRICULTURAL SCIENCE		
Room:	CONFERENCE HALL, ROOM 6		
Chairperson:	Assoc. Prof. Dr. Utai Klinkesorn Co-Chair: Asst. Prof. Dr. Thammarat Kaewmanee		
Time	ID	Speaker	Title
14:00-14:15	F_006	Vichai Puripunyanich	TROPICAL THAI TULIP BREEDING
14:15-14:30	F_007	Timpika Thepsuwan	EFFECTS OF ANTIBIOTICS ON MICROBIAL DIVERSITY AND GENE EXPRESSION OF THE BLACK TIGER SHRIMP (<i>Penaeus monodon</i>)
14:30-14:45	F_008	Nurkhalida Kamal	INVESTIGATION OF METABOLOMICS AND ANTIOXIDANT PROPERTIES OF MODIFIED TEMPE
14:45-15:00	F_009	Areeya Tohteb	THE ANTIHYPERGLYCEMIC EFFECTS OF MICROENCAPSULATED KLUAI TANI (<i>Musa balbisiana</i>) FRUIT EXTRACT IN THE INSTANT DRINK POWDER
15:00-15:15	F_010	Peeraporn Pakakaew	DEVELOPMENT OF A HEALTHY SPREAD WITH RICEBERRY RICE AND BLACK GARLIC

Symposium:	SP1 – FOOD SAFETY AND PRECISION AGRICULTURE		
Room:	EXHIBITION HALL B3		
Chairperson:	Assoc. Prof. Dr. Chongdee Buranachai		
Time	ID	Speaker	Title
13:30-15:30	SP1_INV06 SP1_INV07	Nitsara Karoonuthaisiri Akeanong Jangbua	เสวนา หัวข้อ “ความปลอดภัยทางด้านอาหารกับโอกาสในการแข่งขันของประเทศไทยในเวทีโลก”

Symposium:	SP3 - TRANSFORMING SCIENCE EDUCATION IN THE PANDEMIC ERA		
Room:	Bsc.0705, FACULTY OF SCIENCE		
Chairperson:	Assoc. Prof. Dr. Suttida Rakkapao		
Time	ID	Speaker	Title
13:30-16:30	SP3_INV02	Kwan Arayathanitkul Narumon Emarat Thaned Pruttivarsin	Workshop (TH) ทักษะปฏิบัติการพิศกัศร์ระดับมัธยมปลาย



Session:	SP4 - ENERGY FOR THAILAND - FOR TOMORROW AND BEYOND		
Room:	SEMINAR ROOM A1		
Chairperson:	Asst. Prof. Dr. Helmut Duerrast		
Time	ID	Speaker	Title
14:00-14:30	SP4_INV02	Supawan Saelim	THE ECONOMICS OF SOLAR ROOFTOP PROGRAMS: FROM THE PERSPECTIVES OF END USERS, DISTRIBUTION UTILITIES AND GOVERNMENT
14:30-14:45	SP4_008	Helmut Duerrast	NORTHEASTERN THAILAND AS THE NEW AND FUTURE POWER HOUSE
BREAK			
15:00-16:30	-	Supawan Saelim Helmut Duerrast	(RENEWABLE) ENERGY FOR THAILAND - TOMORROW PODIUM DISCUSSION INCL. QUESTIONS FROM THE AUDIENCE

Symposium:	SP6 - IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND ENVIRONMENT INCLUDING THE STRATEGIES TO TACKLE SUCH ISSUES		
Room:	EXHIBITION HALL B4		
Chairperson:	Dr. Milica Stankovic / Jaruwan Mayakun / Ekkaluk Rattanachote		
Time	ID	Speaker	Title
13:00-13:30	SP6_INV04	Zhao Peng	REVITALIZING OYSTER REEFS WITH ECOLOGICAL CONCRETE MADE FROM WASTE SHELLS
13:30-14:00	SP6_INV05	Sau Pinn Woo	URBAN MARINE SANCTUARY: AN EXAMPLE FROM MIDDLEBANK MARINE SANCTUARY IN PENANG
BREAK			
14:15-14:35	SP6_001	Pachoenchoke Jintasaeranee	DEVELOPMENT OF THE SUSTAINABLE USE OF MARINE NATURAL RESOURCES IN THE GULF OF THAILAND: CASE STUDIES OF CORAL REEF FISHES IN SAMAESARN ISLANDS, CHONBURI PROVINCE, THAILAND
14:35-14:55	SP6_002	Muzafar Zulkifli	ESG FOR INDUSTRY
14:55-15:15	SP6_003	Ahmad Naim Ahmad Yahaya	CIRCULAR ECONOMY OF INDUSTRIAL WASTE
15:15-15:35	SP6_004	Erna Yuliwati	WASTE WATER TREATMENT FROM COMMUNITY
BREAK			
16:00-16:20	-	-	DISCUSSION
16:20-16:30	-	-	CLOSING SESSION

Session:	STT49 CONGRESS BANQUET		
Room:	GRAND BALLROOM, BURI SRIPHU HOTEL		
Time	ID	Speaker	Title
18:00-19:30	-	-	BANQUET



JANUARY 25th, 2024

MORNING PROGRAM

Session:	AWARDING CEREMONY – BEST ORAL & POSTER PRESENTATIONS		
Room:	CONVENTION HALL		
Time	ID	Speaker	Title
10:30-11:00	-	-	AWARDING CEREMONY – BEST ORAL & POSTER PRESENTATIONS

Session:	SYMPOSIUM SP10 – PITCHING PRESENTATION – YRSS		
Room 1:	Bio > CONFERENCE HALL, ROOM 1		
Room 2:	Chem > CONFERENCE HALL, ROOM 2		
Room 3:	Math > Com > CONFERENCE HALL, ROOM 3		
Room 4:	Phy > Env > CONFERENCE HALL, ROOM 4		
Room 5:	Mat > Food > CONFERENCE HALL, ROOM 5		
Room 6:	Committee > CONFERENCE HALL, ROOM 6		
Time	ID	Speaker	Title
9:00-10:30	-	-	PITCHING PRESENTATION – YRSS
BREAK			
Room:	CONVENTION HALL		
11:00-12:00	-	-	YRSS/JYRSS AWARDING SESSION

SESSION A - PHYSICS / APPLIED PHYSICS



PHYSICS / APPLIED PHYSICS

- Chair: Dr. Suparek Aukkaravittayapun**
- Co-Chair: Assoc. Prof. Dr. Chatchai Putson**
- Co-Chair: Asst. Prof. Dr. Pruet Kalasuwan**
- Co-Chair: Asst. Prof. Dr. Narakorn Kaewkhao**

None of breakthrough technology can be achieved without true understanding of Physics behind. Physics and Applied Physics are fundamental and crucial for new developments and innovations not only in problem-solving but also in changing world. From the most fundamental at the bottom to the most challenging in frontier technology at the top, coherent Physics and Applied Physics must be conducted thoroughly in every research or development field. Every step, every knowledge domain, from theory to experiment, must be linked until expected outputs/ outcomes are achieved. This session welcomes presentations from the entire spectrum of Physics and Applied Physics which may lead to the linkage across different fields of Physics and Applied Physics for better understanding of natures and improving life towards Sustainable Development Goals (SDGs).

Invited Speakers



Assoc. Prof. Dr. Pongsakorn Kanjanaboos



Assoc. Prof. Dr. Viyada Harnchana



Assoc. Prof. Dr. Worawat Meevasana



Asst. Prof. Dr. Salinporn Kittiwatanakul



SESSION B - BIOLOGICAL SCIENCES



BIOLOGICAL SCIENCES

Biochemistry / Biotechnology / Microbiology / Molecular biology / Biomedical science / Biodiversity

Chair: Prof. Dr. Tavan Janvilisri

Co-Chair: Prof. Dr. Alissara Reungsang

Co-Chair: Assoc. Prof. Dr. Sehanat Prasongsuk

Co-Chair: Assoc. Prof. Dr. Oramas Suttinun

Co-Chair: Asst. Prof. Dr. Wandee Udomuksorn

Co-Chair: Asst. Prof. Dr. Kringpaka Wangkulangkul

Co-Chair: Dr. Sirawit Ittisoponpisan

We are pleased to invite researchers from all fields of life sciences to submit abstracts/full papers for the upcoming STT49 conference. The conference aims to bring together experts and scholars to explore the critical role of biological sciences in advancing the sustainable development goals (SDGs) at the national and international levels. The SDGs are essential for promoting sustainability worldwide, and biological sciences have emerged as a fundamental discipline in achieving these goals. Numerous research endeavors and initiatives have been dedicated to addressing the challenges posed by the SDGs, and it is crucial to foster collaboration and idea exchange among different branches of biological sciences. The purpose of this session is to provide a dynamic platform for researchers to share their recent data, insights, and discoveries, with a specific focus on how biological sciences contribute to the SDGs. By uncovering shared interests that may have been overlooked, we aim to catalyze innovative solutions and drive progress towards sustainable development. The session will encompass a wide spectrum of life sciences, including but not limited to Biochemistry, Biotechnology, Microbiology, Molecular Biology, Biomedical Science and Biodiversity.

Invited Speakers



Prof. Dr. Benjamas Cheirsilp



Prof. Dr. Sumate Chairapat



Prof. Zulfigar Yasin



Assoc. Prof. Dr. Surang Chankhamhaengdecha



Assoc. Prof. Dr. Prasopchai Patrojanasophon



Dr. Rujira Deewatthanawong

SESSION C - CHEMISTRY



CHEMISTRY

Analytical Chemistry / Inorganic Chemistry / Organic & Medicinal Chemistry / Physical & Theoretical Chemistry

Chair: Prof. Dr. Vatcharin Rukachaisirikul

Co-Chair: Assoc. Prof. Dr. Aporn Numnuam

Co-Chair: Asst. Prof. Dr. Nararak Leesakul

Co-Chair: Dr. Teerapong Pirojsirikul

Chemistry session aims to bring together professors, students and scientists to exchange and share their experiences and research results on four sub-sessions of chemistry including Analytical Chemistry, Inorganic Chemistry, Organic & Medicinal Chemistry, and Physical & Theoretical Chemistry. Each sub-session consists of the following topics:

Analytical Chemistry: sample preparation, chromatographic methods, environmental chemistry, spectroscopic analysis, electroanalytical chemistry, chemical sensor, biosensors, and modern analytical techniques

Inorganic Chemistry: coordination chemistry, structural chemistry and crystal engineering, metal-inorganic/organic framework, bio-inorganic chemistry, photocatalysis, bioactive material, supramolecular inorganic chemistry, catalyst

Organic & Medicinal Chemistry: natural product chemistry, medicinal chemistry, chemical biology, chemical methods, synthetic organic chemistry, computational chemistry and drug design

Physical & Theoretical Chemistry: novel spectroscopic methods, computational chemistry, quantum chemistry and molecular interaction, molecular dynamics

Invited Speakers



Prof. Dr. Rodjana Burakham



Assoc. Prof. Dr. Ekasith Somsook



Assoc. Prof. Dr. Kwanruthai Tadpetch



Assoc. Prof. Dr. Nopporn Thasana



Assoc. Prof. Dr. Thanyada Rungrotmongkol



Assoc. Prof. Dr. Weena Siangproh



SESSION D - MATHEMATICS / STATISTICS / COMPUTER SCIENCE / DATA SCIENCE / AI



MATHEMATICS / STATISTICS / COMPUTER SCIENCE / DATA SCIENCE / AI

Chair: Assoc. Prof. Dr. Chartchai Ieenawong

Co-Chair: Assoc. Prof. Dr. Apiradee Saelim

Co-Chair: Assoc. Prof. Dr. Klairung Samart

Co-Chair: Asst. Prof. Dr. Kamthorn Chailuek

Co-Chair: Asst. Prof. Dr. Teera Siriteerakul

This session provides an inclusive platform for researchers in Mathematics, Statistics, Computer Science, Data Science, Artificial Intelligence, and other relevant disciplines to gather, present, and exchange their cutting-edge academic perspectives on the latest research findings. The session's overarching theme revolves around leveraging these fields to drive sustainable solutions and contribute to the achievement of the 17 Sustainable Development Goals established by the United Nations. While the focus lies on this particular aspect, participants are encouraged to explore other innovative applications and interdisciplinary approaches that align with the session's objectives.

Invited Speakers



Assoc. Prof. Dr. Piyapatr Busababodhin



Assoc. Prof. Dr. Porawat Visutsak



Dr. Chadaporn Keatmanee



Dr. Detchat Samart

SESSION E - ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY



ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY

Chair: Prof. Dr. Suttichai Assabumrungrat
Co-Chair: Prof. Dr. Pitsanupong Kanjanapayon
Co-Chair: Assoc. Prof. Dr. Chanatip Samart
Co-Chair: Assoc. Prof. Dr. Neeranuch Phusunti
Co-Chair: Assoc. Prof. Dr. Yutthapong Pianroj
Co-Chair: Asst. Prof. Dr. Pungtip Kaewtubtim
Co-Chair: Dr. Mati Horprathum

The purpose of this session is to bring together leading academic scientists, researchers and research scholars from all around the world to present research findings and innovation in ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY, and related fields. The session particularly focuses on energy technologies, both renewable and non-renewable energy (e.g., coal, natural gas, biomass, solar, geothermal, and wind energies), energy materials for energy generation and storage (e.g., dielectric, piezoelectric, and triboelectric materials), as well as other aspects such as energy conservation, energy efficiency, economic, policy, and environmental assessment. Beside the sustainable energy, the pioneer research in environmental fields related with waste treatment, upcycling, and pollution control especially carbon dioxide capture and utilization are encouraged for submission. The session is expected to be an interdisciplinary forum for scientists, engineers, and practitioners to exchange and share their experiences, ideas, developments, and applications of the technologies which make advancement towards the sustainable development goals (SDGs).

Invited Speakers



Prof. Dr. Armando T. Quitain



Prof. Dr. Guoqing Guan



Prof. Dr. Haibo Zhang



Prof. Dr. Hwai Chyuan Ong



Prof. Dr. Seiji Yamazoe



Prof. Dr. Zuo-Guang Ye



Assoc. Prof. Dr. Supareak Prasertdam



Assoc. Prof. Dr. Chinnathan Areeprasert

SESSION F - FOOD SCIENCE AND TECHNOLOGY/AGRICULTURAL SCIENCE



FOOD SCIENCE AND TECHNOLOGY/AGRICULTURAL SCIENCE

Chair: Prof. Dr. Karun Thongprajukaew

Co-Chair: Assoc. Prof. Dr. Utai Klinkesorn

Co-Chair: Assoc. Prof. Dr. Yuthana Phimolsiripol

Co-Chair: Assoc. Prof. Dr. Jutarut lewkittayakorn

Co-Chair: Asst. Prof. Dr. Thammarat Kaewmanee

Co-Chair: Dr. Sorawit Powtongsook

This session welcomes all branches of science, technology, packaging, and engineering of foods and food products. Fundamental and applied research findings that have potential for improving product quality, extend shelf life of fresh and processed food products, and improve process efficiency are also welcome, as well as for new perspectives in food handling and processing, and innovation and emerging technologies in food products and food industry by-products. This session also covers original works related to strategic, applied, and interdisciplinary studies in all aspects of agricultural sciences and exploited species. Relevant scopes of interest such as plant science, soil and environmental science, agricultural engineering, animal science, livestock and poultry production, fisheries, forestry, and natural resource management.

Invited Speakers



Prof. Dr. Mohamad Suffian Bin Mohamnad Annuar



Assoc. Prof. Dr. Kornorn Srikulnath

SP1 - FOOD SAFETY AND PRECISION AGRICULTURE



FOOD SAFETY AND PRECISION AGRICULTURE
[ARTICLE SUBMISSION IS NOT AVAILABLE FOR THIS SYMPOSIUM]

Chair: Assoc. Prof. Dr. Chongdee Buranachai
Co-Chair: Assoc. Prof. Dr. Warakorn Limbut

The symposium on Food Safety and Precision Agriculture will showcase significant researches, emerging technologies, and their applications in food safety and precision agriculture. The symposium offers a platform for oral and poster presentations, exhibitions, and a forum for information exchange. Key topics include the development of methods, sensors, devices, technologies, and platforms to detect chemical and biological contaminants in food and agriculture products and processes. Internet-of-things, machine learning, technology and data analytics utilize to optimize crop yields, minimize waste, and reduce environmental impact will also be addressed. The symposium will bring together experts from different disciplines to discuss the latest developments, share insights on how to tackle these complex issues and work towards a safer and more sustainable food and agricultural systems through collaboration and multidisciplinary research.

Invited Speakers



Prof. Dr. Nitsara Karoonuthaisiri



Assoc. Prof. Dr. Warakorn Limbut



Asst. Prof. Dr. Maysaya Thitisaksakul



Dr. Akeanong Jangbua



Dr. Kittiya Shearman



Dr. Vanicha Vichai



Dr. Wanilada Rungrassamee

SP2-1 - THAI TRADITIONAL MEDICINE: FROM TRADITIONAL USE TO COMMERCIALIZATION RHODOMYRTUS TOMENTOSA (AITON) HASSK AND MITRAGYNA SPECIOSA (KORTH) HAVIL



THAI TRADITIONAL MEDICINE: FROM TRADITIONAL USE TO COMMERCIALIZATION RHODOMYRTUS TOMENTOSA (AITON) HASSK AND MITRAGYNA SPECIOSA (KORTH) HAVIL
[POSTER PRESENTATION ONLY]

Chair: Prof. Emer. Dr. Supayang Voravuthikunchai

Rhodomlyrtus tomentosa (Aiton) Hassk

Rhodomlyrtus tomentosa Thai pioneer research group has been publishing about 60 new findings in ISI database. Rhodomlyrtone, a new antibiotic from R. tomentosa leaf extract presented extremely potent and broad Gram-positive antibacterial activity, which is comparable with last resort antibiotics in glycopeptide and lipopeptide groups.

This symposium is set up to highlight an alternative approach for prevention and treatment of drug-resistant bacteria as well as immune-related diseases with the aim to promote human and animal health and well-being and reduce the use of antibiotics and chemicals. The symposium will cover the following aspects in order to:

Demonstrate our findings to a multitude of applications and prepare to extend our available prototypes to other uses including end-user problems.

Display a roadmap to move a product from lab to commercialization including FDA.

Provide solid information on this plant species for agricultural purposes.

Mitragyna speciosa (Korth) Havil

In Thailand, kratom (*Mitragyna speciosa* (Korth) Havil) has a long history of traditional use and has been recognized for its medicinal properties by folk healers. However, for many years it was classified as a prohibited substance under the Narcotics Act. In 2021, Thailand passed the updated Narcotics Act (No. 8) B.E. 2564 (2021), which removed kratom from the list of prohibited substances and allowed possession and consumption. On August 26, 2022, the Kratom Plant Act B.E. 2565 (2022) was published in the Royal Gazette and came into effect the following day. The Act regulates the trade, sale, consumption, study, and advertising of kratom leaves in Thailand.

This exhibition aims to highlight our research including upstream (cultivation), midstream (extraction), downstream (the development of medical grade products and results of preclinical studies on the properties of kratom as a substitute for detoxification and withdrawal symptom management of alcohol, morphine and methamphetamine) and regulation and policy of kratom in Thailand.

SP2-2 - THAI TRADITIONAL MEDICINE: FROM TRADITIONAL USE TO COMMERCIALIZATION RHODOMYRTUS TOMENTOSA (AITON) HASSK AND MITRAGYNA SPECIOSA (KORTH) HAVIL



THAI TRADITIONAL MEDICINE: FROM TRADITIONAL USE TO COMMERCIALIZATION RHODOMYRTUS TOMENTOSA (AITON) HASSK AND MITRAGYNA SPECIOSA (KORTH) HAVIL
[POSTER PRESENTATION ONLY]

Chair: Asst. Prof. Dr. Somchai Sriwiriyan

Co-Chair: Assoc. Prof. Dr. Ekkasit Kumarnsit

Co-Chair: Asst. Prof. Dr. Dania Cheaha

Mitragyna speciosa (Korth) Havil

In Thailand, kratom (*Mitragyna speciosa* (Korth) Havil) has a long history of traditional use and has been recognized for its medicinal properties by folk healers. However, for many years it was classified as a prohibited substance under the Narcotics Act. In 2021, Thailand passed the updated Narcotics Act (No. 8) B.E. 2564 (2021), which removed kratom from the list of prohibited substances and allowed possession and consumption. On August 26, 2022, the Kratom Plant Act B.E. 2565 (2022) was published in the Royal Gazette and came into effect the following day. The Act regulates the trade, sale, consumption, study, and advertising of kratom leaves in Thailand.

This exhibition aims to highlight our research including upstream (cultivation), midstream (extraction), downstream (the development of medical grade products and results of preclinical studies on the properties of kratom as a substitute for detoxification and withdrawal symptom management of alcohol, morphine and methamphetamine) and regulation and policy of kratom in Thailand.

SP3 - TRANSFORMING SCIENCE EDUCATION IN THE PANDEMIC ERA



TRANSFORMING SCIENCE EDUCATION IN THE PANDEMIC ERA [ORAL PRESENTATION ONLY]

**Chair: Assoc. Prof. Dr. Suttida Rakkapao
Co-Chair: Assoc. Prof. Dr. Punnama Siriphannon**

The impact of COVID-19 on science education has been significant and wide-ranging. The pandemic has transformed science teaching and learning for all levels. It forces educational institutions to adopt effective remote learning approaches, disrupts in collaborative learning, triggers the innovation and increases awareness of the importance of science education research. The symposia session on “Transforming Science Education in the Pandemic Era” aims to share and learn from all participants regarding how to help students succeed academically and develop essential skills for their future endeavours. It covers all sub-topics on transforming science education, namely teaching and learning approaches, evaluation and assessment, technology integration and innovation in education. This session provides three main parts: a seminar with outstanding science teachers, oral presentations, and the Arduino workshop. We are pleased to invite all to participate in the session for knowledge exchange, learning, collaboration, and inspiration. Remarkably, the presenter of this session can present works in Thai language, including the full-text publication. We look forward to seeing you all at the Faculty of Science, Prince of Songkla University.

Invited Speakers



Asst. Prof. Dr. Kwan Arayathanitkul



Asst. Prof. Dr. Thaned Pruttivarasin



Asst. Prof. Dr. Narumon Emarat



Dr. Panu Thainiramit



Mr. Wissarut Puaypung

SP4 - ENERGY FOR THAILAND - FOR TOMORROW AND BEYOND



ENERGY FOR THAILAND - FOR TOMORROW AND BEYOND

Chair: Asst. Prof. Dr. Boonyarit Chatthong

Co-Chair: Asst. Prof. Dr. Helmut Duerrast

The energy session aims to bring together professors, students, scientists, representatives from related government agencies, as well as company representatives to exchange and share their experiences and research results on two sub-sessions of energy including Fusion - Energy for the Day after Tomorrow and Renewable Energy for Thailand's Energy Transformation. We would like to explore Thailand's energy options and solutions that can minimize CO₂ emissions to almost zero to keep the Earth in livable boundary conditions tomorrow and beyond. Each sub-session consists of the following topics. Fusion - Energy for the Day after Tomorrow: Thailand Tokamak I (TT1) status and updates, fusion program in Thailand, plasma diagnostics, energetic particles study, plasma transport and suppression, plasma heating and fueling prospect, superconducting magnets and cryogenic system, International outreach and collaboration Renewable Energy for Thailand's Energy Transformation: Renewable Energy, Solar, Wind, Bioenergy, Geothermal, Hydrogen, CCS, Heat&Cold, EV, Energy System Transformation, Energy Efficiency, Energy Policies, Energy Economics, COP28.

Invited Speakers



Prof. Dr. Yasuhiro Suzuki (Online)



Dr. Supawan Saelim

SP5 - ENVIRONMENTALLY FRIENDLY RUBBER AND ITS FUTURE



ENVIRONMENTALLY FRIENDLY RUBBER AND ITS FUTURE

Chair: Assoc. Prof. Dr. Nitinart Saetung

Co-Chair: Assoc. Prof. Dr. Ewipoo Kalkornsurapranee

Co-Chair: Asst. Prof. Dr. Tulypong Tulyapitak

Co-Chair: Assoc. Prof. Dr. Anoma Thitithammawong

Co-Chair: Assoc. Prof. Dr. Skulrat Pichaiyut

Nowadays, global warming is a hot issue. The rubber industry, particularly in the production and processing of rubber, are significant contributors to global warming and climate change. By focusing on environmentally friendly practices in the rubber industry, we can mitigate the environmental impact and contribute to efforts in reducing global warming. The focus on sustainable rubber production, alternative materials, recycling, and waste management in the context of "Environmentally Friendly Rubber and Its Future" is integral to combatting global warming and achieving a more sustainable future for our planet. The conference session "Environmentally Friendly Rubber and Its Future" aims to address key challenges and opportunities in the realm of environmentally friendly rubber, focusing on the following areas:

1. Sustainable Rubber Production:
 - Energy-efficient and resource-saving rubber processing techniques
 - Novel approaches to eco-friendly cultivation methods
2. Alternative Rubber Materials:
 - Innovations in bio-based and renewable rubber substitutes
3. Rubber Recycling and Waste Management:
 - Advancements in rubber recycling technologies and processes
 - Circular economy models for rubber waste management
4. Environmental Impact Assessment:
 - Evaluating the ecological footprint of rubber cultivation and processing
5. Green Chemistry and Materials:
 - Development of sustainable rubber additives and processing aids
 - Eco-friendly formulations and compounding techniques
 - Optimization of material properties for improved environmental performance
6. New value approach of natural rubber for applications

Invited Speakers



Assoc. Prof. Dr. Kannika Sahakaro

SP6 - IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND ENVIRONMENT INCLUDING THE STRATEGIES TO TACKLE SUCH ISSUES



IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND ENVIRONMENT INCLUDING THE STRATEGIES TO TACKLE SUCH ISSUES

[ORAL PRESENTATION ONLY]

Chair: Prof. Dr. Anchana Prathep

Co-Chair: Assoc. Prof. Dr. Jaruwat Mayakun

Co-Chair: Dr. Milica Stankovic

Co-Chair: Dr. Ekkalak Rattanachot

This symposium will provide a platform to diverse groups of experts, researchers, and practitioners to discuss and address the urgent challenges posed by climate change, biodiversity loss, and the need for sustainable management practices. The symposium will address current research knowledge, gaps, case studies, and practices related to life on land, life below water, and nature-based solutions to climate change. This symposium aims to foster knowledge sharing, collaboration, and innovative solutions to mitigate the impacts of climate change, halt biodiversity loss, and promote sustainable management of natural resources. Through this symposium, various topics of interest, problems, and solutions related to climate change, biodiversity, the potential of nature-based solutions will be addressed and highlighted with specific focus on:

1. Climate change and its impacts on the biodiversity and environment
2. Mitigation and adaptation strategies to combat climate change with specific interest to nature-based solutions
3. Restoration and conservation of environment and ecosystems
4. Sustainable management practices and strategies to ensure the long-term sustainability of ecosystems and livelihoods
5. Policy, governance, and stakeholder engagement towards biodiversity and climate change strategy coherence and considerations into decision-making processes

This symposium will explore how to better understand climate change and its impacts on fauna, flora, and microbiomes. It will also address how to better conserve, restore, and sustainably use resources for sustainable development and halting the loss of biodiversity and ecosystem services. Through this symposium, the shared knowledge and research will make contribution to reach the Sustainable Development Goals, in particular SDG 13, 14, and 15 and will link and mobilize scholars, experts, and members of governmental agencies and funding agencies.



Invited Speakers



Assoc. Prof. Dr. Sapit Diloksumpun



Assoc. Prof. Dr. Zhao Peng



Asst. Prof. Dr. Natapol Thongplew



Dr. Milica Stankovic



Dr. Sau Pinn Woo



SP7 - FORENSIC SCIENCE: THE ROLE OF FORENSIC CURRICULA IN SUPPORTING FORENSIC PROFESSIONS AND CREATING INNOVATION



FORENSIC SCIENCE: THE ROLE OF FORENSIC CURRICULA IN SUPPORTING FORENSIC PROFESSIONS AND CREATING INNOVATION

[ARTICLE SUBMISSION IS NOT AVAILABLE FOR THIS SYMPOSIUM]

Chair: Assoc. Prof. Dr. Phuvadol Thanakiatkrai

Co-Chair: Assoc. Prof. Dr. Thitika Kitpipit

Co-Chair: Asst. Prof. Dr. Wongkot Phuphumirat

Co-Chair: Asst. Prof. Dr. Apichai Phonchai

Forensic science is a dynamic discipline that encompasses various scientific techniques and methodologies applied to the investigation of crimes and legal proceedings. In light of the Royal Decree passed last year, which regulates the practice of forensic science as a licensed profession, it is essential to discuss the significance of forensic curricula in shaping the knowledge and competencies of forensic professionals. Furthermore, it is important to explore how forensic curricula in Thailand can support and contribute to the creation of forensic innovations.

Firstly, we will delve into the key components of effective forensic curricula, exploring how they can equip professionals with the necessary tools to address the evolving challenges and demands of modern forensic science in accordance with the requirements of the Royal Decree. This discussion will be led by practitioners and academia who initiated and drafted the Royal Decree.

Secondly, we will examine how innovative research in forensic curricula can drive advancements in the field. By incorporating cutting-edge technologies, emerging forensic methodologies, and fostering interdisciplinary collaborations, we can push the boundaries of forensic science, paving the way for groundbreaking discoveries and improved investigative techniques. This workshop will adopt a multi-faceted approach involving stakeholders from various levels, including the National Research Council of Thailand (funding agency), Prince of Songkla University Science Park (supporter), and forensic practitioners (users and researchers).

Join us in this symposium to discuss the role of forensic curricula in supporting the forensic professions and fostering innovation. Engage in stimulating discussions, interactive workshops, and networking/matching sessions to gain insights, share experiences, and build connections with experts and peers in the field.

SP8 - X-RAY CRYSTALLOGRAPHY



X-RAY CRYSTALLOGRAPHY

Chair: Prof. Dr. Nongnuj Muangsin

Co-Chair: Assoc. Prof. Dr. Kuakarun Krusong

Co-Chair: Assoc. Prof. Dr. Kittipong Chainok

X-ray crystallography is the experimental science and is by far the most powerful method to determine the arrangement of atoms of a crystalline solid in three-dimensional space. This method has been used in structural chemistry and biological macromolecules for over a century. In the biological crystallography, three-dimensional structures of molecules such as proteins and nucleic acids are determined at atomic level. This helps us to understand the basic mechanisms of biomolecules, as well as aid in novel drug discovery. Apart from macromolecular crystallography, the determination of crystal structures of organic, organometallic and coordination compounds (i.e. coordination polymers and metal-organic frameworks), known as small molecule or chemical crystallography, is of great importance and highly valuable for understanding the structure property relationship as well as supramolecular interactions (such as hydrogen bonds, halogen bonds, and π - π stacking) of the crystalline solids. Notably, it also brings about crystal engineering for better structural design and achievement of desired functionalities.

Invited Speakers



Prof. Dr. Christoph Janiak



Dr. Yee Seng Tan



Dr. Yudhi Nugraha

SP9 - RADIOECOLOGY AND ENVIRONMENTAL RADIOACTIVITY



RADIOECOLOGY AND ENVIRONMENTAL RADIOACTIVITY

Chair: Dr. Yutthana Tumnoi
Co-Chair: Dr. Wipada Ngansom

Radioecology is a multidisciplinary scientific concerning the presence/concentration of both natural (e.g., ^{238}U , ^{232}Th , ^{226}Ra , ^{40}K , ^7Be , ^{14}C , and others) and artificial (e.g., ^{90}Sr , ^{134}Cs , ^{137}Cs , and others) radionuclides in the environment, the complexity of their transfer processes within and between ecosystems, and the effects of ionizing radiation on human and non-human biota. Investigations in radioecology consist of field samplings and experiments, controlled-lab experiments, and laboratory procedures including radiochemistry and radioactivity measurement. Radiological studies normally focus on three main environments in the biosphere: marine environment, freshwater environment, and land environment. They could provide necessary data for radiation dose estimation and radiological risk assessment on human and the environmental health using predictive models. Interest and studies in the area of radioecology, environmental radioactivity, and utilization of radiotracers to reveal biogeochemical and ecological processes have significantly increased to ascertain and manage radiological risks associated with both routine and accidental releases from the historical nuclear testing, the nuclear accidents/facilities, and non-nuclear facilities. This session welcomes presentations on both basic and advanced research programmes on radioecology, environmental radioactivity, and related disciplines in order to promote and advance the science of environmental radioactivity research, and to enhance the radiological protection of humans and the environment.

Invited Speakers



Prof. Dr. Shinji Tokonami



Dr. Kiattipong Kamdee



Dr. Rawiwan Kritsananuwat



SP10 - YOUNG RISING STARS OF SCIENCE 2023 (YRSS) & JUNIOR YOUNG RISING STARS OF SCIENCE AWARD 2023 (JYRSS)



YOUNG RISING STARS OF SCIENCE 2023 (YRSS) & JUNIOR YOUNG RISING STARS OF SCIENCE AWARD 2023 (JYRSS) [ARTICLE SUBMISSION IS NOT AVAILABLE FOR THIS SYMPOSIUM]

Chair: Assoc. Prof. Dr. Kitipong Assatarakul

Co-Chair: Assoc. Prof. Dr. Sopark Jantarit

Co-Chair: Asst. Prof. Dr. Wipawadee Sianglum

The Science Society of Thailand under the patronage of His Majesty the King (SCISOC) recognizes the need of training new scientist and technologist to advance to the position of highly skilled scientists and technologists in the country. This leads to a boost in research and development, which is critical for the country's long-term economic and social development in Thailand's Science Society. Accordingly, SCISOC establishes the Young Rising Stars of Science (YRSS) awards for high-school science research projects with remarkable performances under the supervision of the Faculty of Science in Thailand's universities each year since 2020. In addition to honoring these students, it also inspires interest among them in pursuing a graduate degree in science. It is expected that these youths will continue to be highly competent scientists or technologists at national and international levels.



ABSTRACTS FOR INVITED SPEAKERS



INVITED SPEAKER: A_INV01

CEMENT BASED TRIBOELECTRIC NANOGENERATOR FOR LARGE SCALE ENERGY HARVESTING

Viyada Harnchana,* Jirapan Sintusiri, Saman Kuntarin, Wittawat Thongthapthai

Department of Physics, Faculty of Science, Khon Kaen University, Khon Kaen, Thailand 40002

*e-mail: viyada@kku.ac.th

Abstract:

Mechanical energy is one of the most abundant energy forms in our living environment. Harvesting this enormous energy would be promising for the development of next generation power source which is sustainable and clean. Triboelectric nanogenerator (TENG) is emerged as a new energy technology that offers an effective way to convert mechanical energy into electricity based on contact electrification and electrostatic induction. In this talk, the development of the first cement-based TENG for scavenging mechanical energy from human step will be presented. The insight into the power output enhancement in cement-based TENGs will be discussed. Finally, the potential application for large scale energy harvesting and motion sensing will be demonstrated.

Associate Professor Viyada Harnchana is a lecturer in the Department of Physics, Faculty of Science, Khon Kaen University from 2011 to present. She received the bachelor's degree with (1st class honors) in Science from Department of Physics, Faculty of Science, Khon Kaen University, Thailand in 2005. She received her M.Sc. in Nanoscience and Nanotechnology, and Ph.D. in Materials Engineering from the University of Leeds, UK in the area of nanomaterial fabrication and characterization. Her research interests are nanomaterials for energy, nanomaterials and nanotechnology, carbon nanomaterials and energy harvesting technology.

INVITED SPEAKER: A_INV02

THIN FILMS FOR SUSTAINABLE DEVELOPMENTS: SOLAR CELL, LIGHT EMITTING DIODE, PHOTODETECTOR, AND RADIATIVE COOLING FILM

Pongsakorn Kanjanaboos*

School of Materials Science and Innovation, Faculty of Science, Mahidol University, Thailand

*e-mail: pongsakorn.kan@mahidol.edu

Abstract:

Thin films are simple and innovative materials useful for countless applications due to minimal materials usage along with great practical impact. Perovskite thin films have gained tremendous attention for various applications in optoelectronics due to their charge/photon conversion capability and simple fabrication via solution processing i.e., spin coating, spray coating, dipping coating, and roll-to-roll printing. As precursor inks are in liquid form, doping and compositional tuning are facile. Due to the fact that precursor inks solidify into perovskite thin films, fabrication processes, which affect perovskite nucleation and crystallization processes, along with perovskite compositions orchestrate both physical and chemical properties, leading to desired applications such as solar cell, light emitting diode, and photodetector. In the similar fashion, radiative cooling thin films can be fabricated via solution processing or polymer extrusion, which allows facile compositional and morphological tuning to maximize radiative release into the atmospheric transparency window. In this talk, we will discuss both thin film technologies investigated at our laboratory at Mahidol University.



Figure 1. our areas of research in energy materials

Assoc. Prof. Dr. Pongsakorn Kanjanaboos earned his Ph.D. in materials physics from the University of Chicago in 2013. Currently, he is the head of Advanced Technologies for Energy and Sustainability Lab at the School of Materials Science and Innovation, Faculty of Science at Mahidol University in Thailand. His current research interests include perovskite materials for solar cells, LEDs, and photodetectors along with radiative cooling materials for building and agriculture. He has more than 70 publications and 7,000 citations, filing for more than 10 patents and petty patents in Thailand. He enjoys working with many students and researchers from diverse backgrounds to develop innovative energy materials and processes for practical usages in collaboration with both government and industrial sectors.



INVITED SPEAKER: A_INV03

INTERESTING OXIDE THIN FILMS: FROM ELECTRONICS TO SPINTRONICS

Salinporn Kittiwatanakul*

Department of Physics, Faculty of Science, Chulalongkorn University

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Abstract:

Oxide thin films are widely used in semiconductor industry. To utilize some of the films in low energy consumption electronics devices such as phase change switches, memory, or sensors, there are many challenges to overcome. The first interesting material is vanadium dioxide (VO_2) which has Metal-Semiconductor Transition (MST) that can be used in many applications, one of which is ultra-fast, low-power switching device. However, the transition temperature (T_{MST}) of bulk is 340 K or 68 Celsius which is considering to be a bit low for electronics device application. Below T_{MST} it is semiconductor, and above that it becomes metal. The transition can be trigger by heat, electric field, and photon. The challenge is to raise up T_{MST} such that the films can stay in semiconductor state at operating temperature ($\sim 80\text{-}90$ Celsius) and triggered by electric field instead of heat. One of the ways to modify the transition is to introduce strain. The method presented in this work is called substrate clamping effect, where VO_2 is deposited on various orientations of TiO_2 substrates with various film thickness. The second system is Cr_2O_3 using in spintronics application. The idea of spintronics will be introduced along with the problems and challenges with Cr_2O_3 in the voltage-controlled exchange bias for magnetic memory application.

Assistant Professor Salinporn Kittiwatanakul was born in Bangkok, Thailand in 1985. She received the BA from Department of Physics, Cornell University, USA in 2008. She received the PhD in Physics from University of Virginia, USA in 2014. From 2015-2017, she was Research Associate in Department of Materials Science and Engineering, University of Virginia, USA. From 2018 to present, she worked at Department of Physics, Faculty of Science, Chulalongkorn University, Thailand. Her research interests in superconductor, spintronics, strongly correlated oxides, thin film fabrication and characterization.



INVITED SPEAKER: A_INV04

QUANTUM TECHNOLOGY FOR ENERGY STORAGE AND ELECTRICITY GRID OPTIMIZATION

Worawat Meevasana,^{1,2,*} and team

¹ School of Physics, Institute of Science, Suranaree University of Technology, Thailand

² Quantum Technology Research Initiative Consortium, QTRic, Thailand

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Abstract:

This talk is divided into two parts. First part will start with the fundamental studies of strange quantum effect of electrons in two dimensions, called negative electronic compressibility (NEC). This NEC concept, where the chemical potential counterintuitively becomes lower upon doping electrons, leads to application of enhancing capacity of electrical energy storage and later the founding of university startup called EQ Tech Energy. In the second part, we will continue with briefing about quantum technology research in Thailand and forming of QTRic, Thailand. Some examples of research will be explained, especially the application of quantum-inspired algorithm for electricity grid optimization.

Worawat Meevasana received his Ph.D. in physics from Stanford University. He is currently a professor at Suranaree University of Technology (Thailand) with 70 research publications and more than 6000 citations (h-index: 36); he served as the dean of Institute of Science, SUT. Recent focuses are on quantum technology research, especially quantum states of matters and energy applications. Currently Worawat is the Director of Quantum Technology Research Initiative Consortium (Thailand) with more than 100 professors from 17 national universities/institutes as the members.



INVITED SPEAKER: B_INV01

BIOADHESIVE MATERIALS FOR DRUG DELIVERY

Prasopchai Patrojanasophon*

Department of Industrial Pharmacy, Faculty of Pharmacy, Silpakorn university

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Abstract:

The field of drug delivery has experienced significant advancements in recent years, focusing on improving targeted therapeutic outcomes while minimizing systemic side effects. Bioadhesive materials have emerged as promising tools in this pursuit, offering unique advantages in enhancing drug delivery efficiency. This abstract provides a concise overview of key aspects surrounding bioadhesive materials and their application in drug delivery. Bioadhesive materials are substances that adhere to biological tissues, forming a strong bond upon contact. This inherent property is particularly advantageous in drug delivery systems, allowing for prolonged contact with the target site and enabling sustained release of therapeutic agents. The ability of bioadhesive materials to adhere to mucosal surfaces, such as those in the gastrointestinal tract, nasal cavity, and ocular tissues, has garnered significant attention for their potential in overcoming biological barriers and improving drug absorption. Recently, numerous bioadhesive materials have been developed, including first-generation and second-generation materials. Polymers and nanomaterials decorated with thiol, preactivated thiol, maleimide, and catechol functional groups have been discovered to exhibit excellent bioadhesive capability on ex vivo replicas of buccal, ocular, urinary bladder, nasal mucosa, and skin. This lecture will convey the development and characterization of thiol-, preactivated thiol-, maleimide-, and catechol-bearing nanomaterials for drug delivery. The synthesis and functionalization, characterization, and bioadhesive evaluation of these materials are discussed.

Associate Professor Dr. Prasopchai Patrojanasophon was born on December 24, 1988, in Suphan Buri Province. He graduated Bachelor of Pharmacy (First Class Honors) in the year 2012 from the Faculty of Pharmacy, Silpakorn University. He was then received a scholarship under the Royal Golden Jubilee Ph. D Program from the Thailand Research Fund (TRF) to pursue a Doctor of Philosophy in Pharmaceutical Technology at the Faculty of Pharmacy, Silpakorn University and graduated in 2017. He had an opportunity to conduct short-term research at the School of Food, Chemistry, and Pharmacy, University of Reading, United Kingdom, for one year (2015-2016). This research was supported by the Royal Golden Jubilee Ph. D Program and Newton-TRF PhD Scholarship from the TRF and British Council, United Kingdom. He is now working as an Assoc. Prof. at the Department of Industrial Pharmacy, Faculty of Pharmacy, Silpakorn University. His main research is associated with the development of mucoadhesive drug delivery systems. In addition, he also works on the development of hydrophilic pressure-sensitive adhesives and transdermal patches for drug delivery through the skin.



INVITED SPEAKER: B_INV02

ZERO- WASTE BIOREFINERY OF AGRO- INDUSTRIAL WASTES INTO BIOFUELS THROUGH OLEAGINOUS MICROORGANISMS AND EFFICIENT TECHNIQUES

Benjamas Cheirsilp,* Rawitsara Intasit

Center of Excellence in Innovative Biotechnology for Sustainable Utilization of Bioresources,
Faculty of Agro-Industry, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand

*e-mail: benjamas.che@psu.ac.th

Abstract:

The strategy of converting agro-industrial wastes to biofuel is promoted since it can help in the management of the enormous amount of unutilized waste that is continually created globally. Currently, researchers are investigating approaches to reuse, recycle, and upcycle various components of agro-industrial wastes throughout the production-consumption succession and return the residues to the cycle of product formation, which is often envisioned as a zero-waste biorefinery. These wastes could be low-cost nutrient sources for oleaginous microorganisms to produce microbial lipids, which can serve as sustainable and renewable biofuels. Oleaginous yeasts exhibit many advantages over bacteria and algae, including high lipid yields and lipid compositions like plant oils while requiring less area and low-cost nutrients. This review covers various biorefineries of agro-industrial wastes into biofuels using oleaginous microorganisms and several effective techniques. The review also highlights the benefits and drawbacks of each strategy. Furthermore, important difficulties, prospects, and challenges for zero-waste biorefinery, including novel cost-effective pretreatment and procedures with other viable processes, are also discussed. These strategies not only enable industrial waste-based enterprises to become successful and sustainable, but they can also lessen their negative effects on the environment.

Keywords: Agro-industrial wastes, Biodiesel, Biorefinery, Microbial lipid, Oleaginous microorganisms

Professor Dr. Benjamas Cheirsilp received scholarship from Ministry of Science and Technology, Thailand, since 1992 for her study in Japan. She graduated with a bachelor's degree in chemical engineering from Tohoku University, Japan, in 1997 and graduated with a master degree in 1999 and Ph.D. in 2003 in Biotechnology Engineering from Osaka University, Japan. In the past 20 years of her carrier as lecturer and researcher at Prince of Songkla University, which is located in the south of Thailand, she has been supervising >60 graduate students with >140 international papers. She is the recipient of several national awards and fellowships i.e., Outstanding Researcher Award from Thai Society for Biotechnology, L'Oreal Thailand "For Women in Science" Fellowship from L'Oreal Thailand and Thai National Commission for UNESCO, and Bioresource Technology Top Paper Award Winner JOINT THIRD PLACE 2015.

INVITED SPEAKER: B_INV03

IMPROVING ORGANIC BIOCONVERSION TO BIOFUEL BY PHYSICOCHEMICAL PRETREATMENTS

Sumate Chaiprapat^{1,2,*}

¹ Energy Systems Research Institute, Research and Development Office, Prince of Songkla University, Hat Yai, Songkhla, Thailand

² Department of Civil and Environmental Engineering, Faculty of Engineering, Prince of Songkla University, Hat Yai, Songkhla, Thailand

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Abstract:

Anaerobic digestion (AD) of lignocellulosic biomass and wastewater has received significant attention for bioenergy production in recent years. It not only serves the Bio-Circular-Green economy policy, but also acts as one of the important instruments to propel Thailand to the carbon neutrality goal in 2050. Many kinds of AD feedstock have various degrees of degradability depending on many factors of such liquid or solid materials including, for example, nutrient availability, pH, oil, inhibitor, cell structure, etc. Pretreatments of the AD feedstocks can be done in many ways ranging from physical, chemical, and biological means with the main purpose to facilitate the efficient conversion to methane gas either increasing methane yield or methanation rate (Fig. 1). For solid feedstocks, hydrolysis is a rate-limiting in AD. Physical pretreatment such as size reduction can firstly facilitate the transformation to increase microbial enzymatic attack on a larger specific surface area, while the excitation energy thru heating, microwave, or sonication can further compromise the cell structure. Chemicals such as acid or alkaline can disrupt the cell wall integrity but chemical residuals after pretreatments are left to be handled. In many cases, the inhibitors formed could even retard the subsequent digestion to methane. For liquid feedstock, unsuitable traits always caused the AD microbes to lose a healthy balance within the community, and thus resulting in the inefficient conversion of organics to the biomethane desired. Many pretreatment methods come with high costs thus, it is imperative to consider the economic viability, i.e. capital expenditure (CAPEX) and operation expenditure (OPEX) of each method for a full scale or an industrial application.

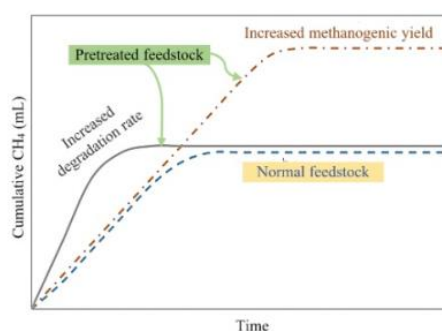


Figure 1. Impacts of pretreatments on biomethanation of feedstock in anaerobic digestion

Prof. Sumate Chaiprapat received a bachelor's degree in mechanical engineering from Kasetsart University, Thailand, a master's degree in environmental engineering from Iowa State University, and a Ph.D. in Biological and Agricultural Engineering from North Carolina State University in 2002. He currently serves as the director of the Energy Systems Research Institute of the Prince of Songkla University and coordinates various national-based research projects related to renewable energy and environmental management. His research interest lies in waste management, emphasizing bioenergy technology applications and nutrient recovery for industrial and agricultural wastes.



INVITED SPEAKER: B_INV04

EMPOWERING COASTAL COMMUNITIES THROUGH SOCIAL INNOVATION FOR SUSTAINABLE DEVELOPMENT

Aileen TAN Shau Hwai, Zulfigar YASIN*

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Abstract:

Due to the reduction in capture fisheries, the fisherman and coastal communities in Malaysia need to have an alternative livelihood to sustain their daily expenses. Through social innovation using the research findings on oyster farming, the coastal communities of Malaysia have been empowered and able to become social entrepreneurs. Besides contributing to SDGs, social innovation through oyster farming has generated new social values, improving well-being, empowerment, and social justice, besides increasing economic values such as markets, jobs, and income. Oyster farming knowledge from the results of the research has been translated to the coastal communities, where advanced technology has been simplified and compartmentalized into easily adoptable technology, which can be applied by the coastal communities. Opportunities are widespread and well accepted by the women folks in the coastal communities. In addition, oyster farming is considered green aquaculture because oysters are filter feeders which do not require feeding like prawns or fish, where excessive feed will pollute the water and environment, besides needing a higher investment cost to operate. This social innovation has fostered environmental values, such as reduced waste and carbon footprint. This is aligned to SDGs as well as to planetary health. Oyster farming is not only able to address the issues of food security as well as protection of the environment (Green and Clean Aquaculture), but it also fits in ideally in the blue economy for three pillars of sustainability (People, Planet & Profit).

Prof. Zulfigar Yasin is an Honorary Professor at the Centre for Marine and Coastal Studies (Universiti Sains Malaysia) and the Head of Heritage and Urban Studies at the Penang Institute. The latter is a think tank for the Penang State Government. He works on sustainable development and engages the stakeholders in making Penang green focusing on the areas of climate change resilience and adaptation.



INVITED SPEAKER: B_INV05

ARBUSCULAR MYCORRHIZAL FUNGI INOCULATION TO IMPROVE GROWTH AND TOLERANCE TO PHYTOPHTHORA ROOT ROT IN DURIAN SEEDLINGS

Rujira Deewatthanawong,^{1,*} Prasit Deewatthanawong,² Kanokpon Bunya-atichart³

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³ King Mongkut Institute of Technology Ladkrabang Prince of Chumphon Campus, Thailand

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Abstract:

A symbiotic relationship between arbuscular mycorrhizal (AM) fungi and their plant hosts can promote plant growth and increase resistance to biotic and abiotic stresses. The aims of this study were to investigate the effect of mycorrhizal inoculation on plant growth and resistance to Phytophthora root rot of durian in greenhouse conditions. Seedlings of local durians were grafted with Monthong variety and grown in sterilized media for 6 months. Each treatment was inoculated with different AM species including *Glomus mosseae*, *G. geosporum*, *Acaulospora scrobiculata*, *Ac. mellea*, *Ac. colombiana*, *Scutellospora pellucida*, *S. calospora*, *Claroideoglomus claroideum*, *C. etunicatum* and *Rhizophagus intraradices*. During the experiment, half-strength Hoagland solution was applied once a week and plant growth parameters including diameter, height, and number of branches were monitored every month for 3 months. Shoot and root dry matter, number of AM spores in rhizosphere soil, and root colonization were measured after 3 months of inoculation. Among those 10 species, *G. geosporum*, *Ac. mellea*, *S. pellucida* and *C. claroideum* showed increases in stem diameter but there was no effect on plant height, number of branches and dry matter. Tolerance of AM inoculated durians to Phytophthora root rot was investigated using *G. geosporum*, *Ac. mellea*, *C. claroideum*, and a mix of the 3 species. Durian seedlings were inoculated with *P. palmivora* 6 months after AM fungi inoculation. Our results indicated that durians inoculated with *C. claroideum* reduced disease susceptibility and enhanced disease resistance.

Dr. Rujira Deewatthanawong received her PhD in Horticulture from Cornell University. She was a recipient of TORAY Research Grant Award 2019. She is currently working as a senior researcher at Expert Center of Innovative Agriculture, Thailand Institute of Scientific and Technological Research. Her research fields include Plant Biotechnology, Beneficial microbes in Agriculture and Functional Agriculture.



INVITED SPEAKER: B_INV06

EXPLORING PHAGE- HOST INTERACTIONS FOR ENHANCED THERAPEUTICS AGAINST *Clostridioides difficile* INFECTIONS

Tanaporn Phetruen,¹ Sittinan Chanarat,^{1,2} Tavan Janvilisri,¹ Matthew Phanchana,³ Sitthivut Charoensutthivarakul,^{4,5} Wichuda Phothichaisri,¹ Surang Chankhamhaengdecha^{6,*}

¹ Department of Biochemistry, Faculty of Science, Mahidol University, Bangkok, Thailand

² Laboratory of Molecular Cell Biology, Center for Excellence in Protein and Enzyme Technology, Faculty of Science, Mahidol University, Bangkok, Thailand

³ Department of Molecular Tropical Medicine and Genetics, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand

⁴ School of Bioinnovation and Bio-Based Product Intelligence, Faculty of Science, Mahidol University, Bangkok, Thailand

⁵ Excellent Center for Drug Discovery (ECDD), Faculty of Science, Mahidol University, Bangkok, Thailand

⁶ Department of Biology, Faculty of Science, Mahidol University, Bangkok, Thailand

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Abstract:

This study explores the intricate interplay between bacteriophages and *Clostridioides difficile*, a notorious cause of nosocomial-associated diarrhea. The initial step in phage infection, characterized by the interaction between a receptor binding protein (RBP) on the phage tail fiber and host receptors, plays a pivotal role in infection dynamics. This coevolutionary arms race has led to a remarkable diversity of RBPs and bacterial receptors, resulting in highly specialized phage-host interactions. Our focus centers on elucidating the recognition and adsorption steps of these interactions, laying the groundwork for the development of bacteriophages and phage-derived proteins as versatile tools for bacterial detection and therapy. Specifically, our research targets *C. difficile* and its limited understanding of phage adsorption structures and receptor binding modules on phage tail fibers. Our objectives encompass identifying and characterizing RBPs for myoviruses that target *C. difficile*, as well as the host receptors they engage. This investigation reveals the receptor binding protein PtsM and its host counterpart, surface-layer protein A (SlpA), shedding light on the fundamental interactions governing myovirus infection of *C. difficile*.

Associate Professor Surang Chankhamhaengdecha was born in Rayong, Thailand in 1974. She received a bachelor's degree in Science from the Department of Microbiology, Faculty of Science, Burapha University, Thailand in 1997. She received her Master's and Doctorate degrees in Biotechnology in 1999 and 2003, respectively from Mahidol University, Thailand. Since 2006 and continuing to the present, she has been working at the Department of Biology, Faculty of Science, Mahidol University, Thailand. Her research interests include alternative therapies for drug-resistant pathogens and research in nutraceuticals and functional foods.



INVITED SPEAKER: C_INV01

BIOBASED MOLECULARLY IMPRINTED POLYMERS: DESIGN, SYNTHESIS AND APPLICATIONS FOR SELECTIVE ENRICHMENT OF PESTICIDES FROM REAL SAMPLES

Rodjana Burakham,^{1,*} Tittaya Boontongto,¹ Nilawan Surapong,¹ Preeyaporn Phosiri,¹ Yanawath Santaladchaiyakit,² Prachathipat Pongpinyo³

¹ Materials Chemistry Research Center, Department of Chemistry, Faculty of Science, Khon Kaen University, Khon Kaen 40002, Thailand

² Department of Chemistry, Faculty of Engineering, Rajamangala University of Technology Isan, Khon Kaen Campus, Khon Kaen 40000, Thailand

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Abstract:

Sample preparation plays a crucial role in determining pesticide residues in real samples. Dispersive solid-phase extraction, an emerging dispersive mode of sorbent-based extraction methods, has become a highly preferred sample pretreatment due to its advantages of simplicity, rapidity, low cost, and low solvent consumption. The extraction process occurs on a solid surface by direct contact of the sample solution with the sorbent. Therefore, the selection of an appropriate sorbent is a key factor. Based on the attractive features, molecularly imprinted polymers (MIPs) have been developed to achieve good extraction performance and enhance the extraction selectivity for the analytes of interest. The MIP is a synthetic polymer with cavities designed for a specific target molecule that uses size, shape, and functional group-based retention mechanism. However, MIP sorbent penetrates and accumulates in ecosystems and has low degradability under natural ecological conditions. Recently, eco-friendly strategies in the field of molecular imprinting technology have been offered to improve the performance of MIP materials by eliminating their negative impacts. In this presentation, several types of biobased MIP materials are proposed, including MIPs synthesized from natural deep eutectic solvents as dummy templates and functional monomers, an aqueous ethanol as a green porogenic solvent, and a biodegradable MIP coated on natural substrate. The applicability of the developed MIP materials for dispersive solid phase extraction of different groups of pesticides, including organophosphorus, carbamates, and organochlorines were demonstrated. The method facilitates the efficient determination of pesticide residues in complex matrices, including fruits, vegetables, and cereals grains. The newly designed biobased MIP sorbents, along with a simple and rapid extraction process, demonstrated a powerful analytical approach for the practical analysis of pesticide residues in real samples.

Associate Professor Rodjana Burakham was born in Ubon Ratchathani, Thailand, in 1976. She earned bachelor's degree and master's degree in chemistry from the Department of Chemistry, Faculty of Science, Khon Kaen University, Thailand, in 1998 and 2001, respectively. Following that, she pursued her Doctorate in Chemistry at the Department of Chemistry, Chiang Mai University, Thailand, which she completed in 2005. She received a Georg Forster Research Fellowship from the Alexander von Humboldt Foundation for postdoctoral research in Germany in 2007. Since 2005, she has been affiliated with the Department of Chemistry at the Faculty of Science, Khon Kaen University, Thailand. Her research interests primarily focus on separation techniques and sample preparation.

INVITED SPEAKER: C_INV02

LC-MS AND NMR-BASED METABOLOMICS ANALYSIS OF SELAGINELLA PLANTS: DISCOVERY OF BIOACTIVE BIFLAVONOIDS AND CHEMOTAXONOMIC MARKERS

Nopporn Thasana*

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Center of Excellence on Environmental Health and Toxicology (EHT) , OPS, Ministry of Education, Science, Research and Innovation, Bangkok, 10400, Thailand

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Abstract:

Selaginella plants (Selaginellaceae), early vascular plants known as spikemosses, contain a wide range of biologically active natural products, particularly biflavonoids (BFVs). These BFVs are known for their diverse properties, including anti-cancer, anti-inflammatory, antioxidant, antimicrobial, anti-allergy, anti-diabetes, anti-UV irradiation, anti-hemorrhagic, and antinociceptive activities. Approximately one hundred *Selaginella* samples were collected from Thai natural resources for biodiversity and plant metabolomic studies. Both untargeted and targeted metabolomics of the BFV-rich ethyl acetate extract from *Selaginella* plants were investigated. An in-house database of BFVs was established using HPLC, LC-MS, and NMR techniques. All measurable analytes from the samples, including chemical unknowns, were characterized and biochemically annotated metabolites. This presentation utilized LC-MS analysis and NMR-based metabolomic profiling as **a fishing tool** to identify the presence of both known and unknown BFVs and to determine chemotaxonomic markers of *Selaginella* plants.



Nopporn Thasana (born in 1970, Pattani)

Mahidol University (Ph.D., 2003, Prof. Somsak Ruchirawat)

Bristol University (Visiting fellow, 2001, Prof. Timothy Gallagher)

Nagoya University (Visiting fellow, 2003, Prof. Minoru Isobe, 2009, Prof. Toshio Nishikawa)

CRI: Research Scientist (1997), Senior Research Scientist I (2010), Senior Research Scientist II (2015-present)

CGI: Lecturer (2007), Associate Professor (2018-present) <https://www.cgi.ac.th/programs/cs/faculty-staff/nopporn-thasana/>

Field of Research: Synthetic Methodology Development, Synthesis of Natural Products and Natural Products Chemistry

INVITED SPEAKER: C_INV03

RENOLUTIONIZING ANTI-CANCER DRUG DESIGN AND SCREENING

Duangjai Todsaporn,¹ Utid Suriya,² Kamonpan Sanachai,³ Panupong Mahalapbutr,⁴ Athina Geronikaki,⁵ Kiattawee Choowongkorn,⁶ Thanyada Rungrotmongkol^{1,7,*}

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Abstract:

Cancer poses a substantial global health challenge, burdening nations worldwide and remaining a leading cause of mortality and morbidity. Janus kinase (JAK) and epidermal growth factor receptor (EGFR) have emerged as promising targets for cancer therapy due to their critical roles in regulating cancer cell proliferation and survival. Specifically, the strategy of targeting overactive kinases offers a promising avenue to mitigate cancer-related mortality. Herein, we harnessed accelerated *in silico* screening techniques to identify potential anti-cancer drug candidates from both natural products and their synthetic analogs, with a focus on targeting JAKs and EGFR tyrosine kinase (EGFR-TK). Subsequently, the screened compounds underwent rigorous experimental studies to assess their biochemical efficacy, apoptosis-induced cell death, and patterns of kinase selectivity. Our research endeavors represent a collective effort not only discovering novel anti-cancer drugs but also comprehensively unraveling the intricate details of compound recognition and susceptibility at the atomic level.

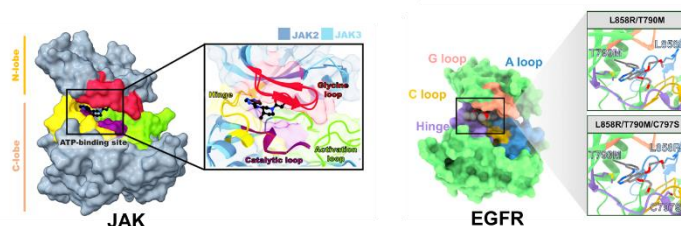


Figure 1. Tofacitinib/JAKs (left) and erlotinib/EGFR-TK in wild-type and drug-resistant strains (right)

Assoc. Prof. Thanyada Rungrotmongkol joined the Department of Biochemistry at the Faculty of Science, Chulalongkorn University, in 2011. Her research career has been dedicated to gaining uniquely detailed, atomic-level insights into biological processes, focusing on molecular recognition as well as the structural and dynamic properties of proteins. In recognition of her contributions to the field, she has received several awards, including the Bernd Rode Award Laureates from ASEA- UNINET (2017), the Jisnuson Svasti- BMB Award from the Science Society of Thailand (2018), the Jisnuson Svasti-Young Protein Scientist of Thailand Award from the Protein Society of Thailand (2018), and the Distinguished Lectureship Award from the Chemical Society of Japan (2022). To date, she has authored or co-authored approximately 240 international publications, with h-index of 31.



INVITED SPEAKER: C_INV04

OXIDATION OF HMF AND FURFURAL

Thinnaphat Poonsawat, Kaleeswari Kalimuthu, Nattapong Kongcharoen, Tassadee Titimahasan, Harshit Shukla, Minh Huy Hoang Tran, Sutthita Baiphokthong, Natcha Temnuch, Peerapong Promcharoen, Ekasith Somsook*

NANOCAS Laboratory, Center for Catalysis Science and Technology (CAST), Department of Chemistry and Center of Excellence for Innovation in Chemistry, Faculty of Science, Mahidol University, Bangkok 10400, Thailand

*e-mail: ekasith.som@mahidol.ac.th

Abstract:

Integrated biorefineries have been receiving more attention to increase the demand responses in bio-green-circular economy for solving the environmental global issues leading to the sustainable development. In this report, 2,5-hydroxymethyl furfural (HMF) and furfural are selected as chemical platforms to be investigated for the productions of 2,5-furandicarboxylic acid (FDCA) and succinic acid (SA), respectively. For the HMF chemical platforms, metal-oxide catalysts will be reported for the oxidation of HMF to FDCA. HMF is an unstable molecule, and it is transformed to humin in an acidic solution or a high concentrated condition. The stabilization of HMF by the structure modification of HMF or the addition of other metal ions will be reported. For the furfural chemical platform, the oxidation of furfural to succinic acid (SA) in the presence of hydrogen peroxide as oxidizing agent will be reported. However, the major product of the oxidation of furfural in this condition was maleic acid.

Associate Professor Ekasith Somsook received a Ph.D. in Chemistry from University of Wisconsin-Madison in 2001. After that he has been working at Mahidol University. His research interests are in plastic recycling and biorefinery.



INVITED SPEAKER: C_INV05

NOVEL SENSING APPROACH AND MATERIALS BASED ON GRAPHENE-AMINO ACID THIN FILM: POTENTIAL FOR ELECTROANALYSIS

Weena Siangproh,^{1,*} Jeerakit Thangphatthanarunguang,¹ Chuleekorn Chotsuwan,² Orawon Chailapakul³

¹ Department of Chemistry, Faculty of Science, Srinakharinwirot University, Sukhumvit 23, Wattana, Bangkok 10110, Thailand

² Nanohybrids for Industrial Solutions Research Team, National Nanotechnology Center, National Science and Technology Development Agency, Khlong Nueng, Khlong Luang, Pathumthani 12120, Thailand

³ Electrochemistry and Optical Spectroscopy Center of Excellence, Department of Chemistry, Faculty of Science, Chulalongkorn University, Pathumwan, Bangkok 10330, Thailand

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Abstract:

Nowadays, advancements in nanomaterials and printing technology have led to the creation of a variety of electrochemical sensing platforms. Herein, we present novel electrochemical sensing platforms based on printed graphene and amino acid thin film for bioanalytical purposes. First, we proposed the creation of an electrochemical sensor based on a poly(L-glutamic acid)-modified screen-printed graphene electrode for 1-hydroxypyrene (1-OHP) detection. Second, we are the pioneers in reporting the deposition of poly(L-methionine) on the surface of a screen-printed graphene electrode for simultaneous determination of 5-aminosalicylic acid (5-ASA) and sulfapyridine (SPD), which are metabolites of sulfasalazine (SSZ). The fabrication is simple and rapid, using a single step of electropolymerization after printing graphene. Important parameters in the fabricated process were systematically investigated by surface composition, morphology, and electrochemical studies. Then, the analytical performances, comprising sensitivity, selectivity, stability, and reproducibility, were carefully performed. Under optimal conditions, 1-OHP sensing provided a linear range of 1–1000 nM with a detection limit of 0.95 nM. Highly sensitive and selective simultaneous detection of 5-ASA and SPD with wide linear dynamic ranges of 1–50 μ M and 80–250 μ M and low detection limits of 0.60 and 0.57 μ M for 5-ASA and SPD, respectively, were obtained. To evaluate the potential of the designed sensors, they were successfully applied for the quantification of target analytes in human urine samples. In comparison with conventional methods, these newly proposed electrochemical methodologies could be tremendously valuable for the evaluation of target analytes in clinical and related applications.

Associate Professor Dr. Weena Siangproh was born in Phetchaburi. She received her Bachelor of Science degree in Chemistry from Srinakharinwirot University in 1998. She then went to pursue her Ph.D. in analytical chemistry from Chulalongkorn University in 2006. From 1999 to present, she worked at the Department of Chemistry, Faculty of Science, Srinakharinwirot University. Her research interests include analytical chemistry, electroanalytical chemistry, and chemical sensors. She is particularly interested in the development of new and improved chemical sensors for a variety of areas, including environmental monitoring, food safety, and clinical applications.

INVITED SPEAKER: C_INV06

TOTAL SYNTHESSES AND BIOLOGICAL EVALUATION OF SELECTED 14- MEMBERED MACROLIDES

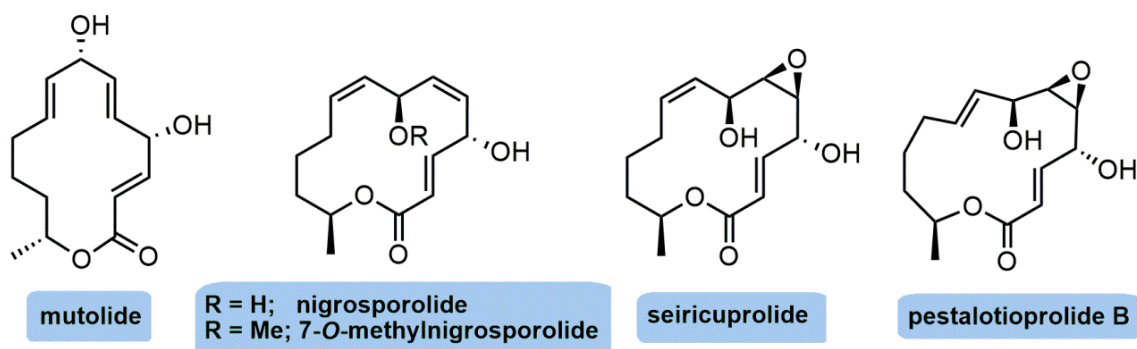
Kwanruthai Tadpetch*

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Abstract:

The 14-membered macrolides are an important class of fungal polyketide metabolites that possesses diverse biological and pharmacological profiles. Owing to a broad spectrum of biological activities of this group of macrolides and as part of our drug discovery program, we have been engaged in total syntheses of some 14-membered macrolides. This presentation will focus on our recent synthetic efforts toward five selected 14-membered macrolactones i.e. mutolide, nigrosporolide, 7-*O*-methylnigrosporolide, seircuprolide and pestalotioprolide B. Cytotoxic activity of the synthetic compounds against some human cancer cell lines as well as inhibitory effect against CFTR-mediated chloride secretion in human intestinal epithelial (T84) cells will also be discussed.



- ★ cytotoxicity against six human cancer cell lines
- ★ inhibitory effect on CFTR-mediated chloride secretion

Kwanruthai Tadpetch received her B.Sc. (First Class Honor) from Prince of Songkla University, Thailand. She then obtained her Ph.D. in 2010 from University of California, Irvine, USA under the direction of Professor Scott D. Rychnovsky. She is currently an Associate Professor of Organic Chemistry at Prince of Songkla University, Thailand. Her research focuses on total syntheses and medicinal chemistry of biologically active natural products.



INVITED SPEAKER: D_INV01

PREDICTING THE UNPREDICTABLE: EXTREME VALUE THEORY AT THE NEXUS OF CLIMATE ACTION, SUSTAINABLE INFRASTRUCTURE, AND TECHNOLOGICAL INNOVATION

Piyapatr Busababodhin*

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Abstract:

In Northeast Thailand, a region rich in agricultural activity, the recurrent challenges of droughts and floods necessitate innovative strategies for safeguarding the agricultural sector. This study articulates the critical role of the Extreme Value Theory (EVT) in fostering resilient agricultural practices and infrastructures.

This study exploits EVT's capabilities through sophisticated modeling techniques — including univariate, bivariate, copula, and spatial extreme value theories — to create reliable strategies that mitigate climate-related challenges, enhancing agricultural resilience in the region. It seeks to equip farmers, agricultural officers, and policy-makers with actionable insights to foster informed decision-making and sustainable agricultural developments. Further, the study highlights the potential synergy between EVT and technological advancements in Thailand. This collaboration envisions fostering innovations that anticipate and mitigate the impacts of extreme climatic events, promoting a resilient and adaptive agricultural sector.

In conclusion, the study advocates for a proactive, EVT-based approach in Northeast Thailand, harmonizing climate action, sustainable infrastructure, and technological innovation, thereby aligning with the Sustainable Development Goals and prioritizing the well-being of the farming community.

Dr. Piyapatr Busababodhin, an accomplished statistician, earned her Ph. D. in Applied Statistics from King Mongkut's University of Technology North Bangkok in 2013. Her academic journey includes a research fellowship at Lund University, Sweden in 2012, and a postdoctoral fellowship at Chonnam National University, Korea in 2014, sponsored by the National Research Funding of Korea. Currently, Dr. Busababodhin holds the position of Associate Professor at the Department of Mathematics, Faculty of Science, Maharakham University (MSU). She is a recognized expert in Extreme Value Theory and its applications, Extreme Risk Assessment, and Statistical Hydro-Meteorological Analysis with a focus on Water Management for Sustainable Agriculture. Since 2017, she has been spearheading a critical research project titled "Development of an Information System for Forecasting Spatial Extremely Drought in Mekong, Chi, and Mun Watershed for Water Management of Precision Agriculture," sponsored by ARDA. Her commitment to advancing knowledge in her field is further demonstrated through her roles as the manager of the Data Science for Sustainable Agricultural Research Unit (DSSA) at the Science Faculty of Maharakham University, and the Digital Innovation Research Cluster for Integrated Disaster Management in the Watershed (DIIDMrc) at the same institution.



INVITED SPEAKER: D_INV02

AN ENHANCED THYROID CANCER ASSESSMENT USING ULTRASOUND IMAGES BASED ON CLINICAL PRACTICE IN THAILAND

Chadaporn Keatmanee,^{1,*} Dittapong Songsaeng,² Mongkol Ekpanyapong,³ Matthew N. Dailey⁴

¹ Department of Computer Science, Faculty of Science, Ramkhamhaeng University, Thailand

² Department of Radiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

³ Industrial Systems Engineering Department, Asian Institute of Technology, Thailand

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Abstract:

Conventional ultrasound and Doppler images are used for the detection and characterization of thyroid nodules and facilitate the decision-making for fine-needle aspiration. The diagnosis varies with the experience of radiologists, image acquisition, and operators. Therefore, artificial intelligence (AI) for the thyroid nodule assessment using ultrasound images is expected to support the diagnostic performance. This paper contributed an AI system for thyroid nodule assessment according to clinical practice at multi-center in Thailand. The thyroid nodules on ultrasound images from patients who underwent thyroid ultrasound-guided FNA and had a decisive diagnosis from FNA cytology at Siriraj Hospital, Vajira Hospital, and HRH Princess Maha Chakri Sirindhorn Medical Center between January were collected. The diagnostic performance of AI was evaluated in the real-world dataset. The highest sensitivity, specificity, PPV, NPV, and accuracy of the AI were at Siriraj Hospital. The prediction results were most correctly classified in Siriraj Hospital's datasets because the AI was trained using different datasets from Siriraj Hospital before. Nevertheless, the average evaluation metrics of the AI were dropped in the multi-center datasets due to insufficient datasets from Vajira Hospital, and HRH Princess Maha Chakri Sirindhorn Medical Center. Although the AI was comparable in diagnostic specificity to the experienced radiologists, it had higher diagnostic sensitivity than the experienced radiologists. Consequently, this proposed AI may play a potential role in clinical practice as an assistant alongside radiologists in the diagnosis of thyroid nodules.

Chadaporn Keatmanee has an accomplished academic, professional educational background, and diverse expertise. She obtained her B.S.I.ED. in Telecommunication Engineering from King Mongkut's Institute of Technology Ladkrabang, Thailand. She further honed her skills by achieving her M. Eng. in Computer Science from the Asian Institute of Technology in Thailand. Driven by her passion for knowledge and innovation, she pursued a dual Ph. D. path, her first Ph. D. in Information Science from the Japan Advanced Institute of Technology and Science, Japan. She achieved her second Ph. D. in Engineering and Technology from the Sirindhorn International Institute of Technology, Thammasat University, Thailand. Currently serving as a lecturer at the Department of Computer Science within the Faculty of Science at Ramkhamhaeng University. With a focus on healthcare research, she aims to spearhead meaningful contributions to the medical industry by leveraging her expertise in medical image processing, machine learning, and data privacy.

INVITED SPEAKER: D_INV03

DEEP LEARNING APPLICATIONS TO TANGIBLE CULTURAL HERITAGE

Porawat Visutsak*

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Abstract:

While countries around the world are hardly to find their unique cultural heritage to identify the cultural identity. Thailand is rich and unique in both of intangible and tangible cultural heritages, e.g., Muay Thai, offering alms to monks, Thai cuisine, and Thai arts. Thai cultural heritage may vary based on ideology, beliefs, and traditions of each ethnic region over the centuries. In this talk, we are going to show you how to apply deep learning techniques to preserve the original pattern of Thai tangible cultural heritage. Our previous works were focusing on the classification of Thai weaving patterns using CNNs and the Benjapakee Buddha amulets classification using discrete wavelet transform and transfer learning. The graphical abstracts of this talk are provided.

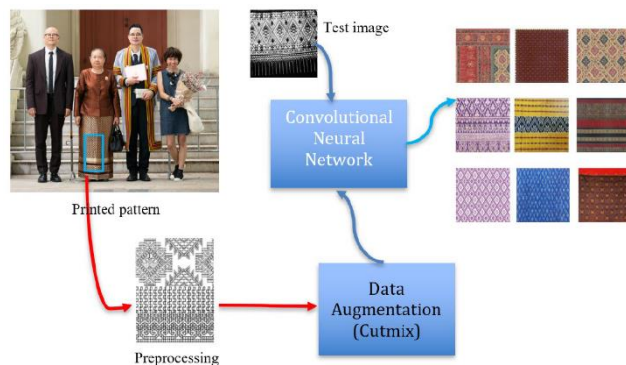


Figure 1. Thai weaving pattern classification

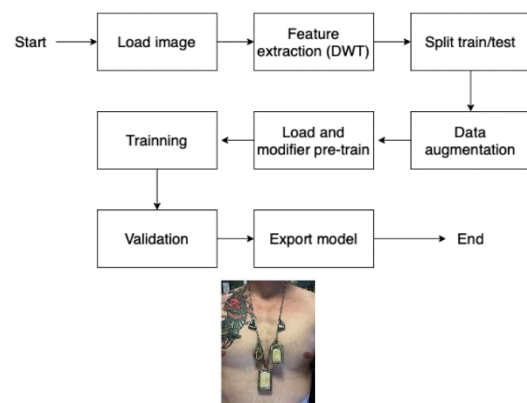


Figure 2. Thai Buddha Amulet Classification

Porawat Visutsak received the Ph.D. degree in Computer Science from the Faculty of Science, KMITL (King Mongkut's Institute of Technology Ladkrabang) in 2010. He was research fellow at SunMoon University, Republic of Korea in 2010. He was selected to receive the Endeavour Research Fellowship in 2016 to conduct his research at the University of Southern Queensland, Australia. He was also awarded the Junior Research Fellowship 2017 to conduct the research at Centre de Recherche en Informatique, Signal et Automatique de Lille, France. He is with the Department of Computer and Information Science, Faculty of Applied Science, KMUTNB. His current position is Associate Professor. In 2023, he was Senior Visiting Scholar in the Computer Science and Technology Program, Beijing Institute of Technology's School of Computer Science and Technology, Beijing, China under China Scholarship Council (CSC) Program.



INVITED SPEAKER: D_INV04

DYNAMICS IN NUMBER THEORY

Detchat Samart*

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Abstract:

Dynamical systems have a variety of applications in many disciplines. In this talk, we present some classical and contemporary results in number theory from dynamical perspectives. Some open problems in this research area will also be discussed. This talk is aimed at a general audience. No background in number theory will be assumed.

Dr. Detchat Samart is currently an assistant professor in the Department of Mathematics, Burapha University. He received a Ph.D. in mathematics from Texas A&M University, USA in 2014. After graduation, he worked as a J. L. Doob Research Assistant Professor at University of Illinois Urbana-Champaign (USA) until 2017. He also briefly held a postdoctoral position at University of Montreal (Canada) in 2015. His research interests lie in the field of number theory and related areas. More specifically, he has been working on problems concerning Mahler measures and their connection with special values of L-functions attached to modular forms or certain algebraic varieties. He has recently become interested in arithmetic dynamics, which is the intersection of dynamical systems and number theory.

INVITED SPEAKER: E_INV01

DEVELOPMENT OF HOLLOW STRUCTURED HZSM-5 BASED CATALYSTS FOR BIO-OIL UPGRADING

Guoqing Guan*

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Abstract:

Hollow structured ZSM-5 is a material that has recently attracted a lot of interest since it can overcome diffusion limitations and improve the catalytic activity, resulting in a highly desired product while reducing coke formation. In this study, the hollow structured HZSM-5 zeolite catalyst with mesopore shell was prepared directly using the hydrothermal method with further treating with tetrapropylammonium hydroxide (TPAOH) and employed for in-situ catalyst upgrading of bio-oil from rapid pyrolysis of biomass. The optimum catalyst upgraded the bio-oil from cedar with an aromatic hydrocarbons content up to 80.2%. In addition, this catalyst exhibited excellent reusability and regeneration property by achieving aromatic hydrocarbons content of 79.60% even in the 4th cycle which was comparable to the use of fresh catalyst. The increased accessibility to the acid sites in the hollow HZSM-5 greatly improved the reaction rate as well as the reduced coking.

Acknowledgment: This work is supported by JST Grant Number JPMJPF2104, Japan.

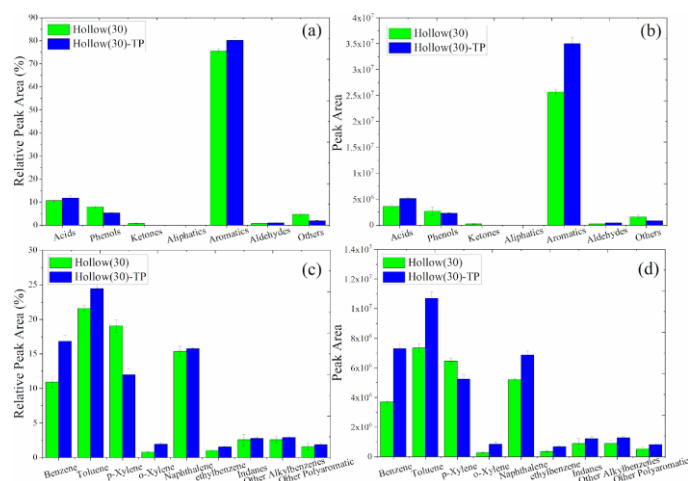


Figure 1. (a-b) Relative peak areas and peak areas of compounds and (c-d) Relative peak areas and peak areas of specific aromatic hydrocarbons obtained from the use of the fixed bed reactor with a B/C weight ratio of 1:2.

Dr Guoqing Guan is a full professor of Hirosaki University, Japan. He received his B.S., M.S. and Ph.D degrees in Chemical Engineering from Sichuan University, China and Kyushu University, Japan, in 1990, 1993, 1995 and 2004. His research interests include sustainable energy system, coal and biomass pyrolysis and gasification, biorefinery, heterogeneous catalysts for energy conversion, energy materials and water splitting for hydrogen production. He has published over 440 international peer reviewed papers, 60 patents and 22 book chapters with a H-index 60. He is now serving as associate editors of Carbon Resources Conversion and MetalMat; editorial board members of Fuel Processing Technology and Resources Chemicals and Materials.



INVITED SPEAKER: E_INV02

CO₂ CAPTURE FROM AIR AND CATALYTIC CO₂ CONVERSIONS USING METAL OXIDE CLUSTERS

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Abstract:

Reducing the concentration of carbon dioxide (CO₂) in the atmosphere and CO₂ conversion to useful chemical products are becoming essential for building a sustainable society. Here, I introduce our direct air capture system using phase separation between liquid amine and solid carbamic acid and catalytic CO₂ fixation and conversion using basic metal oxide clusters. Liquid-solid phase separation using diamines bearing an aminocyclohexyl group exhibited >99% CO₂ removal efficiency under a 400 ppm CO₂ flow system. Among them, isophorone diamine (IPDA) showed the highest CO₂ removal efficiency, and solid carbamic acid was formed. IPDA reacted with CO₂ in a CO₂/IPDA molar ratio of *ca.* 1 even in H₂O as a solvent. The captured CO₂ was completely desorbed at 333 K under N₂ flow because the dissolved carbamate ion releases CO₂ at low temperatures. The reusability of IPDA without degradation, the >99% efficiency kept for 100 h under direct air capture conditions, and the high CO₂ capture rate (201 mmol/h for 1 mol of amine) suggest that the phase separation system using IPDA is robust and durable for practical use.

Since the catalytic CO₂ conversion systems, our group focused on the group V metal oxide clusters among the polyoxometalates due to their CO₂ activation properties. We found that the [Nb₁₀O₂₈]⁶⁻ cluster was active for CO₂ fixation reactions to amine compounds because of the CO₂ activation ability of the metal oxide clusters by the electron donation from the base site of surface oxygen to CO₂. This base catalysis was ascribed to the large negative charges of surface oxygen atoms of Nb oxide clusters calculated by density functional theory (DFT). Furthermore, the [M₆O₁₉]⁸⁻ clusters could activate CO₂ on terminal O sites and showed catalytic activities for CO₂ fixation reactions. Recently, we developed bifunctional catalysts by modifying supported metal nanoparticles with metal oxide clusters. We found that the [Nb₆O₁₉] modified Pt nanoparticles were active for N-formylation of piperidine.

Professor Seiji Yamazoe received his PhD degree in 2008 from Kyoto University. That same year, he transferred to the Department of Materials Chemistry, Ryukoku University as an Assistant Professor. In 2012, he was appointed as an Assistant Professor in the Department of Chemistry, the University of Tokyo. In 2017, he was promoted to Professor at Department of Chemistry, Graduate School of Science, Tokyo Metropolitan University. His current research has focused on direct air capture, strong base catalysis using metal oxide clusters, synthesis of multi-functional catalysts using complex metal oxides, and their local structural studies using synchrotron-based spectroscopies.



INVITED SPEAKER: E_INV03

BIOCOAL PRODUCTION FROM WASTE AND BIOMASS BY HYDROTHERMAL CARBONIZATION

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Abstract:

High-moisture waste and biomass, encompassing materials such as municipal solid waste, oil-palm residues, bark, and sludge, pose significant challenges in terms of usability and recycling. Addressing this concern, a groundbreaking technology known as "Hydrothermal Carbonization" (HTC) emerges as a promising solution tailored for the conversion of high-moisture waste and biomass. This innovative process not only enhances the physical and chemical properties of the resulting product but also achieves notable advancements in dewatering and drying performance, leading to a reduction in overall drying costs. One of the standout features of HTC is its ability to yield products with heating values comparable to, or even surpassing, those of the raw feedstock. This transformative quality positions the product as a versatile resource, capable of serving as solid biofuel or biocoal. In essence, HTC presents a sustainable and efficient avenue for transforming challenging waste and biomass materials into valuable energy sources. This presentation provides comprehensive insights into HTC, spanning its evolution from laboratory-scale development to commercial-scale applications. Furthermore, it will shed light on the diverse array of potential applications stemming from HTC while succinctly addressing the challenges associated with its implementation. Therefore, this presentation aims to offer an understanding of HTC's transformative potential within the realm of waste and biomass conversion.

Associate Professor Dr. Chinnathan Areeprasert was born in Bangkok, Thailand in 1989. He received the bachelor's degree in Engineering from the Department of Mechanical Engineering, Faculty of Engineering, Kasetsart University. He received the Master of Engineering and Doctor of Engineering from the Department of Environmental Science and Technology, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, Japan. Currently, Dr. Chinnathan is working at the Department of Mechanical Engineering, Faculty of Engineering, Kasetsart University. He is also a director of Energy and Environmental Engineering Center, Faculty of Engineering, Kasetsart University. His research interests are waste and biomass conversion technology, waste management, and technology commercialization for both industry and community.

COMPUTATIONAL CATALYSIS ENGINEERING FOR HETEROGENEOUS CATALYST DESIGN AND CATALYTIC PROCESS OPTIMIZATION

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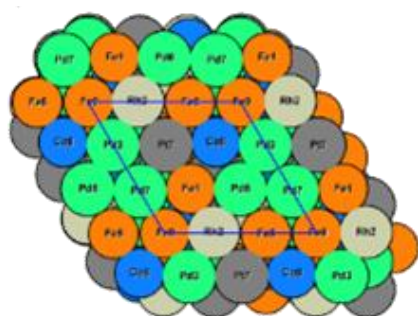
² Center of Excellence on Catalysis and Catalytic Reaction Engineering, Chulalongkorn University, Bangkok 10330, Thailand

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Abstract:

The screening of heterogeneous catalysts relies mostly on experimentations; however, screening for candidates in a large catalyst pool via experiments alone is chemical-intensive and time-consuming. Thus, techniques in quantum chemistry, i. e., Density Functional Theory, have been extensively employed to improve the pre-screening process of catalyst candidates, in which it can accurately determine chemical and catalytic properties of various materials classes, and when combined with experimental screening, can reduce costs. Furthermore, artificial intelligence tremendously helped improve accuracy and screening speed. Thus, this work presented workflow for heterogeneous catalyst screening based on our recent work, where the case of metal and high-entropy alloy catalysts will be showcased. For the metal catalysts, our screening tool – the “Ratings Concept” helps screen for reactive and stable catalysts for the CO₂ reforming process, while the screening protocol for high-entropy alloy catalysts will also be discussed.



HEA	Lattice parameter FCC (a-b-c, in Å)	Enthalpy formation energy FCC (in kJ/mol* _{fu})	Lattice parameter BCC (a-b-c, in Å)	Enthalpy formation energy BCC (in kJ/mol* _{fu})	Valence electron count	Atomic mass (in g/mol)	Atomic radius (in Å)	Atomic size difference (in Å)	Pauling electron
PtPdCuFeCo	6.9645	-2.8234	5.5248	-2.3871	8.6	93.6532	1.64	5.495	1.97
PtPdCuFeNi	6.9636	0.5261	5.5262	0.7531	8.8	93.6865	1.634	6.029	1.976
PtPdCuFeCu	7.0008	0.5215	5.5565	0.7246	9	94.5758	1.626	6.811	1.974
PtPdCuFeZr	7.3467	-2.4531	5.8311	-2.4604	7.6	100.1106	1.748	9.716	1.86
PtPdCuFeMo	7.1339	0.6496	5.6622	0.7603	8	101.0546	1.716	6.64	2.026
PtPdCuFeRu	7.0872	-5.0935	5.8751	-4.8337	8.4	102.0806	1.692	4.749	2.034
PtPdCuFeRh	7.0955	0.2001	5.6317	0.4226	8.6	102.4477	1.682	4.244	2.05
PtPdCuFeAg	7.32	0.1668	5.7282	0.4562	9	103.4402	1.666	4.064	1.98
PtPdCuFeW	7.1593	0.8275	5.6823	1.0354	8	118.6366	1.722	7.192	2.066
PtPdCuFeOs	7.094	0.4853	5.8305	0.8668	8.4	119.9066	1.706	5.774	2.034

Figure 1. Design of active site in High-entropy Alloys (HEA) (left) and Chula-JAIST Catalyst Database for HEA catalyst design (right)

Assoc. Prof. Dr. Supareak Prasertthdam is the director of Center of Excellence on Catalysis and Catalytic Reaction Engineering (CECC), the Principal Investigator of the High-Performance Computing Unit (CECC-HCU), and an Associate Professor at the Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University, Thailand. He graduated Bachelor of Engineering (1st class honors in Chemical Engineering) from the Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University in 2014 and a Ph.D. (Chemical Engineering) from Texas A&M University, College Station, Texas, USA, in 2018. His research in computational catalysis engineering employs density functional theory-based analyses, microkinetic modeling, and machine learning to study heterogeneous catalysts. In 2017, he received the Richard J. Kokes Award from the North American Catalysis Society (NACS), USA. He has published over 77 international peer-reviewed papers in various journals, e. g., Chemical Engineering Journal, ChemCatChem, Catalysis Science & Technology, and Applied Surface Science.



INVITED SPEAKER: E_INV05

PROGRESS ON MICROWAVE-CARBOCATALYSIS FOR GLYCEROL VALORIZATION UNDER SOLVOTHERMAL CONDITIONS

Armando T. Quitain,*¹ Yuri Ogasawara,² Shinnosuke Uchikado,² Jonas Karl N. Agutaya,³ Yusuke Inomata,⁴ Suttichai Assabumrungrat⁵, Tetsuya Kida⁴

¹ Center for International Education, Kumamoto University, Kumamoto, Japan

² Graduate School of Science and Technology, Kumamoto University, Kumamoto, Japan

³ International Research Organization for Advanced Science and Technology, Kumamoto University, Kumamoto, Japan

⁴ Faculty of Advanced Science and Technology, Kumamoto University, Kumamoto, Japan

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Abstract:

The Thai government envisioned a Bio-Circular-Green (BCG) model that can significantly propel economic growth and achieve Sustainable Development Goals (SDGs), thus recently approved a five-year strategic plan to promote the BCG economy. Similarly, the Japanese government has drafted a policy aiming for Carbon Neutral Society by 2050. Both these government policies encourage the use of renewable resources including bio-based fuels and chemicals. In line with this, biodiesel has been considered as an alternative fuel for diesel engine and its production is expected to increase rapidly in the future. As a result, glycerol (Gly) which accounts for about 10 wt%, will be enormously produced as byproducts. Gly can be converted to glycerol *tert*-butyl ether (GTBE), a compound that can be added to biodiesel to increase its cetane number. In this presentation, progress on the conversion of Gly to GTBE will be introduced. Specifically, this talk focuses on our novel solvothermal synthesis process that employs the synergy of microwave irradiation and graphene oxide (GO) catalysts. This also includes effects of parameters such as microwave (MW) heating, reaction time, temperature, TBA-to-Gly molar ratio and catalyst amount on the etherification reaction. Results indicated that MW heating favors conversion of Gly to glycerol *di*- and *tri-tert*-butyl ethers compared to conventional method due to its inherent characteristics of being internal, rapid and selective. The high catalytic performance of GO is attributed to the incorporation of hydrophilic functional groups on the hydrophobic carbon surface. Addition of carbon dioxide into the system was also found to have positive effects on the yield.

Prof. Armando T. Quitain received his BS in Chemical Engineering (*with honors*) from De La Salle University-Manila as a *National State Scholar*, and worked at the same university right after graduation while taking up MS in Chemical Engineering (*with distinction*). He further pursued PhD in Chemical Engineering at Nagoya University (*MEXT Scholar*), and worked on the development of reactive distillation for biofuel synthesis under the supervision of Prof. Shigeo Goto. He pursued a career on research starting as a Post-doctoral Researcher under "JSPS Research for the Future Program", followed immediately as a Senior Researcher at the Research Institute for Solvothermal Technology. He joined the Graduate School of Science and Technology of Kumamoto University in 2010, and currently serves a Professor at the Center for International Education affiliated to the Headquarters for Admission and Education. His research interests focus on the application of green technologies (microwave, hydrothermal and supercritical fluids) for the valorization of biomass to biofuels and high-value chemicals.



INVITED SPEAKER: E_INV06

THE PROSPECTIVE OF BIOFUEL AND BIOENERGY

Hwai Chyuan Ong*

Department of Engineering, School of Engineering and Technology, Sunway University, Jalan Universiti, Bandar Sunway, 47500 Petaling Jaya, Selangor, Malaysia

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Abstract:

Sustainable energy sources are a solution to the increase in energy demand as a result of population growth. Biofuel and bioenergy have become an alternative solution for environment suitability and energy crises caused by the indiscriminate use of fossil fuels. Thermochemical technology can be used to convert biomass wastes into energy. Conventional pyrolysis is conducive to the formation of bio-oil, whereas microwave-assisted pyrolysis can improve the composition of bio-oil and the surface properties of biochar. Biofuels from microalgae biomass have promising potential for a sustainable bioeconomy. One of the case study is bioethanol production from the co-production of solid biochar and liquid hydrolysate under microwave-assisted wet torrefaction process. The microalgal biomass undergone dilute acid pretreatment using wet torrefaction to produce microalgal hydrolysates and biochar. Biochar produced using organic acid is desirable as solid fuel and other value added application such as bioabsorbent and biofertilizer, whereas the use of sulfuric acid is more suitable to produce sugar for bioethanol production. The carbohydrate-rich microalgal showed a good performance in bioethanol production. However, the formation of by-product 5-hydroxymethyl-2-furaldehyde (5-HMF), which might act as the fermentation inhibitor that led to the low ethanol yield. In summary, with the co-production of microalgae biomass by microwave assisted wet torrefaction, high total reducing sugar in the liquid hydrolysate that can be utilized for bioethanol production and solid biochar as another value-added product. Thus, the biomass wastes can be utilized and converted into valuable products via advanced conversion technologies towards a sustainable green technology.

Dr. Hwai Chyuan Ong is currently appointed as Distinguished Professor at School of Engineering and Technology, Sunway University, Malaysia and an Adjunct Professor at Faculty of Engineering & IT, University of Technology Sydney, Australia. His research interests are under the general umbrella of renewable energy system, energy & fuel, green technology, environmental sustainability, and waste management. He has published more than 250 high impact SCI journal papers with H-index 65 (WOS). He is listed as Highly Cited Researcher (Engineering) by Clarivate Analytics in 2019-2022. In 2021, he also named as Australia's top early career researcher in sustainable energy. Currently, he is Associate Editor of Critical Reviews in Environmental Science and Technology, Alexandria Engineering Journal, e-Prime etc.



INVITED SPEAKER: E_INV07

NBT- BASED TEXTURED PIEZOELECTRIC CERAMICS AND MULTILAYER PIEZOELECTRIC ACTUATOR

Haibo Zhang,^{1,2,3*} Chanatip Samart,² Suwadee Kongparakul²

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² Department of Chemistry, Faculty of Science and Technology, Thammasat University, Pathumthani 12120, Thailand

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Abstract:

Piezoelectric multilayer actuators (MLAs) possess the advantages of a wider speed range, faster response, and insensitivity to the magnetic field, and therefore have been widely used in the fields of micro-actuation and micro-manipulation. Currently, the ceramics of Pb-based solid solutions are the mainstream materials for the most commercial MLAs. However, because of increased environmental awareness, environmentally friendly and high-performance lead-free piezoelectric ceramics have been attracting more and more attention. Among the various lead-free ceramic systems, $(\text{Na}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$ -based (NBT-based) ceramics can possess a high electric-field induced strain response, making themselves potential to be applied in MLAs. However, the industrialization of NBT-based MLAs still has many challenges, such as higher sintering temperature, large driving electric field, and large strain hysteresis. To address these problems, this study uses grain-orientation engineering and low-temperature co-fired technology to regulate the electrical and mechanical properties of materials and devices at the multifunctional sequential levels, such as lattice, domain morphology, phase structure, grains, grain boundaries, and multilayer interfaces, and analyze the "processing-structure-performance" structure-effect relationship. Finally, the MLA with low-temperature sintering, low hysteresis, high strain, and high stability was achieved.

Haibo Zhang is a full professor in School of Materials Science and Engineering at Huazhong University of Science and Technology (HUST), Wuhan China. Before joining HUST in 2011, he worked as a postdoctoral researcher in Kochi University Japan and Humboldt Research Fellow in Technique University of Darmstadt Germany from 2011 to 2014. From 2018, he worked as a guest professor in Thammasat University, Thailand and Industrial University of Ho Chi Minh City, Vietnam. He has published over 150 peer-reviewed SCI research papers and had 20 Chinese patents. Zhang's research interests include (i) lead-free piezo- and ferroelectrics materials, (ii) dielectric nanocomposite materials for energy storage and (iii) Precision molding technology of advanced ceramics.



INVITED SPEAKER: E_INV06

CRYSTAL CHEMICAL AND PHYSICAL PROPERTIES OF *HALIDE PEROVSKITES* BEYOND PHOTOVOLTAIC EFFECTS

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Abstract:

Hybrid organic-inorganic halide perovskites have been developed as highly efficient solar cell absorbers. Furthermore, recent investigations have led to the discoveries of extraordinary electrooptic, semiconductive and electrostrictive properties in these materials, making them promising candidates for applications in photo, X-ray and γ -ray detectors, light-emitting diodes, micro-electromechanical actuators. Despite tremendous progress in device technology, the crystal structure and intrinsic properties of hybrid perovskites remain debatable. In particular, it has been suggested that ferroelectric domains may be responsible for their photovoltaic behavior of hybrid perovskites. Furthermore, some authors reported ferroelectricity in these materials, some others, however, questioned their reports. Due to the presence of organic molecules, the structure of hybrid perovskites is more complex as compared to inorganic counterparts, while high-quality single crystals which are necessary for accurate investigations of structure and properties are comparatively hard to grow.

In this talk, we present our recent results on the investigations of MAPbX_3 ($\text{MA} = \text{CH}_3\text{NH}_3$ & Cs ; $\text{X} = \text{Cl}, \text{I}, \text{ \& } \text{Br}$) crystals. We develop an effective synthetic technique by which the MAPbX_3 crystals are grown in polar solvents at room temperature. The X-ray diffraction analysis, steady-state absorption, and photoluminescence measurements of the grown crystals demonstrate an excellent long-term (over two years) stability of perovskite structure against environmental degradation and moisture. To study phase transitions we measure the dielectric spectra in the range from 1 MHz down to an ultra-low frequency of 10^{-3} Hz, the temperature dependences of dc conductivity and optical birefringence, and the dependences of polarization on the electric field. It is found that the symmetry of the intermediate phase of $\text{CH}_3\text{NH}_3\text{PbX}_3$ ($\text{X} = \text{Br}$ and Cl) is orthorhombic but not tetragonal, as previously reported. In the orthorhombic and tetragonal phases of these crystals, twin domains were discovered and examined under mechanical stress and electric field. The crystals prove to be ferroelastic but not ferroelectric. The role of ferroelectric instability in MAPbX_3 is discussed in the framework of incipient ferroelectric behaviour.

Zuo-Guang Ye received his Ph.D. from the Université de Bordeaux (F), and did post-doc at the Université de Genève (CH). He joined the faculty of Simon Fraser University in 1997, and has been a full professor since 2003, and a *Distinguished University Professor* since 2020. He served as Chair of the Chemistry Department in 2009-2014 and is a funding director of the 4D LABS, an interdisciplinary materials research centre.

Ye's research includes (i) growth and characterization of high-performance piezo-/ferroelectric single crystals, (ii) multiferroic and magnetoelectric materials, (iii) lead-free piezo-/ferroelectrics, and (iv) relaxor ferroelectricity and its microscopic mechanisms. He has been an active contributor to the ONR/DARPA program on high-performance piezoelectric single crystals. He has given over 200 plenary/keynotes/invited talks, and published 425 research papers and 21 review articles/book chapters (with > 22,109 SCI citations, H-Index of 73 and i10-Index of 309). He edited "*Handbook of Advanced Dielectric, Piezoelectric and Ferroelectric Materials*" (Elsevier). Ye was the recipient of the 2014 IEEE Ferroelectrics Recognition Award, the American Ceramic Society's 2015 Spriggs Phase Equilibria Award, the 2019 IEEE Robert E. Newnham Ferroelectrics Award, and the 2021 Canadian Society for Chemistry John C. Polanyi Award. He was elected as a Fellow of the Institute of Electric & Electronic Engineers (IEEE, 2017) and a Fellow of the Royal Society of Canada, Academy of Science (2019).



INVITED SPEAKER: F_INV01

ENZYME-LINKED CARBON NANOTUBES COMPOSITE FOR CATALYTIC AMPLIFICATION OF ANTIOXIDATIVE POTENTIAL IN GREEN TEA EXTRACT

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Abstract:

Due to their exceptional mechanical stability, effective dispersibility, high surface-to-volume ratio, and biocompatibility, carbon nanotubes (CNTs) stand out as an innovative matrix for the immobilization of enzymes. In this context, we conducted the immobilization of tannase on multi-walled carbon nanotubes (MWCNT). Several linking techniques were explored to optimize the immobilization process of tannase. Results demonstrated that the radical scavenging activities of tannase-treated green tea extract surpassed those of the native green tea extract. The immobilization of tannase on MWCNT showcased its potential as a biocatalyst, offering high stability and remarkable operational reusability for the biotransformation of catechins in green tea infusion, all within a compact reactor footprint. The amplified antioxidant activities observed in the green tea infusion extract present an opportunity for leveraging these improvements in nutraceutical applications. Additionally, the transformed preparations offer a promising source of platform materials with commercial value.

Professor Mohamad Suffian bin Mohamad Annuar was born in Malaysia. He received the B. Sc (Hons) and Ph. D from the Universiti Malaya, Malaysia. He started his academic career as a lecturer at the same university in 2005. He is actively working in the area of bioprocess technology and advanced biomaterial. Using medium-chain-length poly- 3- hydroxyalkanoates obtained *via* bacterial fermentation from local renewable resources, his research group demonstrated its potential applications for making hydrogel, bone scaffold, nanoparticles and innovative biocomposite films. His approach on scientific investigation places strong emphasis on equal balance between fundamental and applied researches. The approach has enabled his research group to contribute over 120 publications in reputable scientific journals. He has successfully supervised 16 Ph.Ds and 31 Master projects to completion. Through its own projects and collaborative efforts, his laboratory had secured research funding in the excess of RM 4 million to date. His research group welcomes multi-disciplinary scientific approach and collaboration.



INVITED SPEAKER: F_INV02

SIAM CHICKEN: BUILDING RESILIENT COMMUNITIES THROUGH GENETIC WEALTH

Kornsorn Srikulnath*

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Abstract:

The COP27 strategy emphasizes technology and resource utilization for climate change adaptation. Climate change has shifted from a risk to an inescapable reality, necessitating adaptation by humanity, with a focus on vulnerable groups. Poultry farming, constituting 33% of global agricultural production, is of crucial importance. Indigenous and local chicken breeds, known for their low production costs and adaptability to challenging conditions, are widely used in rural and backyard farming, ensuring food security for farmers and local communities. These chickens, more than poultry, are a source of pride and sustenance for communities, revealing the intricate tapestry of rural development and food security's foundation. Domestic chickens, including Thai indigenous and local breeds, are key in the food supply chain and adapt to local conditions, serving socio-cultural roles like ornamental, long-crowing, and game-fighting birds. Intensive human-directed selection shaped diverse breeds from domestic chickens and red junglefowl. Thai indigenous and local chickens underwent diverse genetic adaptations during domestication, enabling them to thrive amidst challenges such as heat, humidity, disease, and diverse agroecosystems. Due to low maintenance costs and adaptability, these chickens also serve as a local food source. Here, the Siam Chicken Bioresource Project" (<https://www.sci.ku.ac.th/scbp/>) created a genetic resource database of red junglefowl and Thai domestic chicken breeds, serving as a reference for assessing chicken agrobiodiversity. Habitat suitability analysis assessed their distribution in past, present, and future scenarios, offering insights for effective habitat management and conservation planning in Thailand. To deepen our understanding of the evolutionary process of Thai chicken domestication, it is essential to explore the genetic profiles of a wider range of domestic chicken breeds of diverse origins. Prioritizing this research involves conducting additional nutritional and genomic scans to effectively pinpoint new alleles and genes of significant agronomic value. This exciting journey into agrobiodiversity beckons us towards a future seamlessly aligned with the Sustainable Development Goals (SDGs), where the preservation of these national treasures transcends geographical limits.

Associate Professor Kornsorn Srikulnath was born in Nonthaburi, Thailand in 1983. He received the bachelor's degree in Science (Biology), 1st honor, Faculty of Science, Kasetsart University, Thailand in 2005. He received the Doctorate in Genetics, Faculty of Science, Kasetsart University, Thailand in 2010. He received the postdoctoral fellow (Reptile Cytogenetics) in Nagoya University, Japan in 2012. Visiting Endeavor postdoctoral fellow (Reptile Genomics) in University of Canberra, Australia in 2018. From 2022 to present, he worked Deputy Dean for Special Affairs, Faculty of Science, Kasetsart University, Thailand and Chair of Operation Committee of AGB Research Unit, Kasetsart University, Thailand. His research interests in clarify genome and chromosome structures as well as their evolutionary processes in vertebrates by cytogenetic and molecular biology techniques.



INVITED SPEAKER: SP1_INV01

METROLOGY IN FOOD SAFETY

Kittiya Shearman*

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Abstract:

With increasing food production, accurate measurements are essential to support the food certification systems, including the quality, food safety, food adulteration and prevention of misleading claims. Metrology is the science of measurement and its applications. It is one of the five keys of the National Quality Infrastructure (NQI) to drive the economic system of the country. Metrology ensures the accuracy and comparability of measurement results. It provides the tools to make the measurement results reliable and comparable in the food industry, minimizing trade barriers and increasing competitiveness. The National Institute of Metrology, Thailand (NIMT) plays an important role in supporting the development of food safety in Thailand. In this talk, the role of NIMT in supporting food safety throughout the entire food supply chain will be explained from production to consumption.

Dr. Kittiya Shearman is currently the Head of Bioanalysis Group and a senior professional level metrologist of the Organic Analysis group of the NIMT. She is also the Deputy Quality manager for ISO/IEC 17025, ISO 17034 quality systems. Dr. Shearman received her B.Sc. (2003, Chemistry, first class honor) and M.Sc. (2005, Inorganic Chemistry) degrees from Prince of Songkla University, Thailand, and her Ph. D. (2009) in chemistry from the University of New South Wales, Sydney, Australia. She joined the Department of Chemical Metrology and Biometry Department of NIMT soon after she graduated her Ph.D and has worked there since in the field of veterinary drug residue analysis. She has more than 10 years of experience in analytical method development and validation for chemical analysis by using LC-MS/MS and GC-MS. Dr. Shearman has developed many high accuracy measurement procedures of exact matching Isotope Dilution Mass Spectrometry (IDMS). She developed Certified Reference Materials (CRMs) for veterinary drugs and contributed to developing other CRMs at NIMT. Dr. Shearman is the main trainer in many courses for testing laboratories and universities, such as Measurement Uncertainty in Chemical analysis, Analytical method validation, Metrological traceability of measurement results, Quality assurance and quality control in chemical analysis, ISO 17034 and ISO Guide 35. Besides that, Dr. Shearman is also a technical assessor for the ISO/IEC 17025 and ISO 17034 for the Bureau of Laboratory Accreditation (BLA), Department of Science and Service (DSS), Thailand. She won the 2020 APMP Young Metrologist Prize for Developing Economies.



INVITED SPEAKER: SP1_INV02

FROM MICROBIAL DIVERSITY TO SUSTAINABLE SOLUTIONS IN AGRICULTURE

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Abstract:

Microorganisms are the main driving force of nature that carry out a wide variety of ecological functions and provide benefits that are essential to human well-being. Among the different life forms that contribute to biodiversity, microorganisms are unquestionably the most abundant with an estimated $\sim 10^{12}$ species present on Earth. They serve as an invaluable treasure trove from which potential microbial-based solutions for sustainable agriculture can be explored. Microbial prospecting is a resource intensive process that requires a multitude of expertise in microbial strain collection, isolation and identification. Additionally, a repository for long-term preservation and storage of microbial strains is necessary to ensure reproducibility. Furthermore, systematic evaluation of biological activities, potential toxicity, and identification of mechanism of action are keys to the discovery process that precedes the decision for subsequent development. Through the application of these multi-disciplinary platforms, bioactive natural products, microbial-based biological control agents that exhibit efficacies against various plant pests and pathogens, as well as those that possess plant growth promoting capabilities have been discovered. The possibilities in which these microbial derived solutions can be utilized to provide more viable alternatives to current agricultural practices, and foreseeable challenges in the implementation will be discussed.

Dr. Vanicha Vichai received her bachelor's degree from the Department of Medical Technology, Faculty of Associated Medical Sciences, Chiang mai University, Thailand in 1991. She continued her education at the Department of Biochemistry, University of Virginia, USA and received her Ph.D. in 2000. She is currently a head of Bioassay Laboratory at the National Center for Genetic Engineering and Biotechnology (BIOTEC). Her research interests range from the discovery of bioactive natural products from microorganisms to the applications of beneficial microbes and microbial derived natural products in agriculture.



INVITED SPEAKER: SP1_INV03

SMART NITRITE SENSOR FOR FOOD SAFETY AND PRECISION AGRICULTURE

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Abstract:

Nitrite is widely used in processed food. It has preservative, antiseptic, antibacterial, and antioxidant properties. Nitrite is a hazardous chemical reagent that can cause blue baby syndrome, gastrointestinal tumors, and stomach cancer. The WHO states that nitrite concentrations between 8.7 μM to 28.3 μM can be fatal, whereas the Codex General Standard for Food Additives (GSFA) allows up to 80 mg kg^{-1} in processed meat, poultry, and game products. Rapid, sensitive, portable, and accurate methods for quantitative nitrite determination in food products are required for food safety. Furthermore, nitrite is extremely toxic to shrimp farming. Its presence can have a variety of negative effects on shrimps, including stunted growth and development or even death. To alleviate such problems for shrimp farmers, the development of a portable nitrite sensor to measure and monitor nitrite levels in shrimp ponds is critical for shrimp farm management. Herein, we developed a fully integrated smart sensing device for on-site nitrite detection of food products for food safety, as well as shrimp ponds for precision agriculture.

Associate Professor Dr. Warakorn Limbut was born in Trang, Thailand in 1975. He received the bachelor's degree in Chemistry from Department of Chemical, Faculty of Science, Rajabhat Institute Phuket Thailand, Thailand in 1997. He received the M. Sc. in Analytical Chemistry and Ph.D in Chemistry, in 2001 and 2007, respectively from Prince of Songkla University, Thailand. From 2007 to present, he worked at Division of Health and Applied Sciences, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla, Thailand. He is a deputy director of the Center of Excellence for Trace Analysis and Biosensor Research Center (TAB-CoE). He is also a member of the Forensic Science Innovation and Service Center and the Center of Excellence for Innovation in Chemistry. His research interests include biosensors, chemical sensors, and electroanalytical chemistry.



INVITED SPEAKER: SP1_INV04

EXPLOITING THE POWER OF THE GUT MICROBIOME TO IMPROVE SHRIMP HEALTH AND PRODUCTIVITY

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Abstract:

Shrimp production is an important part of global food security, providing essential protein and nutrients. However, the industry are facing significant challenges, including disease outbreaks and importantly, global climate change, which can have a significant impact on productivity and yields. Moreover, the extensive utilization of antibiotics and antimicrobials in shrimp farming can impose a serious risk on the rise of antimicrobial resistance (AMR), leading to a concern for both human and animal health. Consequently, several countries have enacted stringent regulations or prohibitions on the use of antimicrobial agents in aquaculture, thereby impacting shrimp disease control strategies.

To address these challenges, it is important to implement measures to reduce antibiotic use, improve biosecurity practices, and promote responsible antimicrobial use, hence alternative approaches to increase health of shrimp are crucial. The use of functional feeds such as prebiotics, which have immunostimulant properties, have been shown to have the potential to boost growth and immune responses in aquaculture, thereby reducing production losses due to disease. Our previous research has shown that incorporating feed additives such as mannan oligosaccharides extracted from copra meal can improve the survival of economically important shrimp species. We have also isolated probiotic strains that can be used synergistically with prebiotics to improve feed efficiency. Additionally, we have developed and optimized nutrient encapsulation techniques to minimize nutrient loss when introduced into aquatic environments.

To further increase efficacy of shrimp feed additive development, it is also important to understand how the gut microbiome plays roles in nutrient utilization and interact to the host immune system. Here, we aim to innovating the shrimp aquaculture industry through investigating the essential roles of shrimp gut microbiomes in shrimp health and aquaculture practices. By understanding the complex interactions between shrimp gut microbiomes and their environment, we will be able to develop targeted feed formulations that can improve shrimp health and growth and reduce the use of antibiotics and other harmful chemicals. Our research is paving the way toward the development of environmentally sustainable and ecologically friendly aquaculture systems.

Wanilada Rungrassamee is a principal researcher and the Director of the Biosensing and Bioprospecting Technology Research Group at the National Center for Genetic Engineering and Biotechnology (BIOTEC) in Thailand. She received her Ph.D. in Microbiology from the University of Massachusetts Amherst in 2008. Her research interests include molecular microbiology, gene expression analysis, bacterial detection methods, and multi-omics platforms. She is particularly interested in the gut microbiota and their interactions with the animal host. Her current research focuses on studying the role of the gut microbiota in shrimp and other invertebrate species. She is also passionate about understanding antimicrobial resistance (AMR) and emerging pathogens in the context of climate change.



INVITED SPEAKER: SP1_INV05

DECIPHERING RICE GROWTH AND PRODUCTIVITY UNDER SALINITY STRESS – FROM METABOLIC REPROGRAMMING TO POSTHARVEST GRAIN QUALITY

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Abstract:

Rice (*Oryza sativa L.*) is one of the world's most economically important commodities. World rice trade relies greatly on both the yield and the quality of the rice grains. However, rice yield and grain quality are severely affected by salinity stress posed by the distribution of soil salinity worldwide. Understanding how the rice plants acclimate to salinity stress at the metabolic level is crucial for the development of salt-tolerant rice genotypes. Rice genome-scale metabolic model was contextualized with transcriptomics analysis to extract control- and salt-specific models. Under salinity stress, the model predicted reduction in photosynthesis and hexose utilization, whereas increase in photorespiration was observed. Cross-validation of the predicted fluxes with trends of metabolite levels from metabolomics and physiological data demonstrated the robustness of model prediction. In addition, postharvest grain quality was observed in rice plants with diverse degrees of vegetative salt-tolerance using food and material science analytical techniques. Interestingly, there were discrepancies between degrees of salt tolerance at vegetative stage vs. the ability to maintain grain quality and starch properties in response to salinity stress imposed at reproductive stage. Such discrepancies raise awareness on the effectiveness of salinity-tolerant screening at the vegetative stage in rice.

Asst. Prof. Dr. Maysaya Thitisaksakul was born in 1984 and spent her childhood in Khon Kaen, Thailand. She received the Bachelor's degree in Biology (1st class honors) from the Faculty of Science, Khon Kaen University, Thailand in 2007. She received the Master's degree and the Doctoral degree in Plant Biology, in 2013 and 2016, respectively from the University of California Davis, USA. From 2016 to present, she works at the Department of Biochemistry, Faculty of Science, Khon Kaen University, Thailand. Her research interests include plant responses to abiotic stress, starch metabolism, and starch molecular structure and functionality.



INVITED SPEAKER: SP3_INV01

หัวข้อ **WORKSHOP-1 (ภาษาไทย):** มาตามหาความเร็วเสียงในอากาศด้วยอาร์ดิวไน์

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บทคัดย่อ:

ในการอบรมเชิงปฏิบัติการนี้ ผู้เข้าร่วมอบรมจะได้ทำการทดลองเพื่อหาความเร็วเสียงในอากาศโดยใช้เครื่องมือวัดที่พัฒนาจากบอร์ดอาร์ดิวไน์ จะได้รับการเพิ่มพูนความรู้ด้านการเขียนโปรแกรมภาษาซี และการเชื่อมต่อวงจรไฟฟ้าร่วมกับบอร์ดอาร์ดิวไน์ซึ่งเป็นบอร์ดไมโครคอนโทรลเลอร์ที่มีราคาถูก ให้ผลที่แม่นยำสูง และทำงานร่วมกับเซนเซอร์และอุปกรณ์ที่หลากหลาย และจะเข้าใจหลักการการเคลื่อนที่ของคลื่นอัลตราโซนิคสำหรับวิเคราะห์ข้อมูล ทั้งนี้ผู้เข้าร่วมอบรมจะสามารถประยุกต์ต่อยอดหลักการและเครื่องมือเหล่านี้ไปใช้งานในห้องปฏิบัติการ การทำโครงการ และการประดิษฐ์สื่อการสอนวิทยาศาสตร์ด้วยบอร์ดอาร์ดิวไน์ที่กำลังได้รับความนิยมสูงในปัจจุบัน

ดร.ภาณุ ไทนิรมิตร (panu.t@psu.ac.th)

มีความเชี่ยวชาญด้านวิศวกรรมคอมพิวเตอร์และดิจิทัล การออกแบบวงจรไฟฟ้าและอิเล็กทรอนิกส์ ระบบฝังตัว ไมโครคอนโทรลเลอร์ การสื่อสารและเชื่อมต่อเซนเซอร์กับระบบ IoT ปัจจุบันดำรงตำแหน่งผู้ช่วยผู้อำนวยการ (ด้านพัฒนาระบบ) อุทยานวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์

นายวิศรุต พวยพุง (wissarut.p@psu.ac.th)

มีความเชี่ยวชาญด้านฟิสิกส์อิเล็กทรอนิกส์ การประยุกต์ใช้อาร์ดิวไน์และ LabVIEW และไมโครคอนโทรลเลอร์สำหรับงานอุตสาหกรรม



INVITED SPEAKER: SP3_INV02

หัวข้อ **WORKSHOP-2 (ภาษาไทย):** ทักษะปฏิบัติการฟิสิกส์ระดับมัธยมปลาย

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บทคัดย่อ:

ปฏิบัติการฟิสิกส์มีส่วนสำคัญที่ทำให้นักเรียนเข้าใจกระบวนการเรียนรู้แบบวิทยาศาสตร์ รวมทั้งช่วยพัฒนาความเข้าใจเกี่ยวกับแนวคิดและเนื้อหาฟิสิกส์ที่เกี่ยวข้องได้มากขึ้น การสอนให้นักเรียนมีพื้นฐานทักษะปฏิบัติการฟิสิกส์ที่ดีและถูกต้องจึงจำเป็น การอบรมฟิสิกส์เชิงปฏิบัติการนี้จะเน้นทักษะพื้นฐานที่สำคัญในปฏิบัติการฟิสิกส์ ตามกรอบเนื้อหาหลักสูตรวิทยาศาสตร์ สาขาฟิสิกส์ ระดับชั้นมัธยมปลาย ซึ่งครูผู้รับการอบรมสามารถนำวิธีการไปประยุกต์ใช้กับการสอนในชั้นเรียนของตนเองได้

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INVITED SPEAKER: SP4_INV01

PERSPECTIVES OF FUSION ENERGY DEVELOPMENT FROM UNIVERSITY-SCALE DEVICE

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Abstract:

Nuclear fusion reaction has strong potential as the most influential power energy with nothing greenhouse gas and carbon footprint, no creating long-lived radioactive waste, and safest. The origin of the fusion reaction can be seen in the 'sun' by fusing two hydrogen atoms to be helium atoms and releasing energy output. Recreating the fusion reaction on the 'earth' is available by extremely high-temperature and density plasma in fusion devices, such as magnetic confinement, inertial, and alternative innovative concepts. Magnetic confinement fusion is potentially possible to build the steady-state fusion reactor. A game to develop magnetic confinement fusion reactors is underway, involving research institutes and start-up companies.

The energy gain of a fusion reactor depends on the size of the fusion reactor. Therefore, huge fusion reactors must be built to achieve sufficient energy gain. For example, ITER, which is constructed in France, is the giant experiment device with a size of 30m by 30m and roughly 23,000 tons weight! What would it take to build the fusion reactor? It is human resources. In such a sense, universities have an important role to play in developing human resources for future. However, universities are very difficult to have large facilities like the fusion reactor. Therefore, universities need to educate their students using 'university-scale device'. There is a large gap between university-scale device and fusion reactors. The presentation will discuss ways to overcome this gap.

Professor Yasuhiro Suzuki was born in Urawa, Japan in 1973. He received the bachelor's degree in engineering from the Department of Nuclear Engineering, Faculty of Engineering, Tohoku University, Japan, in 1998. He received an M.S. and Ph.D. of Energy Science in 2000 and 2003, respectively, from the Graduate School of Energy Science, Kyoto University, Japan. From 2003 to 2005, he worked at Kyoto University as a postdoctoral researcher, and then, he joined the National Institute for Fusion Science (NIFS) in Japan from 2005 to 2021. His role in NIFS was theoretical and experimental studies for Large Helical Device (LHD), the largest superconducting stellarator in the world. In 2021, he was appointed as a full professor of Fluids Engineering Laboratory at Hiroshima University, Japan, and now he is actively leading the team for Fusion Energy Development. His research interests in fusion energy development are plasma physics, fusion engineering, and reactor design. He also has extensive experience in international collaborations with research institutions and universities worldwide.



INVITED SPEAKER: SP4_INV02

THE ECONOMICS OF SOLAR ROOFTOP PROGRAMS: FROM THE PERSPECTIVES OF END USERS, DISTRIBUTION UTILITIES AND GOVERNMENT

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Abstract:

Moving towards the target to achieve carbon neutrality by 2050, various long-term energy scenarios indicated significant roles of rooftop solar in Thailand. However, Thailand unsuccessfully accelerated the rooftop solar through past national schemes, particularly a rooftop solar for self-consumption pilot in 2016 and the net billing scheme launched since 2021. While the economics of rooftop solar for end users have increased due to high electricity prices and continued declining costs of rooftop solar installations, end users are still facing risks imposed through administrative, finance, permit and approval for grid connection burdens that hindered rooftop solar investments. In addition, the government and distribution utilities have raised concerns on the impacts of high rooftop solar adoption on electricity prices and technical problems to the grid. This study will identify the economics of rooftop solar programs for end users, the government, and the distribution utilities in Thailand, including suggestions on policy and financial instruments to facilitate rooftop solar installations in Thailand.

Supawan Saelim works as a lecturer and researcher at Faculty of Economics of Thammasat University. She has been working with various think tanks, research and international organizations to conduct research, training and policy dialogues to support green economy and energy transition, including the industrial transition policies. She seeks to conduct research and policy dialogues to provide evidence-based insights for interested stakeholders in Southeast Asia, leveraging European and international experience on transforming the energy sectors. Before joining the Faculty, Supawan has worked for USAID Clean Power Asia program for three and a half years, managing projects to advise the Government of Southeast Asian countries on renewable energy policies with studies on the economic and technical impacts of distributed PV, disruptive technologies in the power sector and renewable energy auctions. She also worked as a researcher for the study on a peer-to-peer electricity trading project funded by Thailand's Office of the Energy Regulatory Commission. She has several years' experience at PwC Thailand assisting the public and private sector on feasibility studies, valuation, and high-level market analysis.



INVITED SPEAKER: SP5_INV01

SCIENCE AND TECHNOLOGY BEHIND THE SILICA-BASED LOW ROLLING RESISTANCE TIRES

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Abstract:

Low rolling resistance tires improve fuel economy and support sustainable development in the tire industry. Both materials and engineering design have an influence on the rolling resistance of tires, and the tread component plays a major role. Silica-reinforced rubber tread compounds have been designed to reduce energy dissipation, which can be achieved by creating a double network within the rubber through the conventional vulcanization process and coupling between the filler and rubber via silane molecules. Silica-silane technology for energy-saving tire treads has been continuously developed over the past 30 years and is to be continued, as it is driven by the need for greener transportation. A shift from conventional carbon black-filled rubber compounds to successful silica-filled ones involves several aspects of science and technology in the mixing process. In addition to sufficient shear force during mixing, the chemical reactions between alkoxy groups on the silane molecules and silanol groups on the silica surface, so-called silanization at high temperatures, are crucial. Satisfied results can be obtained only if a good balance between the extent of silanization and degradation during mixing as well as fine silica dispersion and distribution in the compounds are reached. This presentation will highlight the core elements of science and technology involved in the preparation of silica-reinforced rubber compounds to produce low rolling resistance tires. In addition, trends in tire development will be highlighted.

Assoc. Prof. Dr. Kannika Sahakaro is an esteemed rubber technologist in the rubber industry, specifically focusing on silica-reinforced rubber tires. She collaborated with the group of Emeritus Prof. J.W.M. Noordermeer at University of Twente (UT) which initiated a lasting partnership between PSU and UT in 2008 under the Double Degree Program to sponsor Thai PhD candidates in pursuing their degrees based on research works on natural rubber. This program was mainly supported by the Netherlands Natural Rubber Foundation. She was honored with the "Thailand Rubber Technologist Award 2016" at the Global Rubber, Latex & Tire Expo (GRTE) 2016 in Bangkok. Her key research interests are natural rubber-related applications; silica-reinforced elastomers; and elastomer blends. At present, she is an Associate Editor for the peer-reviewed Rubber Chemistry Technology journal, and a board member of the Polymer Society of Thailand (PST), Rubber-Elastomer Technology Association (RETA), and Materials Research Society of Thailand (MRS).



INVITED SPEAKER: SP6_INV01

DEVELOPING A STUDY SITE FOR TEAL CARBON - A FRESHWATER ECOSYSTEM

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Abstract:

The concept of Nature-based solutions (NbS) is one of the prominent approaches to cope with climate change. Paying attention to the use of ecosystem services, NbS promotes the conservation and protection of the ecosystem while utilizing the ecosystem to alleviate the impacts of climate change and biodiversity loss. Based on ecosystems in Southeast Asia, NbS divided ecosystems into three ecosystems: forest, wetland, and coastal ecosystems. Regarding the study of carbon stocks and flows in different ecosystems, numerous studies have been done on Green Carbon (carbon storage in terrestrial ecosystems) and Blue Carbon (carbon storage in coastal and marine ecosystems). These studies allow researchers to gauge the potential of carbon storage in both ecosystems. However, carbon accumulated in Teal Carbon (carbon storage in freshwater ecosystems, such as swamps and freshwater swamp forests) still gains less attention from the research community in Thailand. The freshwater ecosystem; however, is expected to have a high potential for carbon storage and sequestration in the soil. As a low-lying area, organic matter from different sources flows into the water during the monsoon season. The organic matter that is rich in organic carbon is stored as sediment layers in the ecosystem. Assessing greenhouse gas emissions/absorption for the freshwater ecosystem is complicated, involving changes in the wetland system along the river basin (both seasonal changes and differences in slopes). Moreover, defining the well-representative period and the area to collect data for obtaining representable, reasonable baseline data on greenhouse gases is a challenge. Our research aims to develop Bueng Khong Long as a study site for Teal Carbon in Thailand. Bueng Khong Long is a large freshwater pond in Bueng Khong Long District, Bueng Kan province. It has an area of 13,837.5 rai with an average depth of 6 meters, a length of approximately 13 kilometers, and a width of approximately 2 kilometers. It is a Ramsar site, ranked 1,098th in the world. The surrounding area of Bueng Khong Long is used for agriculture, including rice farming, and growing field crops and perennial trees. During the dry season, it is used as a water storage area and as a water source for producing tap water for the surrounding community. Moreover, Bueng Khong Long has also been developed into a natural eco-tourism destination. Therefore, Bueng Khong Long is an interesting study site that will serve as an ecological conservation area for carbon storage and sequestration in the freshwater ecosystem.

Asst. Prof. Dr. Natapol Thongplew is a lecturer of the Biological Science Department, Ubon Ratchathani University, Thailand. He teaches courses related to environmental science and environmental management for undergraduate and graduate students. He has a PhD in Environmental Management from Environmental Policy Group, Wageningen University, the Netherlands. As a trained natural scientist and social scientist, his research interests and publications are in the areas of sustainability science, Sustainable Development Goals (SDGs), sustainable consumption and production (SCP), circular economy (CE), climate change, greenhouse gas and carbon footprint, corporate social responsibility (CSR), green university, waste management, and environmental policy and management.



INVITED SPEAKER: SP6_INV02

IMPACTS OF CLIMATE CHANGE ON BIODIVERSITY AND ENVIRONMENT

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Abstract:

Climate change has a profound impact on biodiversity and the environment, manifesting in notable consequences such as shifts in natural distribution, biodiversity loss, forest pests, diseases, and changes in stand structure, productivity, and ecosystem services. Climate change has led to noticeable and immediate shifts in the distribution patterns of flora and fauna in ecosystems. Habitat modifications are leading to alterations in species' environments, disturbing ecosystems and biodiversity structures. This poses significant challenges to the adaptability and survival of various species, ultimately contributing to a decline in biodiversity. The combined effects of natural distribution shifts and biodiversity loss lead to alterations in stand structure within forests and other ecosystems. Changes in species composition, abundance, and distribution have far-reaching impacts on the overall structure and functions of ecosystems. Additionally, warming temperatures and altered precipitation patterns contribute to the proliferation of forest pests and diseases, causing unprecedented damage to tree populations. Concurrently, the increasing frequency and intensity of forest fires exacerbate habitat destruction and biodiversity loss while releasing stored carbon. The consequences of forest pests, diseases, fires, and other disturbances are interconnected, resulting in decreased stand productivity and compromised ecosystem services. In conclusion, climate-induced shifts and disturbances significantly affect forest stand structure and productivity, influencing tree growth, distribution, and species composition. These shifts also impact crucial ecosystem services such as carbon sequestration, water regulation, and habitat provision. Developing comprehensive strategies is imperative to protect ecosystems and biodiversity while addressing mitigation and adaptation efforts.

Assoc. Prof. Dr. Sapit Diloksumpun, associate dean for research and academic services of Kasetsart University Faculty of Forestry, is a highly experienced silviculturist and researcher with two decades of experience in the field of forestry. Her research is primarily focused on forest tree improvement and silviculture, emphasizing the intricate interplay of climate change impacts and the corresponding mitigation and adaptation strategies within the forest sector. With a wealth of knowledge, she has taken on the pivotal role of overseeing the national greenhouse gas inventory in land use, land-use change, and forestry for a period spanning over 10 years. Her proactive involvement extends to the development of methodologies and tools for the Thailand Voluntary Emission Reduction Program (T-VER), a significant initiative facilitated by the Thailand Greenhouse Gas Management Organization (Public Organization). Currently, she serves as the Editor-in-Chief for the esteemed Thai Journal of Forestry, a national peer-reviewed publication, and holds the position of Section Editor for the international peer-reviewed journal, Agriculture and Natural Resources. Her multifaceted contributions underscore her commitment to advancing research and knowledge dissemination in the field of forestry, establishing her as a reputable individual in the academic community.



INVITED SPEAKER: SP6_INV03

COASTAL ECOSYSTEMS AS NATURE-BASED SOLUTIONS

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Abstract:

Coastal ecosystems have various important ecosystem services vital for human-wellbeing, global diversity, climate change resilience, adaptation, and mitigation. These ecosystems capture and store large amounts of organic carbon through which they have the ability to contribute towards climate change mitigation. Due to their importance as carbon sinks, they are considered to act as the nature-based solution (NbS) to target the impacts of climate change and biodiversity loss through addressing societal challenges. Globally, there is a rapid increase of coastal ecosystems as NbS with substantial investments on national scales by the European Union, the USA, Australia, Seychelles and Belize. However, there is a lack of the current national policies and nationally determined contributions and commitments for the Paris Climate Change Agreement in Southeast Asia that include these ecosystems. In Thailand, the research on blue carbon in coastal ecosystems as is rapidly increasing with high robustness to consider them as NbS. With their high potential to offset current CO₂ emission, followed with other ecosystem services, the use of these ecosystems should be soon implemented into the policy, as they can substantially contribute towards Carbon Neutrality by 2050.

Dr Milica Stankovic was born in Belgrade, Serbia in 1986. She received the bachelor's degree (BSc) in Ecology and Environmental Protection from Department of Biology, Faculty of Sciences, University of Novi Sad, Novi Sad, Serbia in 2010. She received master's degree (MSc) in Ecology in 2013 and doctorate degree (PhD) in Biology in 2018 from Department of Biology, Faculty of Science, Prince of Songkla University, Thailand. Until beginning of 2023 she was a postdoctoral fellow at Excellence Center for Biodiversity of Peninsular Thailand, Faculty of Science, Prince of Songkla University, where she worked on various projects including blue carbon in seagrass ecosystems, remote sensing and mapping of seagrass ecosystems using various technologies as well as ecosystem modeling of these coastal ecosystems. From 2023 is lecturer at Faculty of Science, Prince of Songkla University, where she is continuing her research on blue carbon in coastal ecosystems and their potential as nature-based solutions for climate change mitigation.



INVITED SPEAKER: SP6_INV04

REVITALIZING OYSTER REEFS WITH ECOLOGICAL CONCRETE MADE FROM WASTE SHELLS

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‡ Authors with equal contributions

Abstract:

Oyster reefs are biological structures of oyster species created by continuous fixation, aggregation, and accumulation on oyster shells, and are widely distributed in temperate coastal and subtropical estuarine areas. Due to extreme climatic impacts such as ocean warming, ocean acidification and sea level rise, as well as anthropogenic impacts such as overfishing, land reclamation and water pollution, 85% of the world's oyster reefs have been degraded. We tested the compressive strength and porosity of pure cement concrete and added oyster shell eco-concrete, as well as the biomass, cover and biodiversity of oysters attached to them. The results showed that pure cement concrete had the highest compressive strength and eco-concrete with grain size >4 cm had the highest porosity. Pure cement concrete and eco-concrete with grain sizes <1cm, 1-2cm had the highest oyster biomass and cover, while the bottom of eco-concrete also had the highest number of oysters attached to it. Pure cement concrete and eco-concrete with grain sizes <1cm, 1-2cm had the highest abundance. Grain sizes 2-3cm, 3-4cm and >4cm eco-concrete had the highest biodiversity.

Assoc. Prof. Dr. Zhao Peng, serving at Hainan University's College of Ocean Science and Engineering, focuses on blue carbon science and policy, coastal wetland restoration, and polar terrestrial ecology. His leadership roles include chairing the Blue Carbon Working Group of the Intergovernmental Oceanographic Commission's West Pacific Sub-Commission and serving as the Vice-Director of the Marine Standardization Branch of the Chinese Society for Oceanography. Dr. Peng has made significant international contributions as an advisor for the United Nations Economic and Social Commission for Asia and the Pacific's Ocean Accounts project and as a participant in China's 36th Antarctic Expedition. He is also a recognized expert in the United Nations Climate Action Summit. In academia, Dr. Peng is known for leading over 20 national research projects, holding several patents in the U.S. and China, and guiding his students to win prestigious awards in national competitions. His contributions extend beyond research to influencing policy and innovation in marine science and environmental conservation.



INVITED SPEAKER: SP6_INV05

URBAN MARINE SANCTUARY: AN EXAMPLE FROM MIDDLEBANK MARINE SANCTUARY IN PENANG

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Abstract:

The rapid development of island cities has brought many negative impacts to the coastal areas. The coast in fact plays an important role in providing ecological and vital livability functions to a city built near the coast. Conventional town or city planning within an island have often disregarded the importance of the health and aesthetic values of the coastal area. Penang is an island state in the northwest of Peninsular Malaysia, where Georgetown (the capital city) is the second largest metropolitan area in Malaysia with 2.833 million inhabitants within the area. The rapid economic growth has triggered extensive urbanisation this port city has caused much of the development to encroach the coastal area as well as multiple reclamation projects to increase land mass. A unique habitat of seagrass with approximately 2km² area can be found wedged between Georgetown and the Peninsular Malaysia. A long-term monitoring of changes in biodiversity and seagrass area coverage have shown high resilience of the seagrass habitat towards the multiple stressors from development (pollution, sedimentation, and other human activities). The seagrass area has served as an important nursery area for multiple fisheries products as well as a potential carbon sequestration area. Through multisectoral and stakeholder engagement, this can potentially be gazette as a marine protected area with ample protection and conservation effort. This example could be used as a model for future island city planning that incorporates effective management and conservation of coastal area.

Dr. Sau Pinn Woo received his PhD in Natural History Sciences from Hokkaido University. His interest of study includes systematics, taxonomy, and diversity study of marine invertebrates, focusing on the group Echinoderms. Since 2009, he has been actively uncovering the marine biodiversity and systematics of sea cucumbers across the region. He is currently serving as a senior lecturer in the Centre for Marine and Coastal Studies (CEMACS), Universiti Sains Malaysia where he is also actively leading several marine biodiversity research in the Southeast Asian region that includes several taxa of marine invertebrate. At the global front, he is a serving in several UN Decade of Ocean Science Program ECOP co-chairs and also an active contributor to the IOC Sub-Commission for the Western Pacific (WESTPAC) programmes. At the same time, he is passionate in creating awareness and education of marine sciences to the society through various educational programmes done in CEMACS with the concept of experiential learning for marine sciences.

SPECIAL PROBLEMS IN METAL-ORGANIC FRAMEWORK (MOF) CRYSTALLOGRAPHY

Christoph Janiak*

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Abstract:

Metal–organic frameworks (MOFs) are potentially *porous* coordination networks consisting of discrete inorganic secondary building units and multidentate organic linkers. Single crystal and also powder X-ray diffraction with Rietveld refinement is the most utilized and powerful tool for structure determination of porous, crystalline metal–organic frameworks (MOFs) [1]. At the same time structure elucidation of new MOFs is usually imperative for publications. The porosity or potential porosity of MOF leads, however, to special crystallographic problems, such as scattering effects from the not well ordered guest (solvent) molecules in the pores, degradations of the MOF crystals due to loss of solvent molecules, small crystal size, low diffraction power, disorder of ligands, defects in SBUs or linkers or both, subsequently high *R* values etc. From our experience we will present and discuss recent MOF structures from our group, as for example shown in Figure 1:

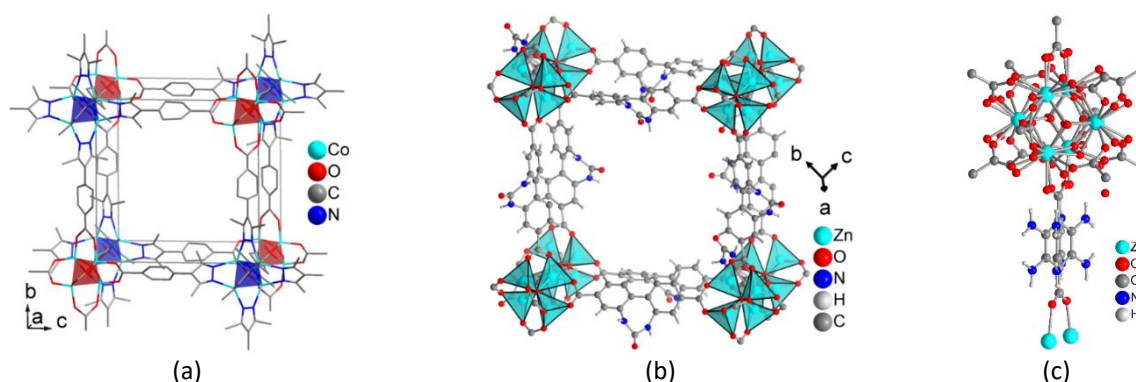


Figure 1: (a) Framework in $[\text{Co}_4(\mu_4\text{-O})(\text{Me}_2\text{pzC}_6\text{H}_4\text{CO}_2)_3]$ as IRMOF analog with the orientational disordered pyrazolate-benzoate ligand. The ligands are crystallographically disordered by a C_2 symmetry operation [2]. (b) Cubic arrangement of metal clusters and internal urea-functionalized dicarboxylate linkers (L) in $[\text{Zn}_4(\mu_4\text{-O})(\text{L})_3]$ with IRMOF topology also with an orientation disorder of one of the linkers (not shown for clarity) [3]. (c) Defect characterization in UiO-66 with ideal " $[\text{Zr}_6(\mu_3\text{-OH})_4(\mu_3\text{-O})_4(\text{O}_2\text{C})_{12}]$ " secondary building unit with one bridging linker shown in full and all disordered atoms. The shown C, O and N atoms are not fully occupied [4].

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- [2] C. Heering, I. Boldog, V. Vasylyeva, J. Sanchiz, C. Janiak, *CrystEngComm*, **2013**, 15, 9757–9768.
- [3] S. Glomb, D. Woschko, G. Makhloufi, C. Janiak, *ACS Appl. Mater. Interfaces*, **2017**, 9, 37419–37434.
- [4] C. A. Trickett, et al. O. M. Yaghi, *Angew. Chem. Int. Ed.* **2015**, 54, 11162–11167.

Christoph Janiak studied chemistry at TU Berlin and the University of Oklahoma, followed by a postdoc at Cornell Univ. and at BASF AG and an Associate professorship at the University of Freiburg. Since 2010 he has been full professor of Bioinorganic Chemistry and catalysis at the University of Düsseldorf with research interests in metal– and covalent–organic frameworks (MOFs, COFs), metal nanoparticles and catalysis. He has published more than 650 research articles which have attracted more than 39 000 citations with an H-index of 88.



INVITED SPEAKER: SP8_INV02

COMPARATIVE ANALYSIS OF X-RAY CRYSTALLOGRAPHY AND CRYO-ELECTRON MICROSCOPY (CRYO-EM) IN PROTEIN STRUCTURE DETERMINATION

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Abstract:

Protein structure elucidation is fundamental to understanding the function and mechanisms of biological macromolecules. X-ray Crystallography and Cryo-Electron Microscopy (Cryo-EM) are two prominent techniques employed in the determination of protein structures. X-ray Crystallography has been a gold standard for decades due to its ability to provide high-resolution structures. However, it necessitates the formation of well-ordered protein crystals, which can be a significant bottleneck. This research discusses the challenges associated with crystallization and the advanced techniques and methods developed to overcome these issues.

In contrast, Cryo-EM has emerged as a powerful alternative that does not require crystalline samples. It allows for the visualization of protein structures in their native, near-physiological states, offering valuable insights into dynamic conformational changes. This study delves into the technical aspects of Cryo-EM, including sample preparation, data acquisition, and image processing, and emphasizes its suitability for large, complex assemblies.

Through case studies of structural determination of PPARdelta-ligand complexes using X-ray crystallography and structural determination of SARS-CoV-2 spike protein complexed with nanobody using Cryo-EM, here we show the pivotal contributions of X-ray Crystallography and Cryo-EM in advancing our understanding of protein structures. It also underscores the importance of selecting the most appropriate technique based on the specific requirements and characteristics of the target protein.

In conclusion, this study elucidates the distinct advantages and limitations of X-ray Crystallography and Cryo-EM in protein structure determination, guiding researchers in their choice of methodology for optimal results. Additionally, it highlights the collaborative potential of these techniques in tackling the most complex and biologically relevant macromolecular structures.

Yudhi Nugraha, holding a Ph.D. in Structural Biology from the Nara Institute of Science and Technology (NAIST), Japan, and completing a postdoctoral fellowship at the Structural Biology Program CNIO-Madrid, specializes in protein structural determination techniques both X-ray crystallography and cryo-electron microscopy (cryo-EM). His research experience spans a broad spectrum of structural biology methods, encompassing the design and expression of protein constructs, crystallization, and advanced cryo-EM analysis. Now, his current position as a permanent researcher at the Indonesia National Research and Innovation Agency and establishing cryo-EM facilities, including the Krios F300C G4, Tundra, Aquilos-2, and Talos F200C, allowing for precise exploration of structural biology.

INVITED SPEAKER: SP8_INV03

REVERSIBLE STRUCTURAL TRANSFORMATION BETWEEN SUPRAMOLECULAR ISOMER AND RESPECTIVE [2+2] CYCLOADDITION

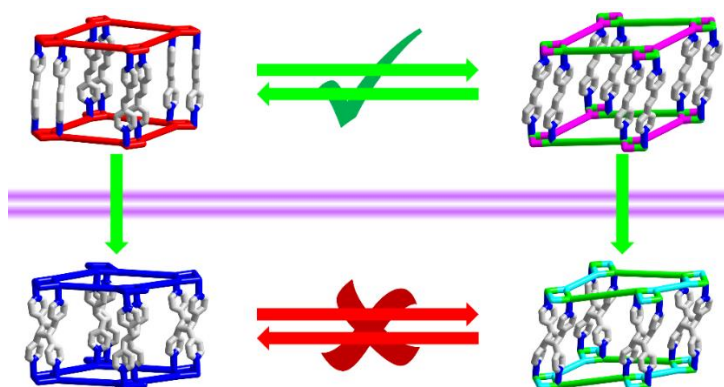
Yee Seng Tan*

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Abstract:

Two distinct supramolecular isomers, α and β , characterized as a doubly pillared layer structure, were successfully synthesized using specific methods. Significantly, these isomers exhibited reversible structural transformations when their powders were suspended in a suitable solvent. Moreover, the olefin moieties of the pillar ligands in both isomers were meticulously aligned, satisfying Schmidt's criteria. Upon exposure to 350nm UV light for hours, crystals of both isomers underwent a complete [2+2] cycloaddition reaction, resulting in the formation of photo-dimerized supramolecular isomers, α' and β' . Interestingly, while α and β displayed reversible transformations, α' and β' did not exhibit similar structural changes. These unique phenomena not only shed light on the intricate chemistry of these compounds but also significantly impacted the porosity of metal-organic frameworks and their ability to uptake CO₂. This study unveils novel insights into the interplay between structural transformations, photoreactions, and the properties of MOFs, offering promising avenues for the development of flexible and post-synthetic modifications of functional materials.



Yee Seng Tan earned his Ph.D. degree in science, specializing in crystal engineering for coordination compounds, from the University of Malaya in Malaysia. He possesses a profound understanding of crystallography, showcasing expertise in single-crystal X-ray crystallography. Yee Seng's skill set is diverse, covering various facets of crystallography, from mastering crystallization techniques to adeptly setting up diffraction experiments. His proficiency extends to solving intricate structural problems, demonstrating expertise in handling unusual data sets, such as disordered and twinning data. Currently, he serves as a dedicated researcher and X-ray crystallographer at the Sunway Biofunctional Molecules Discovery Centre, located at Sunway University in Malaysia. His current research pursuits center around supramolecular isomerism, structural transformation, and post-synthetic modification of coordination polymers. His objective is to unravel the structural dynamic and chemistry within coordination polymers of identical composition, thereby making meaningful contributions to the crystallography community.



INVITED SPEAKER: SP9_INV01

APPLICATION OF ISOTOPE TECHNIQUES FOR GROUNDWATER STUDIES IN THAILAND

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Abstract:

Environmental isotopes as isotope techniques are natural tracers in water composing of stable isotopes (^{18}O , ^2H , ^{13}C), radio isotopes (^{14}C , ^3H) and noble gases (^{81}Kr , ^{85}Kr). They will be used to fulfill the conventional techniques for groundwater studies in many aspects for a long time. These tracers in each study area have significant difference in isotopic composition due to the factor of continental effect, amount effect, temperature effect (latitude, season and altitude), evaporation and residence time. Therefore, they can be conducted to identify the groundwater dynamics (groundwater recharge, groundwater origin, groundwater dating and etc.). Water samples from groundwater samples, surface water sample and rainfall samples were collected for stable isotopes using Laser Water Isotope Analyzer and Gas Bench Isotope Ratio Mass Spectrometry (GB IRMS), Carbon-14 (^{14}C) using Liquid scintillation Counting (LSC) after direct CO_2 absorption for old groundwater and tritium (^3H) using Liquid Scintillation Counting after electrolytic enrichment for young groundwater. For noble gases, groundwater samples were analyzed by ATTA (Atom Trap Trace Analysis) technique in oversea laboratory for very old groundwater samples. This information was combined with geological, hydrogeological, and hydrological data to answer the scientific issues for sustainable of groundwater management in Thailand.

Dr. Kiattipong Kamdee is Nuclear Scientist, Senior Professional Level at Nuclear Technology Research and Development Center, Thailand Institute of Nuclear Technology. I have worked for isotope hydrology in the field of environmental and groundwater studies more than 20 years ago and involved in the IAEA (International Atomic Energy Agency) projects as National Project Coordinator (NPC) for many years. Moreover, I have been participated to establish the Isotope Hydrology since 2006. In 2019, our lab was certified from the agency to be IAEA collaborating centre in the area of Water Resources Assessment and Management for four years. Our researches were focused on application of isotope and related techniques for groundwater management, groundwater contamination, food adulteration, as well as analytical services to research institutes and related institutes.



INVITED SPEAKER: SP9_INV02

UPDATES OF DOSE CONVERSION FACTORS FOR RADON ISOTOPES (^{222}Rn and ^{220}Rn) AND THEIR HISTORICAL OVERVIEW

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Abstract:

New radon conversion factors (DCF) for radon/thoron progeny have been presented in the ICRP Publication 137 (2017). There used to be a large difference in the DCF between those derived from epidemiological (ICRP 65) and from dosimetric approaches (ICRP 66). However, this revision has resulted in a higher DCF than before. Hereafter a variety of radon issues may arise. In the present talk, the following topics will be presented (i) Characteristics of radon and progeny, (ii) How to assess the effective dose due to inhalation of radon progeny, (iii) Lung dosimetry and influential parameters for dose assessment, (iv) Review of dose conversion factors in published data, and (v) Thoron issues.

Dr Shinji Tokonami is a full professor at Hirosaki University Institute of Radiation Emergency Medicine in the Department of Radiation Physics, where he specializes in radiation measurements and dose assessment. In 1995 Dr. Tokonami earned his Ph.D. in engineering from Waseda University. Throughout his career he has been involved with radiation research at Waseda University, the National Institute of Radiological Sciences, and Hirosaki University. In addition, he is a member of several International Organizations for Standards' committees regarding radon and radiation measurements. He also developed multiple measurement techniques and equipment related to his field. In particular, he established a passive measurement technique for detecting radon-222 & radon-220. This discriminative measurement technique for radon isotopes was published as ISO 16641.



INVITED SPEAKER: SP9_INV03

A SURVEY OF NATURALLY OCCURRING RADIOACTIVE MATERIALS IN ENVIRONMENTAL SAMPLES AND PROCESSED MATERIALS FROM THAI MINERAL INDUSTRIES

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Abstract:

In an effort to support in the development of a regulatory framework for naturally occurring radioactive material (NORM) in Thailand, the Natural Radiation Survey and Analysis Project was initiated and led by the Department of Nuclear Engineering, Faculty of Engineering, Chulalongkorn University in 2002. To achieve the project objectives, it is necessary to create linkage and collaboration among governmental organizations, academic institutions, and private sectors. The environmental samples including terrestrial soil, water and plants were collected from selected provinces all over Thailand. The mineral samples including mineral products, by-products, and wastes arising from industrial processes; were collected from some industries potentially generating NORM. The activity concentration of natural radionuclides; ^{226}Ra , ^{232}Th and/or ^{40}K ; was investigated. The obtained data would derive a baseline data in environmental radioactivity and use for the radiological environmental impact assessment as well as provide adequate radiation protection to the environment and the public without imposing unnecessarily burdening on the industries.

Dr Rawiwan Kritsananuwat is a lecturer at Chulalongkorn University in the Department of Nuclear Engineering, Faculty of Engineering. She has graduated Ph.D. in Radiological Science from Tokyo Metropolitan University in a financial supporting under Asian Human Resource Fund established by the Tokyo Metropolitan Government. She specializes in environmental radiation measurements and radioactive waste management.



ORAL PRESENTATION SESSIONS

INFORMATION FOR ORAL PRESENTATION

Oral presentations are required to be made by PowerPoint, which should be controlled by the speaker. Embed font in PowerPoint or the use of PDF file is recommended for those who use special fonts or characters.

The normal oral presentation will be 12 to 15 min plus 3 to 5 min questions in English. There will be warning signals for the end of your presentation. Please strictly follow the schedule.

All speakers are required to load and check the files before the presentation.

A PC-compatible computer and a LCD projector will be provided.



POSTER PRESENTATION SESSIONS

INFORMATION FOR POSTER PRESENTATION

The poster must be in English. The content of the poster should cover title, objectives, methodology, results, discussions and conclusions. The poster board size should not exceed 90 cm width x 120 cm height.

Accessories (like adhesive tape) for setting up the poster will be provided by the organizer.

Poster attachment should be attached on January 24th, 2024 at 8:00-10:00 am according to presentation code which will be notified both in the congress website and at the congress site.

Poster presenters are expected to appear in front of their posters during their scheduled sessions.





PRESENTATION AWARDS

PRESENTATION AWARDS

We are pleased to announce that there are awards for best poster and oral presentations in the STT49.

Best Poster Presentation Awards will be given to the most outstanding poster presentation presented by a student who has submitted an abstract or proceeding under poster presentation category of sessions A to F as a presenter. The winners will be selected from the presentation and Q&A of poster session by the committees of each academic session.

Best Oral Presentation Awards: The winners (students) will be selected by the committees in each session.

Best Poster and Best Oral Presentation Awards will be announced in Awarding Ceremony Session on January 25th, 2024 (morning session).



SESSION A - PHYSICS / APPLIED PHYSICS

ID	Presenter	Title
A_001_P	Napat Kaewtrakulchai	CONVERSION OF SUGARCANE LEAVE INTO CLEAN SOLID BIOFUEL VIA CATALYTIC HYDROTHERMAL CARBONIZATION
A_002_P	Suwit Khongpakdee	DEVELOPING AN EXPERIMENTAL INSTRUMENT TO MEASURE THE APPARENT MAGNITUDE OF STARS
A_003_P	Weerawat Pornroongruengchok	DEVELOPMENT OF CONTROL SOFTWARE AND DATA ACQUISITION FOR NEUTRON IMAGING FACILITY AT THAI RESEARCH REACTOR (TRR-1/M1)
A_004_P	Arnon Borisut	FABRICATION OF THE HOLLOW CORE ANTI-RESONANT FIBER BY A MODIFIED OFF-THE SHELF 3D PRINTER
A_005_P	Vasinee Sunmuang	LATENT HEAT OF VAPORIZATION OF KRATOM LEAVES
A_006_P	Thammarat Taengtang	MODELING GAS DETECTION UTILIZING ONE-DIMENSIONAL PHOTONIC
A_007_P	Patspat Techathanavanich	NEUTRONICS EFFECTS STUDY FOR TRITIUM BREEDING BLANKET OF FUSION REACTOR
A_008_P	Suwit Khongpakdee	'RADIOACTIVE DICE' EXPERIMENT: A NEW APPROACH TO MORE ACCURATELY APPROXIMATING RADIOACTIVE DECAY
A_009_P	Pattarada Nunwao	SORPTION ISOTHERM OF KRATOM LEAVES
A_010_P	Thatchanon Ruengsuwan	STUDY THE END OF NEAR FIELD INTERFERENCE BY GAUSSIAN FUNCTION SERIES FOR VIBRATION DETECTOR DEVELOPMENT
A_011_P	Marina Mani	TEACHING DEVICE UTILIZING VIRTUAL PHYSICS LABORATORY V 8.0 EXPERIMENTS ON ENERGY IN ELEMENTARY PHYSICS
A_012_P	Prasong Kessaratikoon	THE FABRICATION AND REFRACTIVE INDEX MEASUREMENT OF DIY ACRYLIC CONVEX LENSES

SESSION B - BIOLOGICAL SCIENCES

ID	Presenter	Title
B_001_P	Tamonwan Lotangchanintra	A COMPARATIVE BIOINFORMATICS STUDY OF PILA PROTEIN FROM <i>Burkholderia mallei</i>
B_002_P	Chantima Piyapong	A COMPARISON OF AQUATIC ARTHROPOD DIVERSITY IN ORGANIC AND CONVENTIONAL RICE PADDY FIELDS
B_003_P	Kangsadan Boonprab	ALGAL-BASED PROTEIN: TEMPEH PRODUCED FROM <i>Chara corallina</i> (SARAI-KHAM-KUNG)
B_004_P	Napat Prompat	AN INTEGRATED COMPUTATIONAL APPROACH: MACHINE LEARNING AND MOLECULAR DYNAMICS SIMULATION FOR REPURPOSING G-QUADRUPLEX LIGANDS AGAINST SARS-CoV-2 MAIN PROTEASE
B_005_P	Teerapat Onyala	ANTIBACTERIAL GREEN SYNTHESIZED SILVER NANOPARTICLES AND TRANSDERMAL PATCH APPLICATIONS
B_006_P	Sueptrakool Wisessombat	ANTIFUNGAL ACTIVITY OF ENDOPHYTIC FUNGI ISOLATED FROM HERBS IN SOUTHERN THAILAND AGAINST CANDIDIASIS AND MUCORMYCOSIS
B_007_P	Thanyarat Puttika	CAFFEINE RESPONSE OF <i>Cordyceps militaris</i> ON GROWTH AND METABOLITE PRODUCTION



ID	Presenter	Title
B_008_P	Wichin Suebpala	CARBON STORES FROM A CORAL - SEAGRASS COMMUNITY AT AO NAMMAO, KRABI PROVINCE, THE ANDAMAN SEA
B_009_P	Charin Chandit	CHARACTERIZATION OF A DIHYDROFOLATE REDUCTASE FROM <i>Leptospira interrogans</i>
B_010_P	Sirot Inthasorn	CHARACTERIZATION OF MELANIN FROM <i>Streptomyces</i> spp. ISOLATED FROM RUBBER PLANTATION SOIL
B_011_P	Yunshan Xia	CLONING AND PREDICTION OF ANTIFUNGAL PEPTIDES IN SILICO APPROACH OF THAUMATIN-LIKE PROTEIN FROM CHUMPHON 1 CACAO
B_012_P	Panyawut Rattanaarom	COMBINED TOXICITY OF IMIDACLOPRID AND GLYPHOSATE ON AQUATIC OLIGOCHAETES (<i>Tubifex tubifex</i> Müller, 1774)
B_013_P	Ploypailin Rangseethampanya	DIVERSITY AND ABUNDANCE OF CORAL REEF FISH IN TRAT PROVINCE, THE EASTERN GULF OF THAILAND
B_014_P	Kitipong Angsujinda	EFFECT OF SODIUM CHLORIDE ON GROWTH AND PETASE EXPRESSION OF <i>Escherichia coli</i> STRAIN ROSETTA-GAMI AND PET DEGRADATION
B_015_P	Jongrak Attarat	EFFECTIVE MELANIN DECOLORIZATION AND TYROSINASE INHIBITORY BY <i>Pleurotus cystidosus</i> PROTEINS
B_016_P	Pornnatcha Tidchob	EFFECTS OF TEMPERATURE ON BIOLOGICAL ACTIVITIES OF BEE VENOM FROM 3 DIFFERENT SPECIES OF HONEYBEE IN THAILAND
B_017_P	Pongsanat Pongcharoen	EFFICIENCY OF BIOMASS ROTTEN BANANA MUSA "KLUAI NAMWA" AS FEEDSTOCK FOR ETHANOL PRODUCTION AND SINGLE CELL PROTEIN BY YEAST <i>Pichia kudriavzevii</i>
B_018_P	Makamas Sutthacheep	GROWTH RATE OF CORAL MICRO-FRAGMENTS IN CHONBURI PROVINCE, THE UPPER GULF OF THAILAND
B_019_P	Ponsit Sathapondecha	IDENTIFICATION OF CIRCULAR RNA IN WHITE SHRIMP AFTER WHITE SPOT SYNDROME VIRUS INFECTION
B_020_P	Prant Chotiphantawanon	IN SILICO DRUG REPURPOSING FOR SATELLITE CELL DIFFERENTIATION PROMOTING DRUG(S) TARGETTING ACTIVIN TYPE II B RECEPTOR
B_021_P	Wimonsiri Puegsa	IN SILICO SCREENING OF NOVEL GSK3 β INHIBITORS FOR PROMOTING CELL PROLIFERATION
B_022_P	Yingmanee Tragoolpua	INHIBITORY EFFICACY OF SOME FRUIT PEEL EXTRACTS AGAINST ORAL PATHOGENIC BACTERIA
B_023_P	Phatpimol Kitchanakan	INVESTIGATION INTO PET PLASTIC DEGRADATION VIA EXTRACELLULAR PETASE PRODUCED FROM <i>Escherichia coli</i> , EMPLOYING FOURIER TRANSFORM-INFRARED SPECTROSCOPY (FT-IR) FOR ANALYSIS
B_024_P	Wittaya Tawong	INVESTIGATION OF STRESS TOLERANCE OF <i>Pichia kudriavzevii</i> FOR IMPROVING BIOETHANOL PRODUCTION
B_025_P	Narongsak Sriwiran	ISOLATION AND CHARACTERIZATION OF BACTERIOPHAGE AGAINST ANTIBIOTIC RESISTANT <i>Campylobacter jejuni</i>
B_026_P	Wichuda Manorin	LEGUMINOUS PLANTS (FABACEAE) IN LIMESTONE AREA OF NAKHON SI THAMMARAT PROVINCE, SOUTHERN THAILAND
B_027_P	Sanya Meesim	LICHENS FAMILY Physciaceae AND Caliciaceae THE PUBLIC PARKS IN BANGKOK THAILAND
B_028_P	Ton Nguyen	<i>Mahachai bettas</i> : GENETIC DIVERSITY, POPULATION STRUCTURE, AND THEIR CRUCIAL ROLE IN CONSERVATION MANAGEMENT



ID	Presenter	Title
B_029_P	Saowaluk Krainara	MICROBIAL COMMUNITY STRUCTURE OF MUNICIPAL SOLID WASTE LANDFILL SOIL AND ITS POTENTIAL BIODEGRADATION OF BIOPLASTIC FILM
B_030_P	Nattawit Yutimit	MICROSTRUCTURE-PROPERTY RELATIONS OF THERMALLY SPRAYED HYDROXYAPATITE COATINGS
B_031_P	Tavun Pongsanarm	MITOCHONDRIAL AND MICROSATELLITE DATA REVEAL THE GENETIC DIVERSITY AND LANDSCAPE FACTORS OF FISH (<i>Tor spp.</i>) IN MAE HONG SON THAILAND
B_032_P	Thitiporn Promnil	MORPHOLOGICAL AND MOLECULAR IDENTIFICATION OF PATHOGENIC <i>Acanthamoeba</i> spp. IN WATER AND SOIL SOURCES ASSOCIATED WITH HUMAN ACTIVITIES IN 3 PROVINCES OF SOUTHERN THAILAND
B_033_P	Jidapar Wathanaphol	N, N, N-TRIMETHYL CHITOSAN NANOPARTICLE (TMC NP) IS AN EFFECTIVE VEHICLE IN DELIVERY OF SARS-CoV-2 PROTEIN INTO LUNG CELLS
B_034_P	Thanaporn Maswanna	PARTIAL PURIFICATION AND CHARACTERIZATION OF CANTHAXANTHIN FROM GREEN ALGA <i>Tetraspora sp.</i> CU2551
B_035_P	Thunchanok Khammanee	PHYLOGENETIC ANALYSIS OF <i>Plasmodium knowlesi</i> ISOLATES FROM CLINICAL SAMPLES IN SOUTHERN THAILAND: PERSPECTIVE FROM MITOCHONDRIAL CYTOCHROME B AND MEROZOITE SURFACE PROTEIN-1 GENES
B_036_P	Sitapun Jethanajun	PLASMID AND HOST IDENTIFICATION FOR CLONING AND EXPRESSION OF CD163 SRCR5-6
B_037_P	Thida Kaewkod	PREBIOTIC PROPERTIES OF MEDICINAL PLANT EXTRACTS FOR PROMOTING THE GROWTH OF PROBIOTIC MICROORGANISMS
B_038_P	Tipaporn Kumkoon	PREPARATION, CHARACTERIZATION AND IN VITRO STUDY OF GALLIC ACID (GA) ENCAPSULATED POLY(LACTIC-CO-GLYCOLIC ACID) (PLGA) NANOPARTICLES IN BREAST CANCER CELLS
B_039_P	Sawitree Dueramae	PRIMARY SCREENING AND RAPID IDENTIFICATION BY MALDI-TOF MS OF DOMINANT MICROBIAL ISOLATES FROM THAI KOMBUCHA SAMPLES
B_040_P	Amornrat Sanprick	PURIFICATION OF GERM CELLS USING SUCROSE AND PERCOLL GRADIENT CENTRIFUGATION IN THREE SPECIES OF SHRIMP (<i>Fenneropenaeus merguensis</i> , <i>Litopenaeus vannamei</i> AND <i>Penaeus monodon</i>)
B_041_P	Malatee Tayeh	SCREENING OF ANTI-MIGRATION ACTIVITY OF LUNG CANCER CELLS OF ENDOPHYTIC FUNGI EXTRACTS ISOLATED FROM <i>Terminalia bellirica</i> AND <i>Capsicum annum L.</i>
B_042_P	Chayanook Seetha	SCREENING OF COMPOUNDS THAT CAN ALLEVIATE TOXICITY OF α -SYN USING THE DEVELOPED YEAST-BASED ASSAY
B_043_P	Yanika Chantachot	SEARCHING FOR PEPTIDES WITH MUSHROOM TYROSINASE INHIBITION ACTIVITY IN THE FERMENTED UNPOLISHED BLACK RICE SAP
B_044_P	Kedsirin Ruttajorn	SEQUENCING ANALYSIS OF INDEL MARKER IN LOCAL RICE VARIETIES FROM SOUTH THAILAND
B_045_P	Oranit Sriwichian	SHORT CHAIN FATTY ACIDS DERIVED FROM PROBIOTIC LACTOBACILLUS STRAINS INHIBIT THE ACCUMULATION OF LIPIDS IN 3T3-L1 ADIPOCYTES
B_046_P	Gunn Tangkanont	STRUCTURE DETERMINATION AND KINETIC PROPERTIES OF ATP SULFURYLASE FROM DURIAN <i>Durio zibethinus</i>
B_047_P	Phatthira Karnpakob	TEMPORAL CHANGES OF MEIOFAUNA ASSEMBLAGE ON HIN PHOENG UNDERWATER PINNACLE, RAYONG PROVINCE, THE EASTERN GULF OF THAILAND



ID	Presenter	Title
B_048_P	Damratsamon Surangkul	THE INDUCTION OF CANCER STEM CELL-LIKE PROPERTIES IN HCT-116 HUMAN COLON CANCER CELLS BY BUTYRATE
B_049_P	Kanokphorn Sangkharak	THE OPTIMIZATION CONDITION OF ACYLGLYCEROL PRODUCTION USING BIODIESEL DERIVED-GLYCEROL AND ITS PARTIAL CHARACTERIZE
B_050_P	Praepan Lapphaisal	THE ROLE OF LECTIN DOMAIN IN SPIKE PROTEINS OF SARS-CoV-2 AND SARS-LIKE CoV

SESSION C - CHEMISTRY

ID	Presenter	Title
C_001_P	Fonthip Makkluang	AN ECO-FRIENDLY OF DEEP EUTECTIC SOLVENTS IMMOBILIZED IN A MICROCRYSTAL CELLULOSE-POLYVINYL ALCOHOL SPONGE FOR THE DETERMINATION OF PARABENS IN FOOD SAMPLES
C_002_P	Whitchuta Jesadabundit	DENDRITIC COPPER NANOSTRUCTURE FUNCTIONALIZED DIAZONIUM SALT ON INTERLEUKIN-6 IMMUNOSENSOR FOR HIGHLY SENSITIVE SEPSIS SCREENING
C_003_P	Myo Myint Zaw	DETERMINATION OF ACRYLAMIDE FROM POTATO CHIPS USING SEA SAND DISRUPTION METHOD COUPLED WITH HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY
C_004_P	Pawanrat Srithong	DUAL COLORIMETRIC/ELECTROCHEMICAL DETECTION OF ANTIOXIDANTS USING A SCREEN-PRINTED GRAPHENE ELECTRODE INTEGRATED INTO A MICROFLUIDIC
C_005_P	Muktinan Saraban	ELECTROCHEMICAL SENSOR FOR CAFFEINE DETECTION USING CARBON NANOTUBES AND METAL-ORGANIC FRAMEWORK COMPOSITE
C_006_P	Sumonmarn Chaneam	FLUOROMETRIC ANALYSIS OF BENZOIC ACID USING Ni-MnFe-LAYERED DOUBLE HYDROXIDES PEROXIDASE-LIKE MIMICKING
C_007_P	Surachada CHUAYCHOB	IN VITRO MODEL OF A TRIPLET-REPEAT RNA DISEASE IN MYOTONIC DYSTROPHY TYPE 1 UTILIZING DNA NANOSTRUCTURES
C_008_P	Jutamas Jaewjaroenwattana	PORTABLE ELECTROCHEMICAL MICROFLUIDIC DEVICE FOR USER-FRIENDLY DETECTION OF Cd AND Pb
C_009_P	Weeraya Treewanjutha	PREPARATION AND APPLICATION OF INTELLIGENT FILMS INCORPORATED WITH NATURAL ANTHOCYANIN EXTRACT FOR TRACING SEA FOOD SPOILAGE
C_010_P	Suttasinee Suttinon	EFFECTIVE DECOLORIZATION OF CONGO RED DYE USING Mg-OR Ba- DOPED COPPER HYDROXY NITRATE
C_011_P	Kantima Rattana	EFFICIENT MAGNETIC COMPOSITE: AC, NiAl-LDO and Fe ₃ O ₄ FOR REMOVING MALACHITE GREEN AND ERIOCHROME BLACK T DYES IN WATER
C_012_P	Saowapa Chotisuwan	IRON(III) OXIDE PHOTOCATALYST SUPPORTED ON SILICA DERIVED FROM RICE HUSK FOR DEGRADATION OF METHYLENE BLUE DYE UNDER VISIBLE LIGHT
C_013_P	Rattanyu Kongpan	LUMINESCENCE QUENCHING BEHAVIOR OF FE(III) SENSOR BASED ON IRIIDIUM(III) COMPLEX WITH BIS(DIPHENYLPHOSPHINO)METHANE ANCILLARY LIGAND

ID	Presenter	Title
C_014_P	Thanapon Chakarothai	PHOTO-FENTON DEGRADATION OF RHODAMINE B DYE SOLUTION BY $Fe(IO_3)_3/FeOOH$ UNDER VISIBLE LIGHT IRRADIATION
C_015_P	Jongnam Park	SYNTHESIS OF HIGHLY LUMINESCENT AND THERMALLY STABLE Pb-FREE PEROVSKITE NANOCRYSTALS WITH NONLINEAR OPTICAL RESPONSE
C_016_P	Sucharat Sanongkiet	ANTI-INFLAMMATORY CHARACTERISTICS OF SPIRO[INDOLIZIDINE-1,3'-OXINDOLE] AND ITS INDOLIZIDINE DERIVATIVES
C_017_P	Natchapong Chuangsom	APORPHINE ALKALOIDS FROM THE LEAVES OF ALPHONSEA ELLIPTICA
C_018_P	Kanda Panthong	COUMARIN AND ACRIDONE ALKALOID DERIVATIVES FROM THE STEMS OF <i>Citrus hystrix</i>
C_019_P	Pornpat Sam-ang	CYTOTOXIC POTENTIAL OF BIOACTIVE COMPOUNDS ISOLATED FROM <i>Kaempferia elegans</i> RHIZOMES AGAINST BREAST CANCER CELLS
C_020_P	Nishimure Kota	DEGRADATION OF HESPERIDIN INTO HIGH-VALUE CHEMICALS BY CO_2-H_2O SYNERGY UNDER MICROWAVE IRRADIATION
C_021_P	Jirapast Sichaem	EXPLORING THE α -GLUCOSIDASE INHIBITORY COMPOUNDS FROM <i>Garcinia schomburgkiana</i> FRUITS USING BIO-GUIDED ISOLATION: IN VITRO AND IN SILICO INVESTIGATIONS
C_022_P	Wanrudee Hiranrat	α -GLUCOSIDASE INHIBITORY ACTIVITY OF EXTRACTS FROM <i>Mitragyna speciosa</i> LEAVES
C_023_P	Pipat Pobpimai	ONE-POT SYNTHESIS OF 4-ARYL-1,2-NAPHTHOQUINONES AND 2-ARYL-1,4-NAPHTHOQUINONES
C_024_P	Patinnapat Ketbunnak	POTENTIAL OF THE EXTRACTS FROM SOME MEDICINAL PLANTS TO INHIBIT VIBRIO HARVEYI INFECTING THE WHITE SHRIMP (<i>Litopenaeus vannamei</i>)
C_025_P	Parichat Thepthong	TOTAL PHENOLIC CONTENT, FREE RADICAL SCAVENGING ACTIVITIES AND CYTOTOXICITY OF A LEAF EXTRACT AND ITS FRACTIONS FROM <i>Chrysophyllum cainito</i>
C_026_P	Netnapa Chana	UTILIZATION OF FRUIT PEEL EXTRACTS FROM <i>Punica granatum</i> AND <i>Nephelium lappaceum</i> FOR GREEN SYNTHESIS OF SILVER NANOPARTICLES AND THEIR IMPACT ON <i>Staphylococcus epidermidis</i> INHIBITION
C_027_P	Quynh Pham	WATER SENSORS IN ORGANIC SOLVENTS FROM ETHYLNYL NAPHTHALIMIDE DERIVATIVES
C_028_P	Thanapon Charoenwongpaiboon	COMPUTATIONAL DESIGN FOR ENHANCING THERMOSTABILITY OF N,N-8-DEMETHYL-8-AMINORIBOFLAVIN DIMETHYLTRANSFERASE (RosA)
C_029_P	Jarawee Chupiom	CRYSTAL VIOLET ADSORPTION BY MODIFIED SURFACE COFFEE GROUNDS ACTIVATED CARBON
C_030_P	Thanawit Kuamit	CURVATURE AND EXTERNAL ELECTRIC FIELD EFFECTS ON GRAPHENE QUANTUM DOTS
C_031_P	Yuthana Tantirungrotechai	NUCLEOPHILIC SUBSTITUTION OF SQUARIC ACID TO SQUARAMIDES INVESTIGATED BY DENSITY FUNCTIONAL THEORY
C_032_P	Panita Kongsune	SCREENING POTENTIAL COMPOUNDS FROM <i>Mitragyna Speciosa</i> (Korth.) FOR INHIBITION ACETYLCHOLINESTERASE AND COX-2 BY MOLECULAR DOCKING TECHNIQUE



SESSION D - MATHEMATICS / STATISTICS / COMPUTER SCIENCE / DATA SCIENCE / AI

ID	Presenter	Title
D_001_P	Noorayisah Mohd Yaacob	A NOVEL INTELLIGENT FOR ELECTRONIC PERSONALIZED HEALTH RECORD (iEPHR) MODEL FOR INFECTIOUS DISEASE IN MALAYSIA: A PRELIMINARY STUDY
D_002_P	Athtayu Yuthong	DEVELOPMENT OF AUTOMATED PULMONARY VOLUME MONITORING SYSTEM WITH INCENTIVE SPIROMETER BASED ON DEEP LEARNING DETECTION
D_003_P	Hakeemee Sadeeyamu	GRACEFUL LABELING OF SOME THE RING SUM GRAPHS AND THE BISTAR RELATED GRAPHS
D_004_P	Phanuphat Srisukhawasu	MULTIFLARENET: LIGHT-WEIGHT CONVOLUTIONAL NEURAL NETWORKS FOR SOLAR FLARE FORECASTING USING MULTISPECTRAL FLARING REGION IMAGES
D_005_P	Supoj Chamnanprai	RECORDING WATER CONSUMPTION AND DENTAL FLUOROSIS AMONG CHILDREN IN HIGH FLUORIDE AREAS IN NORTHERN PART OF THAILAND BY GEOGRAPHIC INFORMATION TECHNOLOGY
D_006_P	Maripen Thesa	THE CENTER COLORING OF CORONA PRODUCT OF PATHS
D_007_P	Natthanicha Samanchat	VOICE-BASED COVID-19 CLASSIFICATION USING MACHINE LEARNING TECHNIQUES

SESSION E - ENERGY / ENVIRONMENTAL & EARTH SCIENCE / MATERIALS SCIENCE / CHEMICAL TECHNOLOGY

ID	Presenter	Title
E_001_P	Niramol Juntarachat	ADSORPTION OF HYDROGEN SULFIDE CONTAINED IN BIOGAS USING BIOMASS POWER PLANT ASH AS AN ADSORBENT
E_002_P	Saowaluk Chaleawlert-umpon	ADSORPTION STUDY OF AMOXICILLIN BY SURFACE MODIFICATION OF GRANULAR ACTIVATED CARBON
E_003_P	Taisei Nagamine	DEAMINATION OF BIO-OIL USING HYDROTHERMAL LIQUEFACTION INTENSIFIED WITH SUPERCRITICAL CARBON DIOXIDE
E_004_P	Harshit Shukla	DIELS ALDER REACTION OF BIO-BASED DERIVATIVES
E_005_P	Poonsub Threepopnatkul	EXPLORING SUSTAINABLE BIOPOLYMER COMPOSITES FOAM FOR ENHANCED FOOD PACKAGING: A STUDY ON POLY(LACTIC ACID) AND POLYBUTYLENE SUCCINATE BLENDS INCORPORATED WITH ZINC OXIDE
E_006_P	Surarat Siri-in	HYDROGEN SULFIDE REMOVAL OF DURIAN PEEL BIOCHAR FOR BIOGAS CLEANING
E_007_P	Sorathan Tanprasert	INFLUENCE OF OPERATIONAL PARAMETERS ON ELECTROSTATIC PRECIPITATOR EFFICIENCY THROUGH PROCESS SIMULATION

ID	Presenter	Title
E_008_P	Pacharapol Nokpho	MICROWAVE REGENERATION OF MODIFIED SOLID SORBENTS WITH EXHAUSTION INDICATOR FOR DIRECT AIR CO ₂ CAPTURE
E_009_P	Ratchadaporn Kueasook	ONE-STEP SYNTHESIS OF SUGARCANE BAGASSE GROUND-BASED MICROPOROUS CARBON USING KOH AS AN ACTIVATION AGENT FOR CO ₂ ADSORPTION
E_010_P	Raweewan Thiramanas	REVEALING THE PHYSICO-CHEMICAL PROPERTIES AND CELLULAR INTERACTIONS OF COMMERCIAL TITANIUM DIOXIDE NANOPARTICLES
E_011_P	Nishimure Kota	SELECTIVE PRODUCTION OF RUTINOSE FROM THE HYDROLYSIS OF HESPERIDIN IN THE SUBCRITICAL H ₂ O-CO ₂ SYSTEM UNDER MICROWAVE IRRADIATION
E_012_P	Nattaya Tawichai	SUSTAINABLE UTILIZATION OF FLUE GAS DESULFURIZATION WASTE FOR CONSTRUCTION AND CASTING APPLICATIONS THROUGH OPTIMIZED CALCINATION CONDITIONS
E_013_P	Nao Takata	SYNTHESIS OF GTBE BY CARBON-BASED CATALYTIC METHOD USING MICROWAVE IRRADIATION
E_014_P	Somphop Nakwun	THE POWER SYSTEM: THE SEMI-AUTOMATIC PIPING SYSTEM OF FUEL OIL INTO POWER GENERATOR
E_015_P	Sakdinun Nuntang	TUNABLE ORGANOSULFONICACID-FUNCTIONALIZED NATURAL RUBBER/ WORMHOLE-LIKE MESOSTRUCTURED SILICA NANOCOMPOSITES FOR ENHANCING THE ESTERIFICATION
E_016_P	Pawin Sangthong	CaCu _{2.95} Ni _{0.05} Ti _{4-x} Ga _x O ₁₂ CERAMICS: ENHANCED DIELECTRIC PERMITTIVITY AND REDUCED DIELECTRIC LOSS TANGENT
E_017_P	Jakkree Boonlakhorn	CaCu ₃ Ti ₄ O ₁₂ CERAMIC: HIGH DIELECTRIC PERMITTIVITY AND EXTRINSIC AND INTRINSIC ORIGINS
E_018_P	Uraiwan Intatha	EFFECT OF PARTICLE SIZE ON DIELECTRIC PROPERTIES OF ZnO-DOPED Ba _{0.85} Ca _{0.15} Ti _{0.90} Zr _{0.10} O ₃ CERAMIC
E_019_P	Pariwat Dumnui	EFFECTS OF Fe ³⁺ DOPING ON STRUCTURE AND DIELECTRIC PROPERTIES OF CaCu ₃ Ti ₄ O ₁₂ CERAMICS
E_020_P	Natwara Tansungnern	GIANT DIELECTRIC PROPERTIES, ELECTRICAL RESPONSE, AND MICROSTRUCTURE OF CaCu ₃ Ti _{4-x} Ga _x O ₁₂ CERAMICS
E_021_P	Mingkhwan Kruachanta	DAM LEAKAGE DETECTION USING ELECTRICAL RESISTIVITY SURVEY AT HUAI FANG NOI RESERVOIR, CHOM THONG, CHIANG MAI, THAILAND
E_022_P	Kanyarat Kwansirikul	EXPERIMENTAL HEAT TREATING OF AMETHYST FROM URUGUAY
E_023_P	Thawatchai Polsri	Fe SKARN DEPOSIT IN KHAO MAE LEK AND KHAO LEK AREAS, NAKHON SAWAN PROVINCE, CENTRAL THAILAND
E_024_P	Apichet Boonsoong	GEMOLOGICAL CHARACTERISTICS, CHEMICAL COMPOSITIONS AND CAUSE OF COLOR OF CHALCANTHITE CLAIMED TO BE FROM AFRICA
E_025_P	Patcharin Jundee	GEOLOGY AND GEOCHEMISTRY OF THE BAN NONG KHROK HOT SPRING TOURISTIC ATTRACTION, PHRAO DISTRICT, CHIANG MAI PROVINCE FOR SUSTAINABLE GEOTOURISM POTENTIAL EVALUATION
E_026_P	Sutthipong Taweelarp	GROUNDWATER CHARACTERISTICS AND CHEMISTRY OF THE SALINE AREA IN BAN THUM, KHON KAEN PROVINCE
E_027_P	Burapha Phajuy	MINERALOGY AND ALTERATION OF PAK PAT VOLCANIC ROCKS IN NAM PAT DISTRICT, UTTARADIT PROVINCE, NORTHERN THAILAND



ID	Presenter	Title
E_028_P	Tanchanok Kraithep	MODEL FOR ESTIMATE SOLAR RADIATION FROM CLOUD COVER IN SONGKHLA PROVINCE

SESSION F - FOOD SCIENCE AND TECHNOLOGY/AGRICULTURAL SCIENCE

ID	Presenter	Title
F_001_P	Supinya Tanyaros	ANTIOXIDANT (INDOLE-3-CARBINOL) IN VEGETABLES FROM LOCAL MARKET, SOUTHERN THAILAND
F_002_P	Pawinee Panpetch	BIOCHEMICAL CHARACTERISATION OF β -AMYLASE 1 (DzBAM1) FROM DURIAN PULP (<i>Durio zibethinus L.</i>) MONTHONG CULTIVAR DURING RIPENING
F_003_P	Sudarat Sukphanao	BIODIVERSITY OF ENDOPHYTIC ACTINOBACTERIA ISOLATED FROM JASMINE RICE (<i>Oryza sativa</i> KDML 105) AND THEIR PLANT GROWTH PROMOTING IN VITRO AND IDENTIFICATION OF <i>Quadrisphaera endophytica</i> SP. NOV.
F_004_P	Nantharat Phruksaphithak	CHARACTERIZATION OF PECTIN FROM DURIAN RIND USING STEAM EXPOSITION
F_005_P	Nattawut Rungjindamai	CULTIVATION OF OYSTER MUSHROOM USING 5 AGRICULTURAL WASTES
F_006_P	Safiah Saah	DEVELOPMENT OF COMPOSITE KERATIN/CHITOSAN FILMS FOR SUSTAINABLE FOOD PACKAGING APPLICATIONS
F_007_P	Krittika Kaewchumnong	EFFECT OF LIGHT STRESS ON GROWTH AND ALLELOPATHIC ACTIVITY OF RICE IN SOUTHERN THAILAND
F_008_P	Sirirung Wongsakul	EFFECTS OF COFFEE PROCESSING METHODS ON CHEMICAL COMPOSITIONS OF GREEN BEAN AND ROASTED BEAN OF ARABICA COFFEE
F_009_P	Bhudsawan Hiranvarachat	MICROWAVE-ASSISTED EXTRACTION OF CAROTENOIDS IN PALMYRA PALM MEAT BY USING DIFFERENT VEGETABLE OILS AS SOLVENT
F_010_P	Yathippawi Pakkaew	PLANT-BASED GRILLED PORK ON BAMBOO STICK: THE IMPROVEMENT OF KASET TEXTURED PROTEIN, ELIMINATING UNWANTED ODORANT AND REDUCING ROUGH TEXTURE
F_011_P	Patthinan Varichanan	PREBIOTIC PROPERTIES OF THAI LOTUS (<i>Nelumbo nucifera</i>) SEED FLOUR
F_012_P	Jutarut lewkittayakorn	PRODUCTION OF <i>Bacillus amyloliquefaciens</i> STRAIN C2-1 IN POWDER FORM FOR INHIBITING RICE DISEASES
F_013_P	Sasithon Temisak	PRODUCTION OF THAILAND REFERENCE MATERIALS (TRMs) FOR DETECTION OF GENETICALLY MODIFIED RICE
F_014_P	Orathai Sawatdichaikul	PROTEIN BIOINFORMATICS ANALYSIS OF LACCASE ON <i>Lentinus squarrosulus</i> AND RELATIVE SPECIES
F_015_P	Karan Wangpaiboon	SYNTHESIS OF Fisetin GLUCOSIDES USING ALTERNANSUCRASE FROM <i>Leuconostoc citreum</i> ABK-1



SP2 - THAI TRADITIONAL MEDICINE: FROM TRADITIONAL USE TO COMMERCIALIZATION RHODOMYRTUS TOMENTOSA (AITON) HASSK AND MITRAGYNA SPECIOSA (KORTH) HAVIL

ID	Presenter	Title
SP2_001_P	Sirirat Srirat	EVALUATION OF ANTIOXIDANT ACTIVITY AND TOTAL PHENOLIC CONTENT OF DIFFERENT <i>Mitragyna speciosa</i> STRAINS IN THAILAND

SP8 - X-RAY CRYSTALLOGRAPHY

ID	Presenter	Title
SP8_001_P	Chakhon Salee	CRYSTAL STRUCTURE OF A NEW 3D INTERPENETRATING CADMIUM(II) COORDINATION POLYMER CONTAINING 1,4-BIS(IMIDAZOL-1-YLMETHYL) BENZENE AND DICYANAMIDE
SP8_002_P	Sirinan Thanma	CRYSTAL STRUCTURE OF NEW TWO-DIMENSIONAL CADMIUM(II) COORDINATION POLYMER CONTAINING 1,3-BENZENEDICARBOXYLATE LINKER
SP8_003_P	Chatphorn Theppitak	CRYSTAL STRUCTURE OF TERBIUM(III) COORDINATION POLYMERS CONTAINING 4-(HYDRAZINECARBONYL)BENZOATE LIGANDS
SP8_004_P	Kanthida Kummoon	CRYSTAL STRUCTURES AND HIGH-PRESSURE CO ₂ SORPTION OF LANTHANIDE METAL-ORGANIC FRAMEWORKS CONTAINING MIXED OXALATE-FORMATE LIGANDS
SP8_005_P	Suwadee Jiajaroen	CRYSTAL STRUCTURES OF COPPER(II)-BENZENEDICARBOXYLATE FRAMEWORKS HAVING MIL-53 TOPOLOGY
SP8_006_P	Kunlanit Chinchon	CRYSTAL STRUCTURES OF MIXED Ca(II)/Cd(II) ANIONIC MOFs
SP8_007_P	Issaraporn Rakngam	STRUCTURAL CHARACTERIZATION OF NANOPOROUS COPPER(II)-BTB MOF
SP8_008_P	Chompunuch Bunfrueang	SYNTHESIS, CHARACTERIZATION AND CRYSTAL STRUCTURES OF NEW MONONUCLEAR COPPER(II) COMPLEXES CONTAINING DIIMINE DERIVATIVES AND 4-HYDROXYBENZOATE LIGANDS
SP8_009_P	Wanassanan Chaisuriya	SYNTHESIS, CHARACTERIZATION, AND CRYSTAL STRUCTURE OF NEW TERNARY MONONUCLEAR COPPER(II) COMPLEXES CONTAINING 2,2'-DIPYRIDYLAMINE AND HYDROXYBENZOATE DERIVATIVE
SP8_010_P	Kulwadee Ponanunrirk	SYNTHESIS, CHARACTERIZATION, CRYSTAL STRUCTURE AND SENSING PROPERTY OF TWO NEW ZINC(II) COORDINATION POLYMERS BASED 4,4'-BIPYRIDINE AND BENZOATE LIGANDS



ID	Presenter	Title
SP8_011_P	Jannarong Ngoensri	TWO NEW LUMINESCENT 3D STRONTIUM(II) COORDINATION POLYMERS WITH ALIPHATIC DICARBOXYLATE LIGANDS
SP8_012_P	Chanikarn Kummuang	TWO NEW ZINC(II) COORDINATION COMPOUNDS BASED ON IMIDAZOLE-DERIVATIVES CONTAINING LIGANDS: SYNTHESIS, CHARACTERIZATION AND CRYSTAL STRUCTURES
SP8_013_P	Pacharapon Jearanaiwiat	X-RAY CRYSTALLOGRAPHIC STRUCTURE OF COPPER(II)-SQUARATE FRAMEWORK

SP9 - RADIOECOLOGY AND ENVIRONMENTAL RADIOACTIVITY

ID	Presenter	Title
SP9_001_P	Banchert Inkeaw	ASSESSMENT OF GAMMA-RAY DOSE AND NATURAL RADIOACTIVITY IN SATUN GEOPARK, THAILAND
SP9_002_P	Murnee Daoh	INVESTIGATION OF ^{137}Cs , ^{226}Ra AND ^{232}Th IN BEACH SHE-OAK BARK SAMPLES COLLECTED FROM THAILAND'S COASTAL AREAS
SP9_003_P	Thaentawan Saesueng	MEASUREMENT AND ANALYSIS OF SPECIFIC ACTIVITIES RN-222 IN THANTHIP, PHASAWAN AND KHAO THAM PHRA CAVES AT NAKHONSAWAN PROVINCE
SP9_004_P	Komrit Wattanavatee	POSSIBLE USE BRANCHES OF <i>Casuarina equisetifolia</i> L., AS A BIOMONITORING FOR STUDYING THE DEPOSITION OF ATMOSPHERIC RADIONUCLIDE ^7Be AND ^{137}Cs ALONG COASTAL AREAS, SOUTHERN THAILAND
SP9_005_P	Pornrad Srisawad	DISTRIBUTION OF Cs-137 FALLOUT VERTICALLY IN THE SOIL AT FOREST PLANTATIONS IN BAN GANGKULASAMAKKEE, PROVINCE OF PHITSANULOK



SP10 - YOUNG RISING STARS OF SCIENCE 2023 (YRSS) & JUNIOR YOUNG RISING STARS OF SCIENCE AWARD 2023 (JYRSS)

YOUNG RISING STARS OF SCIENCE 2023 (YRSS)

ID	Name of Students	Senior Project's Title
Bio-01	Ganyalak Chaimaha	ISOLATION AND CHARACTERIZATION OF A NOVEL BACTERIOPHAGE SPECIFIC MULTI-DRUG RESISTANT <i>Acinetobacter baumannii</i>
Bio-02	Prasert Chanthorsang	EFFECT OF 5-AZACYTIDINE ON MYCELIA GROWTH AND BIOACTIVE COMPOUNDS PRODUCTION IN <i>Cordyceps militaris</i>
	Thanyarat Puttika	
	Nachapol Mathupo	
Bio-03	Siriphon Jantalert	OPTIMAL DIETARY PROTEIN LEVEL FOR CAPTIVE HAWKSBILL SEA TURTLE (<i>Eretmochelys imbricata</i>)
Bio-04	Pattida Uwichian	SPECIES DIVERSITY AND ABUNDANCE OF BIRDS IN DIFFERENT HABITATS AT KASETSART UNIVERSITY, BANG KHEN CAMPUS
Bio-05	Sartikar Onwong	TRICHOME DIVERSITY ON <i>Plectranthus amboinicus</i> (Lour.) Spreng. LEAVES: ANATOMY, MORPHOLOGY AND HISTOCHEMISTRY
Bio-06	Natladda Choovet	GENOMIC AND ANTIMICROBIAL CHARACTERIZATION OF BACTERIOCIN-PRODUCING LACTIC ACID BACTERIA
	Thanadol Jirakanjanasit	
Bio-07	Kanyapak Khaisri	A NOVEL GENE ENCODING FOR CIRCULAR DNA-ACTIVATING PROTEIN THAT MIGHT BE INVOLVED IN VIRAL ACCOMMODATION IN <i>Penaeus monodon</i>
Bio-08	Vipanee Vibulakhaophan	APPLICATION OF THE METHYLTRANSFERASE ENZYME ASSAY FOR DISCOVERY OF THE DENGUE VIRUS INHIBITOR
Bio-09	Suthinee Onuam	ABOVEGROUND CARBON STORAGE OF TREES IN COMMUNITY FORESTS IN NAN PROVINCE
Bio-10	Nuthaya Boontavee	EFFECTS OF COLLAGEN PEPTIDES ON KERATINOCYTE OXIDATIVE STRESS AND GENE EXPRESSIONS
Bio-11	Paphanpwan Lekboonphet	ANTICANCER ACTIVITY OF <i>Colubrina asiatica</i> (L.) BRONGN LEAF EXTRACTS ON CERVICAL CANCER CELL LINES
Bio-12	Nabhasbhichayabha Deawang	EXPRESSION AND PURIFICATION OF ENCODED PROTEIN FROM GENOME SEGMENT 3 OF TILAPIA LAKE VIRUS
Bio-13	Woratit Intap	A STUDY OF URINARY DNA EXTRACTION USING SKUDKENG KIT
	Pennapah Kerdpa	
	Khwanjira Phothi	
Bio-14	Suttunthip Jangiawechai	INVESTIGATING ENDOTHELIAL ABLATION MECHANISMS IN PANCREATIC DUCTAL ADENOCARCINOMA ON ENDOTHELIAL CELLS
Bio-15	Suradit Jaroenwetwut	

ID	Name of Students	Senior Project's Title
	Kataleeya Thomrongchote	MOLECULAR MECHANISM OF LIPID ACCUMULATION DURING ENDOPLASMIC RETICULUM STRESS IN <i>Saccharomyces cerevisiae</i>
Bio-16	Kodchakorn Phongsai	GREEN ULTRASOUND-ASSISTED EXTRACTION OF LAWSONE FROM <i>Lawsonia inermis</i> L.
Bio-17	Kasimaporn Promubon	CHARACTERIZATION OF THERMOPHILIC CYANOBACTERIA AS A HOST FOR A NEWLY DESIGNED PATHWAY
Bio-18	Kawintip Kiakhunthod	BIODIVERSITY OF ENDOPHYTIC ACTINOBACTERIA ISOLATED FROM <i>Eucalyptus calmadulensis</i> GROWN AT HIGH SALINE SOIL AND THEIR APPLICATION TO INHIBIT FUNGAL PATHOGENS AND PROMOTE PLANT GROWTH IN VITRO
Bio-19	Thanakron Into	FUNGAL INHABITANTS ON <i>Cyclosa mulmeinensis</i> SPIDER WEBS OBTAINED FROM THAI RICE FIELDS
Bio-20	Nutthapon Choopol	AGE VALIDATION OF <i>Lutjanus johnii</i> BY OTOLITH AGING
Bio-21	Inthawat Inpoomma	NECTAR BAT VISITATION TO <i>Oroxylum indicum</i> FLOWERS ALONG AN URBANIZATION GRADIENT IN BANGKOK, THAILAND

ID	Name of Students	Senior Project's Title
Chem-01	Thamonwan Meephun	THE INFLUENCE OF TEMPERATURE ON THERMAL DEGRADATION OF ANTHOCYANIN DYE EXTRACTED FROM LEUM PUA BLACK RICE (<i>Oryza sativa</i> L.)
Chem-02	Chatkamon Lekwongphaiboon	PULCON 1H qNMR SPECTROSCOPY: A SIMPLE AND ACCURATE METHOD FOR PHENYLBUTANOIDS QUANTIFICATION IN <i>Zingiber cassumunar</i> Roxb. rhizome
Chem-03	Sulawich Kittithammo	NATURAL LIQUID CRYSTAL CREAM, A MIRACULOUS SKIN BARRIER MOISTURIZER
	Natthawut Rueangkachon	
	Thitiya Rueangnut	
	Prachaya Saomas	
Chem-04	Phichai Phoemsuk	COLORIMETRIC DETECTION OF CANNABINOIDS USING DNA APTAMER AND PYRROLIDINYL PEPTIDE NUCLEIC ACID WITH GOLD NANOPARTICLES
	Samatchaya Sungnoi	
Chem-05	Patamavadee Tapsarn	DELIVERY AND DIFFUSION OF CURCUMIN IN DERMIS AND EPIDERMIS THROUGH THE PVP/PAA DETACHABLE DISSOLVABLE MICRONEEDLES
Chem-06	Yosita Phailomwong	DEVELOPMENT OF CHEMICAL METHOD FOR DERIVATIZATION OF LIPID FOR MALDI MASS SPECTROMETRIC ANALYSIS
Chem-07	Anawin Promkaew	SCREEN-PRINTED COPPER-ORGANIC FRAMEWORK MODIFIED GRAPHENE AS ELECTROCHEMICAL SENSOR FOR DETECTION OF GLUTATHIONE
Chem-08	Jukkraphop Norrasarn	NANO ZINC OXIDE-STARCH WATER BRUSHED ON WARP YARN FOR ANTIFUNGAL ACTIVITY ON THAI SILK FABRICS
	Maywadee Chinkam	
Chem-09	Samuch Phetduang	A SENSITIVE CHEMICAL SENSOR ON A SMARTPHONE-BASED PORTABLE FLUORESCENCE DEVICE
	Rattanjitra Sompaojee	
Chem-10	Suranee Teng	EFFECTS OF EXTRACTS AND SYNTHESIS CONDITIONS ON ZNO PARTICLE SIZE
	Patimoh Masae	

ID	Name of Students	Senior Project's Title
Com-01	Thapakon Kamujandee	A MOBILE-BASED APPLICATION FOR INTERESTING TODDLERS' FOOD RECOMMENDATION
	Nichkamol Tuampermsup	
Com-02	Trirat Arromrit	H-MAINT : DATA PLATFORM FOR MANAGEMENT AND PREDICTIVE MAINTENANCE OF VENTILATOR
	Napatsakorn Roswhan	
	Chanamet Akkarakitichok	
Com-03	Chisanupong Treesutrummas	THAI FICTION GENRE CLASSIFICATION BASED ON ONLINE NAIVE BAYES MODEL
	Chanwit Mingkhwankeeree	
	Warat Prateepsangkhom	
Com-04	Piyachon Rusuwannakul	CRYPTOCURRENCY RECOMMENDATION BOT
Com-05	Michael Saetern	PRACTICAL MAE MAI MUAY THAI WITH ARTIFICIAL INTELLIGENCE
	Nattapat Sudprasert	
Com-06	Ratchai Thipbumrung	AUTOMATED FACE SELECTION AND CENSORING ON IMAGE AND VIDEO
Com-07	Thanyabun Phutson	AUTOMATION SYSTEM-BASED SMART OFFICE FOR ELECTRICAL APPLIANCE CONTROL USING INTERNET OF THINGS AND ARTIFICIAL INTELLIGENCE
	Nueapop Morasin	
Com-08	Paweena Chaithong	THE DESIGN AND DEVELOPMENT OF A MACHINE LEARNING MODEL-BASED ABNORMAL EVENT DETECTION SYSTEM FOR RESPIRATORY DISEASE PATIENTS
	Fayaz Heembu	
Com-09	Onthada Preedasawakul	DEVELOPING A NEW CORRELATION-BASED FUZZY CLUSTER VALIDITY INDEX AND ITS SOFTWARE PACKAGE

ID	Name of Students	Senior Project's Title
Food-01	Tanisorn Holycross	EFFECT OF INULIN AS A FAT REPLACER ON QUALITY OF POTATO MILK ICE CREAM
	Anusada Pattaravipak	
Food-02	Jindarat Promma	DEVELOPMENT OF THERMAL INSULATION BOX FOR FRUITS: THE POSTHARVEST QUALITY PRESERVATION OF THAI RAMBUTAN
Food-03	Piyawan Phonphimai	MUSHROOM-LEGUME-BASED MINCED MEAT: PHYSICO-CHEMICAL AND SENSORY PROPERTIES
	Shanipa Sukchot	
Food-04	Phumpitug Rakrueang	DEVELOPMENT OF PROBIOTICS BUTTER FROM ORGANIC MILK
	Wattanee Khaosopha	
Food-05	Natcha Janpan	EFFECT OF DRYING TEMPERATURE AND TIME ON THE QUALITY OF COCONUT RESIDUE FLOUR AND ITS USE IN GLUTEN-FREE PIZZA PRODUCT
	Kamonthip Chanpha	
	Nattapong Saenkamson	
Food-06	Thiyada Peerawanichagul	PRODUCTION OF PORRIDGE FROM FERMENTED OKARA BY <i>Rhizopus oligosporus</i> TISTR 3138
	Chittakan Noisathit	
Food-07	Warissara Phathamchart	THE EXTRACTION OF BIOACTIVE COMPOUNDS FROM GINGER (<i>Zingiber officinale</i>) BY SUBCRITICAL WATER EXTRACTION
	Suwitas Sukrot	



ID	Name of Students	Senior Project's Title
Env-01	Thatchapon Seela	PETROGRAPHICAL AND GEOCHEMICAL CHARACTERISTICS OF FELSIC VOLCANIC ROCKS IN UDON THANI AND NONG KHAI PROVINCES, NE THAILAND
Env-02	Areeya Prommahachai	LATE HOLOCENE MANGROVE DYNAMICS AND SEA LEVEL CHANGE IN RANONG PROVINCE OF THAILAND
	Paphawarin Songpattanasilp	
	Pakjira Kanchanavichanon	
Env-03	Tuangtip Jaramai	REMOVAL OF HEAVY METALS FROM INDUSTRIAL SLUDGE BY BIOSURFACTANT-BASED WASHING AGENT
	Chattakarn Krongboon	
Env-04	Mantana Muenkaew	TRACKING SHALLOW-WATER CORALS AND SEAGRASSES ALONG THE COAST OF RAYONG WITH LANDSAT OLI SATELLITE
	Narakate Pabao	
Env-05	Panupong Kongpet	CURIE POINT DEPTH MAP OF SOUTHERN THAILAND USING AIRBORNE MAGNETIC DATA FOR GEOTHERMAL RESOURCES EXPLORATION

ID	Name of Students	Senior Project's Title
Mat-01	Phitchayaporn Maosom	FLEXIBLE THERMOELECTRIC-TRIBOELECTRIC HYBRID NANOGENERATOR BASED ON COTTON FABRIC AND POLYANILINE/CNT COMPOSITES
	Chanachot Sae-tang	
	Chanyanut Khotsombat	
Mat-02	Sirawit Promsai	STRUCTURE AND DIELECTRIC PROPERTIES OF $\text{Na}_{1/3}\text{Sr}_{1/3}\text{Y}_{1/3}\text{Cu}_3\text{Ti}_4\text{O}_{12}$ CERAMICS
Mat-03	Suchawadee Rattana	NEW NANOCOMPOSITE OF WATERBORNE POLYURETHANE BASED ON MODIFIED PALM OIL BY CLICK REACTION FOR COATING APPLICATIONS
Mat-04	Thitiwan Intha	HEAVY-METAL ADSORBENT MATERIALS FROM NATURAL RUBBER FOAM CONTAINING GAMMA-IRRADIATED CHITOSAN POWDER
Mat-05	Panyawat Techo	VANADIUM CARBIDE MXENE BASED-GAS SENSOR FOR VOLATILE ORGANIC COMPOUNDS DETECTION AT ROOM TEMPERATURE
Mat-06	Jinda Chueamue	SURFACE MODIFICATION OF SILICA FROM RICE HUSK ASH WITH ORGANIC AMINE GROUPS VIA POST GRAFTING METHOD AND THEIR APPLICATION AS ADSORBENT FOR CO ₂ REMOVAL
Mat-07	Pruksasub Kittitronsub	VEGAN LEATHER FROM SISAL AND PLA COMPOSITE
Mat-08	Nurhayatee Che-wae	SYNTHESIS OF CALCIUM HYDROXIDE-SALICYLIC ACID NANOPARTICLE BY USING <i>MUSA ACUMINATA</i> PEEL EXTRACT AND TRUNK INJECTION APPLICATION TO TREAT WILD DISEASE
	Afeenee Soree	
Mat-09	Teetat Wattanasilp	DEVELOPMENT OF LITHIUM-ION BATTERY ELECTRODES BASED ON ECOFRIENDLY MATERIALS
	Chaiwalan Tanwilai	



ID	Name of Students	Senior Project's Title
Math-01	Papon Tantiwanichanon	VERTEX COLORING AND EDGE COLORING ON KING'S GRAPHS AND RELATED GRAPHS
Math-02	Wikanda Hongboonmee	FORECASTING MODEL OF AGRICULTURE EXPORT VALUE IN THAILAND
	Suphalaksana Buajan	
Math-03	Peerawit Suriya	SUBMODULARITY PROPERTY FOR FACILITY LOCATIONS OF DYNAMIC FLOW NETWORKS

ID	Name of Students	Senior Project's Title
Phy-01	Sirawit Tripia	DESIGNING OF TWO-DIMENSIONAL ACOUSTIC BEAMFORMING ARRAY USING MACHINE LEARNING
Phy-02	Sudarat Premsiripat	PREPARATION OF rGO/TiO ₂ COMPOSITE DERIVED FROM CASSAVA RESIDUE FOR COUNTER ELECTRODES IN DYE-SENSITIZED SOLAR CELLS
	Woranuch Sudthongkong	
Phy-03	Pichapat Jullasrisawat	PORTABLE COLORIMETER BASED POLYDIACETYLENE SENSOR FOR ON-SITE DETECTION OF AMMONIA NITROGEN
	Chetsadaphon Aekkaphan	
Phy-04	Pongsakorn Sriling	ANOMALY DETECTION OF CMS TRACKER USING AUTOENCODER
Phy-05	Sirachat Kaewkongtham	BACKFLASH PHOTON ANALYSIS IN QUANTUM KEY DISTRIBUTION PROTOCOL.
Phy-06	Susana Ma'sae	SYNTHESIS OF HIGH-PERFORMANCE ACTIVATED CARBON FROM CALOPHYLLUM INOPHYLLUM FOR SUPERCAPACITOR APPLICATIONS
	Sumaiyah Ya'pha	
	Mohamadsamree Tohwaehayee	

JUNIOR YOUNG RISING STARS OF SCIENCE AWARD 2023 (JYRSS)

ID	Name of Students	Student Project's Title
JYRSS-01	Yotsaphat Panichijiwasan	THE FIRST INSIGHTS INTO THE OCCURRENCE OF MICROPLASTIC RESIDUES IN EDIBLE INSECTS FROM FRESH MARKETS IN NAKHON PATHOM, THAILAND
	Wisit Suwannao	
	Woraphat Jittichanon	
JYRSS-02	Kanit Nilrat	FINDING THE SUM OF HYPERCUBE VOLUMES BY ARRANGING NUMBERS
	Narawit Pigunthong	
	Prueksachart Prueksakorn	
JYRSS-03	Rawisara Chokdeepanich	SINGLE-STEP SYNTHESIS OF CARBON DOTS USING CASSAVA WASTE FOR FORMALIN DETECTION IN FOOD AND RETRIEVAL OF RESIDUAL WASTE FROM THE SYNTHESIS PROCESS AS A HYDROCHAR FOR REMOVING ORGANIC DYES FROM AQUEOUS SOLUTIONS.
	Nirinthana Ungudonpakdee	
JYRSS-04	Donlacha Chompooming	CONFORMATIONAL SUGAR ITINERARY IN A-GALACTOSIDASE CATALYZING GALACTOMANNAN HYDROLYSIS
	Thamonwan Pattanapradit	

ID	Name of Students	Student Project's Title
JYRSS-05	Bunnada Sadsee	STEM AND PETIOLE ANATOMICAL STUDY OF SOME AQUATIC PLANTS IN PHAYAO PROVINCE
	Sujira Nontitabut	
	Suphichaya Prangcharoen	
JYRSS-06	Kantida Chaiyo	INVESTIGATION OF ANTIOXIDANT ACTIVITIES AND POLYPHENOL CONTENTS OF <i>Bidens Pilosa</i> L. LEAF EXTRACTS
	Warunya Phukkhom	
JYRSS-07	Rinrada Witchayachaiyanan	THE STUDY OF SPENT COFFEE GROUNDS EFFICIENCY IN PARACETAMOL ADSORPTION FROM SYNTHETIC WASTEWATER
	Pornprawe Ruangsuriyakit	
JYRSS-08	Napat Sakdibhornssup	EVALUATION OF IN VITRO COSMETIC BIOLOGICAL ACTIVITY OF TRITERPENOIDS IN <i>Wolffia globosa</i> EXTRACT
JYRSS-09	Ratthapoom Rangubtook	PEST DETECTION AND ANALYSIS SYSTEM OF CNT0718-26-1-1-1 RICE
	Thapanan Plubplai	
JYRSS-10	Rawi Sawetluk	DETECT AND CLASSIFY THE MANGOSTEEN RIPENING STAGE USING DEEP LEARNING
	Pannawit Chakorn	
	Pawarit Chanttanassup	
JYRSS-11	Natthanet Tantisuwichwong	THE EFFECTS OF ANTIBIOTIC AQUEOUS SOLUTION OF FLOXACIN (OFL) AND PHOTOCATALYST 5Ag-ZnO TREATED OFL ON ONION ROOTS AND CELL DIVISION
JYRSS-12	Warangchart Peeradonkoset	EFFICACY OF <i>Bacillus</i> SPECIES AGAINST PLANT PATHOGENIC FUNGI
	Isika Rodcharoen	
JYRSS-13	Phuriphat Piwdee	OPTIMAL CONDITION OF <i>Bacillus</i> sp. TO INHIBIT <i>Fusarium moniliforme</i> CAUSES ROT CORN DISEASE
	Wannapong Sueamak	
JYRSS-14	Kodchapon Roekwan	ISOLATION OF LACTIC ACID BACTERIA FROM TRADITIONAL FERMENTED FOOD IN SOUTHERN THAILAND FOR INHIBITION OF RICE GRAIN SPOILAGE FUNGI
	Kullapa Jiyipong	
JYRSS-15	Yanisaa Khamsingh	CLEAN TECHNOLOGY TO PRESERVE SEAFOOD BY HYPOCHLOROUS ACID FROM MOUNTAIN SALTWATER BO KLUEA DISTRICT, NAN, THAILAND
	Thanchanok Thatsana	
	Songpol Saejeam	
JYRSS-16	Pattaranan Adulprasatporn	FRUIT PROTECTION BAG COMBINED WITH LIGHTWEIGHT CONCRETE ABSORBED HERBAL EXTRACTS TO CONTROL INSECT PEST, BACTERIA AND FUNGI FOR SUSTAINABLE AGRICULTURAL
JYRSS-17	Pattanan Chanhom	ADSORPTION PERFORMANCE OF AMINE-FUNCTIONALIZED RICE HUSK ASH FOR CAFFEINE REMOVAL FROM WASTEWATER
	Suthida Suriyayot	
	Ponpomkwan Chanhom	
JYRSS-18	Pongnakorn Kunapornchaipong	SULFONIC ACID FUNCTIONALIZED RICE HUSK ASH AS CATALYST FOR ESTERIFICATION OF PALM FATTY ACID DISTILLATE
	Kamol Korn Chaobankrang	
	Thanakamon Wannasan	
JYRSS-19	Sophacha Sugkachiradej	SYNTHESIS OF NOVEL BIOCHAR FROM LONGAN PEEL FOR THE REMOVAL OF CIPROFLOXACIN FROM WASTEWATER
	Nalin Dulyapraphant	
	Rattasart Chaisuwan	



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38. Ms. Kittima Saengow
39. Ms. Pattaraporn Phungam
40. Ms. Sirada Aromchuen



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SESSION A - PHYSICS / APPLIED PHYSICS

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3. Assoc. Prof. Dr. Chongdee Buranachai
4. Assoc. Prof. Dr. Opas Bunkoed
5. Assoc. Prof. Dr. Purim Jarujamras
6. Assoc. Prof. Dr. Thitima Rujiralai
7. Assoc. Prof. Dr. Weena Siangproh
8. Asst. Prof. Dr. Itthipon Jeerapan
9. Asst. Prof. Dr. Supunnee Duangthong
10. Asst. Prof. Dr. Sujitra Poorahong
11. Dr. Panwadee Wattanasin



SESSION C - CHEMISTRY (Inorganic Chemistry)

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3. Assoc. Prof. Dr. Kittisak Choojun
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9. Dr. Teerapong Pirojsirikul
10. Dr. Wasut Pornpatcharapong



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RHODOMYRTUS TOMENTOSA (AITON) HASSK AND MITRAGYNA SPECIOSA (KORTH) HAVIL**

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11. Lecturer Wantapon Ngamdee

SP5 - ENVIRONMENTALLY FRIENDLY RUBBER AND ITS FUTURE

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2. Assoc. Prof. Dr. Ekwipoo Kalkornsurapranee
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5. Asst. Prof. Dr. Tulyapong Tulyapita

SP8 - X-RAY CRYSTALLOGRAPHY

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4. Assoc. Prof. Dr. Kittipong Chainok
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6. Asst. Prof. Dr. Nanthawat Wannarit
7. Asst. Prof. Dr. Puey Ounjai
8. Asst. Prof. Dr. Saowanit Saithong

SP9 - RADIOECOLOGY AND ENVIRONMENTAL RADIOACTIVITY

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2. Asst. Prof. Dr. Wanwiwa Tumnoi
3. Dr. Kittisak Chaisan
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