



**2019**  
**APACE**

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2019 IEEE ASIA-PACIFIC CONFERENCE ON



**APPLIED  
ELECTROMAGNETICS**

25 - 27 November 2019  
Hatten Hotel, Melaka | Malaysia

**PROGRAM BOOK**

Organizer :

Technical Co-sponsor :

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IEEE Malaysia AP/MTT/EMC Joint Chapter



IEEE (HK) Section  
AP/MTT



CENTRE FOR  
TELECOMMUNICATION  
RESEARCH & INNOVATION

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## WELCOME MESSAGE

### Selamat Datang ke APACE 2019!

As the conference general chair, I wish to extend a warm welcome to all participants of APACE 2019, which is the eighth meeting of the IEEE Asia-Pacific Conference on Applied Electromagnetics series. The series was initiated by IEEE Antennas and Propagation/Microwave Theory and Techniques/Electromagnetic Compatibility chapter of Malaysia in 2004 as part of the chapter's continuing efforts to promote research and development in the areas of radio frequency technology and applied electromagnetics among researchers and industrialists in Malaysia.

2019 also marks the third time the conference comes to Malacca, which were previously APACE 2007 and APACE 2012. Malacca was declared a UNESCO World Heritage site in 2008, has developed over 500 years of trading and cultural exchanges between East and West in the Straits of Malacca. The influences of Asia and Europe have endowed the towns with a specific multicultural heritage. With its government buildings, churches, squares and fortifications, Melaka demonstrates the early stages of this history originating in the 15th-century Malay sultanate and the Portuguese and Dutch periods beginning in the early 16th century. Hatten Hotel is purposely chosen because you can enjoy free-ride from hotel to Jonker Street to witness few historical places such as Dutch Square, Stadthuys, A-Famosa, Baba Nyonya Heritage Museum and Cheng Ho's Cultural Museum.

Despite the economic downturn seen in most countries in the region, APACE2019 still managed to attract a good number of papers. This year almost 124 papers were received, and out of these, only about 65 % were accepted. The reviewing panel completed about 465 reviews, with each paper being allocated a minimum of three reviewers. This rather stringent evaluation process is necessary to maintain the quality of papers IEEE conferences are famous for. These papers will be presented over three parallel tracks over two days at the conference.

As with previous editions of APACE, this year's meeting also feature several distinguished speakers. This time we are honoured to have three eminent IEEE Fellows Professor Liang Zhou of Shanghai Jiao Tong University, Professor Keizo Cho of Chiba Institute of Technology and Dr. Tom De Muer of Keysight Technology, US to deliver keynote speeches. Three tutorial speakers, which are Dr. Yuan Chun Li of South China University of Technology, Ng KokJiunn of Laird Technologies (M) Sdn. Bhd and Prof. Dr. Eng-Hock Lim of UniversitiTunku Abdul Rahman, Malaysia were successfully deliver the tutorial talks yesterday. We also bring 10 plenary speakers Prof Hiroyuki Arai, Prof Ibrahim Elshafiey, Prof KunioSakakibara, Prof LutfiAlbasha, Prof Chia-Chan Chang, Professor Dr Mohamad Kamal A Rahim, Professor MohdFadzil Ain, Professor Yoshihide Yamada, Professor Widad Ismail, Professor Qing-Xin Chu.

Again, the support we received from the industry was encouraging. In particular, I wish to acknowledge our sincere thanks to the sponsors, Altair, RF Station, Abex, Rohde and Schwarz and Comrel Technologies. Many thanks go to the researchers, for their willingness to share their findings with us and for their support in this event. This meeting would not have been possible without the support of members of the Organizing Committee, for which I am eternally grateful. I am also indebted to IEEE Student Branch of UniversitiTeknikal Melaka, and Centre for Telecommunication Research and Innovation (CeTRI), UniversitiTeknikal Malaysia Melaka, as the conference secretariat, to ensure smooth sailing event.

I wish you a happy conference and a pleasant stay in Malacca, and hope to see you again in future editions of APACE.



**Assoc. Prof. Dr Fauziahanim Che Seman,  
SMIEEE**

**APACE 2019 General Chair**

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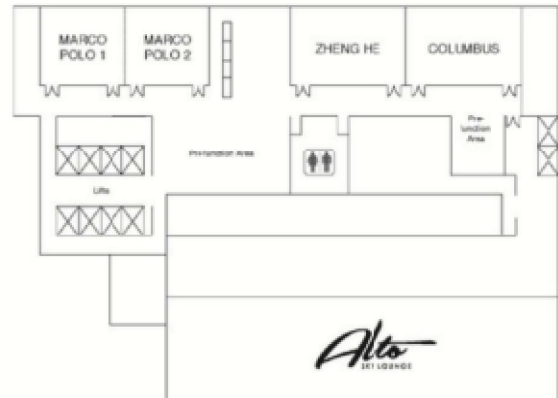
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## EXHIBITORS



### LIST OF EXHIBITORS:

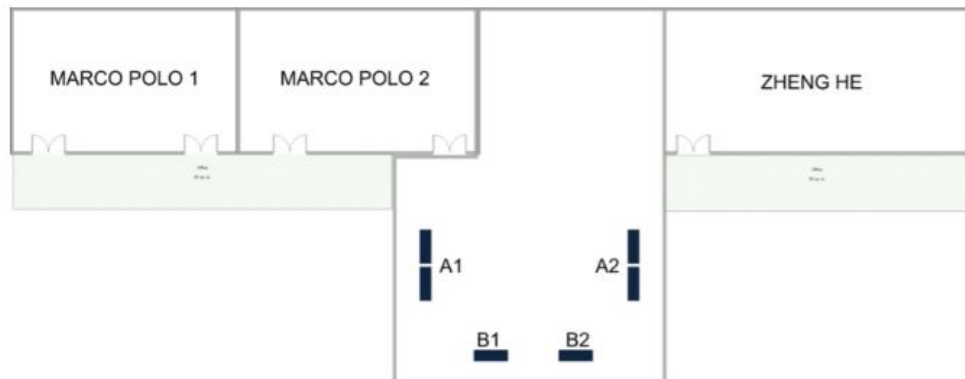
A1: IEEE Malaysia AP/MTT/EMC Joint Chapter

A2: Altair

B1: RF Station Sdn. Bhd.

B2: Abex Sdn Bhd/ R&S

### EXHIBITION LAYOUT:





## TECHNICAL PROGRAM OVERVIEW

Monday 25 November 2019	
13:00 – 14:00	Registration Venue : Zhang He
14:00 – 18:00	Exhibition
14:00 – 14:20	<b>Tutorial 1</b> Design of Filtering Power Amplifiers By Assoc. Prof. Dr. Yuan Chun Li
14:20– 14:40	Tea Break
14:40 – 17:00	<b>Tutorial 2</b> Ultra low Profile antenna design and technologies for Ceiling Mount Distributed Antenna System By <b>Mr Ng Kok Jiunn</b>
17:00 –18:20	<b>Tutorial 3</b> Design Considerations of Passive UHF RFID Tags by <b>Prof. Dr. Eng-Hock Lim</b>

Tuesday 26 November 2019			
08:00 – 09:00	Registration		
09:00 - 18:00	Exhibition		
09:00 – 09:15	<b>Welcoming Speech</b> Venue : Marco Polo 1/Marco Polo 2		
09:15 – 10:00	<b>Keynote 1</b> Multiphysics (MP) Methods for Modeling and Simulating RF Devices/Circuits Under Intentional Electromagnetic Interference (IEMI) by <b>Professor Liang Zhou</b>		
10:00 – 10:30	Tea Break		
10:30 – 11:15	<b>Keynote 2</b> Improvement Of Location Estimation Accuracy Applying Virtual Array Technique To Synthetic Aperture Array For Terahertz Time Domain Spectroscopy by <b>Professor Keizo Cho</b>		
11:15 – 12:00	<b>Keynote 3</b> The Role Of Electro-Magnetic Simulations Tools In Design And Test Environments by <b>Dr. Tom De Muer</b>		
12:00 – 12:20	<b>Platinum Sponsor</b> Accelerate Electromagnetics Modelling & Simulation with Altair Solutions by <b>Mr Lim Seng Tat</b>		
12:20 – 14:00	Lunch Break		
14:00 – 15:40	<b>PS1 : Plenary Session 1</b> Venue : Zhang He		
15:40 – 16:00	Tea Break		
	Zheng He	Marco Polo 2	Marco Polo 1
16:00 – 18:00	<b>A1 : Antenna and Radiating Elements 1</b>	<b>B1 : RF/Microwave/ Circuit and System</b>	<b>C1 : Electromagnetic Modelling, Propagation &amp; Computation</b>
20:00 – 22:00	<b>Conference Gala Dinner</b>		

<b>Wednesday 27 November 2019</b>			
<b>09:00 – 16:00</b>	Exhibition		
	Zheng He	Marco Polo 2	Marco Polo 1
<b>08:00 – 10:00</b>	<b>A2 : Antenna and Radiating Elements 2</b>	<b>B2 : RF /Microwave Circuit and System 2</b>	<b>C2 : Electromagnetic Compatibility, Wireless &amp; Radar Technology</b>
<b>10:00 – 10:20</b>	Tea Break		
<b>10:20 – 12:00</b>	<b>PS2 : Plenary Session 2</b> Venue : Zhang He		
<b>12:00 – 14:00</b>	Lunch Break		
<b>14:00 – 15:40</b>	<b>A3 : Antenna and Radiating Elements 3</b>	<b>B3 : Measurement, Sensors &amp; Wave Applications</b>	<b>C3 : Wireless and Mobile Network</b>
<b>15:40 – 16:00</b>	Tea Break		
<b>16:00 – 18:00</b>	<b>A4 : Antenna and Radiating Elements 4</b>	<b>B4 : Metamaterial and Coupling Structures</b>	<b>C4 : Mobile Communications and Radar Technology</b>

## KEYNOTE SPEAKERS

**Venue: Marco Polo 1/Marco Polo 2  
26<sup>th</sup> November 2019, 09:15 – 10:00**



**Speaker 1:**

**Prof. Liang Zhou**

Shanghai Jiao Tong University, China

*Multiphysics (MP) Methods for Modeling and Simulating RF devices/circuits under Intentional Electromagnetic Interference (IEMI)*

In the past a few years, special attention has been focused on intentional electromagnetic interference (IEMI) effects on communication systems. High power electromagnetics (HPEM), as it is sometimes known, "EM Terrorism," is a new area of concern for public and commercial interests. Transceivers can be easily interfered and their RF devices/circuits can be even damaged under IEMI. In this talk, the electro-thermal-stress (E-T-S) multi-physics method is used to simulate and analyze the interactions of RF devices and electromagnetic pulses. It has been found the parameters of the electromagnetic pulse such as widths, numbers and repetition frequencies affect the thermal and stress of the RF devices. The device breakdown phenomena are observed under a scanning electron microscope (SEM) where the crack curve due to unrecoverable deformation in the device is displayed. Simulation, measurements, and calculations show some correlations.

**Venue: Marco Polo 1/Marco Polo 2  
26<sup>th</sup> November 2019, 10:30 – 11:15**



**Speaker 2:**

**Prof. Keizo Cho**

Faculty of Engineering, Chiba Institute of Technology

*Improvement of location estimation accuracy applying virtual array technique to synthetic aperture array for terahertz time domain spectroscopy*

Terahertz (THz) wave has received much attention as a useful tool of material inspection and non-destructive inspection because of its distinctive reflection and transmission characteristics for various materials. Particularly, time domain spectroscopy (TDS) measurement using THz pulse is attracting attention because wide frequency characteristics can be utilized. The transmitting wave is usually focused in the THz-TDS

measurement to increase the spatial resolution, however, the drawback of using the focused beam is that it takes time to scan the whole observation plane. Measurement time can be reduced by using collimated transmitting wave so that it becomes possible to observe a wide surface at once, However the spatial resolution is degraded. Synthetic aperture array using super resolution direction of arrival (DOA) estimation method is a promising method to increase the spatial resolution. MUSIC (Multiple Signal Classification) is a typical DOA estimation algorithm. However, the estimation accuracy of the MUSIC algorithm is degraded when incoming waves are correlated.

This talk will first present the position estimation results when conventional beamforming algorithm and MUSIC are applied to a synthetic aperture array in the THz-TDS. Then, we will examine the effectiveness of applying array interpolation and spatial averaging techniques to the MUSIC method in order to improve the position estimation accuracy. The measurement results for two target extraction will be also shown.

**Venue: Marco Polo 1/Marco Polo 2  
26<sup>th</sup> November 2019, 11:15 – 12:00**



**Speaker 3:**

**Dr. Tom De Muer**

Design and Test Software, Keysight Technology

The role of electro-magnetic simulations tools in design and test environments

The capability of electronic circuits evolves at a tremendous pace. A pace that is driven by consumer and business demand and supported by advances in production technology. The time a company takes to get from specifications and requirements to a full finished product has become a critical element in its competitive position. A difficult chasm to cross in the product life cycle is going from a design to a verified working initial batch of devices. Often this requires correlating a failure during testing back to a design flaw. Efficient and accurate simulation of end-to-end performance of full systems plays an important role during this phase. By further shrinking of devices and the economical driven desire to bring functionality under single packages, Electro-Magnetic effects become ever more important. Accurate prediction of these effects is computationally intensive and although computational resources increase at similar rates as technology, it is tough to take advantage of all those computational resources.

In this talk we will present those challenges and how they have been overcome in the past and look to the future. We envision that in the future a large mix of techniques will be required to simulate the performance of complete systems without requiring users of these tools to be experts. This requires a combination of state-of-the-art computational technology and application domain knowledge. That domain knowledge is needed inside the tools to break these systems in meaningful parts for simulation and recombine them into complete solutions as if we were dealing with a single system. When we reach that level of convenience it companies can significantly reduce the time it takes to get their products into the market.

## PLENARY SPEAKERS

Venue: Zhang He

26<sup>th</sup> November 2019, 14:00 – 14:20



**Speaker 1:**

**Prof. Hiroyuki Arai**

Yokohama National University

*High Gain Optical Beam Scanning Antenna and Its Measurement*

This talk presents optical high gain beam scanning antenna for the future short-range wireless communication system. Base on the link budget of indoor system, we design high gain beam scanning antenna fabricated by silicon photonics technology. The antenna is leaky wave antenna consisted of waffled or waffle iron waveguide on silicon substrate. Its fundamental characteristics are shown by prototype optical antennas and a novel feeding structure called 2D photonic reflector is demonstrated. This talks also presents phase-less optical antenna pattern measurement technique to evaluate the optical antenna performance.

Venue: Zhang He

26<sup>th</sup> November 2019, 14:20 – 14:40



**Speaker 2:**

**Prof. Lutfi Albasha**

American University of Sharjah

*Smart Dental: A new Frontier?*

Smart dental is becoming an area of interest for RF microelectronics researchers and dental practitioners. It promises to attract significant interest from industry. The ability to wirelessly monitor oral health with minimum power devices is clearly a major advantage. However, the mouth cavity does not allow for easy transmission of waves due to its complex structure and constantly changing and variable environment. In this presentation the speaker will discuss current trends in implantable devices for dental fixtures and orthodontics. The challenges in placing devices, including sensors and miniaturized antenna will be outlined. Recent work by the authors have shown that it is possible to embed self-powered especially designed devices into dental fixtures and use then for various monitoring purposes including teeth health and even on longer terms predict illnesses in the body.

**Venue: Zhang He**  
**26<sup>th</sup> November 2019, 14:40 – 15:00**



**Speaker 3:**

**Prof. Mohamad Kamal A Rahim**

Universiti Teknologi Malaysia

*Antenna with Artificial Magnetic Conductor for Wireless Application*

Metamaterials are designed to exhibit electromagnetic properties that cannot naturally be found in nature. Artificial Magnetic Conductor (AMC) can mimic the characteristic of the Perfect Magnetic Conductor (PMC) which is unnatural and does not exist in real life. AMC is also known as High Impedance Surface (HIS). Over a certain frequency band, AMC exhibits characteristic of in-phase reflection of electromagnetic waves forming a high impedance ground plane that is useful for antenna applications, especially for low profile and conformal antenna. Generally, AMC structures consist of periodical cells composed of metallic patches at the upper layer of a grounded dielectric substrate. Square patch AMC is the most common and simplest AMC structure. In recent years, the interest in investigating AMC structures to address the needs of various communication devices has gradually grown. By utilizing the unique characteristics of metamaterials which are not naturally existed, the performance enhancement of various microwaves devices can be accomplished. This talk elaborated on the technical perspective and recent works on AMC for antenna applications. The technical perspective discusses on the theoretical aspects, simulation design procedures, and the measurement setup used to characterize the AMC unit cell. Subsequently, various recent works of antenna design which involves the incorporation of AMC are discussed thoroughly. Each of the recent works is highlighted with specific performance enhancement that can be achieved by the use of AMC. The flexible textile AMC with flexible textile antenna will also be discussed for wearable application to enhance the transmission of the signal. The other applications of the AMC with antenna are for RFID detection on the metal. The employment of AMC has solves many issues whilst overcoming the typical limitations in conventional antenna design.

**Venue: Zhang He**  
**26<sup>th</sup> November 2019, 15:00 – 15:20**



**Speaker 4:**

**Prof. Chia-Chan Chang**

National Chung-Cheng University, Taiwan

*Designs of Deformed Butler Matrix in 0.18-Um CMOS for Array Beamforming*

The array beamforming is an essential feature in communication and radar systems but can become a great design challenge when it comes to System-on-Chip (SoC) integration. In this work, a novel folding technique is proposed to deform the conventional Butler matrix (BM) beamformer. The design concept is based on the mirror

symmetry in the structure and the beamforming characteristics of BMs. By embedding some switches from the feeding network into the internal BMs, the structure can be folded in half so that the number of building blocks and input ports can be saved. For demonstration, a 38-GHz 4×8 BM was designed and implemented using 0.18-um CMOS process. Measurement results of this proposed 4×8 BM MMIC show that eight orthogonal beams can be successfully generated, while beam synthesizing capability is also achieved by properly controlling the switches, providing more design freedom in the future system.

**Venue: Zhang He**

**26<sup>th</sup> November 2019, 15:20 – 15:40**



**Speaker 5:**

**Prof. Qing-Xin Chu**

South China University of Technology, China

*Design of Broadband Base-Station Antennas Based on Control of Modes*

At present, mobile communication has entered the fifth generation, 5G. New applications and requirements have posed unprecedented challenges to the design of base-station antennas. On the one hand, the antennas need to work in a wide frequency range in order to satisfy the simultaneous operation of multiple communication systems of different generations. On the other hand, in order to reduce the space occupied by base-station antennas, multiple arrays need to have a common aperture, that is, they need to share one reflector plate and one antenna radome, and RF modules even need to be directly integrated into the antenna, therefore the antenna elements are required to be as small as possible. In fact, conventional broadband antennas either can not meet the requirements or they are too large. Traditionally, the designs of compact broadband antennas are mainly based on full-wave simulation software and experimental adjustment, lack of the direction of theoretical foundation or mechanism. Based on the concept of the mode control from input impedance, this talk proposes the broadband mechanism and design method of multi-mode compact antennas, in which the broadband antennas can be realized almost without increasing the antenna size. The proposed method has been applied to design many broadband antennas for the mobile base stations.



**Venue: Zhang He**  
**27<sup>th</sup> November 2019, 10:20 – 10:40**



**Speaker 6:**

**Prof. Widad Ismail**

Universiti Sains Malaysia, Malaysia

*Size Reduction Percentage Study of 5G Hairpin Filer Non-Uniform Transmission Line Resonator*

A study on the maximum size reduction percentage of 5G Hairpin Bandpass filter (HPBF) nonuniform transmission line resonator is presented in this paper. Size reduction is obtained by applying Nonuniform Transmission Lines (NTLs) theory on each  $\lambda/2$  uniform transmission line (UTL) resonator of the filter. To get the required compact-sized filter, some constraints should be applied to satisfy the matching condition in addition to meet the uniform transmission line filter design specifications. High Frequency Structure Simulator (HFSS) software and Computer Simulation Technology (CST) software are used in this study.

**Venue: Zhang He**  
**27<sup>th</sup> November 2019, 10:40 – 11:00**



**Speaker 7:**

**Prof. Kunio Sakakibara**

Nagoya Institute of Technology, Japan

*Multi-beam Antennas using Multi-layer Substrate in Millimeter-wave Band*

Multi-beam antennas can cover wide angular area with high gain. Therefore, they are expected to be used for discrete beam scanning systems such as digital and analogue hybrid massive MIMO for 5G mobile communication systems and beam-scanning antennas for automotive radar systems in the millimeter wave band. We are in the development of various multi-beam antennas using multi-layer substrate. A Rotman-lens phase shifter is a feeding circuit for array antennas. Different beam-directions can be achieved by different phase inclination of the quasi lens feature in the parallel plate waveguide to the output ports assigned to each input port. A Butler matrix and a Blass circuit have a similar function. However, Rotman-lens operates broad frequency bandwidth due to the lens principle. On the other hand, the Rotman-lens suffers from loss consumed into the dummy ports and reduces aperture efficiency due to the deviation from the uniform output illumination. A Rotman lens multi-beam antenna with double-layer structure was developed in this work. Microstrip linear array antennas are connected to the output ports of the backed Rotman lens via microstrip-to-waveguide transitions. Consequently, a compact and low-profile multi-beam system was achieved. The beam-scanning performance of the fabricated antenna confirmed by electromagnetic simulation and measurement at 76 GHz band was presented in this talk.

Venue: Zhang He

27<sup>th</sup> November 2019, 11:00 – 11:20



**Speaker 8:**

**Prof. Mohd Fadzil Ain**

Universiti Sains Malaysia, Malaysia

*28 GHz mmWave Quasi-Lumped Element Resonator Antenna on Air-Substrate*

The increasing applications for nomadic computing have experienced enormous development over the preceding period. This has eventually prejudiced to the lack of bandwidth. Accordingly, to fulfil the consumers' necessity, economical radiating elements need to be constructed for the next generation wireless network. As a result, this paper presents a quasi-lumped element (LE) resonator antenna printed on an air-substrate. Copper (Cu) was employed to construct the quasi-LE model. The impacts of antenna's and substrate's thickness on bandwidth or resonant frequency have been studied. The finalized arrangement occupied 1219 mm<sup>2</sup> extent and operated at 28 GHz with approximately 2 GHz bandwidth. The system displayed efficiency and peak gain values of 94% and 9.26 dBi, respectively. The primary objective of this article is to describe an antenna featuring cost-effective and simple design together with premium results for mmWave frequency band.

Venue: Zhang He

27<sup>th</sup> November 2019, 11:20 – 11:40



**Speaker 9:**

**Prof. Ibrahim Elshafiey**

King Saud University

*Adaptive Energy Concentration in Hyperthermia Treatment of Cancer*

Defeating cancer is one of the major challenges to the research community. An emerging approach with the potential of reducing the side effects of conventional therapeutic methods depends on hyperthermia therapy. By elevating temperature, tumor cell vitality can be reduced, and treatment efficacy is enhanced. Various challenges still face the maturity of hyperthermia treatment. In particular, commercial systems use narrow band operation and implement single element applicator, which limit energy focus capability and negatively affect healthy tissue. This research aims at addressing some of the limitations of hyperthermia treatment. A system is developed with multichannel structure to increase the number of degrees of freedom and improve performance. Novel techniques are implemented to design the electromagnetic (EM) applicator and power amplifiers (PA) modules targeting increasing the bandwidth, augmenting efficiency and improving linearity. Tools are presented for energy focus depending on phased array approach and genetic algorithm optimization. A robust

technique is also introduced based on time reversal (TR) approach to enhance energy localization. This ambitious system has limitations that can deter its clinical use. Techniques are required to deal with system complexity. EM energy is limited in targeting small size tumors. Power amplifiers nonlinearity can also distort energy localization. Feedback mechanism is necessary to guide waveform shaping.

**Venue: Zhang He**

**27<sup>th</sup> November 2019, 11:40 – 12:00**



**Speaker 10:**

**Prof. Yoshihide Yamada**

Malaysia-Japan International Institute of Technology,  
Universiti Teknologi Malaysia, Malaysia

*Aperture Antennas for 5G Mobile Base Stations*

The fifth-generation (5G) mobile communication system will require the multi beam base station antennas. By taking into account a small antenna size at millimeter wave, any antenna types such as array, reflector and dielectric lens antennas become possible candidate. In this paper, aperture type antennas of reflector and lens are selected because of excellent multi beam performances. Fundamental antenna design technologies by MATLAB software and expected radiation patterns by an electromagnetic simulator are shown.

## INVITED PAPERS

No	Title	Session
1	<b><i>Transmission Line Measurement for Characterization of New Textile Sample</i></b> Dr. Nurul Huda Abd Rahman (Universiti Teknologi MARA, Malaysia)	A1-1
2	<b><i>Design of Hybrid Koch-Minkowski Fractal Dipole Antenna for Dual Band Wireless Applications</i></b> Norun Abdul Malek (International Islamic University Malaysia, Malaysia)	A1-2
3	<b><i>A Compact and Lightweight Microstrip Antenna Array with Wilkinson Power Divider for X-band Application at 9.5 GHz</i></b> Sarah Yasmin (International Islamic University Malaysia, Malaysia)	A1-3
4	<b><i>Dual-Element MIMO Antennas with Rectangular Strip Line Insulator for Wi-Fi Hotspots Application</i></b> Sharul Kamal A. Rahim (Universiti Teknologi Malaysia, Malaysia)	A1-4
5	<b><i>Compact and Robust Inversely E-shaped Antenna Integrated with EBG Structure for Wearable Application</i></b> Samsul Haimi Dahlan (Universiti Tun Hussien Onn Malaysia, Malaysia)	A1-6
6	<b><i>3D Printed Waveguide Phase Shifter for Butler Matrix Network</i></b> Noor Asniza Murad (Universiti Teknologi Malaysia, Malaysia)	B1-1
7	<b><i>Towards a Livelier Electromagnetic Education with an Interactive MATLAB-based</i></b> GUI Soo Yong Lim (University of Nottingham Malaysia, Malaysia)	C1-4
8	<b><i>A Conformal Metal Strip Fed Circularly Polarized Rectangular Dielectric Resonator Antenna</i></b> Mohamad Ismail Sulaiman (Universiti Kuala Lumpur & British Malaysia Institute, Malaysia)	A2-3
9	<b><i>Dual Band Textile Monopole Antenna with AMC Plane for WLAN and UWB Applications</i></b> Ping Jack Soh (University Malaysia Perlis, Malaysia)	A2-4
10	<b><i>Design and Synthesis of Parallel Connected Chained Function Filter</i></b> Sovuthy Cheab (University Teknologi PETRONAS, Malaysia)	B2-5
11	<b><i>Concerns on the Risk of Malaysian Civil and Defense Systems Due to Intentional Electromagnetic Interferences</i></b> Wan Fatinhamamah Wan Ahmad (Universiti Putra Malaysia, Malaysia)	C2-1
12	<b><i>Development of U-Shape Antenna for In-Body Communications</i></b> Saidatul Norlyana Azemi (University Malaysia Perlis, Malaysia)	A3-4
13	<b><i>Multiband Monopole Antenna for 5G Mobile Applications</i></b> Huda A. Majid (Universiti Tun Hussien Onn Malaysia, Malaysia)	A3-5

## TUTORIAL

Venue: Zhang He

25<sup>th</sup> November 2019, 14:00 – 15:20



### **Tutorial 1:**

**Assoc. Prof. Dr. Yuan Chun Li**

South China University of Technology

*Design Of Filtering Power Amplifiers*

In the radio frequency transmitters, power amplifier (PA) is usually followed by bandpass filter to suppress the intermodulation. Because of the inter-connecting mismatching and loss between PAs and filters, the efficiency of the system is degraded. To solve this problem, filtering power amplifier is proposed and designed. This tutorial speech will give the details of filtering Class AB PA. After that, for the bandwidth enhancement, continuous mode filtering PA with wide bandwidth and dual-band-band filtering PA will be taken into consideration. The designs exhibit good frequency selectivity and high power added efficiency (PAE). More importantly, comparing to the conventional power amplifiers, the proposed designs possess wide bandwidth of 31.1% with PAE higher than 60% and two passbands with PAE of 70.2% and 69.6%.

**Venue: Zhang He**  
**25<sup>th</sup> November 2019, 15:20 – 16:40**



**Tutorial 2:**  
**Ng Kok Jiunn**

Laird Technologies (M) Sdn. Bhd

*Ultra low Profile antenna design and technologies for Ceiling Mount Distributed Antenna System*

Today wireless evolution has had a massive impact on the way we communicate with the rising usage of the data streaming and its demand to stay connected at any location at any time. According to statistics from American Telephone and Telegraph (AT&T), nearly 80 percent of all wireless call originate or terminate inside buildings. To meet the needs of the indoor coverage and the rising demand for capacity, Distributed Antenna System (DAS) has been widely accepted as a promising solution by the industry. In recent years, ultra-low profile antennas for indoor distributed antenna system (DAS) have gained increased popularity due to high expectation of aesthetically pleasing profile when integrated into the ceiling design of the building. This has become a new class of requirement in which stable and highly omnidirectional radiation pattern with vertical polarization has been gradually superseded by quasi-omnidirectional with horizontal polarization and aesthetically attractive characteristics. Although the requirement of the omni-directionality reduced but it may still be a concern if the typical antenna approach may have deep null in the azimuth plane that causes blind spot of the coverage. Other than the radiation pattern concern, the spectrum has been kept adding into the long-term evolution (LTE) frequency range as it progresses towards the next generation. In addition to that some regional authority has put the public safety DAS as additional requirement in the indoor coverage that may include the band such as Very High Frequency (VHF), Ultra High Frequency (UHF) and 800MHz. This poses a greater challenge to cover even wider bandwidth e.g. from 350MHz-6000 MHz to support both cellular and public safety application with a reasonable radiation pattern. To maximize the throughput and capacity of a modern DAS system, low Passive Intermodulation has become a necessary requirement. Unfortunately, PIM levels are difficult to calculate, or measure and thus very little explicit documentation exists on the subject. The tutorial is dedicated to Ultralow Profile antenna design and technologies for Ceiling Mount Distributed Antenna System and describes the main challenges and features as well as example of realization of the antenna design in the industry.



### **Tutorial 3:**

**Prof. Dr. Eng-Hock Lim**

Universiti Tunku Abdul Rahman (UTAR)

*Design Considerations of Passive UHF RFID Tags*

Fast growth has been seen in the radio frequency identification (RFID) industry in recent years due to the rapid advancements of semiconductor technology. This has significantly lowered the manufacturing costs of the microchip and it has significantly contributed to the rapid increase of the RFID applications in access control, retailing, asset identification, and transportation. Dipolar antennas are commonly used for designing various UHF tags as they can provide broader spatial coverage for better accessibility. When a dipolar tag is brought closer to metallic surface, however, the image current that is being induced is equal in magnitude but opposite in phase, causing its radiation performances to deteriorate significantly. In this talk, the development trends, design methodologies, and tradeoffs of different types of UHF tag antennas will be discussed. It will be shown that designing a UHF tag requires making tradeoffs between radiation efficiency, impedance bandwidth, and tag size. The market trends will also be analyzed.

# TECHNICAL PROGRAMME

## TUESDAY, 26 NOVEMBER 2019

	Zheng He	Marco Polo 2	Marco Polo 1
	<p><b>A1: Antenna and Radiating Elements 1</b></p> <p><b>Chair:</b> Sharul Kamal Abdul Rahim (Universiti Teknologi Malaysia, Malaysia), Norun Abdul Malek (Universiti Islam Antarabangsa Malaysia)</p>	<p><b>B1:RF/Microwave Circuit and System</b></p> <p><b>Chair:</b> Lutfi Albasha (American University of Sharjah, United Arab Emirates), Noor Asniza Murad (Universiti Teknologi Malaysia, Malaysia)</p>	<p><b>C1 Electromagnetic Modelling, Propagation &amp; Computation</b></p> <p><b>Chair:</b> Soo Yong Lim (University of Nottingham Malaysia, Malaysia), Paolo Valerio Testa (Technische Universität Dresden, Germany)</p>
16:00 – 16:20	<p><b>Transmission Line Measurement for Characterization of New Textile Sample</b></p> <p>Nurul Huda Abd Rahman (Universiti Teknologi MARA, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Muhammad Shakir Amin Nordin (Universiti Teknologi MARA); Mohd Shauqi Zulkipli (Universiti Teknologi MARA, Malaysia)</p>	<p><b>3D Printed Waveguide Phase Shifter for Butler Matrix Network</b></p> <p>Noor Asniza Murad (Universiti Teknologi Malaysia, Malaysia); Muataz Watheq Almeshehe (Faculty of Electrical Engineeri, Universiti Teknologi Malaysia, Malaysia); Mohamad Kamal A. Rahim and Osman Bin Ayop (Universiti Teknologi Malaysia, Malaysia)</p>	<p><b>Airy Beam Induced Optical Pulling of Sub-wavelength Ag-Au Plasmonic Structures Immersed in Water</b></p> <p>Shuva Mitra and Intiaj Khan (Bangladesh University of Engineering and Technology, Bangladesh)</p>
16:20 – 16:40	<p><b>Design of Hybrid Koch-Minkowski Fractal Dipole Antenna for Dual Band Wireless Applications</b></p> <p>Norun Abdul Malek (International Islamic University Malaysia, Malaysia); Nur Alyaa Che, Sabri (Kuliyah of Engineering &amp; International Islamic University Malaysia, Malaysia); Md Rafiqul Islam, Sarah Yasmin Mohamad and Farah Nadia Mohd Isa (International Islamic University Malaysia, Malaysia)</p>	<p><b>Design and Implementation of a Low Cost Amateur Radio Unit for Cube Satellites</b></p> <p>Hanns Christian J. Chua, Christian Jay Flores, Arlu Genesis Padilla and Charleston Dale M. Ambatali (University of the Philippines, Philippines)</p>	<p><b>Measurement of an Uneven Terrain Model for Potential Applications in Caves</b></p> <p>Qi Ping Soo (The University of Nottingham Malaysia Campus, Malaysia); Soo Yong Lim (University of Nottingham Malaysia, Malaysia); Wee Gin (David) Lim, Nurhidayah Rusli and Ka Heng Chong (University of Nottingham Malaysia Campus, Malaysia); Kian Meng Yap and Sian Lun Lau (Sunway University, Malaysia)</p>
16:40 – 17:00	<p><b>A Compact and Lightweight Microstrip Antenna Array with Wilkinson Power Divider for X-band Application at 9.5 GHz</b></p> <p>Sarah Yasmin Mohamad Najmin Mohamed, Norun Abdul Malek and Farah Nadia Mohd Isa (International Islamic University Malaysia, Malaysia)</p>	<p><b>Design of via Hole for Multi Layer Butler Matrix</b></p> <p>Noorlindawaty Md Jizat (Multimedia University, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Zubaida Yusoff (Multimedia University, Malaysia); Norsiha Zainudin (University of Malaya, Malaysia)</p>	<p><b>Electromagnetic Waves Propagation for Hyperthermia Application</b></p> <p>Amirah Abd Rahman and Kamilia Kamardin (Universiti Teknologi Malaysia, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia)</p>



<p>17:00 – 17:20</p>	<p><b>Empirical Formula for the Resonant Frequency of an t-Shaped Printed Antenna</b> Dik Ken Cheah (The University of Nottingham, Malaysia Campus, Malaysia); Pei Cheng Ooi (The University of Nottingham Malaysia Campus, Malaysia)</p>	<p><b>Evaluation of Denoising Performance for Noisy Arc Fault Signal Based on Mother Wavelet Selection</b> Melaty Amirruddin and Mohd Rafi Adzman (Universiti Malaysia Perlis, Malaysia); Syahirah Abd. Halim (Universiti Kebangsaan Malaysia, Malaysia); Nur Adyani Mohd Affendi (Universiti Malaysia Perlis, Malaysia); Muzamir Isa (Universiti Malaysia Perlis &amp; UniMAP, Malaysia); Hana Abdull Halim and Muhd Hafizi Idris (Universiti Malaysia Perlis, Malaysia)</p>	<p><b>Towards a Livelier Electromagnetic Education with an Interactive MATLAB-based GUI</b> Shin Yun Wong and Soo Yong Lim (University of Nottingham Malaysia, Malaysia)</p>
<p>17:20 – 17:40</p>	<p><b>Dual-Element MIMO Antennas with Rectangular Strip Line Insulator for Wi-Fi Hotspots Application</b> Sharul Kamal A. Rahim (Universiti Teknologi Malaysia, Malaysia)</p>	<p><b>MIMO Microwave Wireless Power Transfer</b> Lutfi Albasha, Ameen Awwad and Misbah AlKhadem (American University of Sharjah, United Arab Emirates)</p>	<p><b>A Cost-Effective Flip-Chip Interconnection for Applications from DC Until 200 GHz</b> Paolo Valerio Testa (Technische Universität Dresden, Germany); Helmuth Morath (TU Dresden, Germany); Goran Panic (IHP GmbH, Germany); Corrado Carta (Dresden University of Technology, Germany); Frank Ellinger (Technische Universität Dresden, Germany)</p>
<p>17:40 – 18:00</p>	<p><b>Compact and Robust Inversely E-shaped Antenna Integrated with EBG Structure for Wearable Application</b> Samsul Haimi Dahlan (Universiti Tun Hussien Onn Malaysia, Malaysia); Adel Ashyap, Zuhairiah Zainal Abidin, Huda A. Majid, Fauziahanim Che Seman, Muhammad Hashim Dahri and Shaharil Mohd Shah (Universiti Tun Hussein Onn Malaysia, Malaysia)</p>	<p><b>On the Noise Analysis of the Balun LNA</b> Qusai Abubaker and Lutfi Albasha (American University of Sharjah, United Arab Emirates)</p>	<p><b>Contracted T-ring Microwave Resonator for Permittivity Sensing Applications</b> Zahriladha Zakaria, Rammah A. Alahnomi, Zulkalnain Mohd Yussof, Ammar Alhegazi, Malaysia); Amyrul Azuan Mohd Bahar, Norhanani Abd Rahman (Faculty of Electronics and Computer Engineering, Universiti Teknikal Malaysia Melaka (UTeM))</p>

## WEDNESDAY, 27 NOVEMBER 2019

	Zheng He	Marco Polo 2	Marco Polo 1
08:00 - 08:20	<p><b>A2: Antenna and Radiating Elements 2</b></p> <p><b>Chair:</b> Mohd Haizal Jamaluddin (Universiti Teknologi Malaysia, Malaysia)</p>	<p><b>B2:RF/Microwave Circuit and System 2</b></p> <p><b>Chair:</b>Sovuthy Cheab (Universiti Teknologi PETRONAS, Malaysia,Oleksandr Kogut (O Ya Usikov Institute for Radiophysics and Electronics of NAS of Ukraine, Ukraine)</p>	<p><b>C2:Electromagnetic Compatibility, Wireless &amp; Radar Technology</b></p> <p><b>Chair:</b>Ping Jack Soh (Universiti Malaysia Perlis (UniMAP)</p>
08:20 - 08:40	<p><b>Multi-Band Notched Patch Antenna for 5G Applications</b></p> <p>Maryam Mohd Isa (Universiti Putra Malaysia, Malaysia); Hayder Sadir (University Putra Malaysia, Malaysia); Alyani Ismail and Roslina Mohd Sidek (Universiti Putra Malaysia, Malaysia)</p>	<p><b>A Power Converter Circuit of Co-Planar Waveguide RF Harvester Antenna for Low Power Wireless Applications</b></p> <p>Nuraiza Ismail, Mohd Tarmizi Ali, Mazratul Firdaus Mohd Zin, Fatimah Nur Mohd Redzwan (Universiti Teknologi Mara, Malaysia); Ermeey Abd Kadir (The University of Auckland, New Zealand);</p>	<p><b>Concerns on the Risk of Malaysian Civil and Defense Systems Due to Intentional Electromagnetic Interferences</b></p> <p>Fuad Hamamah, Chandima Gomes and Maryam Mohd Isa (Universiti Putra Malaysia, Malaysia); Wan Fatinhamamah Wan Ahmad (Centre for Electromagnetic and Lightning Protection Research (CELP),; Mariyam Jamilah Homam (Universiti Tun Hussein Onn Malaysia, Malaysia)</p>
08:40 - 09:00	<p><b>Dielectric Resonator Antenna Excited Using T-strip Feed Line for Wideband Applications</b></p> <p>Irfan Ali, Mohd Haizal Jamaluddin and Abinash Gaya (Universiti Teknologi Malaysia, Malaysia); Hafizal Mohamad (MIMOS Berhad, Malaysia);</p>	<p><b>Single Resonant Type Tool for Measuring the Solid Dielectrics with a Wide Dielectric Constant Interval and Extra Small Losses in L-band</b></p> <p>Oleksandr Kogut and Zoya Eremenko, Roman Dolia, Alexei Breslavets,Igor Kuzmichev (O Ya Usikov Institute for Radiophysics and Electronics of NAS of Ukraine, Ukraine); Zhu Gang and Li Rong (Anhui Huadong Photoelectric Technology Institute, China)</p>	<p><b>Maximal Ratio Combining Gain of Dual-Band MIMO Antenna for Sub-6 GHz in the Vicinity of User's Hand and Different Elements Configurations</b></p> <p>Ahmed Mohamed Elshirkasi (University Malaysia Perlis (UNIMAP), Malaysia); Azremi Abdullah Al-Hadi (University Malaysia Perlis, Malaysia); Rizwan Khan (Universiti Malaysia Perlis, Malaysia); Ping Jack Soh (Universiti Malaysia Perlis (UniMAP) &amp; Katholieke Universiteit Leuven, Malaysia); Mohd Fais Mansor (Universiti Kebangsaan Malaysia, Malaysia)</p>
08:40 - 09:00	<p><b>A Conformal Metal Strip Fed Circularly Polarized Rectangular Dielectric Resonator Antenna</b></p> <p>Mohamad Ismail Sulaiman (Universiti Kuala Lumpur &amp; British Malaysia Institute, Malaysia)</p>	<p><b>On the Possibility of Use of Planar Dielectric Resonators for Solving the Problems of Frequency Stabilization of Millimeter Waves Oscillators</b></p> <p>Mohammad Tariqul Islam and Iskandar Yahya (Universiti Kebangsaan Malaysia, Malaysia); Oleksandr Kogut and Roman Dolia (O Ya Usikov Institute for Radiophysics and Electronics of NAS of Ukraine, Ukraine))</p>	<p><b>Multi-targets Detection in a Non-homogeneous Radar Environment Using Modified CA-CFAR</b></p> <p>Mustafa Subhi Kamal (Universiti Tun Hussein Onn Malaysia, Malaysia); Jiwa Abdullah (University Tun Hussein Onn Malaysia, Malaysia)</p>

<p>09:00 – 09:20</p>	<p><b>Dual Band Textile Monopole Antenna with AMC Plane for WLAN and UWB Applications</b>                  Nur Farahiyah Mohamad Aun, Azremi Abdullah Al-Hadi (Universiti Malaysia Perlis, Malaysia); Ping Jack Soh (Universiti Malaysia Perlis (UniMAP) &amp; Katholieke Universiteit Leuven, Malaysia); Herwansyah bin Lago (Fakulti Kejuruteraan, Universiti Malaysia Sabah Jalan UMS, Kota Kinabalu, Sabah, Malaysia)</p>	<p><b>RF Rectifier with High Efficiency over a Wide Input Power Range Using a Voltage Controlled Switch in a 'Handover' Fashion</b>                  Abdulkadir Muhammad Lawan, Su Hieng Tiong and Yi Lung Then (Swinburne University of Technology, Malaysia); Jiafeng Zhou (University of Liverpool, United Kingdom (Great Britain))</p>	<p><b>Drone's Radar Cross Section Computation for Various Reflected Angles Using LTE Frequency</b>                  Nur Emileen Abd Rashid and Zuhani Ismail Khan (Universiti Teknologi MARA, Malaysia)</p>
<p>09:20 - 09:40</p>	<p><b>Design of Wideband Dielectric Resonator Antenna with Square Slots Excited Using Microstrip Line at 26 GHz</b>                  Irfan Ali, Mohd Haizal Jamaluddin and Abinash Gaya (Universiti Teknologi Malaysia, Malaysia); Hafizal Mohamad (MIMOS Berhad, Malaysia);</p>	<p><b>Design of Narrowband Tunable Filter for LTE Band 5</b>                  Farah Nadia Mohd Isa (International Islamic University Malaysia, Malaysia); Azah Syafiah Mohd Marzuki (TM R&amp;D Sdn Bhd, Malaysia); Huda Adibah Mohd Ramli and Ahmad Alhadi Ruslan (International Islamic University Malaysia, Malaysia)</p>	<p><b>Extended Dimensionality Reduction MUSIC Method for Signal-Selective Direction Estimation</b>                  Daniel Hallman, Susan Berggren, Benjamin Taylor and Anna Leese de Escobar (Naval Information Warfare Center (NIWC) Pacific, USA)</p>
<p>09:40 - 10:00</p>	<p><b>Wideband Circular Shaped Fractal Patch Antenna for 2.45 GHz Biomedical Applications</b>                  Kanad Ray (Amity University Rajasthan, India); Badrul Hisham Ahmad (Universiti Teknikal Malaysia Melaka, Malaysia); Anita Garhwal (Amity University Rajasthan, India)</p>	<p><b>Design and Synthesis of Parallel Connected Chained Function Filter</b>                  Sovuthy Cheab (Universiti Teknologi PETRONAS, Malaysia); Chong Yi Chuan (University Teknologi PETRONAS, Malaysia)</p>	<p><b>Considerations for W-Fi Router Installation on Wind Turbine at Sea</b>                  Shen Shou Max Chung (National Penghu University of Science and Technology, Taiwan); Shih-Chung Tuan (Oriental Institute of Technology, Taiwan)</p>

	<b>Zheng He</b>	<b>Marco Polo 2</b>	<b>Marco Polo 1</b>
	<p><b>A3: Antenna and Radiating Elements 3</b></p> <p><b>Chair:</b> Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia), Rina Abdullah, (Universiti Teknologi Mara, Malaysia)</p>	<p><b>B3: Measurement, Sensors &amp; Wave Applications</b></p> <p><b>Chair:</b> Kim Yee Lee (UTAR, Malaysia);</p>	<p><b>C3: Wireless and Mobile Network</b></p> <p><b>Chair:</b> Ibrahim Elshafiey (King Saud University, Saudi Arabia), Daniel Hallman (Naval Information Warfare Center (NIWC) Pacific, USA)</p>
<b>14:00 – 14:20</b>	<p><b>Design of Slot Coupled Rectangular Dielectric Resonant Antenna for 5G Application</b> Rina Abdullah, Afiza Nur Jaafar, Hajar Ja'afar Fatimah Nur Mohd Redzwan, Mohd Aziz Aris (Universiti Teknologi MARA Terengganu, Malaysia); Mohd Haizal Jamaluddin (Lecturer, Malaysia)</p>	<p><b>Dielectric Measurement Using Planar and Curved Microstrip Line</b> Kim Yee Lee, Boon Kuan Chung and Yeong Nan Phua (UTAR, Malaysia); Eng Hock Lim (Faculty of Engineering and Science, UTAR, Malaysia); Kok Yeow You (Universiti Teknologi Malaysia, Malaysia); Cheng Ee Meng (Universiti Malaysia Perlis, Malaysia)</p>	<p><b>Investigating the Potentials of GPS Reflectometry System in Storm Monitoring</b> Faisal Alawwad and Ibrahim Elshafiey (King Saud University, Saudi Arabia)</p>
<b>14:20 – 14:40</b>	<p><b>IoT Enabled Wireless Health Monitoring System Using Textile Antenna</b> Husna Idris, Hazilah Mad Kaid, Nurul Aini Bani, Izni Suriani Mohd Sam, Irfanuddin Ahmed and Kamilia Kamardin (Universiti Teknologi Malaysia, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Noureen R. (B. S. Abdur Rahman Crescent Institute of Science and Technology, Singapore);</p>	<p><b>Metamaterial Inspired High Gain Antenna for Microwave Breast Imaging</b> Md. Tarikul Islam; Md Samsuzzaman (Universiti Kebangsaan Malaysia, Malaysia &amp; Patuakhali Science and Technology University, Bangladesh); Iskandar Yahya (Universiti Kebangsaan Malaysia, Malaysia); Oleksandr Kogut (O Ya Usikov Institute for Radiophysics and Electronics of NAS of Ukraine, Ukraine); Norbahiah Misran; Mohammad Tariqul Islam (Universiti Kebangsaan Malaysia &amp; Universiti Kebangsaan Malaysia, Malaysia)</p>	<p><b>Target Recognition Technology of Pulse Doppler Radio Fuze Based on Bandwidth Characteristics for Anti-Chaff Jamming</b> Zhaoshi Yan (Beijing Institute Of Technology, China); Hao Xinhong, Ran Li and Ping Li (Beijing Institute of Technology, China)</p>
<b>14:40 – 15:00</b>	<p><b>Analysis of Helical Antenna for Wireless Application at 2.4 GHz</b> Afiza Nur Jaafar, Hajar Ja'afar, Idnin Pasya (University Teknologi MARA, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Rina Abdullah, Mohd Aziz Aris, Fatimah Nur Mohd Redzwan (Universiti Teknologi Mara, Malaysia)</p>	<p><b>Periodic Metallic Posts Loaded Compact TM01-TE11 Mode Converter</b> Ashish Chittora (BITS-Pilani, K. K. Birla Goa Campus, India)</p>	<p><b>SDN Enabled Wireless Mesh Networks: Routing Architectures and Challenges</b> Mukhtiar Bano (Fatima Jinnah Women University Rawalpindi &amp; Capital University of Science and Technology, Pakistan); Syed Sherjeel A. Gilani (Riphah International University Islamabad, Pakistan); Muhammad Yousaf (Riphah International University Islamabad, Pakistan); Amir Qayyum (Capital University of Science and Technology, Islamabad &amp; Center of Research in Networks and Telecom (CoReNeT), Pakistan)</p>

<b>15:00 – 15:20</b>	<p><b>Development of U-Shape Antenna for In-Body Communications</b> Saidatul Norlyana Azemi (Lecturer, UniMAP, Malaysia)</p>	<p><b>Using Triggers for Synchronization to Measure S-parameters on a Synthetic VNA</b> Charleston Dale M. Ambatali (University of the Philippines, Philippines)</p>	<p><b>Indoor Mobile Localization Using Wireless Sensor Networks (WSNs)</b> M. Hamza Waheed (Capital University of Science and Technology Pakistan, Pakistan); Hassan Khan and Noor Muhammad Khan (Capital University of Science and Technology Islamabad Pakistan, Pakistan); Mukhtiar Bano (Fatima Jinnah Women University Rawalpindi &amp; Capital University of Science and Technology, Pakistan)</p>
<b>15:20 – 15:40</b>	<p><b>Multiband Monopole Antenna for 5G Mobile Applications</b> Huda A. Majid (Universiti Tun Hussein Onn Malaysia, Malaysia); Bashar Esmail (UTHM, Malaysia); Mohamad Kamal A. Rahim (Universiti Teknologi Malaysia, Malaysia); Najib Mohammed AL-Fadhali, Shaharil Mohd Shah and Zuhairiah Zainal Abidin (Universiti Tun Hussein Onn Malaysia, Malaysia); Shharmillah Saravanan (UTHM, Malaysia)</p>	<p><b>Face Recognition for Student Attendance Using Raspberry Pi</b> Zuhani Ismail Khan (Universiti Teknologi MARA, Malaysia)</p>	<p><b>Impact of Bridge Tap on VDSL2 Vectoring Technology</b> Amirah Che Mohd Nuroddin (Telekom Malaysia Research and Development Sdn. Bhd., Malaysia); Azhari Asrokin (Telekom Research &amp; Development Sdn Bhd, Malaysia); Nurhana Norhan (Telekom Malaysia Research and Development Sdn. Bhd., Malaysia).</p>

	<b>Zheng He</b>	<b>Marco Polo 2</b>	<b>Marco Polo 1</b>
	<p><b>A4: Antenna and Radiating Elements 4</b></p> <p><b>Chair:</b> Abinash Gaya (Universiti Teknologi Malaysia, Malaysia)</p>	<p><b>B4: Metamaterial and Coupling Structures</b></p> <p><b>Chair:</b> Fauziahanim Che Seman (Universiti Tun Hussein Onn Malaysia, Malaysia)</p>	<p><b>C4: Mobile Communications and Radar Technology</b></p> <p><b>Chair:</b> Mohd Aziz Aris (Universiti Teknologi MARA Terengganu, Malaysia)</p>
<b>16:00 – 16:20</b>	<p><b>Dual Band Circularly Polarized Rectangular Dielectric Resonator Antenna for Millimeter Wave 5G Applications</b></p> <p>Abinash Gaya, Mohd Haizal Jamaluddin and Irfan Ali (Universiti Teknologi Malaysia, Malaysia); Hafizal Mohamad (MIMOS Berhad, Malaysia);</p>	<p><b>Compact Frequency Selectivity Wideband Reconfigurable Metamaterial Antenna Design</b></p> <p>Adamu Y Iliyasu (University Teknolgi Malaysia, Nigeria); Mohamad Rijal Hamid, Mohamad Kamal A. Rahim and Mohd Fairus Mohd Yusoff (Universiti Teknologi Malaysia, Malaysia); Murtala Aminu-Baba (Universiti Teknologi Malaysia, Malaysia)</p>	<p><b>Effects of Mutual Coupling and Array Dissimilarity on Angle Estimation in MIMO Radar</b></p> <p>Azim Bin Azhar (Universiti Teknologi Mara &amp; Microwave Research Institute, Malaysia); Nur Emileen Abd Rashid and Mohd Khairil Adzhar Mahmood (Universiti Teknologi MARA, Malaysia); Idnin Pasya (University Teknologi MARA, Malaysia)</p>
<b>16:20 – 16:40</b>	<p><b>Hybrid Conformal Fed Rectangular Dielectric Resonator Antenna for Millimeter Wave 5G Applications</b></p> <p>Abinash Gaya, Mohd Haizal Jamaluddin and Irfan Ali (Universiti Teknologi Malaysia, Malaysia); Hafizal Mohamad (MIMOS Berhad, Malaysia);</p>	<p><b>Frequency Selective Surface (FSS) Realization in Terahertz (THz) Range for 6G Initiative Studies</b></p> <p>Nurul Syafeeqa Ishak and Muhammad Hashim Dahri (Universiti Tun Hussein Onn Malaysia, Malaysia); Noor Azura Awang (UTHM, Malaysia); Wu Yi Chong (Photonics Research Center, Malaysia); Fauziahanim Che Seman (Universiti Tun Hussein Onn Malaysia, Malaysia)</p>	<p><b>Sorting of Low Probability of Intercept Radar Signals Based on Frequency Modulation Constancy Using Wigner-Ville Distribution</b></p> <p>Ashraf Adamu Ahmad (Nigerian Defence Academy (NDA) &amp; Bayero University Kano (BUK), Nigeria); Abdulkadir Muhammad Lawan (Swinburne University of Technology, Malaysia); Mohammed Ajiya and Zainab Yunusa (Bayero University Kano, Nigeria)</p>
<b>16:40 – 17:00</b>	<p><b>Complementary Planar Inverted-F Antennas (PIFAs) for On-Metal RFID Tag Design</b></p> <p>Yong-Hong Lee (Universiti Tunku Abdul Rahman, Malaysia); Eng Hock Lim (Faculty of Engineering and Science, UTAR, Malaysia); Fwee Leong Bong (Universiti Tunku Abdul Rahman, Malaysia); Boon Kuan Chung (UTAR, Malaysia); Kim Yee Lee (Universiti Tunku Abdul Rahman, Malaysia)</p>	<p><b>Front to Back Ratio Improvement in Microstrip Antenna Array Using AMC for LTE Applications</b></p> <p>Muhammad Hashim Dahri (Universiti Tun Hussein Onn Malaysia, Malaysia); Mei Fang (UTHM, Malaysia); Shipun Anuar Hamzah (Universiti Tun Hussein Onn Malaysia &amp; Faculty of Electrical and Electronic Engineering (FKEE), Malaysia); Azah Syafiah Mohd Marzuki (TM R&amp;D Sdn Bhd, Malaysia); Hamza Ahmad (Gandhara Institute of Science and Technology, UET Peshawar, Pakistan); Fauziahanim Che Seman (Universiti Tun Hussein Onn Malaysia, Malaysia)</p>	<p><b>Path Loss Measurement of Wideband Signals at Sub-GHz Frequencies in a Line-of-Sight Underwater Environment</b></p> <p>Hanisah Mohd Zali (Universiti Teknologi Mara, Malaysia); Mohd Khairil Adzhar Mahmood (Universiti Teknologi MARA, Malaysia); Idnin Pasya (University Teknologi MARA, Malaysia); Miyuki Hirose (Tokyo Denki University, Japan)</p>

<p>17:00 – 17:20</p>	<p><b>Miniaturized Multi-Band Antenna for Bluetooth/ WLAN and WiGig Applications</b> Elhachmi Ksouri and Amel Boufrioua (University of Mentouri Brothers Constantine, Algeria)</p>	<p><b>Design of Bandpass Filter Based on Substrate Intergrated Waveguide Circular Cavity (SICC) at C-Band Application</b> Siti Aminah Nordin (Universiti Teknologi MARA, Malaysia); Khairul Hasan (Universiti Teknologi MARA Johor, Malaysia)</p>	<p><b>Semi-Loop Patch Antenna with Closed Feeding Line Structure for Mobile Communication Systems</b> Mohd Aziz Aris (Universiti Teknologi MARA Terengganu, Malaysia); Rina Abdullah (Universiti Teknologi Mara, Malaysia); Hajar Ja'afar (Universiti Teknologi MARA, Malaysia)</p>
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## CONFERENCE EVENTS

### Social Events

#### **Gala Dinner**

Date: 26<sup>th</sup> November 2017

Time: 20:00 – 23:00

Location: Hatten Hotel, Melaka

It is our pleasure to invite delegates to the APACE2019 Gala Dinner on 27<sup>th</sup> November 2019, Tuesday evening. The dinner will take place in a restaurant inside the conference hotel.

Please note that Dinner is applicable for participants registered with full conference fee. For those interested to participate, dinner coupon can be purchased at the registration counter.

## TOURIST INFORMATION

### ABOUT MELAKA

#### The Historical City of Melaka

Right from the start Parameswara's political and pecuniary ambition had contributed to the present characteristics of Melaka and made this city to be a multi-cultural centre for traditions and culture.



The site where the city of Malacca stands today was the centre of Malaccan history. It was the capital of the Malacca Sultanate and was the centre of the Malay world in the 15th and the 16th century after the Malays moved over from Sumatra and was the most prosperous Entrepôt and city of the Malay Archipelago before it fell to the hand of Portuguese in 1511. Centuries of colonisation by the Portuguese, Dutch and the British as well as development of Straits Chinese (Peranakan) culture have influenced the architecture of the town, notably the Portuguese A'Famosa, Dutch Stadthuys, and the Dutch, Chinese and British influenced traditional town houses.

Melaka's rapid growth further enhanced the multicultural characteristics of the society and people. Melaka was declared as a UNESCO World Heritage City in July 2008. The anniversary of this historic occasion is celebrated with a host of cultural activities and an array of delectable traditional cuisine that is unique to the state. As the celebration takes place, the well-preserved heritage buildings, cultural enclaves and local attraction spots will be swarming with tourists for all over the world.

### History of Melaka City

<http://www.mmbm.gov.my/web/quest/waris-an-4>  
[http://en.wikipedia.org/wiki/Malacca\\_City](http://en.wikipedia.org/wiki/Malacca_City)

### Transportation

<http://amazingmelaka.com/category/transportation/>  
<http://www.mphtj.gov.my/en/muat-turun-peta-laluan-bas-negeri-melaka>  
<http://panoramamelaka.com.my/services>

### Tourist Attraction

<http://www.malacca.ws/attractions/placesto-visit.htm>  
<http://www.tourism.gov.my/en/us/places/states-of-malaysia/melaka#page1>  
<http://www.malaysia-traveller.com/top-melaka-attractions.html>  
[http://www.virtualtourist.com/travel/Asia/Malaysia/Negeri\\_Melaka/Melaka-1281809/Things\\_To\\_Do-Melaka-TG-C-1.html](http://www.virtualtourist.com/travel/Asia/Malaysia/Negeri_Melaka/Melaka-1281809/Things_To_Do-Melaka-TG-C-1.html)

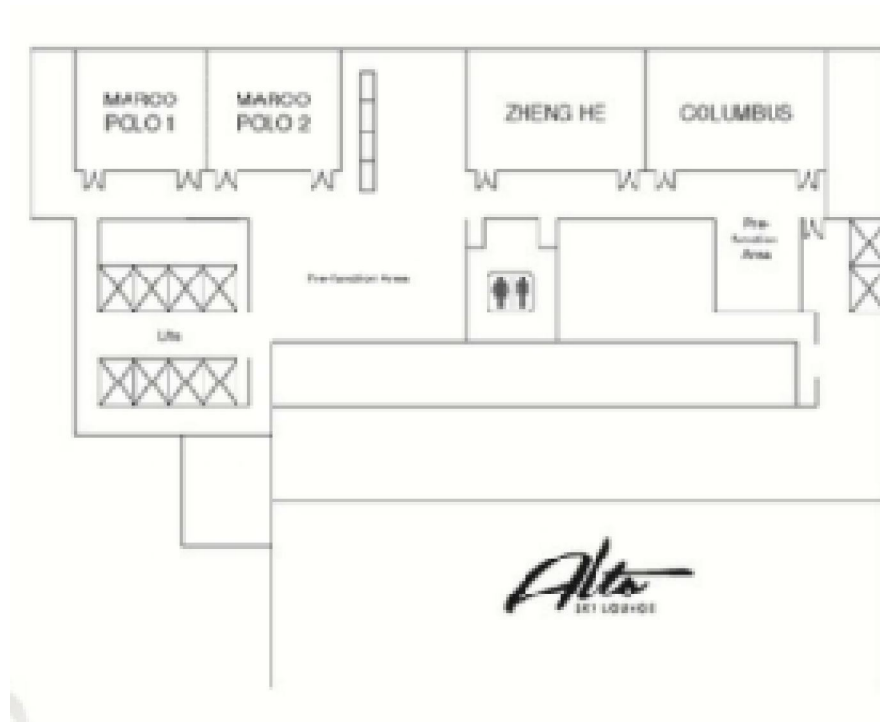
### Hotel and Accommodation

<http://www.ibilik.my/short-term-rentals/melaka>  
<http://www.booking.com/city/my/melaka.en-gb.html?aid=356991;label=gog235jc-hotel-XX-my-malaccaNhomestayNartment-unspec-my-com-L%3Aen-V%3AOCFsQFjAF-O%3Aunk-B%3Aunk-N%3Ayes-S%3Abo;sid=7d1f9d30c2ece1e8351947d32ab853c0;dcid=1>

### Food and Delight

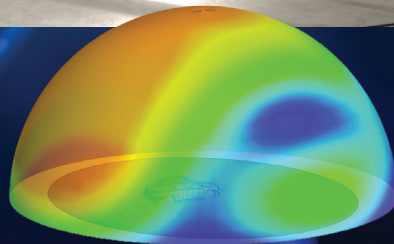
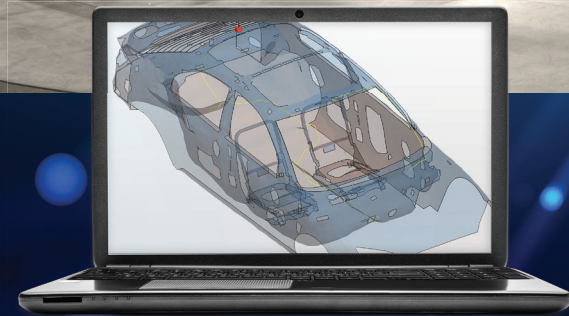
<http://www.placesandfoods.com/2014/04/top-ten-melaka-food.html>  
<http://www.gomelaka.my/top-food-in-melaka/>  
<http://www.halal.gov.my/v3/index.php/ms/enarai-hotel/103-melaka-darul-azim>

## FLOOR PLAN



# NOTES

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## Altair Solutions for EMC/EMI Simulation

### Addressing EMC in the Development Process

Solutions based on simulation-driven processes focused on pre-validation before hardware prototypes are available, more easily analyze and understand issues appearing during tests, improve designs and create new design guidelines, better understand correlation between component and vehicle tests, and manage the complexity of platform variants while reducing prototypes.

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