

**The 2006 CGU J. Tuzo Wilson  
Medallist: Alan G. Jones**  
*Citation by Jim Craven, May 17, 2006, at  
the Awards Banquet*

Who here can remember their first day working as a summer student in geophysics or geosciences? Who here remembers how much they knew or thought they knew in second year? I can. I recall it vividly. Ron Kurtz at the old Earth Physics Branch in 1984 had called me in to start as a summer student. I was in my second year of a Physics and Geology degree and he was very gracious, courteous and showed me around. I was very comfortable until I met this laid back British fellow sitting with one leg over the arm of a chair; sandals, socks and shorts come to mind. He looks at me briefly and starts going on enthusiastically about how this new HP computer (state-of-the-art 32 bit processor, multi-core cpu processing, kind of like a modern Pentium but costing a few hundred thousand in 1984 dollars!). He was having difficulty communicating data from it to the VAX up in the computer room over an rs-232 line. He looked at me and said "Make it work". Basically he was asking me to get a proto-internet working. Within five or ten minutes of being with him I was entirely out of my comfort zone and I knew it would be a great place to work. Of course that fellow was Alan Jones. He had pretty much himself just started at Earth Physics too and his career was about to take off. Ron Clowes, Ian Gough and others were in the process of landing a huge program of earth science with dramatic national and international scope called Lithoprobe. The rest for Alan is history.

Alan G. Jones is now Senior Professor and Head of Geophysics at the Dublin Institute of Advanced Studies. He is acknowledged as one of the world's leading authorities on the use of natural-source electromagnetic (EM) methods - principally the magnetotelluric (MT) method - to address geoscience problems, from mining-scale targets to tectonics on the scale of cratons.

Alan began his career at the Universities of Edinburgh, Münster and Toronto during the late 70's and early 80's. Alan's strong

background in physics was apparent as he actively published in a number of areas related to signal processing and the inversion of MT data. Early papers on the "classification of lower crustal layers" and the "problem of 'current-channelling'" remain authoritative reviews of key aspects of MT even today. His 1984 paper on the "equivalence of the 'Niblett' and 'Bostick' transformations" was included as part of a Society of Exploration Geophysics Reprint Series devoted to seminal papers on MT.

With over a hundred publications in refereed journals he has already made a prolific contribution to both Canadian and international geophysics. His publications span a broad range of sub-disciplines of electromagnetic geophysics. Topics include geomagnetic source-field effects, spectral analysis methods, MT impedance estimation and decomposition, modelling/inversion methods, and geological interpretation. He has published on the application of electromagnetic studies to different targets in a variety of different environments. He has done field-work in virtually all of the provinces and territories of Canada as well as in many other countries. In addition to the coverage they provide in the field of electromagnetic geophysics, Alan's publications build important bridges with other disciplines including geomagnetism, seismology, tectonics, continental crustal evolution, mineral exploration, time-series analysis, and geophysical instrumentation. The publications have included important tutorial-types papers, leading edge contributions on new ideas and methods, and detailed data analysis/interpretation papers.

Alan's research in the field of electromagnetics is innovative and world-leading. For example, he is the lead developer of a computer code for removing 3D galvanic distortions for multiple sites and multiple frequencies, a code that is widely used by others in the EM induction community. For MT research in the remote Slave craton of northern Canada, he designed a novel experimental installation that enabled new data to be recorded along a 600-km-long ice road, including the deployment of ocean-bottom EM instruments in lakes - a unique undertaking. He has organized and led industry

consortiums to address important problems in exploration-related EM studies. He has developed new long-period MT systems and assisted with the transfer of this technology to the private sector. All of these activities have led to publications and new insights into the value of the electromagnetic method and the tectonics or related aspects of the regions in which the research has been undertaken.

Dr. Jones' most important contributions originate from his integrated interpretations of electromagnetic and other data. He has contributed to major advances in our understanding of continental-scale geological structures, including the Canadian Cordillera, Trans-Hudson Orogen, Slave craton, Himalayas, Appalachians, and Scandinavian craton, and has provided fresh insights into the general nature of the lower continental crust and upper mantle. He is widely acknowledged as the key scientist in the contributions of MT surveys and their interpretation to LITHOPROBE transect studies. He is one of only a handful of specialists capable of relating the results of electromagnetic surveys to other geoscience data sets, and is often asked to represent the electromagnetic community at international multidisciplinary meetings and workshops.

It is interesting to note that some of J. Tuzo Wilson's most important contributions concerned the structure and tectonics of continental-scale features. He would have been fascinated with the discoveries that have resulted from the research of Alan Jones. Alan is a rock solid choice for the Tuzo Award.

### **Acceptance by Alan Jones**

Mr. President, esteemed colleagues and guests, and my wife Elke.

Thank you Jim for those words. I am truly humbled beyond belief. For once in my life, I am speechless ..... almost..... I look at the list of previous recipients, and I hold them all in awe.

I received the email from Gary of my award at midnight as I was going to bed in Dublin. After reading and re-reading it many times, and checking that it wasn't dated April 1<sup>st</sup>, I was unable to sleep and spent the rest of the night in a daze. Thanks Gary.

This award is by far the most significant recognition in my scientific career of the contributions that I have made. However, if I may be allowed to paraphrase Sir Isaac Newton, *if I have been successful in my career, it is because I have stood on the shoulders of Canadian giants*. Time does not permit me to recount all of the interactions I have had with many, many excellent and generous Canadian scientists over the 23 years that I worked in Canada at UofT, then the Earth Physics Branch/Geological Survey of Canada, but I would like to identify some of those Canadian giants who influenced my career, many of whom were similarly recognized by receiving the Tuzo Wilson medal.

My personal connection to Tuzo is unfortunately slight. I met Tuzo on only a few occasions, but was always thrilled by his vision. Whilst at UofT, I was in Tuzo Wilson's office, an office I shared with Gary Jarvis, your President. And I note that Tuzo was a Green Scholar at Scripps in 1980, as was I in 1987.

I began my career in EM induction in 1973 at the University of Edinburgh by deploying, in Scotland, Gough-Reitzel magnetometers borrowed by my supervisor, Rosemary Hutton, from Ian Gough – a very deserving recipient of the Tuzo Wilson Medal in 1983. On Ian's invitation, I came to Edmonton for two months in 1974 to hand-digitize the data – arriving in mid-March to be greeted by minus 30C temperatures and swearing never to come back to this frozen land again! Ian made me welcome at UofA, and whilst there made the acquaintance of the two other Canadian induction greats – David Rankin and Walter Jones – and also UVic's John Weaver who came for a visit. The sparks really did fly at UofA in those days. On the way back to Edinburgh, I stopped off in Toronto for a few days and met the members of the other Canadian citadel of EM induction – Nigel Edwards, Dick Bailey, Gordon West, and George Garland.

Gordon's book with Fraser Grant was then, and is now, the bible of EM theory.

At the end of my PhD I was offered a 2-year postdoc fellowship by Nigel Edwards and – after a 4-year sojourn in Germany – took up that offer in 1982 where I was funded both by Nigel and George Garland, another Wilson medallist (1981). Nigel is being recognized this year by being awarded the SEG's Gerry Hohmann Award – a very worthy recipient indeed. And of George I can only say that I held him in awe. There was nobody who came to UofT, no matter how esteemed, to give a seminar who wasn't humbled by his incisive questions. At UofT for 2 years I had many wonderful lunchtime discussions with Nigel, George, Gordon – medallist of 1990 – Dick and Chris Chapman. I also knew the medallist from 2004, Dick Peltier, who took me to a hospital as I writhed in agony after twisting my knee out playing squash with him – after he won the point that is.

In late 1982 I was asked to come to Ottawa for an interview by Mike Berry, medallist of 1994, and Alan Green – more about Alan later. Alan offered me a position at the Earth Physics Branch, which I accepted but was only able to take up in 1984 due to immigration issues. Once at the Earth Physics Branch, I quickly became aware of the fledgling Lithoprobe program, and – although initially reluctant – Lithoprobe has guided my career since 1987 and, I believe, is the direct basis why you consider I should be the 2006 recipient.

Many Lithoprobe activists, especially those who were responsible for its initiation, have been recognized by receiving this award – Ted Irving (1984), Ernie Kanasevich (1988), Charlotte Keen (1995), Chris Beaumont (1997), Roy Hyndman (2001), and, of course, Ron Clowes (1998). Those visionaries of the early 1980s launched a geoscience programme that became the envy of the world. A programme that is still revered across the globe as the way that science – not just geoscience but science in general – should be organized. A programme that has had an immense impact on many careers, especially my own. Tuzo Wilson embraced fully the thoughts of Sir Isaac Newton, who stated "*We build too*

*many walls and not enough bridges.*" Tuzo built bridges, and bridge-building between the geoscience disciplines was the guiding principle, and lasting legacy, of the Lithoprobe programme.

I would like to make a very special mention of the role that Alan Green has played in my career. As I said, Alan offered me the Earth Physics Branch position in late 1982, mid-September to be exact, and although I eventually took it, I must apologize to him for having said *No* when he asked me at the interview if I was interested in the job. Those were very heady days in the mid- and late-1980s – we were doing groundbreaking work – and I consider myself extremely fortunate to have been involved and to be able to interact on a daily basis with the trio of Alan Green, Carl Spencer, and Berndt Milkereit. Alan was the one who constantly pushed me to explain EM to especially geologists, and not to stop at the resistivity model but to consider its geological and tectonic implications. Alan engineered the invitation to me to present the "*MT and reflection: an essential combination*" paper at the 1986 BIRPS seismic reflection workshop, which launched that aspect of my career. Alan's contributions to lithospheric understanding were acknowledged last year with him receiving the Stephan Muller Medal of the European Geosciences Union, and I do think that he is an unsung Canadian great. But I must be honest with you, it is Alan Green who invited and encouraged me to apply for the position I now have in Dublin, so is responsible for me leaving Canada.

By one significant yardstick though, we EM specialists have failed Canadian geophysics. That measure is that electromagnetism in Canada is now far, far, poorer than when I first arrived. In the early 1980s there were no less than 10 university faculty, and 8 research and support scientists at the Earth Physics Branch, undertaking electromagnetic studies at crustal and mantle scale, both marine and on land, covering everything from instrumentation development to theory to scale modelling to numerical modelling to field studies. Today, as I speak there are 4 university faculty and 1 scientist at the GSC doing such EM work. Notwithstanding the

absolutely unparalleled support for EM given by the Lithoprobe program, the numbers undertaking EM studies in Canada have gone from 18 to 5 within one generation. And this is in a country that has been leading the world for over half a century in electromagnetic geophysics. Over the years and in many institutions Canadian universities have consistently chosen to hire those in fields other than EM, and at a time when EM is contributing so much to knowledge and society. We have failed to convince you, my colleagues, of the need for a strong EM capacity within Canada, and I hope that this is addressed in the future.

Finally, I remind you of one of Tuzo's famous quotes - *I enjoy, and always have enjoyed, disturbing scientists*. Those of you who've had the wonderful benefit, as I had, of attending Lithoprobe transect meetings over the years know that I embrace and subscribe fully to that sentiment of Tuzo's. Perhaps some of you were disturbed a little over the years by my criticisms, but it was all in the name of stretching each other.

I would like to finish by again thanking those who supported my nomination, especially Jim Craven, and the CGU for honouring me in this way. Everything I have accomplished in Canada has been made possible because of the gift that the Canadian landmass offers the inquiring mind, the vision of those in the early 1980s, and the generosity of Canadian geophysicists, and I salute you all.