

IVAT Newsletter

ISSN 2289-6988

ISSUE 8

JUNE 2021

IVAT

is the abbreviated name for the Institute of High Voltage and High Current, or in Malay, Institut Voltan dan Arus Tinggi – a Centre of Excellence of Universiti Teknologi Malaysia (UTM).



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Congratulations to Prof. Dr. Zulkurnain for Reappointment as IVAT's Director

JOHOR BAHRU, 1 May 2021 – All IVAT's staff members would like to congratulate Prof. Dr. Zulkurnain Abdul Malek for his reappointment as the Director of IVAT. With this reappointment, IVAT hopes to leapfrog within the next two years so as to achieve its vision to be an internationally well-known centre of excellence in lightning and nanodielectrics studies. It is also hoped that within the next two years, new future leaders capable of bringing IVAT to greater heights shall emerge from within the centre. With the new IVAT's tagline "Towards a sustainable excellence through integrity and synergy", IVAT can surely excel to greater heights in the coming years.



Prof. Dr. Zulkurnain Abdul Malek, Director of IVAT.

Coming Soon: ICPADM 2021 Conference



ICPADM 2021's virtual conference banner.

JOHOR BAHRU, 1 June 2020 – The local organizing committee of the 2021 International Conference on the Properties and Applications of Dielectric Materials (ICPADM) has geared up for the preparation of the ICPADM 2021 virtual conference to be held in from 12-14 July 2021.

ICPADM 2021 is the 13th meeting of this conference series. The IEEE Dielectrics and Electrical Insulation Society (DEIS) undertook sponsorship of the conference after the first meeting in June 24-28, 1985. ICPADM has a long history. So far the conference venues have been in Xi'an, China (1985); Beijing, China (1988); Tokyo, Japan (1991); Brisbane, Aus-

tralia (1994); Seoul, Korea (1997); Xi'an, China (2000); Nagoya, Japan (2003); Bali, Indonesia (2006); Harbin, China (2009); Bangalore, India (2012); Sydney, Australia (2015), Xi'an, China (2018).

ICPADM 2021 will be held virtually, organised by Universiti Teknologi Malaysia via the Institute of High Voltage and High Current, and sponsored by the IEEE DEIS. More details ICPADM 2021 can be found at:

<https://attend.ieee.org/icpadm-2021/>

Assoc. Prof. Ir. Ts. Dr. Lau Kwan Yiew, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

IVAT Director's Remarks



Prof. Dr. Zulkurnain Abdul Malek, Director, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

It is my great pleasure to meet you again in our annual newsletter. It is another busy year for us academically as well with our daily tasks. In line with IVAT's new tagline "Towards a sustainable excellence through integrity and synergy" and mission "Synergising expertise to nurture holistic talents and lead in excellence and creativity", I do hope IVAT can achieve its high voltage and high current excellent centre vision within the next few years. It is also my great pleasure to introduce you the IEEE 13th International Conference on the Properties and Applications of Dielectric Materials (ICPADM 2021). This virtual event is organised by the IEEE Dielectrics and Electrical Insulation Society (DEIS) and hosted by Universiti Teknologi Malaysia (UTM), and it happens from 12th to 14th July 2021. ICPADM 2021 is for the first time coming to Malaysia. IVAT feels honoured to host this IEEE DEIS flagship conference in Malaysia on behalf of UTM. I would like to thank all the organising committee members who come from various organisations throughout Malaysia including our centre of excellence members here in IVAT - you have indeed worked very hard to make this conference a success.

Congratulations to IVAT on the Successful Migration to the Latest MS ISO/IEC 17025:2017 Standard

JOHOR BAHRU, 20 July 2020 – Congratulations to IVAT's calibration and testing laboratories on the successful migration to the latest MS ISO/IEC 17025: 2017 Standard! In 1992, IVAT was the first institution in the country to be accredited to handle high voltage test and calibration works according to ISO/IEC Guide 25. In 2004, IVAT was accredited with the ISO/IEC 17025 standard in the field of high voltage electrical calibration. In certification, IVAT has also successfully migrated to MS ISO/IEC 17025 since July 2007 till date. Since 2013, IVAT has been accredited with the on-site calibration and the scope of calibration has been extended up to 180 kV AC (alternating current), 180 kV DC (direct current) and 140 kV impulse. Beginning 2015, IVAT has been accredited with power cable AC voltage withstand test. Recently in 2020, IVAT has successfully migrated to the latest MS ISO/IEC 17025:2017 standard.



Congratulatory banner.

Editorial Board

Advisor:

Prof. Dr. Zulkurnain Abdul Malek

Editor-in-Chief:

Assoc. Prof. Ir. Ts. Dr. Lau Kwan Yiew

Editor:

Dr. Zulkarnain Ahmad Noorden

Contributors:

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IVAT Supports Community Service and Knowledge Transfer Programme

JOHOR BAHRU, 18 March 2021 – As a result of the effectiveness of the solar electricity system project and its knowledge transfer model in Kampung Orang Asli Pucur, Kluang, researchers from the School of Electrical Engineering, Faculty of Engineering UTM, led by Dr. Jasrul Jamani Jamian, plan to implement the same model of solar electricity project in the last indigenous village without continuous electricity in Johor, known as Kampung Orang Asli Tewowoh, Mersing. As informed by Jabatan Kemajuan Orang Asli (JAKOA), the village still does not have a continuous electricity supply because its location is much far inland than that of Kampung Orang Asli Pucur. Consequently, the electricity supply of the village is very limited.

To help the indigenous community of Kampung Tewowoh obtained continuous electricity, in collaboration with JAKOA, four researchers, Dr. Jasrul Jamani Jamian, Dr. Syed Norazizul Syed Nasir and the two IVAT staff; Dr. Mona Riza Mohd Esa and Dr. Zulkarnain Ahmad Noorden, started the first site visit to the village on 30th August 2020 to observe the latest status of electricity supply, its consumption and fuel amount used for electricity. During the visit, a total of 17 houses, which scattered about 1 km radius within the village, were

visited and the households were interviewed about the number electrical appliances in their houses and the usage period.

All the recorded data during the site visit was used by the researchers to understand the total electricity consumption of the village and also to design the solar electrical system based on their requirement. A detailed analysis of the feasibility and reliability of the solar electrical system such as simulation of the required capacity, financial impact, logistics etc. were conducted. In the initial stage of the project, the analysis is crucial and need to be tailored towards to positive impact to the community, as it may affect the funding decision by any potential funder. The project is expected to commence in Q2 of year 2021. Prior to the installation of solar electricity system in the village, a series of knowledge transfer related to solar electricity system and its maintenance procedure will be organized to ensure that community has the knowledge and is able to take responsibility to maintain the installed system.

Dr. Zulkarnain Ahmad Noorden, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.



Photo at Kampung Orang Asli Tewowoh, Mersing, Johor.

IVAT Completed Reassessment Audit for its Accredited Testing Laboratory



Group photo with Dr. Zulkarnain (top left).

JOHOR BAHRU, 27 April 2021 – IVAT completed a 2-day audit by Standards Malaysia on 26 and 27 April 2021, for reassessing its compliance with the MS ISO/IEC 17025: 2017 (general requirements for the competence of testing and calibration laboratories) for its accredited testing laboratory (SAMM 709). The audit was held virtually, where the general requirements, structural requirements, resource requirements, process requirements and management system requirements of

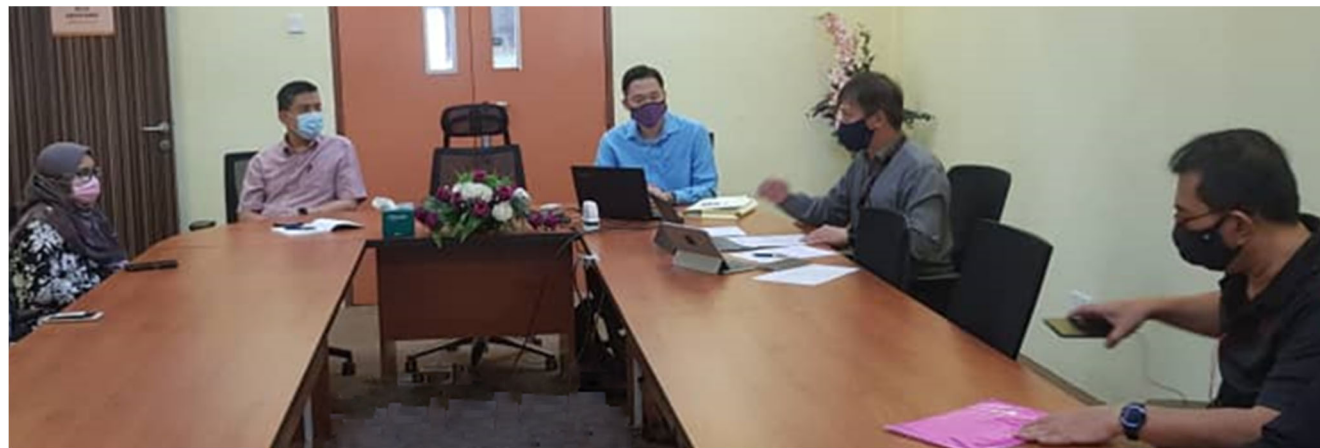


Logo of IVAT's accredited testing laboratory.

IVAT's testing laboratory were assessed. The audit ended with constructive recommendations to improve the laboratory's operation with regard to its accredited testing activities. Dr. Zulkarnain Ahmad Noorden, who is the testing laboratory's Quality Manager, has also been recommended as an Approved Signatory.

Prof. Dr. Zulkarnain Abdul Malek, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

IVAT Completed Reassessment Audit for its Accredited Calibration Laboratory



Opening session for the audit, with Assoc. Prof. Dr. Lau sitting third from right.

JOHOR BAHRU, 22 April 2021 – IVAT completed a 3-day audit by Standards Malaysia on 20, 21 and 22 April 2021, for reassessing its compliance with the MS ISO/IEC 17025: 2017 (general requirements for the competence of testing and calibration laboratories) for its accredited calibration laboratory (SAMM 285). The audit was held physically at IVAT, where the general requirements, structural requirements, resource requirements, process requirements and management system requirements of IVAT's calibration laboratory were assessed.

The audit ended with constructive recommendations to improve the laboratory's operation with regard to its accredited calibration activities. Assoc. Prof. Ir. Ts. Dr. Lau Kwan Yiew, the calibration laboratory's Quality Manager, has also been recommended as an Approved Signatory.

Prof. Dr. Zulkarnain Abdul Malek, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Happy Retirement to Hj. Anuar Kamaruddin



Hj. Anuar Kamaruddin

Happy Retirement!

JOHOR BAHRU, 5 March 2021 – Hj. Anuar Kamaruddin has officially retired after serving Universiti Teknologi Malaysia (UTM) for almost 40 years (since 2 June 1980). Hj. Anuar has been with IVAT since IVAT's early years in 1980s, then

in the Kuala Lumpur campus. IVAT's staff members would like to thank Hj. Anuar for his excellent services at IVAT and will miss his valuable experiences in the field of high voltage. May you always stay healthy and happy!

Dr. Zulkarnain and Team Won Runner Up for Off-Grid Category in NEA 2020



Dr. Zulkarnain at the award ceremony.

KUALA LUMPUR, 5 April 2021 – Congratulations to the team of researchers/lecturers from the Faculty of Engineering, Universiti Teknologi Malaysia (UTM), for receiving the "Runner Up" award for the off-grid category in the National Energy Awards (NEA) 2020 organised by the Ministry of Energy and Natural Resources through a corporate social responsibility project to help supplying solar electricity to the native villagers of Woh Intake, Tapah, Perak, a project in collaboration with Bank Islam Malaysia Berhad in 2020. 83 residents with a capacity of 15 houses in Kampung Orang Asli Woh Intake have never enjoyed a continuous supply of electricity since it was built due to the location of the village which is located far inland and challenging geographical factors. The project leader, Ts. Dr. Jasrul Jamani

Jamani, as well as 12 students and staff of the School of Electrical Engineering, Faculty of Engineering, UTM, including Dr. Zulkarnain Ahmad Noorden (IVAT's staff), managed to end the difficulties of the people by using the available expertise to generate electricity using solar power, a renewable energy easy to find. A solar system has been designed for the convenience of the residents and an energy limiter has also been integrated to ensure that the native community can be frugal in their use of electricity. Congratulations UTM team!

Prof. Dr. Zulkarnain Abdul Malek, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

High Voltage Calibration, Testing, Consultancy, Training, Research and Development at Institute of High Voltage and High Current, Universiti Teknologi Malaysia

Introduction

- The Institute of High Voltage and High Current, or in Malay, Institut Voltan dan Arus Tinggi (IVAT), was established in Universiti Teknologi Malaysia in 1991
- IVAT's establishment stems from the need of the country for a centre which carries out research and development, testing and calibration work, and training in the field of high voltage engineering
- IVAT is a laboratory accredited under the Laboratory Accreditation Scheme of Malaysia and meets the requirements of MS ISO/IEC 17025:2017 (general requirements for the competence of testing and calibration laboratories)

Accredited Calibration and Testing Services



Ensure the reliability of your high voltage equipment through

Accredited Calibration & Testing Services



Accredited scope of calibration:

- AC – up to 180 kV rms
- DC – up to 180 kV
- Impulse – 50 kV to 140 kV
- High current – up to 1000 A



Accredited scope of testing:

- Power cable AC voltage withstand test from 2 kV to 180 kV at 50 Hz

Research and Development

IVAT has 2 main research themes covering comprehensive research on high voltage engineering:

Lightning Research and Safety:

- Lightning monitoring, detection, and protection system
- Lightning characterization, electromagnetic field, and radio frequency emission
- Overvoltage protection system and insulation co-ordination, measurement techniques, surge arresters, and magnetic engineering
- Grounding system improvement and measurement method
- Super capacitor application in high voltage systems
- Electromagnetic compatibility and interference in high voltage systems



Dielectrics, Discharges and Diagnostics:

- Electrical discharge, detection, and monitoring
- Partial discharge analysis on polymeric insulating materials
- Condition monitoring of high voltage equipment
- Diagnosis and fault analysis
- Forensic investigation
- Material assessment
- Plasma and ozone generation applications
- Low voltage and telecommunication surge protective devices

Consultancy and Training Services

IVAT offers consultancy services for the following areas:

- Laboratory accreditation based on MS ISO/IEC 17025: 2017
- Lightning protection systems for buildings
- Protection systems for electrical power networks
- Grounding systems installations
- High voltage product development
- Low voltage and telecommunication surge protective devices

IVAT also organises training, visits, workshops, seminars and short courses. Some popular modules include:

- Electrical Safety Seminar
- Fundamentals of High Voltage Technology
- Three-day Short Course on High Voltage Testing Techniques and Safety
- Two-day Short Course on Grounding Systems
- Short Course on Lightning Protection for High and Low Voltage Systems
- Short Course on Partial Discharge Phenomena

Contact details :

Dr. Zulkurnain Abdul Malek
Professor / Director
E-mail: zulkurnain@utm.my

Dr. Noor Azlinda Ahmad
Senior Lecturer / Deputy Director
(Service, Consultancy and Training)
E-mail: noorazlinda@utm.my

Dr. Mona Riza Mohd Esa
Senior Lecturer / Deputy Director
(Research, Networking and Commercialisation)
E-mail: monariza@utm.my

Dr. Zuraimy Adzis
Senior Lecturer / Laboratory Head
E-mail: zuraimy@utm.my

Dr. Mohamed Afendi Mohamed Piah
Associate Professor / Head of Department
(Electrical Power Engineering)
E-mail: fendi@utm.my

Ir. Ts. Dr. Lau Kwan Yiew
Associate Professor / Quality Manager
(Calibration)
E-mail: kwanyiew@utm.my

Dr. Zulkarnain Ahmad Noorden
Senior Lecturer / Quality Manager
(Testing)
E-mail: zulkarnain-an@utm.my

Dr. Mohd Hafizi Ahmad
Senior Lecturer
E-mail: mohdhafizi@utm.my

Office Phone:
+607 553 5615

Official Website:
ivat.utm.my

Address:

Institute of High Voltage and High Current, Block P06, Faculty of Electrical Engineering,
Universiti Teknologi Malaysia, 81310 Johor Bahru, Malaysia.

IVAT Guides UTM Aerolab to ISO 17025: 2017 Accreditation

JOHOR BAHRU, 04 May 2021 – IVAT has been appointed as the main consultant for the Skim Akreditasi Makmal Malaysia (SAMM) ISO 17025: 2017 accreditation process of Universiti Teknologi Malaysia's Aeronautics Laboratory (Aerolab). The ISO 17025 accreditation version 2017 includes the risk of assessment and special clauses of impartiality as an improvement of the whole laboratory quality system. Aerolab's application is unique as in the process of adequacy, assessment and compliance analysis, the standard has been migrated to the 2017 version, thus requiring quite a major document restructuring and policy change. IVAT has continuously engaged Aerolab in introducing the latest changes to the standard, forming the application team, guiding documentation and submission to SAMM, and addressing non-conformities and observations throughout the adequacy, assessment and compliance audits, specifically with the intent of establishing a sound documented quality system. The accreditation would help in Aerolab's testing (and potentially calibration) activity with globally trusted results.

The adequacy audit of Aerolab was conducted on-site on 13th March 2020, followed by the pre-assessment audit on 18 September the same year. A few tweaks coupled with the onset of the Covid19 pandemic, caused the compliance audit to be delayed to 15 September 2020. With the team's high spirit and cohesion, Aerolab was finally awarded with the SAMM ISO 17025: 2017 accreditation status on 4th May 2021, with the identification serial SAMM 1001.



UTM Aerolab's successful accreditation banner.

With such high determination, the Aerolab's staff and management have come together as a team to achieve their objective. Aerolab is currently the 6th SAMM ISO 17025 certified laboratory of UTM. It increases confidence to the laboratory, school, faculty and UTM in view of the public and technical societies. IVAT would like to congratulate Aerolab for such an excellent achievement and wishes to take this opportunity to encourage other laboratories in UTM to adopt ISO certification for continuous laboratory improvements. IVAT is always ready to offer consultancy services within its fields of expertise.

Dr. Zuraimy Adzis, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Dr. Amirreza Naderipour Successfully Published 23 ISI-indexed Papers within 2 Years



JOHOR BAHRU, 20 July 2020 – Dr. Amirreza Naderipour has been a Postdoctoral Fellow at IVAT since July 2018. He has embarked on several projects during his postdoctoral tenure. These are entitled “Design a new compensation control strategy for grid-connected inverter at the microgrid”, “Reliable and economic allocation of electric vehicles parking lots and renewable energy resources in distribution networks considering uncertainty”, “Evaluation of Uncertainty in The Hybrid Energy System, Including Wind Turbine, Photovoltaic, and Hydrogen Storage”, “A Novel Optimization algorithm, a meta-heuristic method for real parameter optimization” and “Development of an Analyti-

cal Tool for GIS Diagnostic using SF6 by-Product Analysis”. All of these are under Prof. Dr. Zulkurnain Abdul-Malek's supervision. Until now, he has published his research findings in more than 24 research articles in ISI-indexed journals with high impact factor, such as Energy Conversion and Management, Scientific Reports, Journal of Cleaner Production, Energy Journal, IEEE Access and ISA Transactions Journal. Currently, Dr. Amirreza serves as an Editor at Frontiers in Energy Research.

Within 2 years of his postdoctoral tenure, Dr. Amirreza has published 23 ISI-indexed papers, almost all of these are either in quartile 1 or 2 ranked journals. Congratulations, Dr. Amirreza!

Prof. Dr. Zulkurnain Abdul Malek, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Pursue Your Postgraduate Studies at UTM IVAT

The Institute of High Voltage and High Current (IVAT), Universiti Teknologi Malaysia (UTM), welcomes applications for Doctor of Philosophy (PhD) and Master of Philosophy (MPhil) studies to undertake research projects at IVAT. The themes of the projects include:

- Lightning characterisation, monitoring and detection
- Electromagnetic compatibility and interference
- Partial discharge detection and measurements
- Plasma and ozone generation applications
- Supercapacitors in high voltage applications
- Dielectrics and electrical insulating materials

Admission Requirements:

- **PhD:**
Entry to the programme requires a Master degree in Electrical Engineering or equivalent from UTM or other Institution of Higher Learning recognised by UTM. First-class Bachelor graduates (CGPA $\geq 3.67/4.00$) may apply for a fast-track PhD (terms & conditions apply)
- **MPhil:**
Entry to the programme requires a Bachelor degree in Electrical Engineering or equivalent from a tertiary institution recognised by UTM, with a minimum CGPA of 3.00/4.00 for fresh graduates, or a minimum of 2.50/4.00 with four (4) years experience as an Electrical Engineering practitioner
- **English Requirement for International Students:**
All international students must have a valid two-year old TOEFL or IELTS certificate with a TOEFL score of 550 (or 79 IBT) or an IELTS Band 6

Why Study at IVAT?

- Our field of electrical and electronic engineering is ranked Top 100 in the world (according to QS World University Rankings by Subject 2020)
- Our high voltage laboratory is the largest in Malaysia
- We have well-equipped high voltage facilities
- We have widely experienced supervisors working on a variety of high voltage related research and development
- We have dedicated student working areas for office and laboratory work

To Apply:

- Please send your resume with academic qualifications, transcripts and research proposal to the Director of IVAT, Prof. Dr. Zulkurnain Abdul Malek at zulkurnain@utm.my anytime throughout the year. You may also directly contact the respective project supervisors at IVAT.

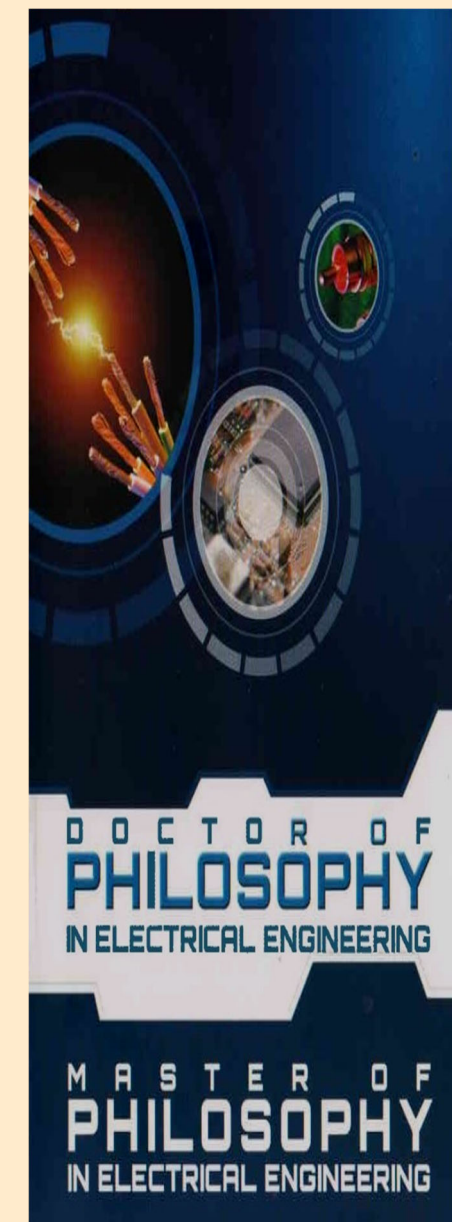
For more information about IVAT, please visit: <http://ivat.utm.my/>

For more information about UTM's postgraduate programmes, please visit: <http://admission.utm.my/>



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Institute of High Voltage and High Current
IVAT



Prof. Dr. Zulkurnain Appointed as Adjunct Professor of UNIMAS



Prof. Dr. Zulkurnain Abdul Malek.

Congratulations!

JOHOR BAHRU, 26 April 2021 – IVAT's staff members convey their heartiest congratulations to Prof. Dr. Zulkurnain Abdul Malek for his appointment as an Adjunct Professor at Universiti Malaysia Sarawak (UNIMAS) from 1 March 2021 to 28 February 2023.

With this appointment, Prof. Zulkurnain will coordinate collaboration work between Universiti Teknologi Malaysia (UTM) and UNIMAS, including the setting up of a high voltage laboratory in UNIMAS's Faculty of Engineering.

Assoc. Prof. Ir. Ts. Dr. Lau Successfully Registered as Competent Electrical Engineer



Assoc. Prof. Ir. Ts. Dr. Lau Kwan Yiew.

Congratulations!

JOHOR BAHRU, 20 April 2021 – IVAT's staff members would like to convey their heartiest congratulations to Assoc. Prof. Ir. Ts. Dr. Lau Kwan Yiew for his successful registration as a competent electrical engineer of IVAT with the Energy Commission

of Malaysia. It is the requirement of the law in Malaysia to have a full-time competent electrical engineer attached to any high voltage laboratory in order for it to operate.

More News on IVAT and MyHVnet

In case you missed the previous news on IVAT, Issue 7 of IVAT Newsletter, published in June 2020, can be downloaded from the following link:

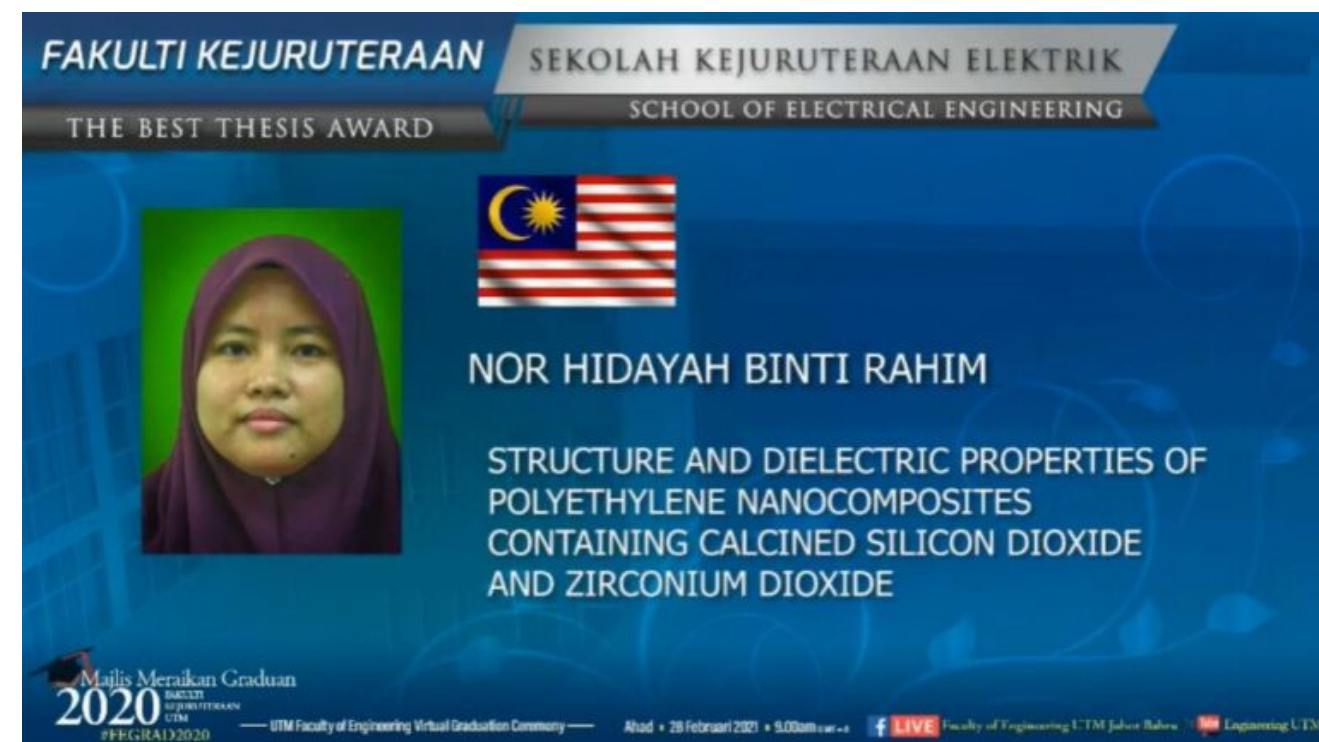
<http://ivat.utm.my/newsletter/>

Meanwhile, the latest news on Malaysian High Voltage Network (MyHVnet), disseminated through MyHVnet Newsletter (an initiative for the dissemination of high voltage related news, with particular emphasis on MyHVnet's activities), can be downloaded from the following link:

<http://ivat.utm.my/myhvnet/news/>

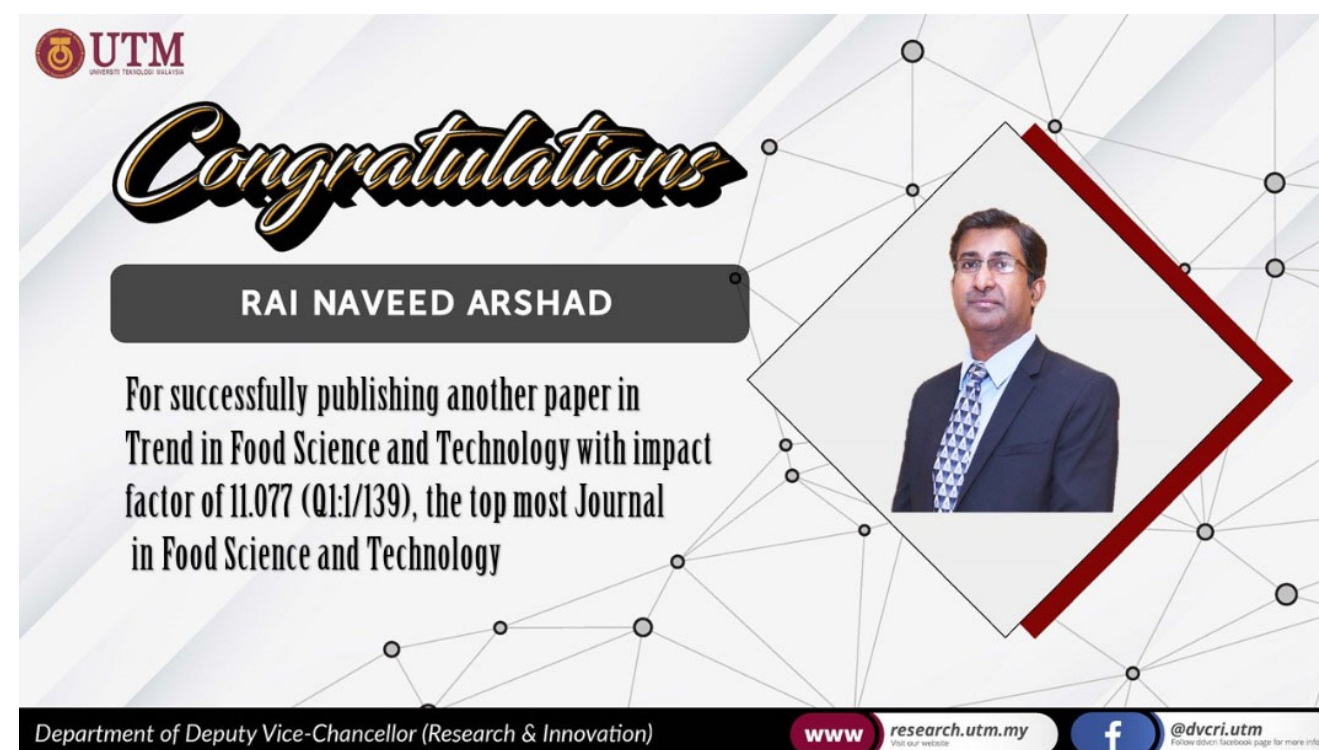


Best Thesis Award



JOHOR BAHRU, 8 March 2021 – IVAT congratulates Dr. Nor Hidayah Rahim, one of IVAT's postgraduate students who successfully completed her Doctor of Philosophy (PhD) programme in January 2020, for being awarded the Best Thesis Award in conjunction with the Universiti Teknologi Malaysia Faculty of Engineering Virtual Graduation Ceremony 2020 held on 28 February 2021.

Congratulations to Rai Naveed Arshad



JOHOR BAHRU, 23 February 2021 – IVAT congratulates its Doctor of Philosophy (PhD) student, Rai Naveed Arshad, for successfully publishing another paper in a reputable journal—Trends in Food Science and Technology.

Welcome to IVAT

The Institute of High Voltage and High Current (IVAT), Universiti Teknologi Malaysia (UTM) is committed to entertain visits by delegates from not only its own university, but also as far as overseas. The main aim for IVAT organising visits is to share their research, services and consultancy experience to as many people as they could, especially in areas relevant to high voltage engineering.

For interested students from schools or higher learning institutions, the focus of visit would be on IVAT's role in building the nation through their technical support to electrical energy industries to achieve reliable and efficient operations. This is inculcated through their fascinating demonstration on high voltage air discharges (either impulsive or sus-

tainable low current arcs).

For representatives from private companies, IVAT showcases their services and consultancy capabilities, as well as their research achievements, in attempts to increase the return of investments to the university. As for executives of ministerial bodies and government parastatals, IVAT extends their knowledge and experience to open possible collaborations on research works.

A routine visit to IVAT would include a 5-minute video presentation on IVAT, followed by a 10-minute briefing by an IVAT's academician, then a question-and-answer session on any topic relevant to the visit. Interested parties are most welcome to visit IVAT.



Photos taken during visits to IVAT.



Published by:

**Institute of High Voltage and High Current
(IVAT)**

Block P06

Universiti Teknologi Malaysia
81310 Johor Bahru, Johor
Malaysia

Phone: +60 7 553 5615

Fax: +60 7 557 8150

E-mail: ivat@utm.my

Website: ivat.utm.my

The Institute of High Voltage and High Current, or in Malay, Institut Voltan dan Arus Tinggi (IVAT), was established in Universiti Teknologi Malaysia in 1991. It was initially an educational laboratory which provides facilities for carrying out experiments, research and consultancy services in high voltage engineering, as early as the 1970s.

The establishment of IVAT stems out from the needs of the country for a centre which carries out research and development, test and calibration works in high voltage areas, so that efficient technologies and power system apparatus can be effectively employed for the transmission and distribution to the consumer of electrical energy.

In 1992, the institute became the first institution in the country to be accredited to handle high voltage test and calibration works according to ISO/IEC Guide 25. In 2004, IVAT was accredited with the ISO/IEC 17025 in the field of high voltage electrical calibration. In certification, IVAT has also successfully migrated to MS ISO/IEC 17025 since July 2007 till date. Since 2013, IVAT has been accredited with the on-site calibration and the scope of calibration has been extended up to 180 kV AC (alternating current), 180 kV DC (direct current) and 140 kV impulse. Beginning 2015, IVAT has been accredited with power cable AC voltage withstand test. Recently in 2020, IVAT has successfully migrated to the latest MS ISO/IEC 17025:2017 standard.