

Northern Australia Section Report 2021

PART A - SECTION SUMMARY

A.1 Executive Summary

- Section Executive Committee Member List

Position	2021 Incumbent
NA Section Chair	Melanie Olsen
NA Section Vice Chair	Bronson Philippa
Treasurer	Mostafa Rahimi Azghadi
Secretary	Kenny Leong
Web Master	Kenny Leong
NT Subsection Chair	Mamoun Alazab
Membership Dev Officer	Ron Goodwin
Technical Seminars Coordinator	Ben Halfpenny
Education Activities Coordinator	Mohan Jacobs
Industry Liaison Officer	Joel Cox
WIE Rep	Maryam Ebrahimpour
YP Rep	Mostafa Rahimi Azghadi
Student Branch Councillor	Kevin (Tao) Huang
Student Branch Mentor	Ashley Gillman
Student Representative	Ross Siddins
Power & Energy Society Chapter	
PES Chair	Graham Woods
PES Vice Chair	Ahmad Zahedi
Communication Society Chapter	
MTT-S/Com Sec Chair	Mohan Jacob
MTT-S/Com Sec Vice Chair	Janina Mazierska
Oceanic Engineering Society Australia Chapter	
OES Rep	Ron Goodwin



- Section Highlights
 - Achieved 2021 R10 Best Small Section Award
 - PES Chapter achieved High Performing Chapter Award
 - Several members achieved awards at the Australian Council 35th anniversary celebrations (including our original IEEE President who has been part of IEEE Northern Australia for 25 years, and still resides on our exec committee today – Janina Mazierska)
 - Continued our IEEE Backyard Inventions series (IBIS), drawing good attendance for content from within our region despite COVID restrictions.
 - Held 19 events including Distinguished Lecturer presentations
 - Held the annual IEEE Peter Arlett Night face-to-face with great success
 - Assisted shape the future of IEEE R10 with workshops with IEEE-President-Elect Lance Fung
 - Held a face-to-face Women in Engineering technical seminar with great attendance
 - Held 4 executive section meetings joint with Chapter meetings and Affinity group meetings

- Major Events (International, National)
 - 23 Sep 2021 – Dean Condon “*Peter Arlett Lecture – Distributed Energy Resources and the changing energy landscape*”. Technical Seminar. 39 Attendees.

- Major Chapter Activities
 - PES Chapter Technical seminars: 6
 - MTT-S/Comms Chapter Technical seminars: 6
 - Local OES Chapter Technical seminars: 1



2021 Peter Arlett Lecture

- Major Student and Affinity Group Activities
 - A variety of workshops and a face-to-face WIE sponsored event
 - Held 4 WIE & YP affinity group joint executive meetings
- Awards:
 - IEEE Northern Australia section awarded four undergraduate students awards at University awards ceremonies:
 1. Townsville: 1st year Engineering Student with highest GPA, who is joining Electrical/ Computer Engineering UG program.
 2. Townsville: 4th year Electrical/ Computer Engineering Student for the best project work.
 3. Darwin: IEEE prize awarded to a 3rd year CDU Electrical Engineering Student with the highest GPA
 4. Darwin: IEEE prize awarded to the best CDU computer science / engineering student.

A.2 Financial Report – (Please follow the format given below)

- Summary (as per submitted on NetSuite)
 - 2021 - US\$4,216.15 was paid (including 10% early reporting bonus thanks to Mostafa) as the IEEE NA membership rebate payment for ~200 members;
 - 2021 – US\$500 was paid for 2020 R10 Award and Recognition activities - Best Membership Growth
 - 2021 – US\$1000 2021 R10 Small Section Award
 - 2021 – US\$1500 2021 R10 Section Incentives
 - Minor interest credits were received over the year;
 - Over the reporting period, payments were made to support awards, meeting catering. These were all paid from our local bank account. The total expenditure for the year 2021 was AU\$2840.19 including
 - AU\$60 for 12 months account fee
 - AU\$1530 for Peter Arlett Lecture Catering
 - AU\$500 for James Cook University 2021 student awards
 - AU\$250 for Charles Darwin University student award
 - AU\$500.19 for AGM Dinners in Townsville and Cairns
 - Final balances (as at 15th of Feb 2022) are \$14,613.73 in the everyday account and \$21,421.36 in the term deposit account
 - Financial balance (as at 15th of Feb 2022) in our section NextGen Bank account is US\$9233.50

PART B - ORGANIZATIONAL ACTIVITIES

B.1 Membership Development Activities

- Total number of active members in the past 3 years.
 - Currently 141 members (as at 28 Jan 2022). This has slowly grown over the last few years.
- Summary and evidence of work done to improve the value of membership, which leads to retention and growth of members
 - Awarded a certificate for R10 Small Section best membership growth in 2020
 - Northern Australia Membership development plan for 2021 awarded one of the top 10 plans within IEEE, and it was presented to the IEEE MD team.
 - Held a wide range of technical & networking events in different locations within the section
 - Our focus has been to deliver engaging content to section personnel amid COVID constraints, including boosting local content.
 - We have also focused on high profile events such the Peter Arlett lecture to attract new members as well as reached out into the community through judging robotics competitions.

B.2 Chapter Activities

- Total number of Chapters in the Section
 - Two (2) (MTT/Comm and PES). We are also part of an Australia wide OES Chapter
- Number of Chapters formed in the current year
 - Nil
- Number of active Chapters (Chapters who have reported required number of meetings during the year)
 - All Two (2) (MTT/Comm and PES) full chapters were active this year and we also reported activity locally as part of the Australia wide OES Chapter
- Summary of Chapter activities (Chapter wise with attachment table/information)

PES

1. 22-23 Jul 2021 – “IEEE PES Global Workshop – Electric Vehicle Grid Integration: Opportunities Challenges & Remedial Measures” Cosponsored technical seminar
2. 19 Aug 2021 - Professor Lina Bertling Tjernberg “Electrical vehicles for sustainable developments with a European perspective” Cosponsored technical Seminar
3. 15 Sep 2021 – Ron Goodwin “Wiring Rules Simplified and the Humble Standard House” Technical Seminar
4. 16 Sep 2021 - Santiago Peñate-Vera “Power systems analysis, open source and the current challenges, the example of GridCal” Cosponsored PES WA Technical Seminar
5. 23 Sep 2021 – Dean Condon “Peter Arlett Lecture – Distributed Energy Resources and the changing energy landscape”. Technical Seminar. 39 Attendees.
6. 6 Oct 2021 – Michael Short “Case Studies on Control and Informatics for Smart Energy Systems” Technical Seminar.

MTT/Comm

1. 29 May 2021 – Prof Sudip Misra “UAV Networks: Architectures, Opportunities, Challenges, and Future”. DL Cosponsored Technical Seminar MTT Comm. 23 Attendees
2. 8 Jun 2021 – A/Prof Kaushik Sengupta “Towards Universally Programmable Chip-scale TeraHertz Source, Sensors and Systems: Bridging the TeraHertz and Application Gap in the Next Decade” Cosponsored Technical Seminar. 3 NA Attendees
3. 8 Jun - Andrés Glazunov “Antenna Systems, Propagation Channels, OTA Characterization of Wireless Devices and Wireless Performance of Buildings” Cosponsored Technical Seminar
4. 9 Sep 2021 – Ashley Gillman “Smart Switch Brewpiless: Hacking an \$18 Smart Switch into a WiFi-controlled Beer Fermentation Fridge” IEEE Northern Australia Backyard Invention Series Technical Seminar. 5 attendees

5. 6 Jul 2021 – Dr. Daniel Headland “*Integrated Microphotonics for Terahertz Systems*”. Technical Seminar. 35 attendees
6. 13 Aug 2021 – Manfred Huschka “*Laminates for mmWave PCBS: Different Solutions for All-RF Multilayer, Hybrid Multilayer and Double-Sided PCBs*” Cosponsored Technical Seminar. 37 Attendees

OES

1. 20 Oct 2021 – Mel Olsen “*ReefWorks – Australia’s Tropical Marine Technology Test Range*” Technical Seminar. 11 Attendees.

B.3 Professional and Continuing Education Activities

Summary of continuing Educational activities including conferences, technical activities, training courses, and distinguished lecture programs with attachment table / information

1. 29 May 2021 – Prof Sudip Misra “*UAV Networks: Architectures, Opportunities, Challenges, and Future*”. DL Cosponsored Technical Seminar, 23 Attendees
2. 8 Jun 2021 – A/Prof Kaushik Sengupta “*Towards Universally Programmable Chip-scale TeraHertz Source, Sensors and Systems: Bridging the TeraHertz and Application Gap in the Next Decade*” Cosponsored Technical Seminar. 3 NA Attendees
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6. 13 Aug 2021 – Manfred Huschka “*Laminates for mmWave PCBS: Different Solutions for All-RF Multilayer, Hybrid Multilayer and Double-Sided PCBs*” Cosponsored Technical Seminar. 37 Attendees
7. 18 Aug 2021 – Townsville Primary School Lego Robotics Car Racing Competition – IEEE Judging, 120 Attendees.
8. 19 Aug 2021 - Professor Lina Bertling Tjernberg “*Electrical vehicles for sustainable developments with a European perspective*” Cosponsored technical seminar
9. 19 Aug 2021 – Lance Fung “*Introduction to IEEE Volunteers in Australia*” Administration Meeting, 2 NA Attendees
10. 25 Aug 2021 - A/Prof. Nemaï Karmakar “*Harmonising engineering education with nature*” Cosponsored Technical Seminar, 11 Attendees
11. 9 Sep 2021 – Ashley Gillman “*Smart Switch Brewpiles: Hacking an \$18 Smart Switch into a WiFi-controlled Beer Fermentation Fridge*” IEEE Northern Australia Backyard Invention Series, Technical IBIS seminar, 5 attendees
12. 15 Sep 2021 – Ron Goodwin “*Wiring Rules Simplified and the Humble Standard House*” Technical Seminar, 5 attendees
13. 16 Sep 2021 - Santiago Peñate-Vera “*Power systems analysis, open source and the current challenges, the example of GridCal*” PES WA Cosponsored technical seminar
14. 23 Sep 2021 – Dean Condon “*Peter Arlett Lecture – Distributed Energy Resources and the changing energy landscape*”. Technical Seminar. 39 Attendees.
15. 6 Oct 2021 – Michael Short “*Case Studies on Control and Informatics for Smart Energy Systems*” Technical Seminar.
16. 20 Oct 2021 – Mel Olsen “*ReefWorks – Australia’s Tropical Marine Technology Test Range*” Technical Seminar. 11 Attendees.

B.4 Students Activities

- Total number of Student Branches in the Section
 - One (1) with Two new branches through SubSection
- Number of Student Branches formed in the current year
 - Nil, although 2 through SubSection
- Section level student activities (student congress, paper and other contests, awards etc)
 - Student branch held three (3) student branch workshops and an AGM through year.

- Number of active Student Branches (Student Branches who have reported required number of meetings during the year)
 - One (1) and two new ones through Sub-section that need more assistance with reporting
- Summary of Student Branch activities (Student Branch wise with attachment table/information)
 - Running group study sessions and workshops regularly as a club at JCU, Townsville.

B.5 Affinity Group Activities

- Young Professional (YP)
 - Held four joint executive meetings through year.
 - 23 Sep 2021 – Dean Condon “Peter Arlett Lecture – Distributed Energy Resources and the changing energy landscape”. Technical Seminar. 39 Attendees.
 - 18 Aug 2021 – Townsville Primary School Lego Robotics Car Racing Competition – IEEE Judging, 120 Attendees.
 - 19 Aug 2021 – Lance Fung “Introduction to IEEE Volunteers in Australia” Administration Meeting, 2 NA attendees
- Women In Engineering (WIE)
 - Held four joint executive meetings through year.
 - 25 Aug 2021 - A/Prof. Nemaï Karmakar “Harmonising engineering education with nature”
 - 20 Oct 2021 – Mel Olsen “ReefWorks – Australia’s Tropical Marine Technology Test Range” Technical Seminar. 11 Attendees.
- Life Member (LM)
 - Currently don’t have enough members to form a LM affinity group. Instead, we have invited our life members to be part of our Exec.

B.6 Awards & Recognition Activities

- Award constituted by the Section
 - IEEE Northern Australia section awards four undergraduate students awards at University awards ceremonies:
 - Townsville: 1st year Engineering Student with highest GPA, who is joining Electrical/ Computer Engineering UG program.
 - Townsville: 4th year Electrical/ Computer Engineering Student for the best project work.
 - Darwin: IEEE prize awarded to a 3rd year Electrical Engineering Student with the highest GPA.
 - Darwin: IEEE prize awarded to the best CDU Computer Science Student.
- Please list all Awards and Recognitions received by the Section, and members in the Section, from R 10 and IEEE HQ during the year
 - Awarded R10 award for Best Small Section (and \$1000 USD)
 - Awarded High Performing PES Chapter \$430

B.7 Communication Activities (Newsletter, Home Page, E-mail etc.)

- Newsletter (name and number of issues in the year)
 - IEEE NA wrote a Section Article for the R10 Newsletter in 2021.
- Home Page of the Section (give the URL and how often it is updated)
 - <https://r10.ieee.org/naus/>
 - Website was revamped this year and is typically updated on an ad-hoc basis https://www.youtube.com/channel/UCmifeUSFgpY6kBXtvDzJ8_Q
 - Zoom recordings were shared amongst attendees of seminars and uploaded to youtube where permission was granted
- Other means of contacts with Section members including social media

- Member contact is based on ad-hoc email to the member lists with information on upcoming events. NEWS & EVENTS are also typically reported on the section Web site.
- Collabratec setup for storing Exec content,

B.8 Industry Relations

- Membership growth and retention
 - Have had good growth in Industry membership over recent years. High profile events including the Peter Arlett lecture were particularly focused at industry members, and WIE's face-to-face event also attracted potential future female members.
- Activities for/with industrial members
 - 2021 IEEE Peter Arlett Lecture was a joint event with PES and was held in concert with an industry networking event.
 - A variety of industry focused technical seminars were held virtually throughout the reporting period.

B.9 Humanitarian Technology Activities

- Humanitarian Technology related activities supported by the Section including collaboration with other OUs.
 - Shared with our members, an economical COVID Respirator initiative to support India that was setup through sister Australian sections.
- SIGHT Activities
 - The Section Chair attended a meeting providing info on SIGHT activities with the intent to start increasing our Section awareness and participation in future years.

B.10 Community Activities

- IEEE Social activities (Family day, IEEE day, Engineers Week)"
 - 23 Sep 2021 – Dean Condon “Peter Arlett Lecture – Distributed Energy Resources and the changing energy landscape”. Technical Seminar. 39 Attendees.
 - 18 Aug 2021 – Townsville Primary School Lego Robotics Car Racing Competition – IEEE Judging, 120 Attendees.
 - 20 Oct 2021 – Mel Olsen “ReefWorks – Australia’s Tropical Marine Technology Test Range” Technical Seminar. 11 Attendees.
 - Assisting the Australian Council with Northern Australia information for it’s 35th Anniversary Celebrations.

PART C - OTHERS

C.1 Special Events

- Please briefly describe the importance of special events and the outcomes achieved
 - The Peter Arlett event is held in honour of Peter Arlett from the NA Region, and it is always a highlight from the PES society in our region.
 - The IEEE Backyard Invention Series (IBIS) initiative really kickstarted our section mid-COVID leading to an increase in activity in 2020 when compared to previous years. Local IEEE members presented their inventions to our section which boosted morale and that continued into 2021.
- Funding secured from the IEEE and external sources including sponsorships
 - 2021 R10 Best outstanding small section.
 - High Performing PES Section Award

C.2 Relationship with National and International Societies and Non-Government Organizations (NGO)

- Nature of relationship and details of any formal agreement signed
 - IEEE has a signed MOU with Engineers Australia
- Details of joint activities
 - Many of our virtual events were advertised across Australia.
 - 20 Oct 2021 – Mel Olsen “ReefWorks – Australia’s Tropical Marine Technology Test Range” Technical Seminar. 11 Attendees, jointly held with the Australian Institute of Marine Science and James Cook University
- Benefit to IEEE members (for example discounts, access to technical information etc.)
 - Subsidised or free cost to IEEE members.
- Benefit to Section (for example help in membership development, venue facilities, cost saving etc.)
 - Increase in exposure of IEEE within our region and exposure of our members to new technology areas outside of those typically promoted within IEEE Northern Australia (e.g. Renewable Energies, Artificial Intelligence and Marine Engineering).

C3. Collaboration with other IEEE Sections

- Support extended to neighboring Sections
 - Supported events to boost the newly formed IEEE Northern Territory sub-section.
 - Shared hosted events with other sections and chapters nationally through virtual presentation formats.
 - As part of the Australia Council our section contributes to Australia wide initiatives such as the student branch competitions and also consultation on important matters relevant to Australia.
- Joint activities with any other Section
 - The Northern Australia section covers a huge geographical area. The nearest section is approximately 1500km from our sections geographic centre. Joint activities typically involve coordinating visiting lecturers throughout the year and cohosting virtual events. The vast majority of our virtual technical seminars were also cohosted with other Australian sections.

C.4 Support extended to Sub-sections & Society Chapters within the Section

- Support extended for organizing technical, educational and professional activities
 - In a small section, the activities of the section and chapters are very closely linked with section executive committee members often also having chapter official positions.
- Joint activities for membership development
 - Key membership development activities were focused on joint technical talks and networking events often involving industry partners such as Energy Queensland and the Australian Institute of Marine Science. For details see section B.2 above.
- Support extended for the formation of a Sub-section or transition of a Sub-section into a full Section
 - Supported the new Northern Territory sub-section in Darwin this year. Provided advice and substantial financial support to the sub-section for events and awards, as well as support for hosting future international IEEE events.

C.5 Best Practices of your Section (which you would like to share with other Sections for the benefits of members)

The section has focused on a small number of events to enhance the IEEE’s profile within the local professional community. This year we provided a judges for a regional robotics lego car racing competition,

and continued our 2020 launched “IBIS - IEEE Backyard Inventions Series”, named after Australia’s iconic Ibis bird – the bin chicken.



A 2021 IBIS talk by Ash Gillman

Executive committee members were encouraged to assist with the planning and execution of key events throughout the year. This was very successful not only leading to outstanding events but also empowering members within the Section. This has led to increased interest from members, particularly young members to take on new executive roles within the Section.

An activities calendar was developed at the start of the year to set dates and start planning for key events in the year. This planning was useful to ensure funding was available to support upcoming events and new initiatives.

The WIE affinity group was more active this year thanks to a new WIE exec rep joining the NA Section for 2021. The Exec will continue to encourage affinity group activities to explore new virtual mechanisms of increasing involvement in these changed COVID times, as well as enhancing collaboration across industry and the wider community.

A strategic plan for the section was developed in 2019 which helped define what are the main aims of the section and give executive members a resource to assess how best to focus resources in future years. This was reviewed during the year with a 2021 membership development plan established to really focus efforts into industry in the coming year.

C.6 Problems anticipated and suggestions for solutions, if any

The student branch and YP Affinity group did hold some activities this year but was not as active as in previous years. The executive needs to continue to invite and encourage the student branch and YP executive committee members to attend Section executive committee meetings and plan events for the student branch.

PART D - GOALS AND PLANS

D.1 Continuation of project/activity in progress and their implementation plans

The NA Section website was maintained in 2021 as well as continuing an archive for important documentation such as the section’s history, photographic records, strategic plan, etc on both the website and Collabratec.

D.2 Goals and Future Plans

Establish Section Volunteer Awards for;

- IEEE Northern Australia Outstanding Volunteer
- IEEE Northern Australia Outstanding Young Professional
- IEEE Northern Australia Outstanding Women In Engineering Volunteer

➤ IEEE Northern Australia Outstanding Student Volunteer

Details of the awards and nomination forms are to be added to the Website. Nominations will in general close in August of each year with award winners presented with a certificate at the AGM in November.

In 2022 we will continue our IEEE Backyard Invention Series whilst also establishing a robotics competition within the community to promote IEEE within our regional, small section.

D.3 Any innovative ideas to make IEEE more creative and value added for sustaining the membership retention and recruitment goals.

Investigate opportunities for hands-on workshops catering to the interests and needs of local members. These could be non-technical in nature and may include a networking/ social focus as well.

Hold an Industry meets Student members event possibly with a Mock Job Interview element included. The event might also incorporate a YP and /or WIE affinity group focus as well.

Engage in regional events involving problem solving, engineering & innovation initiatives to broaden our member-base. This includes joint events with other engineering groups (especially affinity groups) and wider community initiatives such as science week.

Incorporate social media and more frequent website promotion into our advertising regime, to increase the audience at our activities and our presence in the community.

The 2020 successful launch of our IBIS (IEEE Backyard Invention Series) program will be continued into 2021 to boost regional engineering content profile amongst our members and provide a platform to showcase local innovation.

Given the interest in robotics within our student and industry membership base, we will also be working to establish a community engaged robotics competition, including encouraging friendly competition between our Cairns and Townsville groups.

D.4 Business Plan for Sustainable Growth and Financial Stability.

The Section is fortunate to have a stable organizational committee with a good mix of members from academic and industry backgrounds that understand the area and member needs. The executive committee includes representation from many of the major regional cities within the section including Cairns, Townsville and Darwin to encourage activities in the various regions. The executive members are also generally highly motivated and willing to assist and support the Section as required.

By focusing on a small number of high-profile events and including networking opportunities, the Section aims to remain relevant to the needs of local members and promote growth within the wider professional community.