

PROGRAMME BOOK

**2ND Applied Science Research
International Conference 2022**

2ND

ASRIC

2022

In conjunction with
**Ipoh International Summit on Professionalism,
Research and Education (INSPIREd) 2022**

**APPLIED SCIENCE
KEY AND CURRENT CHALLENGES
BEYOND THE PANDERMIC**

**21st September 2022
Virtual conference**



Message from the RECTOR UiTM PERAK

It gives me great pleasure to welcome all participants to the 2nd Applied Science Research International Conference 2022 (2nd ASRIC 2022) organized by Universiti Teknologi MARA (UiTM) Perak, Tapah branch in conjunction with Ipoh international summit on professionalism, Research, and Education (INSPIRED 2022),

Universiti Teknologi MARA has been actively doing and promoting scientific technological innovation, design and conferences in various field. Parallel to this, UiTM has organized many such events to broaden the mind of our young researchers and scientist, allowing them to extend their perspective and visions towards the development of new technologies and theories. Therefore, it is a great delight that UiTM Perak, Tapah Branch is organizing this event. This is a follow up even to similar event in 2019. Hence, it is expected that ASRIC 2022 will continue to provide another excellence platform for the mutual exchange of creative ideas, knowledge and information between the institutions and individuals.

ASRIC 2022 is part of UiTM Perak pursuit to disseminate the culture of knowledge excellence. It aims to bring together researchers and professionals in the context of multi and inter-disciplinary field. The event will provide excellent opportunities of knowledge sharing and research ideas exchanges in the field of science, technology and engineering for a better quality of life to meet future challenges.

This event has come at a time when current advancement in technology is immeasurable and I do hope that all participants will benefit from this virtual gathering of professionals not only in terms of getting touch with others in their field, but also taking chance to exchange and share ideas and opinions. It is our hope that this event will succeed in generating many new academic innovations, research findings and ideas in the near future.

Professor Ts. Sr. Dr. Md Yusof Hamid, *PMP, AMP*

Rector,

Universiti Teknologi MARA (UiTM Perak).

WELCOME AND SELAMAT DATANG

Warm Welcome to all of you to 2ND APPLIED SCIENCE RESEARCH INTERNATIONAL CONFERENCE 2022 (2ND ASRIC2022) which organized by the Faculty of Applied Sciences, Universiti Teknologi MARA Perak Branch, Tapah Campus in conjunction with the Ipoh International Summit on Professionalism, Research, and Education (InSPIREd 2022).

With the theme “**Applied Science: Key & Current Challenges beyond the Pandemic**”, this one-day conference will be run virtually, comprising three major tracks which are applied Biology, applied Chemistry and applied Physics but not limited to the following areas. We are welcoming multidisciplinary research. This conference will serve as a platform for international researchers, industries, academicians and students to share and exchange their findings in applied science research as well as promoting networking and collaboration.

The COVID-19 pandemic has affected a variety of researchers, students and academicians. As institutions of higher education have limited in-person activities, research and training have been disrupted. Many graduate students have faced new barriers as a result. With this theme, we hope we can provide an international forum to discuss topics and developing new knowledge relevant to the key and current challenge beyond the pandemic.

ASRIC2022 features two fabulous keynote lectures by Professor Dr. Nor Ashikin Mohamed Noor Khan (Faculty of Medicine, Universiti Teknologi MARA Malaysia) and Professor Dr. Hadi Nur (Center of Advanced Materials for Renewable Energy (CAMRY) Universitas Negeri Malang (UM) and three invited speakers by Assoc. Prof. ChM Dr. Zainiharyati Mohd Zain (School of Chemistry & Environment Universiti Teknologi MARA Malaysia), Dr Vipul Agarwal (University of New South Wales (UNSW) and Dr. Mohd Hafiz bin Mohd Zin (Advanced Medical and Dental Institute, Universiti Sains Malaysia).

I especially want to welcome all keynote speakers, invited speakers and participants. We received 173 oral presentations from all over Malaysia and also from Philippine. I am very pleased that you accepted our invitation. Thanks for the participation! All accepted full paper will be submitted for consideration for publication in Scopus/Mycite Indexed Journals.

Last but not least, Congratulations and thanks again to all keynote speakers, participants, co-organizers and committee members of ASRIC2022 for your effort and time. We look forward for your active participation.

Conference Chair,

Dr Nurul Izza Binti Taib

Keynote Speakers

Professor Dr. Nor Ashikin Mohamed Noor Khan



A Professor of Physiology with Universiti Teknologi MARA (UiTM), Nor Ashikin Mohamed Noor Khan has taught biology and physiology to students across multiple faculties in UiTM, since the beginning of her academic career in 2000. Currently attached to the Faculty of Medicine, she is an external examiner for Physiology at several public and private universities. Nor Ashikin's research passion is in Reproductive Biology and Early Embryology. She heads the Maternofoetal and Embryo Research

Interest Group (MatE), and is actively supervising MSc and PhD candidates in the area. A firm advocate of multidisciplinary research and public engagement, Nor Ashikin also mentors researchers from diverse backgrounds, in collaboration with industrial partners and non-profit organizations.

Pandemic Adaptations in Physiology Pedagogy: Turning challenges into novel opportunities

Traditionally, students of human Physiology were exposed to didactic lectures, followed by the opportunity to observe, explore and appreciate normal human function in laboratory sessions. This long-practiced pedagogy was disrupted when the Covid-19 pandemic hit. The Movement Control Order necessary for public safety, caused shutdowns of in-person teaching, with little or no access to laboratory facilities. Academic institutions worldwide had to rapidly make the transition into emergency remote teaching for students. These changes saw an adaptation to the "new normal" for Physiology, with the introduction of online lectures, as well as practical classes. Adjustments to teaching and learning methodologies posed significant challenges to both academicians and students. Academicians were faced with the challenge of learning new online teaching skills fast, and incorporating new online teaching modalities into the curriculum. Students were challenged with learning in isolation, reduced peer interaction, and studying in less conducive environments. On the flip side, the pandemic has indeed driven the use of online platforms, which allowed for greater geographical accessibility, as well as synchronous/asynchronous learning and assessment. The utilisation of remote teaching and learning modalities will pose an advantage in the future, by creating opportunities for better education delivery through blended or flipped learning.

Professor Dr. Hadi Nur



Professor Dr. Hadi from Center of Advanced Materials for Renewable Energy (CAMRY), Universitas Negeri Malang, Indonesia who is expert in Material Chemistry and Heterogeneous Catalyst. His research activities involve the integration of materials science, heterogeneous catalysis, fuel cell science and engineering in order to develop and characterize new materials for use in emerging technologies. He is currently the member of Perhimpunan

Periset Indonesia, Associate Member of Pertubuhan Akademi Profesor Malaysia and Life Member of Malaysian Analytical Sciences Society

Structure–physical properties–photocatalytic activity relationship: An extent perspective using density-functional theory and fuzzy logic graph

Photocatalysis is currently used in a large variety of products across a broad range of research areas. Titanium dioxide (TiO₂) has recently been the most commonly studied and suitable for industrial use among the many different photocatalysts because TiO₂ has the highest photo-activity and the lowest cost. Although there are many publications about the enhancement of TiO₂'s photocatalytic activity, the relationship between the structural and physical properties with the photocatalytic activity of TiO₂ is still not clearly understood. Carbon doped TiO₂ (C-doped TiO₂) was chosen as the photocatalyst model to explain the structure-photocatalytic relationship of TiO₂. Carbon doping is a promising way to modify the properties of TiO₂ for the enhancement of TiO₂'s photocatalytic performance. In this study, a new approach has been proposed to evaluate the structure-photocatalytic activity relationship to understand better the dominant properties that determine the photocatalytic activities of C-doped TiO₂. The fuzzy logic graph has been used as a new approach in determining the dominant factor for the structure-photocatalytic activity relationship of C-doped TiO₂. This study demonstrated that the combination of photocatalytic experiment, density functional theory (DFT) and fuzzy logic graph analysis could be used to predict the structure-photocatalytic activity relationship in TiO₂ photocatalytic systems.

Invited Speaker

Assoc. Prof. ChM. Dr. Zainiharyati Mohd Zain



Dedicated and experienced University Associate Professor with over twenty years of experience serving as a Lecturer in the School of Chemistry and Environment, Faculty of Applied Sciences Universiti Teknologi MARA (UiTM) Shah Alam, Malaysia. Head of Electrochemical Material and Sensor (EMaS) UiTM and an active researcher in analytical chemistry bringing forth knowledge

from a variety of sensor research. Adept in creating powerful curriculum in the fields of Analytical Chemistry. A committed faculty member, passionate about working to further enhance the educational offerings of an institution. Knowledgeable and experienced scientist in various chemical, electrochemical and optical sensor work. Great skill in writing research publications, grant proposal and product pitching.

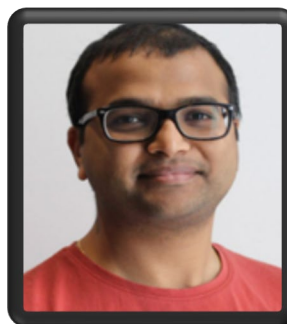
Strategies and Challenges in the Pre-commercialization of SARS-coV-2 Nanobiosensor

Electrochemical nano biosensor for nucleic acids of COVID-19 detection in real nasopharyngeal samples offers an alternative detection of rapid and point of care detection to RTPCR. The developed COVID-19 sensor was able to significantly differentiate positive and negative samples using differential pulse voltammetry technique. Strategies in the success of COVID-19 sensor deployment begins from the planning and framework of this project. The project consists of six subprojects that focuses on the development of; (i) sensor fabrication and sensor surface characterization, (ii) DNA biosensor and LAMP reagent (iii) biological sample handling, extraction process and clinical testing, (iv) microfluidic channel system, (v) portable signal processing unit (portable potentiostat) and (vi) machine learning and internet of things module. Each project is carried out concurrently and fortnightly research presentations were compulsory for continuous monitoring of the research progress in achieving clear objectives laid earlier. There are many hurdles in doing clinical research in resource limiting setting. The delivering of unique reagents like extraction reagents were delayed from overseas was still a common problem in resource limited setting. Close collaboration with Standard Clinical Laboratory practices namely Institute of Medical Research (IMR), Ministry of Health Malaysia seems able to alleviate the challenges in clinical study. In this way, a culture of laboratory quality especially in new diagnostic method development is promoted and seen as valuable to everyone involved in clinical research of a COVID-19 biosensor development.

Controlling Polymer/Reduced Graphene Oxide Nanocomposite Properties Using Emulsion-based Approaches

Graphene-based polymer nanocomposites continue to draw considerable research interest due to their versatility in terms of physicochemical, mechanical and electrical properties for a variety of applications. However, many significant challenges still remain pertaining primarily to the restacking of graphene or reduced graphene oxide (rGO) sheets within the polymer matrix. The restacking of the rGO sheets compromises the final properties (especially electrical conductivity) of the nanocomposite. To mitigate the impact of restacking, rGO loading is traditionally increased in the nanocomposite. However, the intrinsic challenge of restacking of rGO sheets within the nanocomposite remains.¹ We have developed synthetic strategies based on emulsion polymerisation using GO as a surfactant to fabricate polymer particles decorated with GO sheets (Figure 1). The obtained polymer/GO nanocomposite latexes can be easily moulded to prepare two-dimensional (2D) films at ambient temperature and 3D foams. The developed approach allowed us to tailor the physicochemical, electrical and mechanical properties of both 2D and 3D nanocomposites on demand.²⁻⁴ We will demonstrate that simple adjustments in synthetic strategy and reaction conditions can fundamentally change the orientation and arrangement of GO sheets within the 2D and 3D nanocomposites, leading to significant control over the nanocomposite properties. In addition, the potential applications of these polymer/rGO nanocomposites will also be highlighted.

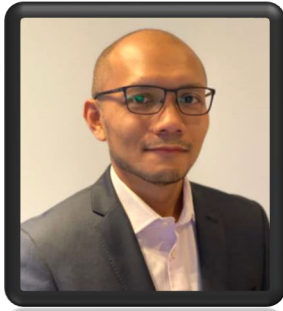
Dr Vipul Agarwal



Dr Vipul Agarwal is a lecturer and University of New South Wales (UNSW) Research Fellow. He joined UNSW in 2018 on a prestigious Australian National Health and Medical Research Council (NHMRC) Research Fellow in the School of Chemical Engineering. Prior to this, he was awarded SERB-DST National Postdoctoral Fellowship to undertake postdoctoral training at the Indian Institute of Science,

India. Dr Agarwal graduated with a PhD in Nanobiotechnology from The University of Western Australia, Australia in 2015, MAppSc in Chemistry from University of Tasmania, Australia in 2010, and BSc (Hons) in Chemistry from the University of Delhi, India in 2005. Dr Agarwal's current research interest is in materials chemistry focusing on development synthetic and fabrication strategies towards two- and three-dimensional scaffolds for tissue engineering including neuronal and bone regeneration.

Dr Mohd Hafiz Mohd Zin



Dr Hafiz received his first degree and subsequently his master's degree in medical physics at the University Sains Malaysia (USM) in 2006. He obtained his PhD in radiotherapy physics from the Joint Physics Department, Institute of Cancer Research London and the Royal Marsden Hospital UK. During his PhD, he was involved in developing prototype CMOS image sensors for real-time radiotherapy

treatment verification. The work was part of a multi-institutional and multi-disciplinary research consortium funded by the Engineering and Physical Sciences Research Council (EPSRC UK) involving various universities and institution in the UK including University College London and Rutherford Appleton Laboratory, Oxford. In 2012, he returned to Malaysia to join the Advanced Medical & Dental Institute (AMDI) of USM, where he became a Senior Lecturer in Medical Physics at the institute.

Medical physics practice during the pandemic: remote and automated quality assurance of radiotherapy treatment

Medical physics is a branch of applied physics that uses physics principles, methods and techniques in clinical practice and research for the prevention, treatment and diagnosis of human disorders, illnesses and disabilities to improve human health and well-being. There are several areas of the fields including radiation oncology, medical imaging, nuclear medicine and radiation protection.

The talk will cover the roles of medical physicists in the hospital applying physics principles in the quality control of radiation equipment to ensure the safety of cancer treatment using radiation therapy. The talk will focus on the basis of quality assurance (QA) in medical physics practice and the implementation of QA remotely and automatically using computer algorithms developed for the purpose.

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