IEEE

The Institute of Electrical and Electronics Engineers, Inc.

VOLUME 46 Issue 1 July 2019

Secretariat

AUSTRALIAN PROFESSIONAL CENTRE
PO Box 576
CROWS NEST NSW 1585
Tel: +61 2 94318600

IEEE NEW SOUTH WALES SECTION
ARBN 078 576 495 ABN 34 078 576 495

Editor: Bill Sloman
e-mail: bill.sloman@ieee.org
Web page:
http://sites.ieee.org/nsw/

Contents:

Editorial:

This is the fourteenth newsletter I've edited. This one is being edited with an old version of Libre Office – 5.4.7.2 - which is the latest version that I can get to compile on my lap-top (which is seven years old and probably due for replacement).

Note the nomination form on page 12. Do nominate for something you'd be willing to do – it can save you from being importuned to do something you'd fancy less.

We seem to have acquired a tolerably famous associate member in Michelle Simmons – see page 30.

Chairman's Message

As we reach the mid-point of 2019 I would like to thank all IEEE members that have played an active role in contributing to the success of the IEEE. Contributions take many forms such as involvement in the Section Committee, involvement with IEEE technical societies and affinity groups, being involved with the student branch, reviewing and/or submitting papers to IEEE journals and conferences, undertaking outreach activities, putting on events and simply participating in IEEE events. Membership value comes from engaging with the IEEE.

Progressing through the IEEE volunteering opportunities is an incremental process starting with small contributions that slowly - with recognition and experience - lead to bigger and better opportunities. To say thank you to those that have made large contributions to the IEEE we last year started the **IEEE NSW Section Outstanding Volunteer Awards**. Winning such an award is a visible recognition of your contributions and looks good in your CV or in a promotion application. Winners will also be automatically nominated for the respective Region 10 and Australia Council awards (if they meet the respective eligibility criteria), which offers an opportunity to obtain national and international recognition of your experience. Please consider an application. See page 4 for more details.

Many volunteers will not be ready to apply for a NSW award at the moment simply because they don't have a strong enough track record of contributions. One way to build such a record is to **join the NSW Executive Committee**. It is that time of year that nominations open with details outlined on page 12. I strongly recommend anyone looking to give back, looking to build a diverse network, or trying to gain high level leadership experience, to submit such a nomination. My two years as Chair has been a lot of work, but the opportunities to meet inspirational leaders and decision makers nationally and internationally has been priceless and well worth all the time that I put in. Chair, Vice-Chair, Secretary or Treasurer – all offer an opportunity to make a difference and gain recognition of your capability.

In August we hold our free networking and dinner event **UNITE** for the second time with the purpose of uniting our members to interact and engage. Last year 160 members participated and this year we are making the event bigger by adding a professional development and technical component. We aim to have 300 members participate this year. We are also calling upon our academic and industry members to exhibit their research, product or services for the cost of a donation. For our industry members this is a great way to extract value from membership and connect the work you do with the IEEE community - see page 5 for more details. Academic members should think about the benefits of disseminating your research - many research proposals ask how you are going to do that. At UNITE you can do this to a diverse audience and for free!

The NSW Section committee continues to make strong progress with the **strategic plan**. You can follow the progress and the ways we are trying to bring value to membership by following progress on the Section website http://sites.ieee.org/nsw/nsw-section-strategic-plan/.

Our website has been fully revamped. When was the last time you took a look at it?

One of the new initiatives in 2019 has been to start the section's **YouTube** channel https://www.youtube.com/channel/UCcHapDQ69e6XXlzH2R1Ui9Q. This will provide access to recordings of NSW events that we have been given permission to distribute. While the collection is currently small it will increase with time.

We have also started to list new additions on IEEE TV to help increase awareness of many of the great opportunities available with your IEEE membership.

It was also a great pleasure to announce in June that the NSW Section has had an IEEE Milestone approved. A huge congratulations to the history team for this great accomplishment. The IEEE Board of Directors approved the IEEE History Committee's recommendation for the following citation:

Reception of First Communication to Earth from a Human Walking on the Moon, *1969*
the Parkes radiotelescope and Honeysuckle Creek stations in Australia received voice and video signals from the Apollo 11 moonwalk, which were redistributed to millions of viewers. Parkes' televised images were superior to other ground stations, and NASA used them for much of the broadcast. One of the first to use the newly developed corrugated feed horn, Parkes became the model for the NASA Deep Space Network large aperture antennas.

Get involved and engaged and make the most of your IEEE membership today!
I wish you all the best for the second half of 2019 and hope to meet you at one of our events, especially at UNITE2019 – register now as its free!

Sasha Nikolic
Chair, IEEE NSW Section

IEEE NSW Section Outstanding Volunteer Awards

The NSW Section is proud to promote local awards to recognise the contribution of our members. Many members donate enormous amounts of their time spent on a diverse range of activities that benefit the IEEE membership.

If you or somebody you know has made a substantial contribution then we encourage you to apply. The following awards will be presented at the 2019 NSW Section AGM:

IEEE NSW Outstanding Volunteer,

IEEE NSW Outstanding Young Professional,

IEEE NSW Outstanding Women in Engineering Volunteer

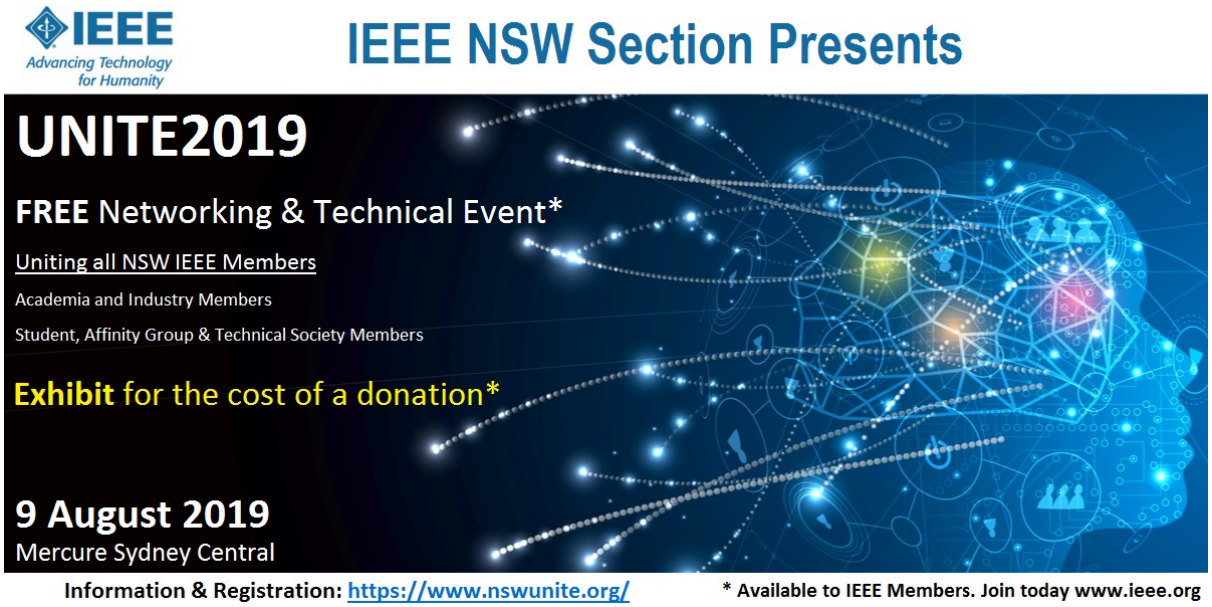
IEEE NSW Outstanding Student Volunteer.

Such recognition looks good in your CV and can help in promotion applications.
Receiving such an award is a formal recognition of your capabilities.
Winners will also be automatically nominated for the respective Region 10 and Australia Council awards (if they meet the respective eligibility criteria), offering an opportunity to obtain national and international recognition of your experience.

Nominations close on the 31st of August.

More information: http://sites.ieee.org/nsw/awards-recognition/

IEEE UNITE2019



Cost: Free for all IEEE Members *(and one partner or guest)*

About: This event aims to unite all IEEE Members (Student, Young Professional, Women In Engineering, Life Members, Academia & Industry etc.) in one place with a free dinner and loads of activities focused on networking and making the most of the IEEE. Discover the latest trends, discover the opportunities offered by the various IEEE societies, discuss membership elevation options, engage with TISP and much more! More details will become available closer to the event.

Date: 09 August 2018

Time : 4:00 - 6:30pm Technical and Professional Development Program
6:30 – 8:30pm Exhibits, Poster Competition and Networking Component

Registration is a must! Numbers are Limited! You must show your IEEE membership card and confirm registration to gain entry.

More information and registration here: https://www.nswunite.org/

Exhibit for the cost of a Donation:
We are offering IEEE members an opportunity to exhibit products or services for the cost of a donation. If you are not one register for a 2019 membership before August with a 50% discount at https://www.ieee.org/

Why Exhibit: Showcase your products, research and services; Connect your company, school or faculty with the IEEE network; Engage with IEEE members, especially student members who will be looking for work when they graduate (IEEE Members that attend such events are engaged and motivated individuals); –

Discover new opportunities; and Showcase your support to the IEEE

The Parkes Radiotelescope is an International Celebrity

Trevor S. Bird[1,2]ts.bird@ieee.org and Karu P. Esselle[3]karu@ieee.org

1. Antengenuity, PO Box 306, Eastwood NSW 2122, Australia
2. Global Big Data Technologies Centre (GBDTC) University of Technology Sydney (UTS), Ultimo, NSW 2007, Australia
3. School of Engineering, Macquarie University, Sydney, NSW 2019, Australia,

The "star" of the acclaimed movie The Dish is in the headlines again for its unique role in the moon landing.
It is now fifty years since Neil Armstrong stepped out onto the Moon's surface and the Parkes Radiotelescope received the signal from the Moon that conveyed this event to millions of TV sets world-wide.
For this achievement, the international engineering body, IEEE, has granted Australia's first ever IEEE Milestone. IEEE Milestones are considered world heritage items in Science and Technology, recognised by IEEE for their historical technical significance and achievements.
The IEEE is the world's largest global professional association for technology (previously also known as the Institute of Electrical and Electronic Engineers) with about half a million members worldwide.

Celebrations of the Parkes Milestone are being planned in Parkes and around from August 2019.

In May 2019, IEEE Board of Directors approved the new milestone with the following citation:

**"Reception of First Communication to Earth from a Human Walking on the Moon, 1969:
The Parkes radiotelescope and Honeysuckle Creek stations in Australia received voice and video signals from the Apollo 11 moonwalk, which were redistributed to millions of viewers. Parkes' televised images were superior to those from other ground stations, and NASA used them for much of the broadcast.
One of the first radio telescopes to use the newly developed corrugated feed horn, Parkes became the model for the NASA Deep Space Network large aperture antennas."**

This milestone was proposed by the IEEE New South Wales history committee, supported by the IEEE Antennas & Propagation Society, and has now been accepted.

The visitors centre at Parkes Observatory is open to the public 7 days a week.

It is located 20 kilometres north of Parkes town, off the Newell Highway (the main highway between Brisbane and Melbourne) and approximately 370km from Sydney.

From the dedicated viewing area, you can watch as the dish moves, controlled by astronomers as they explore the Universe.

A 3D theatre shows a 30 minute program of short 3D films. An AstroKids Scavenger Hunt is suitable for students 7–14 years of age and takes about 30 minutes to complete.

The award-winning Dish Café is open for breakfast and lunch every day.

Fig 2: The Parkes site has been recognized as a National Engineering Landmark for its involvement in the Apollo 11 moon landing.

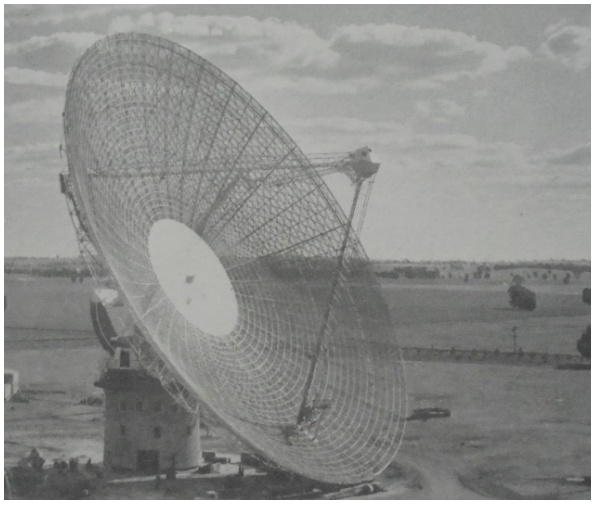


Fig 1: The 64m Parkes radiotelescope is in farming country in far-western New South Wales far from radio noise sources.

About the Landing

On July 20th 1969, as astronaut Neil Armstrong set foot on the moon and said, “one small step for man, one giant leap for mankind”, the video signal from the moon was being received by NASA's antenna at Honeysuckle Creek near Canberra [1] and shortly after by the Parkes radiotelescope. This provided signals conveying one of humanity's most significant achievements, namely the first moon walk. The pictures were distributed to millions of people watching here on earth (editors note – I was one of them).

It is this historical episode, as well as of the major technical achievement of the Australian stations that allowed this to happen, that justify the recognition.

In coming into land, the lunar module, piloted expertly by Armstrong, skirted over a boulder field and landed safely in the Sea of Tranquillity [2].

After Armstrong and Aldrin had landed and had checked out all systems, the original intention had been for them to rest for about 8 hours and then explore the surface nearby. By that time the main receiving station at Goldstone, CA would have been in view to receive signals from the moon.

Understandably, the astronauts were keen to get out and explore, so sleep was out of the question. It was decided by Mission Control that they should venture out of the landing module sooner than planned.

During the broadcast of the first moon walk, NASA initially alternated between the signals being received from its two stations at Parkes and Honeysuckle Creek, searching for the best quality picture. A little under nine minutes into the broadcast, the Parkes signal proved superior.

NASA stayed with Parkes as the source of the TV for the remainder of the five-hour broadcast.

The overall technical achievement of the moon landing was immense. On the communications side [4], signals in S-band were used for continuous tracking information, analog voice transmission and digital data transmission between spacecraft and earth when line-of-sight viewing conditions existed. The Apollo telecommunications system consisted of special equipment on board the command and service module (CSM) and the LM, and the Manned Space Flight Network (MSFN) provided a variety of communications and tracking functions that fulfilled these requirements. In addition, this

system had to have a capability for television transmission from the lunar surface.

Ground stations in three countries - including Australia - were used to support the Lunar Module's powered descent and TV transmission from the moon's surface. The Parkes radiotelescope, along with NASA's antenna at Honeysuckle Creek, was chosen to be part of the earth receiving network and these stations were fully equipped to communicate with Apollo 11. At that time, signals from the Lunar Module (LM) were being received simultaneously by the 64-metre Goldstone antenna in California, the 26-metre antenna at Honeysuckle Creek in Australia [1], and the 64-metre radiotelescope at Parkes [3].

The NASA Honeysuckle Creek station has now been dismantled. The Parkes radiotelescope is still an operational observatory and the site has been recognized as an Australian National Engineering Landmark as shown in Fig. 1.

Development of Parkes

The Parkes radiotelescope pictured in Fig. 2 is a unique instrument. It was commissioned in the late 1950s by CSIRO who set very tight specifications [3]. Freeman, Fox and Partners of London prepared a design that met these requirements and it was fabricated by Machinenfabrik Augsburg Nurnberg AG (MAN).

The driving force behind this telescope was Taffy Bowen FRS, who had very high standing because of his involvement in early radar on aircraft [5]. Amongst other things, he had carried the secret and vital component of radar, the high-power magnetron, to the US as part of the Tizard mission early in WWII.

Later, as a Chief of the Radiophysics Division at CSIRO, he was able, through his American contacts, to raise more than 40% of the cost of the telescope from the Rockefeller Foundation and the Carnegie Corporation in the United States.

Bowen wanted a steerable dish comparable in size with, and more accurate than, the 250 ft Mk I radiotelescope at Jodrell Bank in the UK, which had been completed in 1956 and was the first large steerable reflector telescope. Parkes was used as a test bed for several future radiotelescopes, then in the planning stage.

It has several unique technical features including a master equatorial - designed by Barnes Wallis FRS of WWII dam-busters fame - located in the column in the concrete tower supporting the telescope. The dish is 'slaved' to follow its master, which could be programmed to follow a celestial track and thus control the direction of the telescope. CSIRO scientist Harry Minnett was seconded to Freeman-Fox in London during the design phase where he made some unique contributions to the antenna structure.

The Innovations

ne contribution was that the parabolic dish at Parkes has a longer focal length than the one at Jodrell Bank. The focal-length to diameter ratio (f/D) of Parkes is about 0.41, which subtends a half-angle from the focus to the rim of 62.69° and allows more efficient horn feeds to be used. Minnett and co-worker Bruce Thomas undertook an improved and detailed analysis of a parabolic reflector and this influenced the design of Parkes and predicted the aperture field of the feed for a conjugate match at the focus [6]. This led to their development in 1966 of the corrugated feed horn for Parkes [7-8] as shown in Fig. 3. The corrugated horn has, since the 1970s, become dominant in large ground station applications. Both features and some others were first used on the Parkes radiotelescope. As well, for

the Apollo program, the original inner ring of solid panels shown in Fig. 2 were extended outwards to cover about two-thirds of the dish and this improved Parkes' signal-to-noise ratio. Therefore, in 1969, the Parkes radiotelescope was superbly equipped to receive the small signals under adverse local weather conditions.

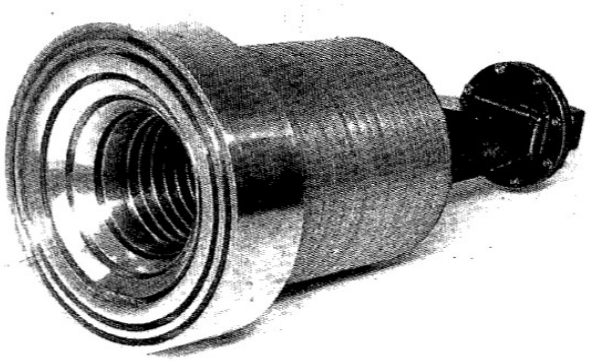


Fig 3: The first Parkes corrugated feed horn [7].

During the moonwalk, the reception at Parkes took place in very high winds gusting to 110 km/h (68 mph) at 60 degrees inclination, risking damage to the dish, to keep the antenna pointed at the Moon. A fictionalized account of Parkes' role in the moon landing is dramatized in the movie 'The Dish' [9].

Other improvements over the years include further resurfacing of the dish, a larger focus cabin, stronger struts, a rotatable feed mount, and a 13-element multibeam feed [10] to complement new high-performance feeds.

Conclusion

When a human being first stepped onto the surface of our Moon, there was international earth station receiving network that made this singular event possible.
In Australia, the receiving stations were the Parkes radiotelescope, along with NASA's antenna at Honeysuckle Creek near Canberra. Although Honeysuckle Creek took the first seven minutes, Parkes was the source of the remainder of the 5-hour TV broadcast from the Moon.

Parkes was used as a test bed for several future radiotelescope then in the planning stage. It has several unique technical features including a master equatorial that followed a celestial track for controlling the direction of the telescope. It has a longer focal length giving a focal length to diameter of 0.41, which allowed more efficient feeds to be used in a front-fed position. A detailed study of the focal region fields of a parabola led to the development of the corrugated horn feed, which has now become commonplace in earth station applications.

The Parkes radiotelescope and Honeysuckle Creek stations in Australia received the telemetry from the Lunar Module "Eagle", including the first television pictures from the first moonwalk for distribution to millions of people on Earth. Parkes' TV picture quality was superior to those received at the other ground stations, therefore NASA used Parkes as the TV source for all but the first nine minutes of the over 5 hours of the TV broadcast. The Parkes radiotelescope is historically important for its contribution to the first Moon landing as well as its design and for the corrugated feed horn first used at Parkes.

ACKNOWLEDGMENT

The authors wish to thank John Sarkissian and Mal Smith and of CSIRO for their comments and supply of Fig. 1.

REFERENCES

- H. Lindsay, 'Honeysuckle Creek Tracking Station: 1967–1981: Apollo 11', https://honeysucklecreek.net/msfn_missions/Apollo_11_mission/hl_apollo11.html.
- J. Hansen, 'The First Man', Simon & Schuster Ltd, 2018 ISSBN: 9781471177873.
- B. Collis, 'Fields of discovery: Australia's CSIRO', Allen & Unwin, Crows Nest, Australia , 2002, pp. 386-400.
- H.R. Rosenberg (ed.), 'Apollo experience report- S-band system signal design and analysis', NASA Report, Washington DC, Mar. 1972.
- E.G. Bowen, 'Radar days', Adam Hilger, Bristol, UK, 1987.
- H.C. Minnett & B. McA. Thomas, 'Fields in the image space of symmetrical focusing reflectors', Proc. IEE, Vol. 115, pp. 1419-1430, Oct. 1968.
- H.C. Minnett & B. McA. Thomas, 'A method of synthesizing radiation patterns with axial symmetry', IEEE Trans. Antennas Propagat, Vol. AP-14, pp. 654-656, Sept. 1966.
- T.S. Bird, 'The early development of corrugated horns', IEEE Antennas & Propagation Society Symposium, Puerto Rico, USA, 27 June - 1 July 2016, pp. 1009-1010.
- The Dish', Roadshow Entertainment & Warner Bros movie, 2000, https://en.wikipedia.org/wiki/The_Dish.
- L. Staveley-Smith,W.E.. Wilson, T.S. Bird, M.W. Sinclair, R.D. Ekers, & R.L. Webster, 'The Parkes 21cm multibeam receiver", in D.T. Emerson & J.M. Payne (ed.), "Multi-feed Systems for Radio Telescopes', Astronomical Society of the Pacific Conference Series, Vol. 75, 1995, pp. 136-143.

IEEE EDUCATION SOCIETY WORKSHOP

A MELANGE OF INDUSTRY SPEAKERS AND UNDERGRADUATE STUDENTS

11TH APRIL 2019

IEEE Education Society, NSW Chapter organized a workshop titled 'A melange of industry speakers and undergraduate students' on 11th April. This workshop was intended for the undergraduate students. It is often found that the undergraduate students have limited interaction with the industry and there is little connection between what they study in their curriculum and what is being done in the industry. To give a current industry perspective, we persuaded three industry speakers to talk to students and recent graduates who are interested in the Automation and Control Industry.

This workshop was intended to inform undergraduate students and recent graduates about the hardware and software tools commonly used in the industry, along with hints about the skill sets they might acquire to make them more attractive to the Automation Industry.

The three speakers were **Pankaj Yadav (Power Control Area Manager NSW, Rockwell Automation), Nick Psahoulias (Managing Director, Beckhoff Automation Pty Ltd) and David Gardner (COO, Robohelix Pty Ltd).** The workshop was well attended by students from different universities across NSW such as University of New South Wales, University of Technology Sydney and Macquarie University.

A few academics also took part in the event.

We would like to share a few photographs from the workshop:

Nomination Form for one position in the IEEE NSW SECTION

Section Executive Officers to be elected by electronic vote (by the Members);
Elected positions by Chapters and Affinity Groups (Chair/Vice Chair/Secretary/Treasurer);
Non-elected positions (appointed Officers).

Closing date Friday 31 August 2019 midnight

NOTE: Chapter and Affinity Group Committee Executive positions are elected by the respective Chapter Members.

Nomination Form Instructions:

Before completing the form, review the following guidelines for nominating a volunteer Candidate:

(a) Nominators must contact their nominee before submitting the form and confirm their acceptance of the time and other commitments required for the position.
(b) Nominees must have had at least 2 years on the Committee to nominate for the key positions of Chair, Vice Chair, Treasurer and Secretary.
(c) Nominees for Section Executive positions should be Senior Member or higher
(d) Self nominations require the submission of additional information e.g. CV or SMIEEE referee
(e) If you are nominating for more than one position, separate forms should be submitted.
(f) Please note the closing date, completed forms to be emailed to:
Mahmoud Elkhodr
Email: elkhodr@gmail.com

Nominee Contact Information
Given Names:
Surname:
IEEE Email or
other address
Address Line 1:
Address Line 2:
Address Line 3:
IEEE Member No.
POSITION SOUGHT:

Nominator Contact Information
Given Names:
Surname:
IEEE Email or
other address
Address Line 1:
Address Line 2:
Address Line 3:
IEEE Member No.

Industrial Visit: An IEEE Opening doors Initiative

Exposure to industries is a key component for any graduate and post graduate degree. It not only expands the horizon but also creates a whole new world of opportunities and springs innovative ideas in the inquisitive minds of future young professionals.

Our IEEE student branch organized an Industrial visit to ResMed as a part of IEEE opening doors initiative. The event was a huge success with full participation and everyone enjoyed the wonderful manufacturing tour. The interactive product exhibition was, and presentations captivated the audience. A peek into the platform that solves real world challenging problems is a revelation.

This was one of the most challenging venture of our student branch and it turned out to be extremely rewarding. Students from almost all the university in New South Wales participated and we had support form all other student branches. A huge thanks to ResMed at Bella Vista and Mr. Adam Panerello for opening the doors of the industry for academia.

Submitted by: Khushboo Singh

Circuit simulation of switching power converters using GaN device models

Macquarie University is well known for its innovative research. One such project is outlined here.

The EDAC research group at Macquarie University's Engineering department is actively involved in creating device models for the next generation of state of the art, III-V semiconductors.

ASM-GaN is such a model which has been developed by Prof. Sourabh Khandelwal, who heads the EDAC group. In this work, they measured and modelled the I-V and (ON and OFF state) and C-V characteristics of a commercial SMD (Surface Mounted Device) GaN transistor the PGA26E19BA. Using this model, they were able to run simulations of a DC-DC boost converter design at two different switching frequencies.

Designers can use this model for their specific power converter circuit topology to compare different devices from different manufacturers, by extracting the different sets of model parameters that describe those different devices. This can be used to select the best device for the specific power converter topology for a specific application.

Submitted by : Dhawal Mahajan

IEEE NSW WIE – Share-To-Inspire Series

Share-To-Inspire series is IEEE NSW WIE initiative, started in 2017, with the aim to outreach to high school girls and motivate them to join STEM careers, with the help of the workshops and role model events.

As part of the project, we have also started collecting the role-model stories which are published on IEEE NSW WIE affinity group website, and are shared with the high school students.

IEEE NSW WIE is calling for inspiring stories from all IEEE women members. Your story, journey of STEM can help in inspiring future generation. Please send your story to naila.mukhtar@mq.edu.au. The published stories are available on IEEE NSW WIE website, link given below.

http://sites.ieee.org/nsw-wie/activities/success-stories/.

Submitted by: Naila Mukhtar (Vice-Chair, IEEE NSW WIE Affinity Group)

MQ WIE Leadership Summit at Macquarie University

IEEE Macquarie University (MQ) WIE Affinity Group organised a "MQ WIE Leadership Summit", in collaboration with local MQ WIE group on 15-April-2019, for the students and staff members of Macquarie University, and the IEEE MQ Student Branch provided voluntary support. The summit provided an opportunity to the participants to develop their leadership skills. There were over 70 participants.

The whole day event consisted of two sets of sessions with the first session targeted at industry and the second directed at academia.

The industry session opened with a keynote talk from Ms. Tracey Gramlick (Senior Analyst, CSIRO). In the afternoon session Professor Rose Amal (Scientia Professor and ARC Laureate Fellow at University of New South Wales) presented an inspiring talk about leadership lessons learned. Prof. Candace Lang shared her views about gender diversity and highlighted the need for WIE groups at local and global level.
Both keynote talks were followed by panel discussions with the theme of "Leadership in Industry" and "Leadership in Academia" respectively.
A diverse range of panel members from Academics and Industry took art in the discussions. Panel members shared their exciting experiences and gave tips on how to be a good leader. Prof. Darren Bagnall, Dean School of Engineering at Macquarie University, who was one of the panel members in afternoon panel discussion, talked about the ways he has strengthened and enhanced equal opportunity and diversity friendly policies at School of Engineering over the past year. Others who on the panel included Mellissa Hardtke (Integration Leader Raytheon Australia), Anna Gao Channel Manager (Huawei Technologies), Elizabeth Tosti (Sector Director Safework NSW), Jane Rapsey (Department Manager, Cochlear), Prof. Min Chen RC CoE (Node Leader, University of Sydney), Prof. Francesca Iacopi (Head of Communications and Electronics, UTS), Dr. Sophie Primig (Senior Lecturer and DECRA, UNSW), Dr. Shuying Wu (Senior Lecturer and DECRA, Macquarie University).

Submitted by: Naila Mukhtar (Chair, IEEE MQ WIE Affinity Group)

IEEE Women In Engineering (WIE) Activities at Macquarie University

The IEEE Women In Engineering affinity group at Macquarie University has organised several events in the first six months of 2019 to support Women in STEM, including undergraduate, postgraduate, and staff members working at Macquarie University.

In February, IEEE Macquarie University student branch and WIE AG welcomed first year engineering students. This event provided a chance to promote the IEEE and explain the benefits of being an IEEE member.

An event was organized, on 11-March-2019, International Women's day, to celebrate the achievements of women in STEM. This role-model event is intended to increase the motivation and retention of women in STEM. It also provides a networking and meetup opportunity for the Macquarie University community.

The speakers at the event included early-career researchers and renowned senior professors. Prof. Judith, Prof. Shoba, and Prof. Candace talked about their career paths and shared the valuable experiences and lessons encountered along their STEM journey. Dr. Fatemeh and Dr. Noushin shared their views about the positive research environment and emphasised that failures are a necessary part of the learning process.

IEEE MQ WIE Executive Committee Members - 2019

The event was attended by primarily members of Faculty of Science and Engineering. Almost half of the attendees were IEEE members. This successful event enabled us to promote IEEE more effectively and we expect that it will help in our IEEE Membership drives in future.

The IEEE Macquarie University (MQ) WIE Affinity Group organized “MQ WIE Leadership Summit”, in collaboration with local MQ WIE group on 15-April-2019, for the students and staff members of Macquarie University, and was supported by IEEE MQ Student Branch. The summit provided an opportunity to the participants to develop their leadership skills. There were over 70 participants. This was a whole day event with two keynote speakers and two productive panel discussions.

MQ WIE provided volunteer support for an outreach event on the 18-April-2019, organized by the MQ School of Engineering to promote STEM to high school students,. The outreach was titled "MQ in a Day" and purpose of the event was to give a glimpse of engineering to high school students. Students got a chance of having hands-on experience with the bio-medical projects. They were amazed to see how EMG signals can be used to control the robotic arm. Reading the brain signals (EEG) was another hit of the event. For further detail about the past and upcoming events, please visit MQ WIE website and follow IEEE MQ WIE on social media - links given below.

Website: https://edu.ieee.org/au-wiemq/
Facebook: https://www.facebook.com/wiemq/
Twitter: https://twitter.com/IEEEMqWIE
Instagram: https://www.instagram.com/ieeemqwie/

Submitted by:
Naila Mukhtar (Chair, IEEE MQ WIE Affinity Group)

The Social Implications of Technolgy

There has been much concern after the Christchurch shootings with the role played by social media in spreading hate speech and, in particular, promoting video of the shooting.

SSIT ran a series of talks in Sydney, Melbourne and Brisbane, featuring Dr Andre Oboler, CEO of the Online Hate Prevention Institute to explore responses. The challenges are technical (identifying material for removal), societal (the role of NGOs and interfaces with government and corporates), ethical (our own obligations as individuals) and legal (can/how should regulation work in this space).

SSIT also made a submission in response to the *Discussion Paper on Artificial Intelligence: Australia's Ethics Framework* that was developed CSIRO's Data61. The submission emphasised the need for greater social contextualisation of AI – understanding ethics as something more than legal principles, understanding the likely differing impacts of AI on sectors of the community, and cautioning against conceptualising AI as having moral agency.

SSIT aims to bring technical and other professionals together to discuss complex socio-technical challenges such as those presented by hate speech on the Internet. Any IEEE member is welcome to join – just tick the box when you renew your membership.

Kieran Tranter (Chair), Lyria Bennett Moses (NSW co-ordinator), Michael Guihot (Deputy Chair)

UNSW Sydney Student Branch

The UNSW has recently revived its IEEE Student Branch, and we would like to take this opportunity to extend a warm welcome to our student members, and to outline the exciting opportunities offered by the branch.

The main aim of our student branch is to act as a liaison between the broader IEEE community and our students and to ensure that all the student-based opportunities and events to be held are advertised to the potential student participants and audiences, and to further strengthen the relationship between university and industry. We hope that by encouraging students to attend and participate in these events, they will get valuable experience in applying the skills and the knowledge gained in their university courses, and further encourage the burning passion of students to acquire technical knowledge that could advance humanity.

We aim to host technical seminars showcasing work conducted in different fields. We have hosted two technical seminars this year, namely *Motion Control using Program Logic Controllers (PLCs)* by Dr Budhaditya Majumdar and *Introduction to Electronics and PCB Design* by Mr Sam Wallace. It was inspiring to hear the enthusiasm both our speakers expressed about their lines of work and they provided valuable insights into where they believe the future of their field and broader engineering will be in the future. Both events were well-attended, and it was especially encouraging to see a large cohort of enthusiastic undergraduate students join us and actively participate in the discussions.

Our events calendar for the remainder of the year includes more technical seminars and workshops (e.g. an introduction to competitive programming), IEEEXtreme, and other social events to encourage networking between our student members. The aim of these events is not just to increase the students' technical knowledge, but – just as important - to give them a wider perspective on the interconnectedness and mutual importance of different technologies. We encourage all students, especially coursework and research students, to support us in our endeavours by attending and taking part in our events.

Submitted by Madhuvanthi Muralidharan and Luke Sy

Figure 1 Intro to Electronics and PCB Design seminar

Figure 2 Demo during Motion Control PLCs seminar

Digital Twins - the Role of Real-time simulation in Modern Power Systems

On the 3rd of May 2019, the IEEE NSW PES Chapter together with the joint Power Electronics, Industrial Electronics and Industry Applications chapter hosted,, a lecture by Dr. Jean Belanger, CEO and CTO OPAL-RT Technologies in Canada.

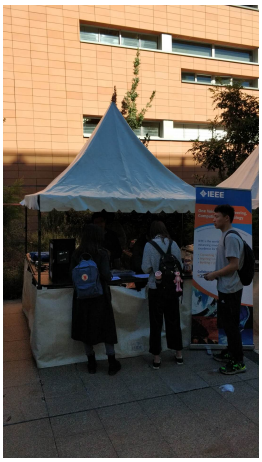
The topic of the lecture was "'Digital Twins': How Real-Time Simulation is Helping Create the Power Generation, Power System Control and Management and Cybersecurity Solutions of the Future". The event attracted more than 40 attendees from across Sydney and generated a lot of discussion on the role of real-time solutions in modern and future power systems and power electronics. We would like to thank Bruce Lehman and Simon Buchwald of ECADtools in Sydney for their help with organising the event.

IEEE at the 2019 UNSW EET Industry Night

The School of Electrical Engineering at UNSW Sydney run its 2019 Industry night with the participation of more than 25 local companies and attended by more than 200 students. The event was a great opportunity to also visit the newly completed second stage of the EET Building at UNSW Sydney. IEEE was present both as a NSW Section (Tony Zaglas, Colin Elston and Georgios Konstantinou) as well as the newly formed and highly active IEEE UNSW Sydney Student branch (represented by its chair Luke Sy and vice-chair Ricco Pradama).

IEEE UNSW Student Branch Joins Week 1 Showcase

The UNSW student branch joins the activities during Week 1 of the second term at UNSW and engages with undergraduate and postgraduate students across the whole university about the activities of the IEEE and the local student branch. See also page 18



IEEE UNSW Student Branch Workshop

"Thank you Sam Wallace of Thales for sharing your experiences around electronics and PCB design (many of the design stories were just on a mindblowing scale). I am pretty sure many of the students left the room with a renewed passion for electronics, are encouraged to study harder, and will definitely take regulations seriously to avoid the worse-than-jail experience."
The presentation is available at IEEE UNSW's facebook page:
https://www.facebook.com/IEEEUNSWSB/videos/1253623838153531/

PES Conferences around R10
The 2019 IEEE PES Asia-Pacific Power & Energy Engineering Conference (APPEEC 2019) is scheduled from the 1st to the 4th of December in Macao.

More information at: http://www.ieee-appeec-2019.org/

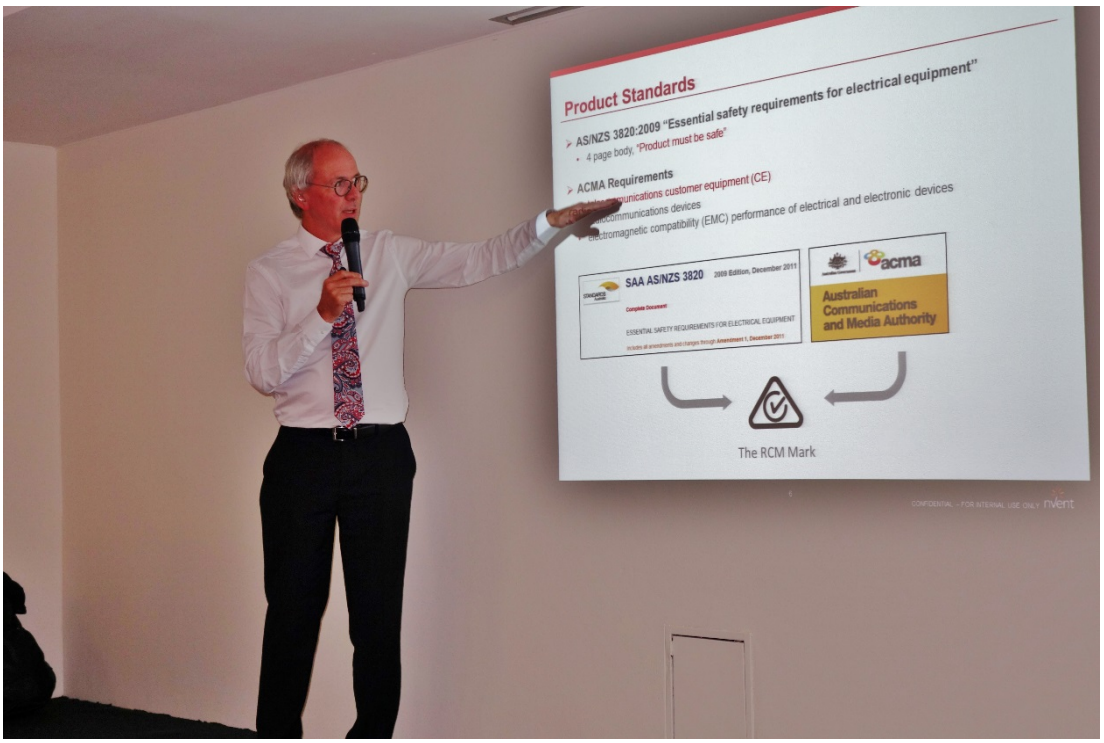
The 2019 9th International Conference on Power and Energy Systems (ICPES 2019) will take place in Perth, Western Australia from the 10 – 12 December 2019. ICPES 2019 will provide a forum for academics, university researchers and industry experts in power engineering to share ideas and experiences, and discuss innovations.

Full Paper submission due date is the 17 July 2019.

More information can be found at: http://www.icpes.org/cfp.html

Joint Institutions Lecture Series – Surge Protection

On 26 March 2019 Phil Jones, Principal Engineer ERICO and Chair of SAA Surge Arrester Committee EL007-03, delivered a lecture on the Essential Elements of Surge Protection.



Topics covered included

Australian Standards AS/NZS 3000, AS/NZS 4070, AS/NZS 4117, AS/NZS 3100 , AS/NZS 3820 and AS 1768.

Also discussed were the changes to IEC 61643-11 and some of the consequences.

There is no Australian Surge Protection Testing Standard and each manufacturer has their own set of tests, and the UL Standard is not relevant to Australia

IEC 61643-11 covers Testing of Surge Protection Devices including;

Voltage Clamping Level, Operating Duty, Temperature Withstand, Thermal Stability, Short Circuit Current behaviour, Temporary Overvoltage(TOV) Levels

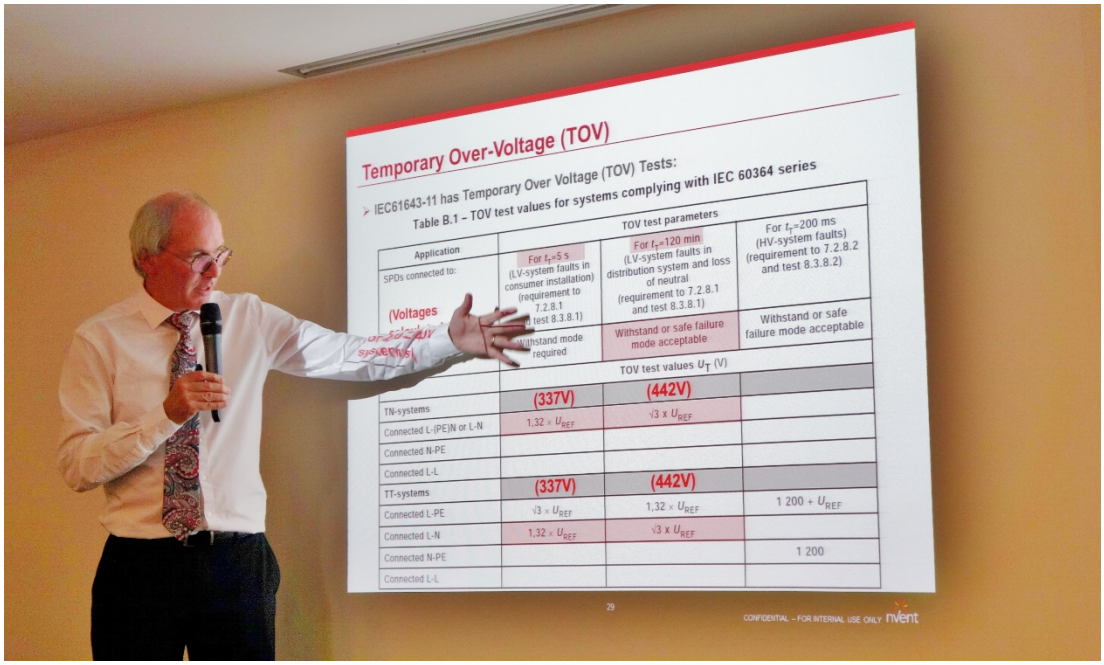
The various Classes of Lightning Protection Levels were explained as well as specifications and markings.

Connecting cable sizes(set by fuse rating) and lengths(between 0.5 and 1m max) were dictated.

As 1768 Draft is being prepared and is to be available in several weeks.

Recommended inspections every 12 Months or after lightning strikes.

Multi-stage surge protection devices are available for sensitive electronic equipment.



There were numerous questions at the end of the lecture which the presenter did answer. The presenter kindly indicated that the presentation would be made available to attendees.

Submitted by Tony Zaglas

New and upgraded Members of the NSW branch of the IEEE

Fellows

We have one new Fellow - Professor Yonghui Li - and we gave him half a page in the March issue of Circuit

Life Fellows

We have three new (or up-graded) Life Fellows

Dagan Feng, Robert A Minasian and Professor Branka S Vucetic

Senior Members

We have thirty-one new or up-graded senior members. Sherry Moghadassi is active in the NSW executive committee, who did encourage her to up-grade to Senior Member.

Eliathamby		Ambikairajah	Mohsen		Asadnia
Boualem		Benatallah	David	I	Farrant
Jahan	A	Hassan	Min-Hsiu		Hsieh
Shoudong		Huang	Md. Rabiul		Islam
Rafiqul		Islam	Yinan		Kong
Euan	David	Lindsay	Justin		Lipman
Haiyan		Lu	Ke		Meng
Peter	L	Mirtschin	Sherry		Moghadassi
Richard	Scott	Morrison	Andrew	S	Mowbray
Diep	Ngoc	Nguyen	Stephen	John	Palmer
Adam	M	Panarello	Ha	Ngoc	Pham
Mukesh		Prasad	Pei-Yuan		Qin
Andrey		Savkin	Gary	C	Speechley
Yan		Wang	Xiaofeng		Wu
Ping		Yu	Basit	Ali	Zeb
Minjie		Zhang			
Mohammad Mahmoud Jamil		Abuhilaleh			

Life Senior Members

We have six new life senior members – they aren't so much up-graded into this role as have survived long enough to get moved into it. Ollencio D'Souza is a decidedly active member, deeply involved in standards.

Charles	A	Barrett	Ollencio	R	D'Souza
Ian	M	Davis	Kenneth	R	James
Harry	A	Schnapp	Jennifer	R	Seberry

Members

We have 247 new or up-graded members. Naila Mukhtar is one of them who is active (and has a couple of articles in this edition of Circuit). Dushmantha Nuwan Prasanna Thalakotuna is another – he is our secretary again this year. The pressures of fatherhood get reduced as the new child sleeps for longer stretches.

Rana		Abbas	Mahmoud		Abdolhoseini
Mohammad	H	Aghdaei	Pasquale		Aliberti
Mohammed	Ajaz	Alikhan	Hugo	Erick	Allca
Mojtaba		Amjadipour	Neil	William	Anderson
Affan	Aziz	Baba	Joonsang		Baek
Anthony	J	Bagala	Derek	R	Bailey
Keith	W	Bannister	Wei		Bao
Justin		Barbour	Timothy	J	Batten
Meriam Gay	Valdendez	Baustista	Allen	M	Benter
Graeme	S	Booker	Mounir		Boudali
Paul	P	Breen	Scott		Calvert
Catherine		Chan	Archie	Carl	Chapman
Siyuan		Chen	He		Chen
Huaming		Chen	Eva		Cheng
Hon	Wah	Cheng	Joon		Cheong
Mudiyanselage	S	Cherath	Anamul	Quader	Choudhury
Wai	Tony	Chung	Philip		Chung
Yuk	Y	Chung	Brett		Cleaves
Steven	Guy	Clifton	Andrew	James	Cook
John	A	Cooper	Nectarios		Costadopoulos
Adelle	C	Coster	Alistair		Craib
Anthony		Cross	Ting		Dang
Nicolas		Darmanthe	Ahmed		Dawoud
Greg		Delforce	Oliver		Diessel
Eugene		Doma	Katryna		Dow
Michael	H	Drewry	Serdar		Erozan
Eric	Leonard	Ferguson	Andrew	J	Fleming
Mark	B	Freeman	Paul	G	Fudge
Oliver		Fuller	Emmanuel		Galanos
Ziba		Gandomkar	Zhankui		Gao
Gabriel		Garcia	Eleanor		Gates-Stuart
Lawrence		Gatt	Ravinder	Singh	Goraya
Gregory	J	Gowans	Stephen	J	Graham
Marie-Claude		Gregoire	Philip		Gun
Hemantha		Gunasinghe	Alexander	Ludmilov	Hadjiivanov
Ferhat		Hajdarpasic	Gerrit		Hattingh
Fengxiang		He	Warwick		Hehir
Chun	Hin	Ho	Van	Truong	Hoang
Adrian		Hobbs	Jane	Maree	Hogan
Zhanwei		Hou	Matthew	Gregory	House
Zhaocheng		Huang	Shujuan		Huang
Alfredo		Huete	Peter	F	Hull
Farookh	Khadeer	Hussain	Muzaffar		Hussain
Ibrahim	Anwar	Ibrahim	Ocha	Edwin	Ikwu
Matthew		Imhoff	Reenu	Tresa	Jacob
Mohammed	Ahmed	Jaddoa	Mohammad		Jafari

Muhammad		Jafer	Hiranya	Samanga	Jayakody
Sachini	Nisansala	Jayasooriya	David	R	Jeffery
Michael		Johnson	Prakrit		Joshi
Yuba	Raj	Kafle	Jignesh		Kakkad
Prabath		Kamalasena	Basanta		Kandel
W		Keerthipala	Marcus		Khan
Arash		Khatamianfar	Say	H	Khor
Gary	J	Kopff	Maria		Kovaleva
Divesh	Noel	Lal	Sarah		Lawrie
Janine	Frances	Lea-Barrett	Dong-Hoon		Lee
Claire		Leong	Tuo		Li
Weihua		Li	Peter	C	Li
Binghao		Li	Xiao		Li
Wenda		Li	Kuldip		Limbu
Yang		Lin	C	X	Lu
Sam		Lumley	Yuyue		Luo
Lingjuan		Lyu	Likai		Ma
Simon		Ma	Jianbo		Ma
Kenneth		MacCormick	Iain	F	Macgill
Susanna		Mann	Stefan		Martin
Darren L		Maybour	Allan	James	McCarthy
David	J	Mckenzie	Paul	J	Mcmahon
Joe		Messiter	David	W	Moore
Paul	W	Morrison	Pablo		Moscato
Naila		Mukhtar	Md Nafiz	Nafiz	Musarrat
Ganesh		Muthusamy	Rahim		Mutlu
Siavash		Nasr	Muhammad	Kashif	Naveed
Huyen		Nguyen	Mehdi		Nobakht
Nasimul		Noman	Milan		Obradovic
Chigozie	Christopher	Orji	Devinder		Pal
Yuxin		Pan	Madhav		Pant
Mira		Park	Seung	Bae	Park
James	Kenneth	Parlevliet	Xueping		Peng
Minh	Nguyet	Pham	Linh		Pham
Ha	Tran Hong	Phan	James		Phung
Pallab	Kanti	Podder	Hanieh		Poostchi
Himath		Priyananda	Min		Qiu
Fassahat	Ullah	Qureshi	Alireza		Raghami
Amin		Rajabi	Vishal		Rana
Nitin	Darshansingh	Ranka	C. M.	F. S.	Reza
Abish		Rishal	Tim		Robins
Gustavo	Andres	Romero	Abel	Kevin	Rop
Fiacre	Emile	Rougieux	Sharon	Mahipal	Roy
Abhish		Saha	Deepak	S	Sahay
Robert	Shuhdi	Salam	Eduardo	B	Sandoval
John	M	Scott	Farzana		Shabnam
Mohammad	Mousa	Shalby	Paul	William	Simmons
Jamie		Simonsen	Shreya		Singh
Inderbir		Singh	John		Slowey
Stuart	Trevor	Smith	Neethu		Sreenivasan
Jean-Luc		Stevens	Peter	L	Storey
Thavanathan		Sujendan	Peter	Thomas	Svehla
Corey		Sylvester	Nhi		Ta

Emiel		Temmerman	Dushmantha Nuwan Prasanna Thalakotuna		
S		Thiruloganathan	Farzad		Tofigh
Thuy Linh		Tran	Kwok		Tsang
Faisel		Tubbal	Ambre		Umair
Gary	Vincent	Valdez	Michelle		Vaqueiro Contreras
Benoy		Varghese	Velimir		Vujnovic
Louis		Wang	Peng		Wang
Jianguo	Jack	Wang	Huogen		Wang
Yishun		Wang	Shuyang		Wang
Meiyu		Wang	Morgan		Wegener
James	S	Welsh	Yan		Wen
Andy		West	Mark		Whitty
Dean	J	Wild	Thein	Moe	Win
KinWah		Wong	Taras		Woronjanski
Penjie		Wu	Dan		Xiao
Xuekuan		Xie	Jingsong		Xu
Min		Xu	Ying		Xu
Xinzhi		Yan	Jie		Yang
Jiajia		Yang	Junnan		Yang
Yi		Yang	Yikai		Yang
Dong		Yuan	Alex		Zambrano
Wenjie		Zhang	Qian		Zhang
Wang		Zhang	James		Zhao
Vincent		Zhao	Liang		Zhao
Xi		Zhu			

Life Members

We have thirteen new life members

Basil	C	P	Borun	Harry	J	Dutton
Graeme	O		Ferry	Russell	G	Gough
Ross	C		Halgren	Colin	J	Healy
Michael	K		Lawrence-Slater	Claude J		Lecomte
G	John		Montagner	James		O'Sullivan
Bernard	J		Power	Bernard	L	Schaffler
Anil			Sharma			

Graduate Student Members

We have 295 new graduate student members

Mahrokh		Abdollahi Lorestani	Ojo	Daniel	Ademola
Hemraj		Adhikari	Naqash	Afzal	Afzal
Jignesh	Vikas	Agarkar	Basam		Ahmad
Awais	Ahmad		Foez		Ahmed
Al	Jumlat	Ahmed	Afroja		Akter
Majid		Al-Ali	Firas	Qais	Al-Doghman
Stefano		Aldini	Abdulaziz	Sulaiman	Alghazi
Haider		Ali	Hamzeh		Aljarajreh
Hamed	Saleh	Alqahtaniu	Mohammad	Khalid	Alsawwaf
Mir	Nahidul	Ambia	Uzma		Amin

Nadia		Anam	Shahzeb		Ansari
Maral		Ansari	Ernauli	Christine	Aprilia
Manisha	Dilip	Arde	Janindu		Arukgoda
Sara		Ashfaq	Rubin		Awale
Mohan	Sai Santosh	Ayyala	Mohammed	Abdul	Aziz
Graeme	William	Beere	Stefanos		Bekiaris
Julie	Stephany	Berrio Perez	Bishal		Bhandari
Arun		Bhusal	Tarriq		Bird
Yoann		Buratti	Maryam		Butt
Daniel	Gebbran C.	Bacilla Ferreira	Emerson		Cabrera
Yuanxin		Cai	Hua		Chai
Bikesh		Chaudhary	Yukun		Chen
Shu	Lin	Chen	Xuefeng		Chen
Xi		Chen	Ziqi		Chen
Voon	Yang	Chow	Yekaterina		Chshipunova
Thai Son		Chu	Charuka Senal Bandara		Damunupola
Kenneth		Davies	Bishal		Dewan
Rajesh		Dhungana	Raj		Dighe
Tian		Ding	Manqing		Dong
Xuanyi		Dong	Rui		Dong
Anan		Du	Rabin		Dulal
Rabin		Dulal	Soan Thi Minh		Duong
Amir		Ebrahimighahnavieh	Ayman	Ahmed	Elgharabawy
Asmaa		Elsaeidy	Yixi		Feng
Md	Meftahul	Ferdaus	Faizul		Firoz
Gilad		Francis	Kerl	Arnel	Galindo
Qishuo		Gao	Harshit		Garg
Ehsan		Gatavi	David		Gay
Pratul		Ghimire	Bikesh	Shrestha	Ghinangju
Matthew		Gibson	Yongshun		Gong
Andrew		Goodwin	Swaroop		Gopalam
Vivasha		Govinden	Amal Delpachchitra Arachchige		Gunatilake
Tharshini		Gunendradasan	Yang		Guo
Noman		Haider	Md	Shahriar	Haque
Faiazul		Haque	Claire		Hardgrove
Asraful		Hasan	Riasat	Farooq	Hassan
Touseef		Hayat	David		Henry
Mohammadhesam		Hesamian	Md.	Bellal	Hossain
Kang		Huang	Huaxi		Huang
Robin		Huang	Xiandao		Huang
Fernando		Huerta Monsivais	William	Ferrer	Infante
Mohammed	Arif	Iqbal	Tim		Jackson
Alice		James	Kamal		Jarada
Maleen	Nipun	Jayasuriya	Sadari	Samanmalie	Jayawardena
Lu		Jiang	Muchen		Jiang
Jiahui		Jiang	Chris		Johnathon
Grant	Alexander	Joslin	Thisandu	Dulhara	Kahingala
Peng		Kang	Nazmul		Kaonine
Kanyawee		Keeratimahat	Farshid		Keivanian
Asif		Khan	Md	Noman Habib	Khan
Muhammad	Talal Ali	Khan	Zaid	Ahmed	Khan
Tahsin	Ashraf	Khan	Shakil	Ahamed	Khan
Talaha	Ali	Khan	Safal		Khanal

Prajjwal	Khanal	Bijay	Khatri
Erfan	Khordad	Mst. Nishat Yasmin	Koli
Scarlet	Kong	Jianming	Kuang
Louis	Kwashigah	Samson	Lamichhane
Taiwo	Lawal	Anh Huy Tuan	Le
Thanh Hoang	Le	Ki Myung Brian	Lee
James Ju Heon	Lee	Chuangwei	Li
Wenxing	Li	Yaran	Li
Bo	Li	Zhibin	Li
Chai Shing	Li	Xiaohui	Li
Jun	Li	Yunfeng	Lin
Hengyu	Ling	Liyang	Liu
Feng	Liu	Tongming	Liu
Hangrui	Liu	Jiaqi	Liu
Tianqi	Liu	Shibo	Lu
Aijun	Lu	Boying	Luan
Zihan	Ma	Yiju	Ma
Dong	Ma	Pragyansu	Maharana
Sthitapragyan	Maharana	Subir	Majumder
Mohammad Mohiuddin	Mamun	Chenwei	Mao
Khawaja Fahad	Masood	Taye Tolu	Mekonnen
Musaib Mohtashim Ali	Mir	Jeihaan Devanshu	Modi
Nurul Izzah Mohammad	Afandi	Mak	Nazecic-Andrlon
Thi Vanh Khuyen	Nguyen	Phuong Thi Huyen	Nguyen
Minh	Nguyen	Shuai	Nie
Bairun	Nie	Zituo	Niu
Diego Ignacio	Ocampo Herrera	Danielle M	Ochangco
Chidinma	Okoye	Ilham	Osman
Juan	Ostos	Shankar	Pangeni
Bhagya Vijaykumar Parmar	Tirth Rasikkuma Patel	(one name)	
Oliver Hamish Catling	Paull	Yige	Peng
Nav	Phokela	Noushin	Poursafar
Aiswarya	Pradeepkumar	Michal	Rac
Kamrul Hasan	Rahi	Md Shamsur	Rahim
Zahra	Rahimpour	A M Mahfuz Ur	Rahaman
Md. Ashib	Rahman	Obaidur	Rahman
Md Lushanur	Rahman	Shahriar	Rahman
Pooja	Rai	Dilantha	Rajakaruna
Safdar	Rasool	Honglin	Ren
Javad	Rezazadeh	Patrick	Rufangura
Majid	Saeed	Subhash	Sagar
Martin	Sagradian	Surya Kumar	Sah
Animesh	Sahoo	Abubakar Sadiq	Sani
Pejush Chandra	Sarker	Avishkar	Seth
Faiza	Shabbir	Dhruvil Bijal	Shah
Abhishek Balaji	Sharma	Smriti	Sharma
Xiaowei	Shen	Wei	Shen
Zihao	Shi	Zhiyuan	Shi
Sujan	Shrestha	Kiran	Shrestha
Sarah Ali	Siddiqui	Sarvesh Kumar	Singh
Sonit	Singh	Suyesh	Singh
Tharmakulasingam	Sirojan	Connor	Stead
Robert Michael	Stephenson	Uthayakumaran	Subramaniyam

Heng		Sun	Lingling		Sun
Gajan		Suthokumar	Thanchanok		Sutjarittham
Binod		Syangtan	Xiuhui		Tang
liyun		Tao	Bharat		Thapa
Bikash		Thapa	Shakila	M	Tonni
Turker		Topal	S M Muslem	Muslem	Uddin
Gaurav		Vats	Alanna Heather Therese		Vial
Vishnu		Vijayakrishnan	Timothy	Arnie	Villafana
Nazar		Waheed	Shengyu		Wang
Bo		Wang	Yiquan		Wang
Qian		Wang	Clyde	Robert	Webster
Kaixin		Wei	Richard	Stephen	Winkler
Kang		Wu	Fan		Wu
Xinheng		Wu	Xiaowei		Wu
Jianqing		Wu	Yang		Yang
Haimang		Yi	Siqi		Yi
Yang		Yu	Arian		Zahedmanesh
Hijab		Zahra	Munazza		Zaib
Khawaja		Zain-Ul-Abideen	Mohammad		Zamani
Seid	Miad	Zandavi	Jingqi		Zhang
Yangyang		Zhang	Shuai		Zhang
Rui		Zhang	Juan		Zhang
Shisheng		Zhang	Chen		Zhang
Ruiheng		Zhang	Hao		Zhang
Tianhui		Zhang	Wenxuan		Zhang
Yan		Zhang	Wenjie		Zhang
Ruiwen		Zhang	Longji		Zhang
Zizhu		Zhang	Jiahong		Zhao
Luke		Zhao	Zeyu		Zhao
Lu		Zheng	Hengliang		Zhou
Fujin		Zhu	Yan		Zhu
Huiyao		Zuo			

Student Memebers

We have 104 new student members

Md. Mahmoud Jamil		Abuhilaleh	Sujan		Ale
Nicholas	Mark	Banic	Stepan		Bashkirov
Thomas		Battye-Smith	Robert		Bell
Timothy	David	Boye	Aaron	James	Bruchhauser
Linh	Phuong	Bui	Quang	Tu	Bui
Kaiyi		Cao	Huaning		Chen
James		Chiu	Patrick		Chiu
Esther		Chong	Matt		Christie
Ping		Chu	Joshua	Jacob	Clancy
Joachim		Copeland	Hayden	James	Crain
Max	Lang	Crittenden	Luke	William	Dart
Nicholas		Davies	Antoni		Dimitriadis
Leiping		Duan	Isaac		Dunne
Kirill		Duplyakin	Quintin	Edward	Dwyer
Isaac	Joshua	Falvey	Yimeng		Feng
Beau		Fleming	Michael	Luke	Fraser

Nabin		Ghimire	Luca	Ruben	Gonzalez
Xinyi		Gu	Yuzhe		Guan
Yuyu		Guo	Sai	Myat Myo Min	Han
Nicholas		Heath	Thao	Minh	Hoang
Jefferson		Hora	Heqing		Huang
Kaan		Kaban	Hocine		Karare
Julian	Robert	Keledjian	Zarraf		Khan
Abid		Khan	Vichai		Konangi
Linh		Le	Sheng		Li
Binglun		Li	Daniel	Shinyu	Li
Yihuan		Liao	Daichen		Liu
Yi		Liu	Zachary	John Maurice	Longe
Kevin		Lucas	Inesh		Manandhar
Luke		Marshall	Edward		Merewether
Kerrod		Meyers	Brendan		Morton
Alois		Murapa	Tammy		Nair
Pippy		Namana	Kioni		Ndirangu
Long	Hung	Nguyen	Ethan	Chia Sing	Oo
Logan	Dominic	Peters	Toriki	Thorvald Christophe	Pitt
Sanjeevan		Prabahar	Meilin		Qian
Yunke		Qu	Mohammad	Ahnaf	Rahman
Nirosh		Rambukkana	Kelly	Lee	Reid
Cheng		Shen	Pranish		Shrestha
Prashanna		Shrestha	Kiran		Singh
Rohan		Smith	Joel	Daniel	Smith
Nicole	Nathalie	Tan	Norman		Thien
Charlie		Tran	Alan	Le	Truong
Nigel		Venaruzzo	Henry		Veng
Myron		Wan	Chester		Wang
Viktor		Wang	Jamon		Windeyer
Alvin		Wong	Jingyao		Wu
Yongchao		Xu	Xinhong		Yang
Md.	Tanvir	Yeasin	Alex		Young
Steven		Yuen	Yu		Zhang
Zhihao		Zhang	Zhaorong		Zhang
Andy		Zheng	Yubo		Zhou

Associate Members

We have nine new associate members. Michelle Simmons is tolerably famous for her involvement in quantum computing and was Australian of the Year recently.

Sejeong	Kim	Junye	Li
Amirmohammad	Pasdar	Suranga	Seneviratne
Michelle	Simmons	Kaavya	Sriskandaraja
Lorenzo	Vigentini	Yucheng	Wang

Charika Sanjeewani De Alvis Weerasiriwardhane

Affiliate Members

We have eight new affiliate members

Susann		Beier	Khai	Van	Do
Oliver	James	Fletcher	Mak		Makielan
Ali		Parvini	Greg	John	Peters
Laura	Anne	Poole-Warren	Jian		Yang

Dr. Bruce Poon – e-mail adsphere@optusnet.com.au – extracted this data from the IEEE's SAMIEEE data-base. He has finally mastered the changed system and we should have shorter lists of name (less onerous to format) in every subsequent issue of Circuit.

Circuit is currently provided electronically from the IEEE NSW Section web site
http://sites.ieee.org/nsw/newsletters/
Members will be notified by email when a new issue is posted on the Website. Future copies of ***Circuit*** will only be sent by paper mail on request.

If you require Circuit to be mailed to you in 2019 please complete the form below:
Don't bother if you were already getting it by mail in 2018.
Please Detach

Yes, I want to continue receiving future editions of *Circuit* by post

Name: .....
Member No: .....
Address: ..... Postcode: ……..
Tel:
(H)…… (W)…….... (M)…….…….. FAX…….
Email: .....
Post to: Bill Sloman,**Circuit Editor, Unit 60, 1Tewkesbury Avenue, Darlinghurst NSW 2010**