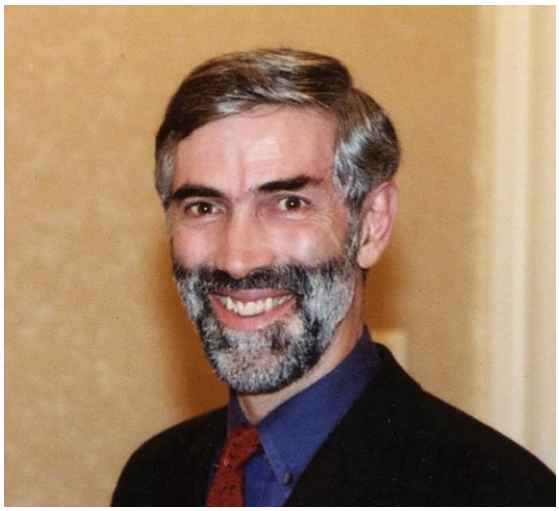
Brian Spies



Dr Brian Spies passed away in Sydney on the 8th of February 2020, after a courageous two-year battle with cancer.

Brian was one of Australia's most eminent and visionary research exploration geophysicists, an accomplished national and international science leader, inspiring geoscience innovator, inventor and research collaborator, science mentor and advocate, and a great science educator.
He remained an active geoscience collaborator and advocate for the importance of science in our modern society, with significant late-career contributions in the field of environmental and climate science, until a few months before he died.
Brian's geoscience career and his innovations and contributions to exploration geophysics, particularly as one of the pioneers of Transient Electromagnetics (TEM) as well as his contributions to other areas of science, have been brilliant and transformative.

Brian was a foundation member of the Australian Society of Exploration Geophysicists (ASEG) in 1970 and gave the strongest support to the Society over five decades including distinguished service as ASEG President in 1999-2000, using his position at that time as Director Cooperative Research Centre for Australian Mineral Exploration Technologies (CRCAMET) and his international expert standing in Transient Electromagnetics to promote Australia's innovations and breakthroughs in the science of mineral exploration geophysics.

Brian joined the Society of Exploration Geophysicists (SEG) in 1972 and was acknowledged for his outstanding service in many capacities, including a term as 1st Vice President (2003-2004) and Secretary-Treasurer (1996-1997) with the award of SEG Life Membership in 1996.

Brian was an author of many scholarly papers on exploration geophysics presented in journals and at international conferences through his memberships of the ASEG, SEG, Environmental and Engineering Geophysical Society (EEGS), American Geophysical Union (AGU), Society of Petrophysicists and Well Log Analysts (SPWLA) and European Association of Geoscientists & Engineers (EAGE).

Brian gained a BSc from the University of New South Wales in 1971, double-majoring in geology and physics, and went on to earn a Post-Graduate Diploma in Applied Geophysics from UNSW in 1972, supported by a Graduate Cadetship from the Australian Bureau of Mineral Resources, where he undertook applied research throughout the 1970s with a broad range of geophysical techniques in the Australian outback.

In 1976, Brian received the first SEG Foundation scholarship given in the southern hemisphere. This scholarship, and an Australian Public Service Board award, allowed him to commence his PhD studies at Macquarie University, under the supervision of the late Professor Keeva Vozoff.

Brian enthusiastically led the BMR TEM field trials over the Elura and the Woodlawn orebodies and followed with new interpretative scale model studies, presenting and publishing influential findings.
This BMR research under Brian's leadership helped to further establish Transient Electromagnetics as a practical exploration method for metallic ore deposits in Australia's conductive terrains. Brian is responsible for these and a number of other developments in the TEM technique in Australia, which was transferred to the minerals exploration industry in a campaign of field demonstrations, presentations and publications – TEM is now an indispensable geophysical technique in Australian mineral exploration.

Brian presented much of this work at the 1st ASEG Biennial Conference and Exhibition in Adelaide in 1979, and was awarded the ASEG Best Paper at the Conference.

In 1979, Brian undertook a major international research study, supported by the Australian Government under the Australia-USSR Agreement on Scientific Cooperation, focussed on "use of the electrical methods MT, TEM and IP for petroleum prospecting". Until that time, few technical details of these techniques were available in Western countries despite a great interest in them. Brian visited the Ministry of Geology in Moscow and Novosibirsk and the Academy of Sciences in Novosibirsk.
Brian completed his doctoral studies at Macquarie University in 1980 and was awarded a PhD for an outstanding Thesis "The application of the transient electromagnetic method in Australian conditions: field examples and model studies", which still has relevance to today's exploration geophysicists.

Brian's international geoscience and leadership roles began in the USA in 1980, when he joined Exploration Data Consultants in Denver as Senior Geophysicist and in 1981, he moved to California to join Electromagnetic Surveys Inc. as Vice President and Director.

In 1984 he joined the ARCO Oil and Gas Research Center in Texas as Senior Principal Research Geophysicist. In 1989 Brian was awarded ARCO's highest technical award, the Outstanding Technical Achievement Award in Research, for development of the Transient Electromagnetic Probing (TEMP) corrosion detection technique.

In 1990 Brian joined Schlumberger-Doll Research where he led the Deep Electromagnetics research program, involving theoretical and experimental investigations of new borehole electromagnetic and electrical techniques, with an emphasis on multi-scale measurements of petrophysical and reservoir properties. Fundamental to these studies was the integration of geophysical, geological and engineering data, and large-scale computer modelling of complex, realistic geological sequences. During his time in the US, Brian also took on university Adjunct Professor teaching and post-grad student supervision.

He led the team that developed a new generation of deep-imaging electromagnetic tools for the oil well environment, based on a three-component digital cross-well system capable of generating accurate 2-D images of reservoirs between boreholes separated by several hundred metres, operating at depths to 3000 m and at temperatures to 125^{o} C. He also helped develop the next generation of monitoring technology using instrumented oilfields.

Photo caption: Ground TEM survey using SIROTEM, Alaska USA

In 1996, Brian returned to Australia to take over from Dr Andy Green as Director of the Cooperative Research Centre for Australian Mineral Exploration Technologies (CRC AMET), appointed as part of the Corporate Executive of CSIRO Exploration and Mining.

CRC AMET was a collaborative joint venture of seven government, academic and industry partners, developing a new generation of geophysical exploration technologies for Australian conditions of deep and varied weathered cover. The research programs involved all aspects of airborne and ground electromagnetic exploration, instrumentation, processing, modelling and geological interpretation.

Brian assumed the position of Director in Year 4 of the CRC AMET, and successfully integrated the research programs and participants to achieve the CRC objectives, particularly commercialisation and knowledge transfer. Brian's leadership of the research partnerships delivered a new generation of broadband high-resolution airborne electromagnetic exploration techniques optimised for Australian conditions.

Following the successful delivery of the outcomes from the CRC AMET, Brian was appointed in 2000 as the Director Physics Division of the Australian Nuclear Science Technology Organisation (ANSTO).

In 2003, Brian took on the role of Chief Research Scientist, CSIRO Exploration and Mining, with major contributions to Australia's strategy and policy for the "Mineral Exploration Action Agenda", announced by the then Department of Industry, Tourism and Resources. Brian was co-leader for targeted R&D funding for mineral exploration and lead writer for the education and training programs, including increased support for science and technology in secondary and tertiary education.

Brian's leadership positions in ANSTO and then CSIRO Exploration & Mining, provided the platforms for his passion for advocacy of great science influencing good government policy outcomes.
A great example of Brian's contribution to leading strong science evidence, informing national science debate and influencing good policy outcomes was his co-leadership of the Project Review Team on "Review of Salinity Mapping Methods in the Australian Context", funded by Environment Australia and Agriculture Forestry and Fisheries Australia (AFFA) to evaluate the range of methods, including airborne and ground EM near surface systems, for mapping the extent and severity of dryland salinity – an important roadmap delivered to the National Ministerial Council of the time.

In 2004 Brian was appointed Science Manager and later Principal Scientist, Sustainability and Climate Change, in the Sydney Catchment Authority. It was during his time in SCA that Brian began working in climate science.

In Brian's later career he was highly respected as a science advocate for the broader integration of science-technology-engineering and mathematics in modern research, education and formulation of Government policy. His co-authorship in 2012 of a major report supported by the Australian Research Council under the auspices of Australian Academy of Technological Sciences and Engineering - Dr Brian Spies and Professor Graeme Dandy "Sustainable Water Management – Securing Australia's Future in a Green Economy" – produced a visionary roadmap for Australia's future water management.

During this period Brian also made huge contributions through the Australian Academy of Technology and Engineering (ATSE) and was elected as Fellow of ATSE (FTSE) in 1998. In 2003 he was awarded the Australian Centenary Medal for his contributions to geoscience. Brian also made substantial science contributions in environmental and climate science through the Royal Society of New South Wales and was elected as Fellow (FRSN) in 2016.

Above all else, Brian's most important legacy to geoscience and to successful exploration and discovery has been through his forty eminent, if not transformative, and well-cited scholarly papers in refereed geoscience journals, many book chapters and over thirty other papers and articles in geoscience publications and conference proceedings.

In addition, Brian's inspiring initiatives and leadership in establishing over 30 national and international workshops at the fore-front of research and the application in geophysical exploration technology, environmental geophysics, reservoir characterisation and trends in science management, has produced ground-breaking conference proceedings and workshop publications that now form a core part of the industry's reference works on electrical and electromagnetic exploration geophysics.

Brian initiated, organised and chaired the AEM 1998, in Sydney, also overseeing the compilation of the proceedings – a great reference work and in hindsight, a visionary early initiative that continues to bring together the latest and best international research and technical innovations in airborne electromagnetic prospecting:

- Spies, B., Fitterman, D., Holladay, S., and Liu, G.(Eds), 1998, Proceedings of the International Conference on Airborne Electromagnetics (AEM 98): *Exploration Geophysics*, **29**(1&2) 262pp

Throughout his career Brian has earned many prestigious awards, working in research and management in the resources and energy sectors in Australia and North America and across industry, academia and government sectors. He has also held numerous eminent board and senior management positions. He was particularly proud of his Life Membership of the SEG.

To his colleagues, Brian's name brings to mind words like internationalism, collaboration, communication, hard work, commitment, and, most of all, zeal. He approaches every job with an outrageous sense of humour and enthusiasm, and it is more important to him to achieve the vision than to get credit.

Brian leaves an extraordinary legacy of achievement beyond the science of exploration geophysics. His Australian and international science partners, friends and colleagues all speak of him with the highest praise and with reverence for his achievements and contributions and his inclusiveness and openness sharing new ideas and knowledge.

Dr Ted Tyne
ASEG President 2019-20

With appreciation for contributions and advice:
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