

ISC'5: a unique melting pot for geotechnical and geophysical professionals

Were you aware of the following difference between exploration and engineering geophysicists? Conferences such as ASEG, SEG, EAGE etc. bring together exploration geophysicists and their mining or petroleum clients, while engineering geophysicists meet at SAGEEP, Near Surface Geoscience and the likes, where they mainly meet their peers and compare notes on methods but get little feedback on the user value of near surface geophysics. Every five years or so, engineering geophysicists and their geotechnical colleagues and clients get the chance to meet at the International Conference on Geotechnical and Geophysical site characterisation and it's my pleasure to report from this year's ISC'5 on the Gold Coast. Some 350 delegates from 47 countries, with 75% percent of delegates from overseas, made it a truly international conference.

With the predicted massive future infrastructure developments in the decades to come, the geotechnical industry may need some disruptive innovation. A new way of thinking that can best be stimulated when specialists from various disciplines learn each other's language and challenges and jointly find possible solutions. A cross-discipline-conference like this is fertile ground for that.

The technical program was well balanced between geophysical and geotechnical content, given that ISC primarily is a geotechnical conference. The geophysics talks involved the 'traditional' geotechnical methods, being seismic studies, and, increasingly, resistivity methods (DC and EM) and other geophysical or remote sensing themes (Figure 1). I shall try to report on talks

I personally found memorable. NGI was represented with eight delegates (6 from Oslo and 2 from Perth) and I shall not mention any of our own talks as my personal favourites, even though they were pretty impressive. Many of the presentations should be available online at the time you are reading this, so see for yourself at isc5.com.au. As my geotechnical knowledge is rather superficial I won't comment too much on the geotechnical talks either. Here are simply some interesting aspects of the geophysical presentations:

Silvia Castellaro from Bologna University in Italy made a good case for the use of a more physics based approach to seismic soil classification. Current state of practice for seismic site effect assessment is Vs30, the apparent shear-wave velocity to 30 m depth, used as a proxy for the expected earthquake amplification factor. Both statistical and physical limitation of Vs30 have been reported and Castellaro proposed an alternative approach, based

'The 'uber' of our industry may be geophysics, it can disrupt the way we plan our ground investigations leading to higher efficiency in terms of costs and time'

on the average shear wave velocity of the soil layer, the resonance frequency and the impedance contrast between soil and bedrock (VfZ). The beauty of the VfZ approach is that these parameters can be derived using the same measurements that are currently used for Vs30, namely H/V spectra and surface waves.

Natalie Campbell of Jacobs Australia and colleagues from Canterbury in NZ and Imperial College in the UK showcased results from a massive collection of shear wave velocity data (6500 measurements) from global lab and field sites stretching throughout the UK, US, Turkey, Canada, Taiwan, Romania and Italy. In addition to expected correlations between fracturing and weathering with Vs the data showed that estuarine, alluvial, aeolian and offshore sediments were on average characterised by an almost 40% lower velocity than colluvial, glacial and residual material. Differences in sorting and grading were stated as a possible explanation for this. Another interesting observation was a distinct difference in Vs based on field- or laboratory measurements. Great effort is taken when one takes sediment samples or rock cores and only the 'best' parts of the material are consequently tested in the lab. Velocities measured on samples (3000–4000 m/s) were found to be four times higher than the ones based on field tests (600–1400 m/s).

All in all, a good mix of method papers, case studies and especially integration with geotechnical soundings, lab data and soil physics models.

I'll end my summary with two quotes from the conference: (note that both quotes are presumably not fully correct, are based on my memory and have not been approved by the quoted individuals) Professor Carlos Santamarina (KAUST) concluded his excellent keynote with the remark that: 'Geophysics extends our senses, makes us see what we otherwise can't see' and Tim Thompson (Arup) said something along the lines of 'The 'uber' of our industry may be geophysics, it can disrupt the way we plan our ground investigations leading to higher efficiency in terms of costs and time'.

All in all a compulsory conference for engineering geophysicists to mutually learn and educate with our geotechnical colleagues and clients.

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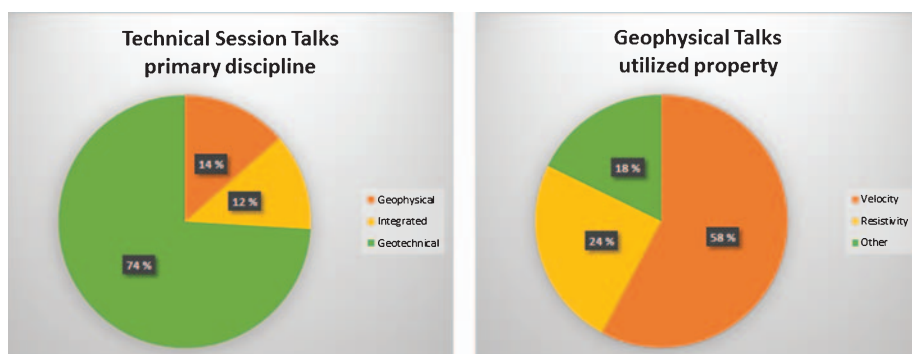


Figure 1. ISC talks grouped by discipline and geophysical techniques.

ASEG-PESA-AIG 2016

Reflections

The 25th Geophysical Conference and Exhibition was a landmark occasion on many levels. It was the 25th Conference and Exhibition, fittingly back in Adelaide where it all began. It was also the first ASEG conference held in the newly renovated Adelaide Convention Centre and the first conference involving the Australian Institute of Geoscientists; the first ASEG-PESA-AIG conference.

Here are some statistics from the conference:

- 712 delegates
- 87 exhibitors
- 10 conference sponsors
- 22 keynote presentations
- 133 regular oral presentations
- 43 posters
- 12 workshops
- 7 official social events.

Adelaide's August weather behaved itself and after a couple of days of workshops the conference began with opening drinks in the exhibition area on the Sunday

afternoon. The great food and drink continued for three more days, including the conference dinner at the newly refurbished Adelaide Oval with stunning views of the Oval and North Adelaide.

The conference theme 'Interpreting the Past, Discovering the Future' was a nod to where we are now, not just as societies, but as geoscientists. Many of us find ourselves revisiting legacy data, reprocessing, and reinterpreting. Our conference logo was split into two halves: the greyscale past and colourful future. The wavefront pattern, the colour scales used, the layers of the circle representing layers of the Earth, the fault in the rock: all nods to the geophysical world.

Some highlights of the conference were:

- Professor David Blair's amazing keynote address on the discovery of gravity waves
- Dennis Conway and Victoria Seesaha winning the EAGE geoquiz night – enjoy your trip to Paris!
- Carmine Wainman winning the exhibitor passport prize
- Dr Ted Tyne's remarks on 25 ASEG conferences at the closing ceremony.

The Conference Organising Committee have received much praise for the conference, which has been greatly appreciated. We worked our hardest to deliver an enjoyable conference for all. The post-conference survey indicated that the vast majority of delegates and exhibitors were very pleased with how the event went. Thank you to everyone involved in organising this major conference and exhibition at a time which was economically very difficult.

We hand the baton to the NSW branch of the ASEG, and wish them all the best of luck for the Sydney Conference in early 2018. While the title of the next conference will change, registrants can be assured that all the aspects of the ASEG conference that they love will still be there, whether it be catching up with colleagues, clients and contractors, seeing the latest geophysical innovations in the exhibition hall or the technical geophysical presentations at the oral sessions.

On behalf of the 2016 Conference Organising Committee,
Philip Heath and Luke Gardiner
(Co-chairs)



The 2016 Conference Organising Committee on stage during the closing plenary.

ASEG honours and awards

ASEG Gold Medal: Professor David Boyd

The ASEG Gold Medal is awarded from time to time for exceptional and highly distinguished contributions to the science and practice of geophysics by a member, resulting in wide recognition within the geoscientific community. Professor David Boyd was awarded the ASEG Gold Medal in 2016 for his outstanding achievements in his long professional career and in the education of generations of geophysicists, and for his successes in promoting the effective integration of aeromagnetism in geological mapping and exploration.

David entered Glasgow University in 1943 after a mildly disrupted secondary education during World War II. Alongside Natural Philosophy (Physics) he took geology, having been too late to join the Chemistry stream. This stroke of luck resulted in a double Honours in Natural Philosophy and Geology – a first for Glasgow University and the beginning of a most fruitful career trend.

After graduation in 1946, David became a Lecturer in the new science of geophysics and spent nine years teaching and conducting exploration field work in the UK, Iceland, and the Rift Valley in Uganda. He then spent two years with mining engineers, John Taylor and Sons working on many mines in the UK and also in Cyprus during the EOKA paramilitary uprising. Falling metal prices prompted a successful application for a geophysicist position at Hunting Geology and Geophysics in 1956. Thus began twelve very busy, productive and happy years working predominantly on large airborne magnetic projects worldwide. This work included extensive petroleum surveys for major oil companies in many parts of the world, including Australia. The integration of aeromagnetism with geology for mineral exploration was developed in Ghana, where excellent mapping existed, and refined in Uganda where David could work directly with geologists who were mapping in synchronisation with the airborne survey. The Hunting's era culminated in David's landmark paper at the Canadian Centennial Mineral and Ground Water Conference in Niagara in 1967; 'The contribution of airborne magnetic surveys to geological mapping', still a compelling read!

Eventually David decided to return to the more settled academic life. Fortunately for us he accepted a post as the new

Chair of Geophysics in Eric Rudd's Department of Economic Geology at Adelaide University in 1969. His main focus was nurturing honours graduates who would be sought after by the mining industry. This has resulted in a 'breed' of geophysicists who have become leaders and achievers in the exploration industry. While best known for his passion for aeromagnetism and the accompanying emphasis on 'hard-rock' geology, many of his graduates have made their mark in the oil and gas industry, in seismic research, well logging and as founders and operators of successful exploration companies.

In the mining industry, David's students include company founders, ore-body discoverers as well as high profile researchers and company geophysicists. During his term as Professor, David attracted many interstate and international students to pursue post graduate research at Adelaide University. In particular his female PhD graduates from India, China and Poland have each made major contributions to worldwide geophysics. Another great contribution to the mining industry was the Australian Mineral Foundation course, Geophysics for Geologists, which David helped initiate and actively supported for many years. Over 600 geologists in Australia and overseas attended this course in the 1970s, 80s and 90s. This did much to bring the two disciplines together and had a significant impact on the Australian exploration culture.

David's research was predominantly through his students' projects, as shown in his publication list, but he has had a strong personal interest in the mafic dyke patterns in Australia. He was an advisor on many Government airborne survey programmes, including the South Australian Exploration Initiative which became a watershed in the application of aeromagnetic and radiometric surveys in Australia. He nurtured relationships with the airborne geophysical industries in Finland, India, China and Africa and was a frequent visitor to these countries, as guest lecturer and counsel.

Whilst Professor of Geophysics at Adelaide, he was appointed Dean of the Faculty of Science, then invited to chair the University's Education Committee. He also served as Acting Vice-Chancellor in 1982–83. He was elected President of the Geological Society of Australia (1986–87) during which time he agitated for a revival in geological mapping.

Government mapping and aeromagnetic surveying flourished in Australia soon after this. Outside of geoscience, David was Chairman of the Animal Ethics Committee for the University of Adelaide Departments of Science, Medicine and Dentistry, and for the Waite Institute (1983–92), and was Chairman of the organising committees for ANZAAS congress in 1991 and 1997.

After retirement in 1992, David continued his involvement with geophysics students at Adelaide University and maintained his interest and enthusiasm for aeromagnetic applications. He continues today as advisor to Archimedes Consulting, a company created by one of his overseas PhD graduates, specialising in potential field applications for oil and gas exploration and deep crustal sensing.

David's hallmarks have been his enthusiasm and wisdom. His ability to inspire students to passionately pursue careers in geophysics and exploration has created a legacy that will be long-lived. He has not been the 'typical' geophysicist or geophysical professor but has forged a path that has brought geophysicists and geologists together in all manner of geoscientific endeavours. To his former students and professional associates, he remains a teacher, a mentor, a respected colleague and, most of all, a friend.

David was awarded Honorary Membership of the ASEG in 1997 for his outstanding contribution to the profession to that time, and it is only fitting that David's personal achievements, his positive influence on so many other members of the profession, and his distinguished career spanning 70 years, should now be recognised with the award of the ASEG Gold Medal.

Editor's note: for more information and images about Professor Boyd's career visit www.ageg.org.au/events.



Professor David Boyd speaking after receiving the ASEG Gold Medal.

Grahame Sands Memorial Award: Des Fitzgerald

The Grahame Sands award is based on an endowment made by Members of the ASEG and the geoscience profession in memory of the late Grahame Sands, who was tragically killed at the prime of his life in an aircraft crash in 1986, whilst developing and testing new equipment for geophysical survey aircraft. Because of Grahame's abilities to turn scientific theory into innovative application, the award is made for innovation in applied geophysics through a significant practical development of benefit to Australian exploration geophysics in the field of instrumentation, data acquisition, interpretation or theory.

The Grahame Sands Award for 2016 is presented to Dr Des Fitzgerald in recognition of Des' leadership and significant personal involvement in directing the development of the Intrepid Geophysical Processing System into an internationally renowned system for the processing of potential field and radiometric data.

Des graduated from the University of Melbourne in 1971 and completed his PhD in 1977. He founded Des Fitzgerald & Associates in 1978. Over the decades since that time, Des has been a great ambassador for Australian geophysics, the ASEG and his company. Des led the development of the Intrepid Geophysical Processing System, which began with an amalgamation of the successful BHP Pitts and BMR ARGUS geophysical processing systems, but under Des' leadership was developed into a world class, flexible, adaptable system to allow both GUI-based interactive and batch processing of potential field and radiometric data. The geophysics behind the software is very robust, due in no small part to Des' personal involvement in the writing and testing of the software.

As well as the Intrepid data processing system, Des has been instrumental in the development of the Jetstream data management and delivery system, which is at the core of the GADDS data delivery system used to deliver geophysical data collected by Geoscience Australia and state and territory surveys to the exploration industry. In addition, the Geomodeller software, initially developed by the BRGM (GeoFrance3D), was significantly enhanced under Des' leadership to invert geological field measurements to produce a geological model, in association with additional field

geology observations. Combinations of implicit functions calculate the model from the interpreted geophysics and field geology observations. Testing and improving the 3D geology model is achieved via forward and potential field inversions.

The international success of the Des' software is testimony to the ability of the Australian geophysics industry to create solutions and a range of practical tools with universal application, making the software a major promoter of innovative Australian geophysics.

Des is generous with his time in helping students both from within Australia and overseas and with advice to practicing geophysicists and geologists. He shares his knowledge and experience in the geophysical community, regularly presenting at ASEG and other conferences, publishing numerous papers and encouraging his colleagues to publish their works. He has represented the ASEG at overseas conferences on a number of occasions. Des also chairs GeoJAG Australia, an association of companies and public sector organisations exporting a wide range of geoscience services. He was an early participant in setting up the Uncover initiative.

Des continues to bring new and innovative approaches to his software, in so doing helping Australian potential field and radiometric geophysics to flourish. He travels the world in search of new ideas and incorporates them into his software, thereby making the ideas available to Australian geophysicists. On this leading edge, Des has helped champion a 2.5D AEM solution for complete surveys, as well as a patented tensor gridding algorithm, as part of a comprehensive processing and interpretation system for vector and tensor observed gradients.

Through collaboration with government, university and company research organizations, Des has been able to bring new, innovative developments in geophysics to a much broader range of users through rapid development, enhancement and commercialization of new ideas.

Des is not only an excellent software engineer, he is also an outstanding geophysicist who has been able to turn scientific theory into innovative application, resulting in many internationally recognised products of practical benefit to Australian and

international exploration geophysics. He is a worthy recipient of the ASEG Grahame Sands award.



Des Fitzgerald after receiving the Grahame Sands Memorial Award.

Shanti Rajagopalan Memorial Award: Camilla Sørensen

The Shanti Rajagopalan Memorial Award, inaugurated in 2013, is presented for the best paper published by a Student Member in *Exploration Geophysics* in the period prior to each ASEG Conference.

The award is named in memory of the late Dr Shanti Rajagopalan, who passed away in 2010. Shanti was one of the best known and respected members of the ASEG, and was well known within the geophysical profession for her outstanding contributions and service to the profession, and to the ASEG.

Shanti was a major contributor to the ASEG in many ways. She was Victorian branch President, and was actively involved in the organisation of ASEG conferences in Hobart and Melbourne. She was also Managing Editor of *Exploration Geophysics* in 2000 and 2001.

But it is most noteworthy in the context of this award that, in 1987, as a Student Member, Shanti received the inaugural Laric Hawkins Award for the most innovative use of a geophysical technique from a paper presented at the ASEG Conference. It is therefore very appropriate that an award to encourage technical excellence by our Student Members is named in honour of Shanti.

The winner and recipient of the Shanti Rajagopalan Memorial Award for 2016 is Camilla Sørensen, for her paper co-authored with Tim Munday and Graham Heinson entitled 'Integrated interpretation of overlapping AEM datasets achieved through standardisation'. The paper was published in *Exploration Geophysics*, **46**, 309–319.

Camilla has been completing a PhD at the University of Adelaide on Airborne Electromagnetic methods, specifically working on improving the conductivity-depth information that can be extracted from historical AEM datasets. She expects to complete her PhD during the latter half of 2016. She is currently working at CSIRO in Perth as a research scientist.



Camilla Sørensen receiving the Shanti Rajagopalan Memorial Award from ASEG President Katherine McKenna.

Honorary Membership of the ASEG: Doug Roberts

ASEG Honorary Membership has been conferred upon South Australian Branch Member Doug Roberts, in recognition of his distinguished career and outstanding contribution and leadership in geoscience spanning 40 years, and for his most valuable contributions to the ASEG over many years.

After graduating from Adelaide University with a BSc(Hons) in geology and geophysics in 1971, Doug worked initially as a geologist with Gold Copper Exploration Ltd in the Flinders Ranges and North Queensland, and as a demonstrator in geophysics at Adelaide University with Professor David Boyd. From 1974–1978, he worked as a geophysicist with the SA Department of Mines, prior to joining the SA Oil & Gas Company, leading to his long association with the SAGASCO/Boral/Origin Energy group from 1978 to 2000. He became Chief Geophysicist and subsequently Manager – Exploration Operations during this time.

He worked as a consultant geophysicist from 2000–2003 before joining Beach Energy as Operations co-ordinator and subsequently in 2012 was appointed Manager for Geophysics and Land Access.

During his career, he has contributed to the development of seismic acquisition and processing techniques suitable for a variety of Australian conditions, and he has worked to improve the quality and

resolution of the resulting seismic data. At the same time Doug has pioneered various methods to minimise the environmental impact of seismic operations in remote areas of Australia (particularly the Cooper/Eromanga Basins), and in more densely populated rural areas of Australia (notably the South Australian and Victorian Otway Basin).

He has also endeavoured and succeeded in fostering very good working relationships with the Native Title groups associated with the exploration activities. He is a long-term member of the Petroleum Data Consultative Group, composed of representatives from Government, Industry and APPEA, and for many years a contributor to APPEA's Exploration Committee Data Working Group.

During his entire career Doug has been an active supporter and participant in many ASEG committees and activities, and has striven to promote the aims of the society. He has been a Member since 1973, and served on the SA Branch committee from 1975 to 1990 including secretary for several years.

He has contributed directly to ASEG Conferences through his roles on the organizing committees for all seven ASEG conferences held in Adelaide since 1979, up to and including the 2016 conference. He is one of the white jacket brigade, those rare members who have attended all 25 ASEG conferences in Australia so far. Doug has also served on the ASEG Research Foundation Committee since 1990, and has undertaken the important role of secretary since 1995.

Doug was awarded an ASEG Service Certificate in 1998 in recognition of his significant contributions to the society at that time. It is very fitting that the ASEG now recognises Doug's continuing outstanding contributions to the ASEG, and to the geophysics profession, with the award of Honorary Membership of the ASEG.



Doug Roberts.

Honorary Membership of the ASEG: Mark Lackie

ASEG Honorary Membership has been awarded to Dr Mark Lackie, in recognition of his sustained and exceptional service to the ASEG over many years, and for his leadership in the education of geophysics at Macquarie University since 1994.

Mark graduated with a BSc(Hons) from Melbourne University in 1982, and completed his PhD on palaeomagnetism at Macquarie University in 1989. He was appointed as lecturer at Macquarie University in 1994 and has been there ever since.

Mark became a Member of the ASEG in 1981, and has been a consistent supporter and contributor to his State Branch since that time. Of note he has served as NSW Branch President since 2007 to the present, and he has made significant contributions to ASEG conferences, with his outstanding Co-Chairmanship of the Organising Committee of the 2010 ASEG-PESA International Conference and Exhibition, setting a benchmark for future conferences. In 2018, ASEG will again hold the convention in Sydney, and Mark has once again stepped forward to serve the society as co-chairman of the Organising Committee.

But it is Mark's ongoing efforts and contribution to ASEG Publications that have had a major impact on the Society. He took on the role of Managing Editor of *Exploration Geophysics* in 2009, a role that is pivotal to maintaining the Society's vital professional journal *Exploration Geophysics* on behalf of all Members of the Society. The Managing Editor is involved in developing journal strategy, scope, quality and direction, as well as overseeing the routine management of manuscripts, making editorial decisions on content of each publication, and liaising with Associate Editors and publisher. Through his diligence in this role, Mark has continued to develop and enhance the scientific quality and international reputation of the journal, as reflected in the 2016 Impact Factor figure for *Exploration Geophysics*, which showed a significant increase on the previous year.

The award also recognises Mark's leadership in the education of geophysics at Macquarie University from 1994. Mark is a Senior Lecturer and currently Director of Teaching in the Department of Earth and Planetary Sciences at

Macquarie University. His leadership in the education of numerous students in geophysics who have passed through Macquarie University from 1994 to 2016, and his valuable research activities no doubt have had a major influence on the future well-being of our industry.

Mark's research interests span a broad area of geophysics beginning with palaeomagnetism in his early career. More recently Mark's investigations have ranged from using magnetic and density measurements to validating the interpretation of potential field signatures of granitoids, and regional scale gravity modelling of basins. Mark has co-authored papers from diverse fields such as crustal architecture, geothermal gradients, seismic studies of the Amery Ice Shelf, Antarctica to the environmental control of magnetic properties of sediments near the Great Barrier Reef.

Mark maintains a high enthusiasm for student excursions, which is a disappearing attribute of some tertiary institutions. Mark has supervised a number of postgraduate students again with a strong focus on practical field studies. In addition to his teaching and research activities, he has been a strong supporter of ASEG grants to students to attend relevant courses and conferences.

For his outstanding contributions to the Society and his leadership in the education of geophysics, the ASEG is pleased to confer the award of Honorary Membership to Mark Lackie.



Mark Lackie thanking the ASEG for giving him Honorary Membership.

ASEG Service Certificate: Peter Milligan

Dr Peter Milligan has been awarded an ASEG Service Certificate for distinguished services to the ASEG over 28 years, in particular for his contributions to the ASEG through involvement in State Branch Committees,

Conferences, Publications and Workshops.

Peter graduated from Flinders University of South Australia with a BSc(Hons) and DipEd in 1975, and in 1989 was awarded a PhD for his research in geomagnetism. Upon graduation in 1975, he taught science and maths in high schools before joining the Geomagnetism Section of Geoscience Australia (then the Bureau of Mineral Resources) in 1985. From 1986 to 1999 Peter worked with the Airborne Group, participating in airborne magnetic and radiometric surveys, and conducting research into the significance of micropulsations as a noise source in airborne magnetic data. Later research resulted in the production of a new Magnetic Anomaly Grid Database of Australia and the associated Magnetic Anomaly Maps of Australia. From 2007 to 2014 Peter helped establish the capability of Geoscience Australia to acquire regional magnetotelluric surveys across Australia. Peter retired from Geoscience Australia in 2014 as an Executive Level Senior Geophysicist.

Peter has been a long-time contributor to the local ACT Branch of the ASEG. He has been a Branch Member since 1988, and a member of the Branch Committee for over 15 years, serving as Treasurer from 1996 to 2002.

Peter has also played an important role over many years in supporting the ASEG's goal of being a learned society, by virtue of his efforts in reviewing abstracts and geophysical papers for *Preview* and *Exploration Geophysics*.

Peter has attended and presented scientifically significant oral presentations, workshops and posters at ASEG conferences since 1985. In addition, he has represented the ASEG at many international conferences and meetings, and has assisted on conference organising committees including Melbourne in 2013.

Peter has represented the ASEG formally and informally through his scientific work. Since 2005, he has been on the Task Force of the World Digital Magnetic Anomaly Map and was a member of the Executive Committee. He has had an active role in implementing data acquisition and data quality standards worldwide, and contributing to new research in this area.

Peter continues to be an active member of the ACT Branch community. The

ASEG recognises these achievements and significant contributions to the profession with this ASEG Service Certificate.



Peter Milligan (far right) listening to his citation being read by ASEG President Katherine McKenna.

ASEG Service Certificate: Kathlene Oliver

An ASEG Service Certificate has been awarded to Kathlene Oliver, the WA State Branch President, for her distinguished contributions over many years to local ASEG branch activities, both in Qld and WA.

Kathlene graduated from Macquarie University in 1994 with a BSc(Hons), majoring in Geophysics with Geology. She started her career in Environmental Geophysics acquiring, processing and interpreting geophysical datasets for the detection of environmental contamination and unexploded ordnance. Following this she worked in Petroleum Geophysics where she was involved in the acquisition and processing of 2D and 3D land and marine seismic datasets. She then moved into Mineral Geophysics working with Geophysical Technology Ltd, Geoforce, and Fugro Airborne Surveys before taking on the role of Managing Director of Fugro Ground Geophysics in 2009. She was a Founding Director of the Ground Geophysical Survey Safety Association Ltd in 2013, a not-for-profit association formed in response to particular concerns over safety on ground electrical surveys.

She subsequently completed an MBA at Murdoch University specialising in Economic and Environmental Sustainability, following which she joined the WA State Government in 2015 in her current regulatory role in the Department of Mines and Petroleum.

Kathlene joined the ASEG in 1995, and soon after became part of the local Branch Committee. She was Qld Branch Secretary from 1998–2002, and was involved in the Brisbane ASEG conference in 2001.

After moving to WA, Kathlene joined the local Committee and became State

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Branch President in 2014. Since taking on this role she has organised and facilitated many excellent meetings presenting quality work in all aspects of geophysics, whilst providing networking opportunities to the Members. Throughout this, she has managed to create a very participating environment with healthy scientific debates.

Kathlene has brought a lot of energy and passion to the WA branch. Through her leadership she has championed the cause of diversity and inclusion, and has brought much vigour to the State Branch networking events. She is a worthy recipient of the ASEG Service Certificate for her past and ongoing contributions to the Society.



Kathlene Oliver.

ASEG Service Certificate: Wendy Watkins

An ASEG Service Certificate has been awarded to Wendy Watkins, for distinguished contributions to State Branch committees, conferences, and in particular for her significant contribution to the education activities of the ASEG as Chair of the ASEG Education Committee.

Wendy graduated from Flinders University in South Australia with a BSc (Hons) majoring in Geophysics. She joined ASEG in 1993 and whilst working as a geophysicist for Santos in Brisbane she was part of the Queensland State Branch Committee for several years, as well as the Conference Organizing Committee for the 2001 Brisbane Conference. After a few years out of geophysics, she returned to the profession in 2007, re-joining the oil industry with Velseis, Origin Energy and MBA Petroleum Consultants in Brisbane, and subsequently with AGL in Sydney.

Since 2013, Wendy has been an active member of the ASEG Federal Executive and Chair of the Education Committee. Her main task and contribution over this time has been to oversee all the training programmes for ASEG, including SEG's DISC and Distinguished Lecturer

programmes, and EAGE's Education Tours.

When ASEG started its own OzSTEP programme, Wendy organised distinguished lecturer tours throughout the country in association with the State Branches. Her capable administration was appreciated by the Members attending the courses, and also by the State Branch organisers and the OzSTEP lecturers.

Her leadership and enthusiastic participation in these activities is a guiding example to all geophysicists, especially to those who may consider a career elsewhere when the industry experiences a hard time. The award of the ASEG Service Certificate is in recognition and appreciation of these valuable contributions to the Society.



Wendy Watkins receiving her award from ASEG President Katherine McKenna.

Early Achievement Award: Mojtaba Rajabi

The Early Achievement Award was inaugurated in 2007 in order to acknowledge significant contributions to the profession at an early stage in a person's career, by way of publications or professional work by an ASEG Member under 36 years of age.

The Early Achievement Award has been awarded this year to Mojtaba Rajabi of Adelaide University for his outstanding contributions through research and publication to our understanding of contemporary tectonic stress fields in Australia and the Earth.

Mojtaba Rajabi graduated as the top of his class in both his BSc (2006) and MSc (2009). After doing his compulsory military service, he undertook research work in Iran. In 2012, he was awarded a prestigious Adelaide Scholarship (International) to do his PhD at the University of Adelaide.

During his PhD he has also undertaken part-time work for Ikon Science (formerly

JRS Petroleum Research), and completed significant extra research projects for the World Stress Map Project in Germany. Mojtaba will complete his PhD in 2016.

Mojtaba has already achieved an amazing reputation in petroleum geomechanics and geophysics over his short career. Before he has even completed his PhD, he has published 12 fully peer-reviewed papers including nine in journals such as *Tectonophysics*, *Journal of Geophysical Research*, *Computers & Geosciences* and *Basin Research*, and he has four more manuscripts submitted for review. He has authored or co-authored over 30 conference papers, including four extended abstracts published at ASEG and EAGE conferences.

His research has received 10 awards, including the prestigious Louis Cagniard Award for best poster presented at the 2015 EAGE international conference, and the Hugh Crocker Award from the Formation Evaluation Society of Australia. His research has also been widely read and utilised, with his publications being cited in over 60 other papers.

Furthermore, Mojtaba has made a remarkable contribution to our global knowledge of present-day stress, personally analysing over 1000 wells, which is more than any other person in the 30-year history of the World Stress Map Project. His work has revolutionised our understanding of contemporary stress in Australia, and his expertise in the field has been recognized by his numerous invitations to review papers for professional journals, and to give featured talks.

For his extraordinary contributions to the profession to date, Mojtaba is certainly a worthy recipient of the ASEG Early Achievement Award.



Mojtaba Rajabi.

Conference and exhibition awards, sponsored by First Quantum

Best Oral Paper: Minerals

Regis Neroni: Application of the airborne electromagnetic method for banded iron-formation mapping in the Hamersley Province, Western Australia

Best Oral Paper: Petroleum

Konstantin Galybin: Multi-azimuthal walkway VSP for full azimuth seismic calibration

Best Oral Paper: Near Surface/Engineering

Tim Munday: Uncovering the groundwater resource potential of Murchison Region in Western Australia through targeted application of airborne electromagnetics

Best Student Oral Paper: Minerals

Janelle Simpson: Interpreting the Eromanga and Georgina Basins from magnetotelluric data

Best Student Oral Paper: Petroleum

Stephanie Tyiasning: Uncovering seismic HTI anisotropy of the Cooper Basin

Best Student Oral Paper: Near Surface/Engineering

Roderick Lawrence: Finding bedrock in uncontrolled clayey fill – success with GPR profiling

Best Poster Paper: Minerals

Clive Foss, Tania Dhu: The bark without a dog – magnetic anomalies over holes in a volcanic sheet in the greater McArthur Basin, NT

Best Poster Paper: Petroleum

Irena Kivior, Stephen Markham, Leslie Mellon: Mapping sub-surface geology from magnetic data in the Hides area, Western Papuan Fold Belt, PNG

Best Poster Paper: Near Surface/Engineering

Marina Costelloe et al.: Geoscience Australia's geophysical network: critical infrastructure and observed and derived data for earth monitoring and community safety

Best Student Poster Paper: Minerals

Paul Soeffky, Graham Heinson, Stephan: Thiel The electrical resistivity of the Australian lower crust

Best Student Poster Oral Paper: Petroleum

Alexander Robson, Rosalind King, Simon Holford: Analysis of gravity-driven normal faults using a 3D seismic reflection dataset from the present-day shelf-edge break of the Otway Basin, Australia

Best Student Poster Oral Paper: Near Surface/Engineering

Joseph Rugari, Graham Heinson, Dennis Conway: Electrokinetic monitoring groundwater flow in fractured rock media

Best Exhibitor

Terrex Seismic

Laric Hawkins Award: For the most innovative use of a geophysical technique from a paper presented at the ASEG Conference

Alison Kirkby, Graham Heinson, Lars Krieger: Relating electrical resistivity to permeability using resistor networks

