

## **Greeting from Chapter Chair:**

Greetings to all EPS M'sia members. Time flies, we are approaching the end of Y2020, with many new methods of living and working; basically establishing new norms in this pandemic Y2020. This newsletter also marks our planning on the forthcoming new year!

While World Health Organization (WHO) and all our government agencies reminding us on the important of avoiding the 3Cs (crowded places, close contacts and confined spaces), the semiconductor leaders feel that COVID-19 will have a positive impact on the investment and growth in the industry that all of us are working on. This great opportunity lies ahead of us with more adoption of 5G, greater usage of artificial intelligence, and Internet of Things (IoT) as it will result in increased investment in the state-of-the-art technology computing power to enable the industry 4.0 Initiative. This indeed a very good sign for all of us to continue to have engineers capable of handling this development while learning to adapt further to these new norms of life challenges.

Despite the restrictions, the team still accomplished several key achievements with their tireless volunteering effort for our technical community. We have delivered some good technical talks to our academic partners, namely UM, UniTen, Taylors University and UniMAP (esp. during the IEEE Day). This is also part of our active engagement with the IEEE student branch to cultivate more Industry-Academic interaction on the STEM related program. However, as no cross-border traveling is allowed, we have had to on hold some of our cross chapters' engagements which we promise to resume back in Y2021. Nevertheless, the continuous active engagement from our EPS chapter had rewarded our Chapter's Secretary General - Dr. Yew Hoong Wong an Outstanding Young Engineer Award (OYEA), which we all are certainly proud of!

Hence, what's next from IEEE EPS Malaysia Chapter to constantly motivate regional engineering community on technical excellence? It's the 39th International Electronics Manufacturing Technology (IEMT) 2021 Conference (which is rescheduled from Y2020). We are looking forward to seeing you next year in Putrajaya, Malaysia!!

I strongly believe we can maintain the good linkage and our long-time established friendship beside the technical knowledge exchanges. Have fun and I wish you a great Y2020 and looking forward a better chapter in Y2021! Stay safe everyone.



**Shaw Fong WONG**  
**IEEE EPS M'sia**  
**Chapter Chair 2020**  
***Intel Technology***

## IEEE EPS Malaysia BESA 2019 Win Reported in Star Newspaper

A student in Universiti Tunku Abdul Rahman (UTAR) snagged a Best Engineering Student Award (BESA) in 2019 and this was published in the Malaysian Star Newspaper. The talented student, Tan Yu Jun, received the award on her final year project “Thermo-migration in Sn-Ag-Cu-Pt Solder Joints”. She expressed her deep gratitude to her project supervisor Dr. Wong Chee Meng for this prestigious recognition. This is the 3<sup>rd</sup> year that the BESA program is rolled out. Its sole aim is rewarding and encouraging technical excellence amongst the next generation of engineers in Malaysia. However, this is the first time that the BESA program received countrywide publicity coverage through a national newspaper.



Figure 1: Snap shot of STAR Newspaper publication of a BESA 2019 winner

Tay also expressed her gratitude to the IEEE Electronics Packaging Society (EPS) Malaysia Chapter for the opportunity to participate in the BESA 2019 program. She shared some of her real life winning tips with her juniors, by encouraging them to pay attention not just to the project technicalities but also its presentation delivery. She stressed on the importance of appealing to a wide audience by simplifying technical terms and concepts so that the general public can comprehend the material presented. Furthermore, Tay pointed out that a strong conclusion helps enlightened the audience.

Her research was mainly on the thermo-migration (TM) phenomenon in Sn-Ag-Cu-Pt (SAC-Pt) solder joints. The reliability of solder joints is often compromised due to thermo-migration caused by a large thermal gradient generated from high current density and joule heating across the interconnection. In the research, a patented (Malaysia & International patents) SAC-Pt alloy was used to compare against the commercial SAC solder to study the microstructural behavioral evolution under TM stressing for up to 600 hours. Signs of TM were pronounced in unreinforced SAC solder joints due to the high growth rate of the intermetallic compound (IMC) layer on the cold side and the progressive decrease of IMC layer thickness on the hot side. This observation is noticeably subdued in SAC-Pt samples due to the formation of (Cu, Pt)  $6\text{Sn}5$  compound on the IMC layer, slowing down the interfacial diffusion process. Once again, we offer our congratulations to Tay Yu Jun! Kudos! And to the BESA core team, job well done!

## 2019 - A Spectacular Year of Wins for IEEE EPS Malaysia!!

It was a dazzling start of the year 2020 for us with all with the various accolades awarded to EPS!!

**Q1 edition**  
Jan-Mac 2020



**IEEE**

**IEEE Malaysia Section Newsletter**

**Awards and Recognition**

Compiled by Guat Li CHEW and Kian Chuan TAN  
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Please join me in congratulating the following Malaysian recipients of the recently announced 2019/2020 IEEE Malaysia Section/Region 10/Society Awards.

**IEEE Malaysia Section Small Chapter Award – IEEE Electronics Packaging Society (EPS) Malaysia Chapter 2019**

This is the 2<sup>nd</sup> consecutive year IEEE EPS Malaysia has been awarded the Outstanding Small Chapter by the IEEE Malaysia Section. We are very thrilled with our team's accomplishments and grateful for the opportunity to be in the running. In 2019, we held 16 events, with 62.5% of them being Technical/ Professional Programs. Our Semiconductor Advanced Packaging Workshop 2019 was a major success with 180 participants from diverse industry and academic professionals. EPS has also seen a strong growth in our Senior Member elevation who are currently actively participating in IEEE Programs. This was achieved under the strong leadership of Shaw Fong WONG and his dedicated team of ExComm. Many thanks to Dr. Shutesh and Dr. YH Wong for their efforts in compiling EPS 2019 achievements for the nomination submission!



Fig 1: IEEE EPS Committee Group Photo at 2019 AGM

**2019 IEEE EPS Contributions Award – Region 10 (Asia and Pacific) – Shaw Fong WONG**

Shaw Fong Wong of Intel Technology Sdn. Bhd., has served the Electronics Packaging Society as its chair for the past several years, growing the organization to its current high profile. He has been an excellent role model in his voluntary capacity, mentoring the next generation engineer professionals including sponsoring the Vietnam EPS Chapter startup. His encouragement and supervision of younger committee members is exemplary at so many fronts. Wong Shaw Fong was selected to receive the 2019 Regional Contribution Award for Region 10 (Asia and Pacific) due to his outstanding and sustained leadership contributions to the IEE/EPs Malaysia Chapter. He deserves this prestigious award given his numerous years of outstanding contributions and leadership in multiple regional conferences and local IEEE EPS activities. Well done Shaw Fong! Thank you for your fine leadership!



**IEEE EPS Outstanding Young Engineer Award 2020 – Dr. Yew Hoong WONG**

Yew Hoong Wong, IEEE-EPS Malaysia Chapter Secretary was nominated and awarded the 2020 IEEE EPS Outstanding Young Engineer Award for his contributions to the field of electronic packaging materials and semiconductor fabrication technologies through novel material and process dev as well as continuous service to EPS. He is currently a lecturer in University of Malaya. This award will be presented in 2020 ECTC held in Orlando, Florida and will also be presented in 2020 EPTC which will be held in Singapore. Well done Yew Hoong!!! IEEE EPS Malaysia is proud of you!!!



**IEEE Malaysia Outstanding Women In Engineering (WIE) Volunteer 2019 – Dr. Yik Yee TAN**

Dr. Tan Yik Yee, an ON Semiconductor Senior Manager in CRD (Corporate Research and Development) Open Innovation supporting the Asia Region, began her volunteering journey in IEEE EPS chapter 8 years ago. Over the years, she has taken on multiple active roles and is currently the Vice Chair representing Industry. She played a key role in EPS winning the Outstanding Small Chapter award for the past 2 years. Moreover, she was the General Chair of 2018 IEMT (International Electronic Manufacturing Technology) conference, which attracted more than 600 participants from industrial and academia internationally. She continuously strives to attract more female participation in engineering through her active contributions in University and Regional events. She is truly an inspiration to aspiring young women to embark in technical fields! Kudos YY on role modeling!





## 2020 Talk on Emerging Technologies Session

*(Reported by Guat Li)*

IEEE EPS ExCo member, Dr. Eu Poh Leng was the invited speaker for the topic “Semiconductor Packaging for 5G Wireless Communications”. This special talk held on 7th January 2020 at the Engineering Faculty of The National Energy University of Malaysia (UNITEN), Kajang in Peninsular Malaysia. The technical talk series session was organized and co-sponsored by UNITEN, IEEE EPS Malaysia and NXP Semiconductors Malaysia. Approximately 40 undergraduates from The School of Electrical and Electronics Engineering participated in this informative and valuable knowledge sharing session. Many interesting sub-topics such as various 5G Solutions and Overview of 5G Global Deployments were also discussed.



Figure 2: Students at Semiconductor Packaging for 5G Wireless Communication Sharing



Figure 3: Group photo of students and Dr. Eu Poh Leng.

## Semiconductor packaging for Autonomous Driving at Taylor’s University

*(Reported by Guat Li)*

Dr. Eu Poh Leng was the invited speaker at Taylor’s University Malaysia to give a talk on the hot topic “Semiconductor Packaging for Autonomous Driving”. This technical event was organized by NXP Semiconductor & IEEE EPS on the 8<sup>th</sup> of Jul 2020 and had a total of 53 student attendees; mostly from the 3<sup>rd</sup> and 4<sup>th</sup> year Electrical and Electronics Engineering cohort plus 4 lecturers, via ZOOM! It’s our first ZOOM technical seminar! There were numerous positive feedbacks on the session and this was channeled back to Dr. Eu via Taylor University Dr. Hafisoh binti Ahmad.





No	Discussion Items	Owner
4	<p><b>Treasurer Report</b></p> <ul style="list-style-type: none"> <li>• Treasurers' report shared by KC.</li> <li>• KC explained line-by-line of the financial report.</li> </ul> <p>Poh Leng proposed and seconded by Prof. Cheong for the financial report to be accepted.</p>	KC & Shutesh
5	<p>Shaw Fong proposed to dissolve committee for 2019/20 and seconded by Wee Teck. Election started after the dissolution of committee for 2019/20.</p> <p><b>Congratulation to New Committee for 2019/20:</b></p> <ol style="list-style-type: none"> <li>1) Chair: Wong Shaw Fong</li> <li>2) Vice Chair (Academia): Prof. Mohd Nasir Tamin</li> <li>3) Vice Chair (Industry): Dr. Tan Yik Yee</li> <li>4) Vice Chair (Industry): Dr. Eu Poh Leng</li> <li>5) Junior Past Chair: Dr. Siow Kim Shyong</li> <li>6) Secretary: Dr. Wong Yew Hoong</li> <li>7) Vice Secretary: Dr. Banu Poobalan</li> <li>8) Treasurer: Tan Kai Chat</li> <li>9) Vice Treasurer: Dr. Shutesh Krishnan</li> <li>10) Exco (Webmaster &amp; Newsletter): Chew Guat Li</li> <li>11) Exco (Webmaster &amp; Newsletter): Ng Chee Yang</li> <li>12) Exco (Webmaster &amp; Newsletter): Tan Kian Chuan</li> <li>13) Exco (Industry Liaison): Dr. Choong Kooi Chee</li> <li>14) Exco (Membership Development): Bernard Lim</li> <li>15) Exco (Membership Development): Faiz Zuhairy</li> <li>16) Exco (Membership Development): Vanessa Tan</li> <li>17) Exco (Education &amp; Technical Talk): Lim Sze Pei</li> <li>18) Exco (Education &amp; Technical Talk): Lau Teck Beng</li> <li>19) Exco (Auditor): Lim Wee Teck</li> </ol>	
6	<p><b>Others</b></p> <ul style="list-style-type: none"> <li>• A small token of door gift was handed to those attended the AGM F2F.</li> <li>• Shaw Fong also shared EPS Malaysia plan for 2020 and four key focus areas as the 1<sup>st</sup> Exco kicks off &amp; introduction meeting.</li> <li>• The meeting adjourned at 10:32 am.</li> <li>• The next ExCo meeting will be held in April 2020.</li> </ul>	Shaw Fong/ Yew Hoong

## IEEE 1<sup>ST</sup> Chapter Chair Meeting 2020 Notes/Passdown

*(Notes from Dr. Poh Leng EU, Compiled by Kian Chuan TAN)*

IEEE 1<sup>st</sup> Chapter Chair Meeting 2020

Date: 11<sup>th</sup> April 2020

Time: 9.10am – 12.00pm

Venue: Virtual Meeting using Cisco WebEx Platform

Extract of meeting based on materials presented by Section exco members.

1. Congratulations to 2019 IEEE Malaysia award winners
  - a. Congratulations to IEEE Electronics Packaging Society (EPS) for Outstanding Small Chapter Award
  - b. Congratulations to Dr. Yik Yee Tan from EPS for runner-up in Outstanding WIE Volunteer Award



**Figure 4:** 2019 Outstanding Small Chapter Award

2. IEEE Malaysia Section Membership Development
  - a. Section Chair raised concern on IEEE membership. He informed that there is a steady decline of members under M (Member) and GSM (Graduate Student Member) grades. He suggested for targeted initiatives to be developed to stop the decline.

- b. From record, there is also a drastic drop of YP members from 2019 (1057 members) to 2020 (645 members). This means that many students who have graduated did not renew their membership with IEEE.
- c. Section Chair encouraged more awards nominations as that can give recognition, motivation, encouraged members to target higher volunteering positions and may help in career development. He suggested to develop a culture of recognizing our own peers by nominating them or supporting their nominations for Section / R10 / MGA and Society awards.

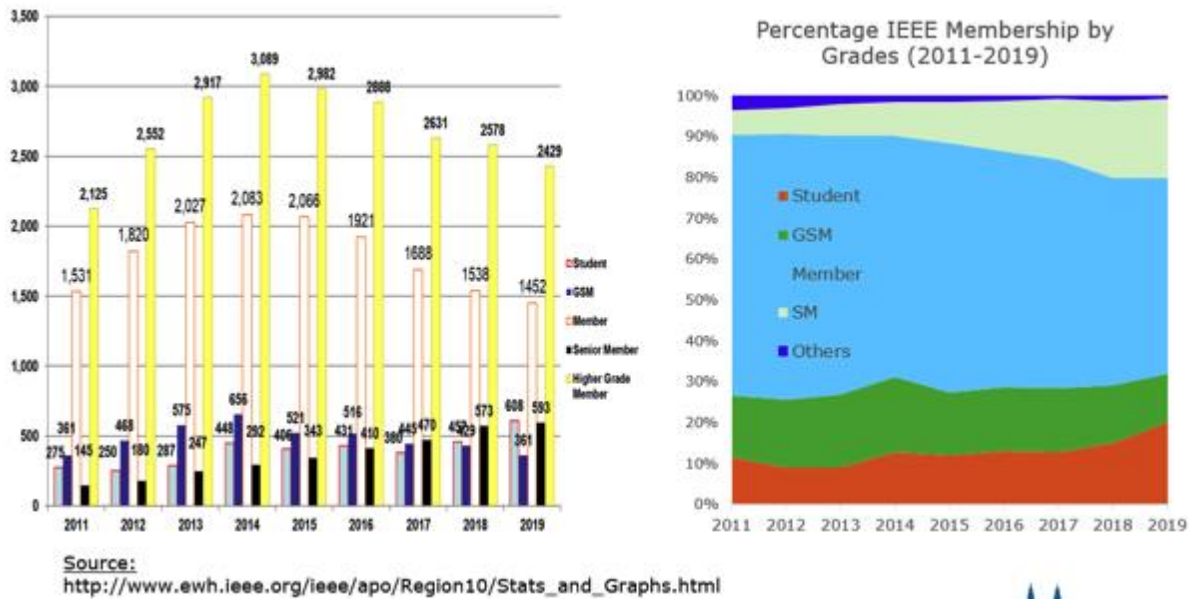


Figure 5: Historical membership data from year 2011 to 2019

3. IEEE Malaysia Section Status with Registrar of Society (ROS) Malaysia
  - a. Section Chair brought again issues on opening bank account and to do online banking for some chapters. Problem also occurred when changing of chapter bank signatories as the names are different from what was written in ROS database.
  - b. He informed that current registration of IEEE Malaysia Section to ROS is society without branches. There is a need to register the society with branches as to recognize all the chapters under the Malaysia Section.
4. Conference
  - a. Section Chair Elect presented on situation for IEEE conferences during COVID-19 pandemic. The conference can either be postponed to a later date or be conducted virtually. IEEE do not recommend for conference cancellation.
  - b. Conferences which were rejected for publication in IEEE Xplore are due to certain quality issues. Chapters need to carefully maintain the quality of paper submitted to the conference.



## **Packaging-Related Applications of Mechanical and Interfacial Bonding Characterizations at Nano-Scale Webinar (via CISCO WebEx)**

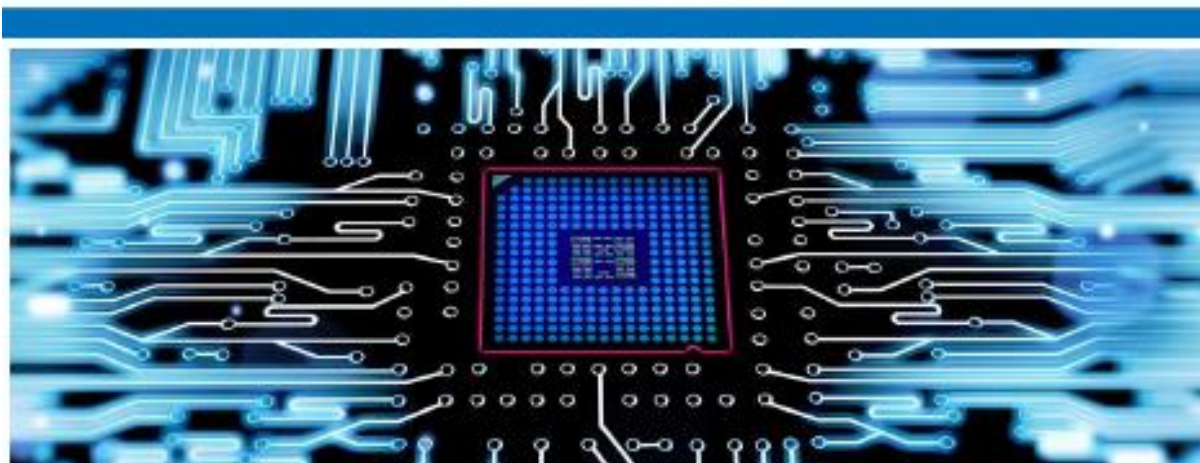
*(Moderated and Reported by Assoc. Prof Dr Ir Yew Hoong WONG)*

Advances in packaging technologies and material development have enabled a wide range of semiconductor and microelectronics applications. Decreasing sizes and material as well as manufacturing complexities pose increasing challenges for engineers and process control in the evaluation of mechanical properties and interfacial bonding. This has created a need for process grade metrology instrumentation with significantly enhanced precision in measurements. This is challenging given that the accurate screening of mechanical properties and high throughput process are imperative for rapid production. With high positioning precision and load-depth control accuracy, nano-mechanical testing was specifically developed to measure highly localized mechanical properties and interfacial bonding.

In this webinar Dr. Wei Pal-Jen, an application Scientist from Bruker Nano Surfaces, reviewed many of the current important considerations in metrology for packaging, including nano-mechanical properties and interfacial adhesion. He also presented new and existing techniques that offer significant benefits to address such obstacles. The webinar is jointly organized by IEEE EPS, Bruker and CREST Nanosolutions and held on the 9<sup>th</sup> of Jul'20. It was well received and had 21 attendees.

**Join us for a Webinar**

## **Packaging-Related Applications of Mechanical and Interfacial Bonding Characterizations at Nano-Scale**



**Figure 6:** Packaging-Related Applications of Mechanical and Interfacial Bonding Characterizations at Nano-Scale Poster

**Technical Webinars by Electronics Packaging Society (EPS) organized by Universiti Malaysia Perlis (UniMAP) in conjunction with IEEE Day 2020**

*(Compiled by Ir. Dr. Banu POOBALAN)*

IEEE Day is an annual celebration event hosted by Universiti Malaysia Perlis (UniMAP) and several IEEE societies including Electronics Packaging Society (EPS). IEEE Day for the first time in the history was celebrated when engineers worldwide and IEEE members gathered to share their technical ideas in 1884. IEEE Day celebration carries the theme, which emphasizes on Leveraging Technology for a Better Tomorrow. While the world benefits from what’s new, IEEE focuses on what’s next. IEEE Day is celebrated on the first Tuesday of every October as an annual event. In the year of 2020, for the 11th consecutive year, IEEE Day worldwide celebration was initiated on Tuesday (6th October 2020) and continued throughout the first two weeks in October.

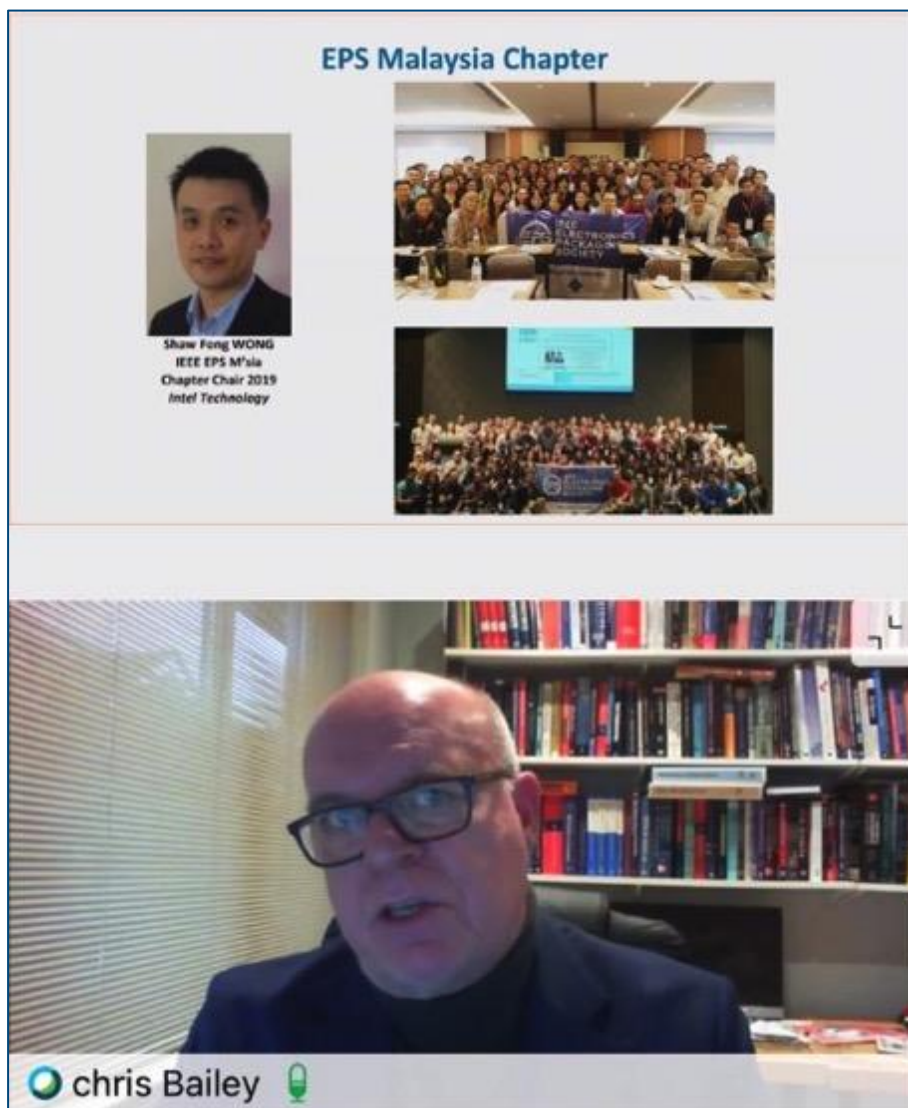
In conjunction with IEEE Day 2020, EPS once again succeeded in its mission of constantly motivating the local engineering community with technical knowledge sharing session from the internationally respected speakers. However, due to the Covid-19 pandemic, this year, the technical sharing was conducted via online webinars.

It’s our honor to have invited semiconductor packaging industry’s notable speakers, presenting three topics of interest: (1) First Speaker : Dr Andy Mackie (Principal Engineer & Manager, Thermal Interface Material Applications, Indium Corporation) on “What’s Driving - Automotive Electronics Assembly and Packaging” (2) Second Speaker: Prof Chris Bailey (President, IEEE Electronics Packaging Society) on “Overview of the IEEE Electronics Packaging Society” (3) Third Speaker: Dr Ravi Mahajan (Director, Technology & Manufacturing Group Intel Corporation) on “Direction and Opportunities in Heterogeneous Integration using Advanced Packaging”.



Figure 7: The webinars schedules, topic titles and speakers information

Dr Andy Mackie covered the introductory overview of advanced automotive packaging technology trends, main market players and a prospective outlook on related future growth. This talk was attended by over 200 participants; mainly from industry, academic and international backgrounds. Prof Chris Bailey highlighted on the overview of IEEE EPS, achievements, membership benefits and packaging technology advancement. This talk was attended mainly by academics and industry key players, with some international participants. The third speaker Dr Ravi Mahajan discussed about the technology opportunities and challenges in heterogeneous integration of package design domain. This talk was well received by industry, academicians and international participants.



**Figure 8:** The webinar delivered by Prof Chris Bailey from president of IEEE Electronics Packaging Society

In summary, these technical webinars were very informative. Many of the participants are truly inspired by the quality and quantity of ground-breaking developments of emerging semiconductor packaging technologies. We would also like to thank Universiti Malaysia Perlis (UniMAP) for the continued commitment and support of this annual event. We are looking forward for a grand IEEE Day 2021 event next year once COVID-19 is behind us!!!



## **Semiconductor packaging for Autonomous Driving at Universiti Malaya** *(Reported by Dr. Poh Leng EU)*

Dr. Eu Poh Leng was the invited speaker at Universiti Malaya to give a talk on “Semiconductor Packaging for Autonomous Driving”. The technical event was jointly organized by Universiti Malaya (UM), Institute of Mechanical Engineers, NXP Semiconductor and IEEE EPS Malaysia and held on the 24<sup>th</sup> Oct 2020 via ZOOM. 60 Engineering students participated in this webinar, which lasted 1.5 hours with a 30mins Q&A session. At the end of the presentation, 5 relevant technical questions related to the topic were posed to the attendees.

Five different individuals correctly answered all questions, indicating the depth of understanding and retention of the material shared. It also displayed good interaction between the presenter and the audiences. All five students will be shipped an USB Memory stick, courtesy of IEEE EPS Malaysia, as a reward for their participation.



**Figure 9:** Semiconductor packaging for Autonomous Driving Webinar on ZOOM



**Figure 10:** ZOOM view of the UM participants

## **EPS Membership Reward Program**

*(Compiled by Bernard LIM, Vanessa TAN and Faiz Zuhairy)*

IEEE-EPS Malaysia Chapter has a Membership Reward Program to its loyal members. This is to appreciate and acknowledge members who have been providing support and engagement to the chapter and to encourage more IEEE-EPS Malaysia Chapter’s membership.

In order to obtain the latest particulars from the members, a Google Form will be created and disseminate. A special IEEE-EPS souvenir as membership reward will be delivered.

If you have not renewed your membership, please do so quickly by end of the year so that you will not missed out this gift.

Stay tuned!

IEEE EPS Members Development Team



## **Best Engineering Student Awards (BESA) Final Year Project Undergraduate 2020**

*(Compiled by Assoc. Prof. Ir. Dr. Yew Hong WONG)*

EPS Malaysia has a regular “Best Engineering Student Awards (BESA)” for Undergraduates on their Final Year Project. This is the 4<sup>th</sup> year of its roll out and the aim is to reward and encourage technical excellence in Malaysia’s next generation engineers. Congratulations to the winners who receive cash prize, book, a certificate and membership current year subscription, from IEEE EPS!

Student	Supervisor	Final Year Paper Title	University
TBD by end of Dec’20	TBD by end of Dec’20	TBD by end of Dec’20	Universiti Tunku Abdul Rahman (UTAR)
Chuah Ching Fun	Dr. T. Nandha Kumar	Low Power Configurable Stochastic Multiplier	University of Nottingham (Malaysia Campus)

**Table 1:** Summary of the 2020 BESA FYP Recipients

### **Winner of Best Engineering Student Award (BESA) 2020 at University of Nottingham (MY Campus)**

The Best Engineering Student Award (BESA) 2020 was awarded to Chuah Ching Fun, an Electrical and Electronic Engineering student from University of Nottingham Malaysia, for his final year project entitled “Low Power Configurable Stochastic Multiplier”. Stochastic computing consumes low power but suffers from long latency, low accuracy and large hardware area overhead to generate stochastic bit streams. Among these disadvantages, long latency is particularly undesirable especially for multiplication. Through this project, a novel stochastic multiplier design is proposed and incorporated in an image convolution system. From the results of experiments, it is deduced that the proposed stochastic multiplier is superior in terms of latency, accuracy, area for stochastic bit stream generation and overall optimization level. The most significant contribution is that the latency is drastically reduced by an order exponential to the number of bits of input binary multiplicands, as compared to the state-of-the-arts existing solution. Moreover, the area for stochastic bit stream generation for the proposed design is approximately 1.5 times reduced whilst its overall optimization is over 100 times better for 8-bit binary inputs. Ching Fun would like to extend his sincere appreciation for all the guidance and dedication of his supervisor, Dr. T. Nandha Kumar, to making this project a success. The award comprised of RM3,000 cash prize and a certificate.



**Figure 11:** Chuah Ching Fun from University of Nottingham (Malaysia Campus) and his BESA Certificate

## IEEE Malaysia Section 2<sup>nd</sup> Chapter Chair Meeting 2020 Passdown

*(Notes from Dr. Poh Leng EU, compiled by Kian Chuan TAN)*

IEEE 2<sup>nd</sup> Chapter Chair Meeting 2020

Date: 7<sup>th</sup> November 2020

Time: 9.00am – 12.00pm

Venue: Virtual Meeting using Cisco WebEx Platform

Extract of meeting based on materials presented by Section exco members.

1. IEEE Malaysia Section Awards and Nominations
  - a. Section Chair urged to build a culture of recognizing peers hard works and efforts by nominating them or endorsing their nominations for section, R10, MGA or Society Awards
  - b. An award of recognition may be a great motivation for volunteers who have contributed to the chapter's activities. This recognition may serve as evidence of leadership and team player in their career development.
2. New addition to IEEE Malaysia Section
  - a. Section Chair introduced two new additions to Malaysia section in year 2020.

### **New Addition to Malaysia Section (2020)**



11/03/2020:

Multimedia University Power & Energy Society  
Student Branch Chapter (**SBC65471**)



24/07/2020:

University of Malaya WIE  
Student Branch Affinity Group (**SBC65471**)



IEEE Malaysia 2<sup>nd</sup> Virtual Chapter Chairs Meeting 2020



**Figure 12:** Two new addition to Malaysia Section in year 2020

3. Annual General Meeting (AGM) 2021
  - a. The preliminary date for AGM 2021 planned on 6<sup>th</sup> February 2021.
  - b. Election Committee formed and led by Prof Borhanuddin Mohd Ali (Chairman) and AP Dr Mohammad Faizal Ahmad Fauzi (Deputy Chairman).

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## **REGIONAL EVENTS:**

### **EMAP-IMPACT 2020 – Theme: Toward the Data Era**

International Microsystems Packaging, Assembly and Circuits Technology (IMPACT) and Electronic Materials and Packaging (EMAP) otherwise known as IMPACT-EMAP 2020 Conference was organized by IEEE-EPS-Taipei, iMAPS-Taiwan, ITRI and TPCA. For the past 15 years, IMPACT has been the global stage for innovation and one of the largest gatherings of PCB and packaging professionals over the world. The theme of this year is “IMPACT-EMAP on HPC - Toward the Data Era.” The conference has reached more than 500 attendees participated in the physical conference during Oct 21<sup>st</sup> to 23<sup>rd</sup>.

It is fair to conclude that the conference was a great success! So many people have contributed in so many ways to turn this event into a smoothly running meeting with various intriguing presentations and posters; forming a very good atmosphere for discussion and networking. We thank our distinguished keynote speakers for their inspiring and timely insights. We also thank our TPC members for their wonderful response and continuing support. Most of all we wish to thank all of the participants, without whom, the success of the conference would not have been possible. All those who contributed to the conference: Thank you for all your excellent work!

Even though the physical conference of IMPACT-EMAP 2020 was concluded on Oct 23<sup>rd</sup>, the IMPACT-EMAP 2020 would like to make to maximize participation in order to engage with distinguished guest from around the world; An digital IMPACT-EMAP 2020 will allow the entire PCBs and packaging community to safely share ideas that will shape our future. You'll be able to participate in all the awe-inspiring moments of IMPACT-EMAP 2020 with **27 videos of plenary/invited talks wherever you are in the world**. We are designing a unique experience for the tech industry.

**【Digital conference registration deadline】 15<sup>th</sup> December, 2020. (EXTENDED till 31<sup>st</sup> Dec. 2020)**

**【Registration fee】 NT\$3,000 (Access to 27 On-demand videos)**

**【Digital Proceedings】 NT\$3,000 (Content provided through weblink)**

**\*NO REFUND IS APPLICABLE WHEN THE ON-DEMAND WEBINAR STARTED\***

**【How to register?】 Fill out the registration form and email to register@impact.org.tw**

\*\* Summary taken from EMAP-IMPACT web site:

[http://www.conf.tw/site/mypage.aspx?pid=213&lang=en&sid=1283&utm\\_source=BenchmarkEmail&utm\\_campaign=%f0%9f%93%a2IMPACT-EMAP 2020 On-Demand Webinar Registration&utm\\_medium=email](http://www.conf.tw/site/mypage.aspx?pid=213&lang=en&sid=1283&utm_source=BenchmarkEmail&utm_campaign=%f0%9f%93%a2IMPACT-EMAP%20On-Demand%20Webinar%20Registration&utm_medium=email)

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## **70<sup>th</sup> IEEE Electronic Components and Technology Conference ECTC 2020**

*(Modification of Excerpt from Chris A Bower's email to ECTC attendees)*

The pandemic made this a very unique year for ECTC. It is the first time that the in-person conference had to be cancelled, and had to be held as a virtual event. While it was a disappointment to cancel the in-person event, it was exciting to see a large number participating in the online event. The support from our sponsoring organizations, IEEE and EPS, along with the generosity of our corporate sponsors, allowed us to provide free attendance for the virtual conference. The numbers below reveal how the online, free-to-attend ECTC reached a much larger and more diverse audience.

- Over 7,500 people registered to attend the free virtual ECTC. For comparison, the record attendance for an in-person ECTC is 1,738, which was in 2018.
- The attendees were from 55 different countries around the world. For comparison, at the 2019 in-person conference, we had attendees from 25 different countries.
- The on-demand conference had 45 technical sessions with 346 presentations and 7 special sessions with 60 invited presentations.
- During the conference, attendees watched over 22,000 hours of content.
- Over 1,800 people watched the excellent keynote presentation from Dr. Douglas Yu of TSMC.
- The average attendance for the sessions was 424. We had 21 sessions with over 400 attendees. The most attended session was "Fan-Out Technologies for System Integration," with over 900 attendees.

We would also like to thank all authors, presenters, invited speakers, program committee members, sponsors, volunteers, and all attendees who contributed to the success of the 70<sup>th</sup> ECTC! Special thanks to the keynote speaker, Dr. Douglas Yu from TSMC who gave a very impactful lecture on the subject of heterogeneous integration and the future direction of innovation in the semiconductor industry. We have received a great deal of positive feedback regarding the quality of the keynote lecture. Thank you, Dr. Yu!

Many thanks to our corporate sponsors! Due to their generous support, we were able to provide this year's conference to our entire community for free! Other notable people to be acknowledged are - Rich Jannuzzi, Brett Houseal, David Stankiewicz, Denise Manning, plus the IEEE staff members who helped us quickly convert to the virtual conference. Not forgetting our Program Chair, Rozalia Beica, for her expertise in establishing very timely and important invited sessions; our Assistant Program Chair, Ibrahim Guven, for his tireless efforts in managing our technical sessions, and to the other members of the Executive Committee for their dedication to making ECTC a premier conference. Last but not least, our gratitude to Dr. C. P. Wong for his assistance in securing our keynote lecturer and our sincere appreciation of his unwavering 33-year volunteer service to ECTC! Planning for the 71<sup>st</sup> ECTC is already underway.

The conference is planned for June 1-4, 2021 and will be a Virtual Conference. We look forward to your support to help make the 71<sup>st</sup> ECTC in 2021 a huge success.



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## **21<sup>st</sup> International Conference on Electronics Packaging Technology (ICEPT 2020)**

*(Excerpt from Denise Manning's eNews Sept 2020)*

The 21st International Conference on Electronics Packaging Technology (ICEPT 2020) was held at the Conference Center of Guangzhou Science City from August 12th to 15th, 2020. The conference was hosted by Guangdong Greater Bay Area Institute of Integrated Circuit and System, Guangdong University of Technology (GDUT), IEEE Electronics Packaging Society, Electronic Manufacturing and Packaging Technology Society of the Chinese Institute of Electronics, organized by School of Electromechanical Engineering, Guangdong University of Technology / State Key Laboratory of Precision Electronic Manufacturing Technology and Equipment, and co-organized by National Center for Advanced Packaging (NCAP), State Key Laboratory of Mobile Network and Mobile Multimedia Technology (ZTE), Hong Kong Applied Science and Technology Research Institute Co. Ltd., Guangdong Fozhixin Microelectronics Technology Research Co., Ltd., Guangdong XH Microelectronics Co., Ltd., Guangzhou Semiconductor Industry Association, IEEE EPS Beijing Chapter and Beijing Faith Information Consultant Ltd. More than 600 delegates from China, the United States, Sweden, Singapore, Japan, Netherlands and many other countries and regions, including experts, scholars and business representatives participated in the event.

Read More at link below:

[https://eps.ieee.org/images/files/enews/ICEPT\\_2020.pdf](https://eps.ieee.org/images/files/enews/ICEPT_2020.pdf)

### **Up Coming EPS Conferences & Meetings:**


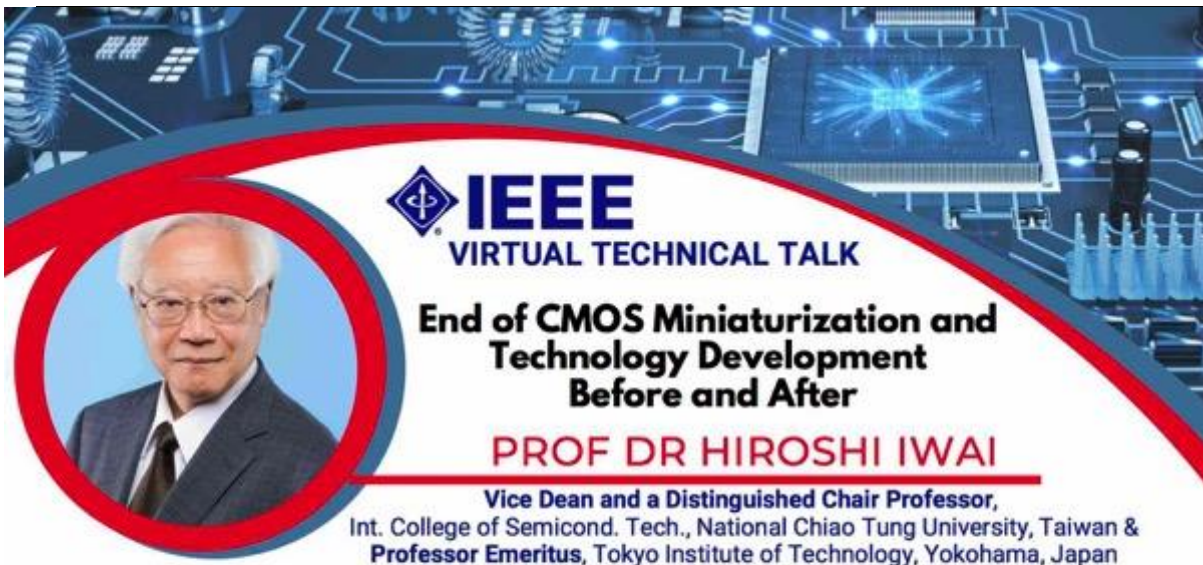
Networking and constant knowledge advancement opportunities are always an important part of any conference. EPS chapters have lined up an outstanding program with top tier speakers and timely topics for 2021. Below is a sample of what's in store for us. Mark the dates!!

### **EPS CONFERENCES IN 2021:**

<https://ieee-epsmalaysia.org/events-activities/upcoming-events>

### **Some Important References:**

- Official IEEE website: <http://www.ieee.org>
- Official IEEE/EPS website (HQ) <https://eps.ieee.org>
- IEEE EPS Malaysia website: <https://ieee-epsmalaysia.org>



**IEEE**  
VIRTUAL TECHNICAL TALK

**End of CMOS Miniaturization and  
Technology Development  
Before and After**

**PROF DR HIROSHI IWAI**

Vice Dean and a Distinguished Chair Professor,  
Int. College of Semicond. Tech., National Chiao Tung University, Taiwan &  
Professor Emeritus, Tokyo Institute of Technology, Yokohama, Japan

### Abstract

Recent smart society has been conducted by the progress of semiconductor technologies, especially by that of CMOS miniaturization, and demand for further high-performance CMOS development is increasing. However, the gate length of MOSFETs is approaching its limit of 10nm caused by the leakage current increase, and no more significant performance increase is expected at the level of a single MOSFET. Still the demand of the society is strong, and thus, the industry is squeezing the performance by increasing the MOSFET density per unit area by decreasing interconnect pitch with EUV and stacking the MOSFETs to vertical directions such as nano-sheets. These efforts are expected to continue for another 10 years depending on the cost and market requirements. In addition, new technology development for semiconductor memory, communication, and power devices are being conducted very aggressively. In any case, the importance of semiconductor device will increase significantly in next 30 years. In this talk, the recent development of CMOS towards its limit is explained and the future electronic device engineering combined with bio technology for the latter half of 21st century is discussed.

### Registration



[https://forms.gle/  
epECYKZcEgmmXXTA](https://forms.gle/epECYKZcEgmmXXTA)

**3 DECEMBER 2020**

**3 PM (Malaysia)**

**E-CONFERENCING LINK:**

Will email the link to registered participants  
before the talk

**This event is organized by:**



**IEEE Penang  
Joint Chapter**



**IEEE  
Sensors Council**  
Malaysia Section Chapter

Faculty of Electronic Engineering  
Technology **FTKEN**  
UNIVERSITI PALANGSI PERLIS





## EPTC 2020

22<sup>nd</sup> Electronics Packaging Technology Conference (Online)  
2<sup>nd</sup> to 29<sup>th</sup> December 2020, Singapore

IEEE EPS Flagship Conference  
in Asia Pacific Region

### 1<sup>st</sup> Call for Registration and Participation

Dear Electronics Packaging Colleagues,

First and foremost, I hope that everyone is coping well despite the disruptions caused by the pandemic. We are all affected in one way or another, and it is more important than ever to support each other. We also quickly learned that digital transformation, which all of us have a key role to play, becomes more essential than before. Understanding what is at stake and to ensure continuity, the EPTC 2020 organising committee have decided to carry on with the cause.

The [22<sup>nd</sup> Electronics Packaging Technology Conference \(EPTC 2020\)](#) is an international event organized by the IEEE RS/EPS/EDS Singapore Chapter and sponsored by IEEE Electronics Packaging Society (EPS). Since its inauguration in 1997, EPTC has developed into a highly reputed electronics packaging conference in the Asia-Pacific and is well attended by experts in all aspects of packaging technology from all over the world. EPTC is now the flagship conference of IEEE EPS in Region 10.

We appreciate your continued support despite the unusual time. EPTC 2020 will be run as a fully online event of **on-demand presentations (Dec 2 – 29, 2020)**, as well as **live presentations (Dec 2-3, 2020)**. The contents from the live presentations will be recorded and available on-demand post-event.

EPTC 2020 will feature Keynotes, Technology Talks, Panel Discussion, HIR Workshop, Forum, Invited Talks and Technical Sessions. We are very grateful to our sponsors who have continued to provide generous supports despite the uncertainties. These supports have enabled us to keep the registration fee affordable. We only ask for a **nominal fee of S\$30** for you to access all the online contents (on-demand and live). In addition, a copy of the conference proceedings can be downloaded for S\$50 only.

EPTC 2020 **Registration fee** can be found [here](#)

EPTC 2020 **Registration** can be completed [here](#)

EPTC 2020 **Advance program** can be found [here](#)

Let me walk you through the digital platforms we use to run EPTC 2020. Registration can be completed via **ConfTool** (<https://www.conftool.org/eptc2020/>). The online contents will be delivered and hosted via **Whova** ([https://whova.com/portal/webapp/virtu2\\_202012/](https://whova.com/portal/webapp/virtu2_202012/)). Upon successful registration, you will receive the instructions to set up your login a few days closer to the actual conference dates. The Whova platform allows you to view the contents from the comfort of your desktop/laptop or mobile devices, any where any time.

The Program highlights are as follows:

## **KEYNOTES**

### **KEYNOTE I**

**TBC**

**MANISH RANJAN**

**MANAGING DIRECTOR - DEPOSITION PRODUCT GROUP**

**LAM RESEARCH**

### **KEYNOTE II**

**HETEROGENEOUS INTEGRATION FOR HPC APPLICATIONS DRIVEN BY 5G AND AI**

**JOHN H LAU**

**CTO**

**UNIMICRON TECHNOLOGY CORPORATION**

## **TECHNOLOGY TALKS**

### **TECHNOLOGY TALK I**

**THE PROMISE OF ADVANCED PACKAGING FOR MOORE'S LAW**

**RAMESH CHIDAMBARAM**

**STRATEGIC MARKETING DIRECTOR**

**APPLIED MATERIALS**

### **TECHNOLOGY TALK II**

**HETEROGENEOUS WAFER LEVEL 2.5D AND 3D INTEGRATION**

**SEUNG WOOK YOON**

**CORPORATE VP / PACKAGE TECHNOLOGY PLANNING, TEST & SYSTEM PACKAGE**

**SAMSUNG ELECTRONICS CORPORATION**

## **PANEL**

### **"PANEL LEVEL PACKAGING"**

Panel Level Packaging is the latest trend in microelectronics packaging. This method has the potential to offer significant package miniaturization (volume and thickness), high throughput manufacturing and lower cost of ownership. It also improves the electrical and thermal performance, enabling a range of applications in heterogeneous integration. In this panel discussion, experts will share their experiences and views on this promising technology covering technology options, challenges and solutions, use cases and the future outlook.

The Panel will be moderated by Sam Karikalan (Broadcom) and the speakers include Tanja Braun (Fraunhofer IZM), Rozalia Beica (AT&S), C. P. Hung (ASE), Tim Olson (Deca) and Tingyu Lin (NCAP).

## **WORKSHOP**

### **"Heterogeneous Integration Roadmap (HIR)"**

The Heterogeneous Integration Roadmap (HIR), released October 2019, is a roadmap to the future of electronics identifying technology requirements and potential solutions. The primary objective is to stimulate pre-competitive collaboration between industry, academia and government to accelerate progress. The roadmap offers professionals,



industry, academia and research institutes a comprehensive, strategic forecast of technology over the next 15 years. The HIR also delivers a 25-year projection for heterogeneous integration of Emerging Research Devices and Emerging Research Materials with longer research-and-development timelines.

The HIR Workshop at EPTC 2020 features overall updates on the HIR (Bill Chen, ASE), updates on selected chapters on 2.5D/3D (Ravi Mahajan, Intel) Photonics Technology (Bill Bottoms, Third Millennium Test Solutions), Data Center/HPC (Kanad Ghose, Binghamton University) and Security (Sohrab Aftabjahani, Intel). There will be a live panel on Photonics Technology moderated by Surya Bhattacharya, Director of Systems in Package at the Institute of Microelectronics, Singapore, and co-moderated by C. P. Hung, Vice President, Corporate R&D of ASE Group.

## FORUM

### “Advanced Packaging for Mobile Applications”

*Details to be finalized*

## INVITED PRESENTATIONS

There are **12 invited presentations** by experts from industry and academia on emerging topics in electronics packaging. The industry experts are from Applied Materials, ASM, GlobalFoundries, Samsung, Zeiss, SPIL, JCET, Inphi and Yole. We also have invited talks from distinguished professors from Purdue University, Portland State University, and Lamar University.

## CONFERENCE TOPICS

There are all together **102 technical presentations** covering important aspects of electronics packaging as listed below.

- 2.5D, 3D and TSV Processes
- Advanced FA and Reliability
- Advanced Flip Chip, Substrate and SiP
- Advanced Materials and Processing
- Advanced Package Designs and Characterization
- Assembly and Manufacturing Technology
- Emerging Materials and Processing
- Flex and Printed Electronics
- Metrology and Inspection for Advanced Packaging
- RF, 5G and mmWave Packaging
- Silicon and Glass Interposer
- Solder Joint Characterization and Reliability
- Thermal Characterization and Cooling Solutions
- Thermo-Mechanical Simulation
- Wafer and Panel Level Processing
- Wafer Fab Out Processes
- Wafer Hybrid Bonding

## 2020 Technical Webinar - UPCOMING

The exciting technical webinar organized by IEEE EPS will be launch thru Cisco WebEx Platform on the 16<sup>th</sup> December 2020 9.00am (M'sia Time, GMT +8:00). The webinar invited speaker is Dr. Hong Wen Zhang. who has extensive experiences in various aluminum (Al) alloys and fiber/particle-reinforced Al-based composite materials, and Al-rich and ZrHf-based amorphous alloys. The title of this technical webinar is "The Evolution of Lead-Free Solder Alloys". Don't miss this opportunity to learn about lead-free solder alloy from renowned experts!

### EPS Webinar Series 2020/21

#### *The Evolution of Lead-free Solder Alloys*

Dr. HongWen Zhang is Manager of the Alloy Group in Indium Corporation's Research & Development Department. His focus is on the development of lead-free solder materials and the associated technologies for high-temperature and high-reliability applications. He and Dr. Ning-Cheng Lee invented the mixed powder solder technique to combine the merits of constituents to improve wetting, reduce processing temperatures, modify the bonding interface, and control the joint's morphology, thus improving the reliability.



**Dr. HongWen Zhang**

Manager, Alloy Group  
Indium Corporation's R&D  
Department.

**JOIN US FOR THIS UPCOMING WEBINAR**

**Figure 13** The biography of Dr HongWen Zhang

Registration link:

<https://ieeemeetings.webex.com/ieeemeetings/onstage/g.php?MTID=ecce160e540d57b2319f306de4e470fcf>