Brian J. Jackel
Physics and Astronomy
University of Calgary
Calgary Alberta T2N 1N4
brian.jackel@ucalgary.ca

Curriculum Vitae

Research Interests

- Optical measurements of the aurora applied to magnetospheric remote sensing.
- Multi-site observations of rapid global ionospheric response.
- Coordinated studies of ground-based and satellite data.
- Signal processing, stochastic processes, and information theory.

Education

- **Ph.D. Physics, University of Western Ontario, November 1997.** Coursework included computational physics, antennas and radio wave propagation, tropospheric and ionospheric propagation, radio remote sensing.
- **M.Sc. Physics, University of Western Ontario, August 1992.** Coursework included mathematical methods, statistical physics, classical electrodynamics, ionospheric physics, introductory plasma physics, non-linear plasma physics.
- **B.Sc. Geophysics (Honors), University of Alberta, May 1990.** Coursework included physics, mathematics, computer science, geology, geophysical field school, seismology, potential theory, time-series analysis.

Teaching Experience

- 2010 Electrodynamics, radiation, and relativity for 3rd year physics students (Phys 457)
- 2009-2010 Electrostatics and magnetostatics for 3rd year physics students (Phys 455)
- 2009 Data analysis, transformation, and reduction for graduate students (Phys 605)
- 2008-2010 Electricity and magnetism for 1st year engineering students (Phys 259)
- 1999 Instructor of a first year electricity and magnetism physics course for 150 engineering students (Phys 259)
- Five years as demonstrator for a second year modern physics lab course
- Tutorial leader for a first year physics lecture

Contributions to Research

Refereed publications

(1) S. Mende, V. Angelopoulos, H. U. Frey, E. Donovan, **B. Jackel**, K.-H. Glassmeier, J. P. McFadden, D. Larson, and C. W. Carlson Timing and location of substorm onsets from THEMIS satellite and ground based observations, Annales Geophysicae, 27, 2813-2830, 2009

(2) E. Spanswick, E. Donovan, W. Liu, J. Liang, J. B. Blake, G. Reeves, R. Friedel, **B. Jackel**, C. Cully, and A. Weatherwax Global observations of substorm injection region evolution: 27 August 2001, Annales Geophysicae, 27, 2019-2025, 2009

(3) S. E. Harris, S. B. Mende, V. Angelopoulos, W. Rachelson, E. Donovan, **B. Jackel**, M. Greffen, C. T. Russell, D. R. Pierce, D. J. Dearborn, K. Rowe and M. Connors THEMIS Ground Based Observatory System Design, Space Science Reviews, 141, doi:10.1007/s11214-007-9294-z, pp213-233, December 2008

(4) Donovan, E., et al., Simultaneous THEMIS in situ and auroral observations of a small substorm, Geophys. Res. Lett., 35, L17S18, doi:10.1029/2008GL033794, 2008

(5) Liang, J., E. F. Donovan, W. W. Liu, **B. Jackel**, M. Syrjsuo, S. B. Mende, H. U. Frey, V. Angelopoulos, and M. Connors, Intensification of preexisting auroral arc at substorm expansion phase onset: Wave-like disruption during the first tens of seconds, Geophys. Res. Lett., 35, L17S19, doi:10.1029/2008GL033666, 2008

(6) W.W. Liu, J. Liang, E.F. Donovan, T. Trondsen, G. Baker, G. Sofko, **B. Jackel**, C.-P. Wang, S. Mende, H.U. Frey, V. Angelopoulos, Observation of isolated high-speed auroral streamers and their interpretation as optical signatures of Alfvn waves generated by bursty bulk flows, Geophys. Res. Lett., 35, L04104, doi:10.1029/2007GL032722, 2008

(7) W.W. Liu, E.F. Donovan, J. Liang, I. Voronkov, E. Spanswick, P.T. Jayachandran, B. Jackel, M. Meurant On the equatorward motion and fading of proton aurora during substorm growth phase, *Journal of Geophysical Research* Vol. 112, doi:10.1029/2007JA012495, 2007

(8) S.B. Mende, V. Angelopoulos, H.U. Frey, S. Harris, E. Donovan **B. Jackel** M. Syrjaesuo, C.T. Russell, and I. Mann, Determination of Substorm onset Timing and Location using the THEMIS ground based observatories, *Geophysical Research Letters*, Vol. 34, doi:10.1029/2007GL030850, 2007.

(9) E. Donovan, S. Mende, **B. Jackel**, H. Frey, M. Syrjäsuo, I. Voronkov, T. Trondsen, L. Peticolas, V. Angelopoulos, S. Harris,M. Greffen, and M. Connors, The THEMIS All-Sky Imaging Array - System Design and Initial Results from the Prototype Imager, *Journal of Atmospheric and Terrestrial Physics*, Volume 68, Issue 13, pp 1472-1487, September 2006

(10) E. Spanswick, E. Donovan, W. Liu, D. Wallis, A. Aasnes, T. Hiebert, **B. Jackel**, M. Henderson, and H. Frey, Substorm associated spikes in high energy particle precipitation, The Inner Magnetosphere : Physics and Modelling, Geophysical Monograph Series 155, pg 227-236, 2005

(11) Gregory J. Baker, Eric F. Donovan, **Brian J. Jackel**, A comprehensive survey of auroral latitude Pc5 pulsation characteristics, *Journal of Geophysical Research* Vol. 108, No. A10, 1384 10.1029/2002JA009801, 29 October 2003

(12) J. C. Brown, A. R. Taylor and **B. J. Jackel**, Rotation measures of compact sources in the Canadian Galactic Plane Survey, *Astrophysical Journal Supplement* 145:213-223, 2003.

(13) E.F. Donovan, **B.J. Jackel**, I. Voronkov, T. Sotirelis, F. Creutzberg and N.A. Nicholson, Ground-based Optical Determination of the b2i Boundary: A Basis for an Optical MT-index, *Journal of Geophysical Research* A3:1115, doi:1029/2001JA009198, 2003.

(14) **B.J. Jackel**, D.R. Moorcroft, J.C. Foster and K. Schlegel, Spectral characteristics of UHF radar aurora, *Journal of Geophysical Research* 10.1029/2001/JA000165, 2002.

(15) **B.J. Jackel**, P. Eglitis, E.F. Donovan, A.T. Viljanen, D.D. Wallis, L.L. Cogger and H.J. Opgenoorth, Observations of highly correlated near-simultaneous magnetic field perturbations at contraposed ground stations. *Journal of Geophysical Research* A11:25857-25872, 2001

(16) W. Lyatsky, L.L. Cogger, **B.J. Jackel**, A.M. Hamza, W.J. Hughes, D. Murr and O. Rasmussen, Substorm development as observed by a UV imager and a 2-D magnetic array, *Journal of Atmospheric and Solar-Terrestrial Physics* Volume 63, Issue 15, Pages 1609-162, October 2001.

(17) D.J. Knudsen, E.F. Donovan, L.L. Cogger, **B. Jackel** and W.D. Shaw, Width and structure of mesoscale optical auroral arcs, *Geophysical Research Letters* 28:705-708, 2001.

(18) H.J. Opgenoorth and 58 other authors including **B.J. Jackel**, Coordinated ground-based, low altitude satellite and Cluster observations on global and local scales during a transient post-noon sector excursion of the magnetospheric cusp, *Annales Geophysicae*, 19:1367 - 1398, 2001.

(19) **B.J. Jackel**, Characterization of auroral radar power spectra and autocorrelation functions, *Radio Science* 35:1009-1023, 2000.

(20) I. Voronkov, E. F. Donovan, **B.J. Jackel** and J.C. Samson, Large-scale vortex dynamics in the evening and midnight auroral zone: Observations and simulations, *Journal of Geophysical Research* A8:18505-18518, 2000.

(21) E.F. Donovan, **B. Jackel** and L.L. Cogger, The Aurora, *Physics in Canada* 54:285-294, 1998.

(22) **B. Jackel**, D.R. Moorcroft and K. Schlegel, Characteristics of very large aspect angle E-region coherent echoes at 933 Mhz, *Annales Geophysicae* 15:54-62, 1997.

(23) G. Rostoker, **B. Jackel** and R. Arnoldy, The relationship of periodic structures in auroral luminosity in the post-noon sector to ULF pulsations, *Geophysical Research Letters* 19:613-616, 1992.

Invited Talks

(1) **B. Jackel**, Design and operation of large scale multi-instrument networks, invited presentation at the 10th Scientific Assembly of the International Association of Geomagnetism and Aeronomy (IAGA) session on Global scale synthesis from models and distributed observations, Toulouse France, July 18-29, 2005.

(2) **B. Jackel**, Data retrieval and software configuration for THEMIS Ground-based observatories, invited presentation at the THEMIS NASA EPR, University of California (Berkeley), October 2003.

(3) **B. Jackel**, D. Moorcroft and J.C. Foster, Spectral Characteristics of UHF Radar Aurora, invited presentation at the DASP meeting in London Ontario, February 1998.

Theses

(1) **B. Jackel**, Spectral Characteristics of UHF Radar Aurora, Ph.D. Thesis, University of Western Ontario, 1997.

(2) **B. Jackel**, Height profiles, aspect sensitivity, and spectral characteristics of large aspect angle radar echoes at 933 Mhz, M.Sc. Thesis, University of Western Ontario, 1992.

Refereed conference proceedings

(1) **B. J. Jackel**, F. Creutzberg, E. F. Donovan, and L.L. Cogger, Triangulation of auroral red-line emission heights *Proc. of Atmos. Studies by Optical Methods*, 2003.

(2) E.F. Donovan, **B.J. Jackel**, D. Klumpar, and R. Strangeway, Energy dependence of the isotropy boundary latitude, *Proc. of Atmos. Studies by Optical Methods*, 2003.

(3) N. A. Nicholson, E. F. Donovan, **B. J. Jackel**, L. L. Cogger and D. Lummerzheim, Multipoint Measurements of the Ion Isotropy Boundary *Proc. of Atmos. Studies by Optical Methods*, 2003.

(4) E.F. Donovan, T.S. Trondsen, L.L. Cogger and **B.J. Jackel**, Auroral imaging in Canadian CANOPUS and NORSTAR programs, *Proc. of Atmos. Studies by Optical Methods*, 2003.

Non-refereed conference proceedings

(1) M.T. Syrjäsuo, **B.J. Jackel**, E.F. Donovan, T.S. Trondsen and M. Greffen, Low-cost multi-band ground-based imaging of the aurora, Proc. of SPIE Volume 5901 Solar Physics and Space Weather Instrumentation (eds. Silvano Fineschi, Rodney A. Viereck), in press, 2005

(2) **B.J. Jackel** and E.F. Donovan, Azimuthal substorm propagation inferred from an L-shell chain of ground-based magnetometers, Sixth International Conference on Substorms, 129-134, 2002.

(3) N.A. Nicholson, E.F. Donovan, **B.J. Jackel**, I. Voronkov, L.L. Cogger, D. Lummerzheim, F. Creutzberg and T. Sotirelis, Multipoint observations of the ion isotropy/b2i boundary, Sixth International Conference on Substorms, 157-162, 2002.

Posters and presentations at international conferences

(1) **B.J. Jackel** Correlation of solar wind and magnetospheric variations, Fall AGU meeting, San Francisco December 2009

(2) N. McGuffin, E. Donovan E. Spanswick, D.J. Knudsen, R. Rankin, G. Baker, V.M. Uritsky, **B.J. Jackel**, K. Barnetson New Observational Constraints on Theories of Auroral Arc Generation Fall AGU meeting, San Francisco December 2009

(3) E. Donovan, E Spanswick, J. Liang, **B.J. Jackel**, W. Liu, K. Kabin, R. Rankin Using Optical and Riometer Observations to Study the Relationship Between the Spatio-temporal Evolution of Magnetic Field Topology and Dispersionless Electron Injection Fall AGU meeting, San Francisco December 2009

(4) E. Donovan, E. Spanswick, V. Uritsky, J. Liang, **B.J. Jackel**, S. Mende The Interrelationship of auroral onset, dipolarization, fast flow, and injection AGU Joint Assembly, Toronto, May 2009

(5) J. Liang, E.F. Donovan, T. Trondsen, E. Spanswick, **B. Jackel**, J. McFadden, J. Bonnell, K. Shiokawa, K. Sakaguchi, T. Aslaksen THEMIS observations of magnetospheric ELF emissions, ULF Pc5 waves and their auroral features AGU Joint Assembly, Toronto, May 2009

(6) **B.J. Jackel**, S. Marple, E. Spanswick, M. Syrjäsuo, E. Donovan, F. Honary, Global Auroral Imaging Access (GAIA), poster at CEDAR-DASI workshop, Santa Fe June 2007

(7) **B.J. Jackel**, Multi-scale data exchange, comparison, and assimilation, IPY kickoff meeting, Helsinki Finland February 2007

(8) **B.J. Jackel**, E. Donovan, M. Greffen, V. Angelopoulos, S. Mende, S. Harris, W. Rachelson, C. Russell, D. Pierce, D. Dearborne THEMIS Ground Based Observatories, poster at Fall AGU meeting, San Francisco December 2006

(9) **B. Jackel**, E Donovan, M Greffen, V Angelopoulos, S Mende, S Harris, W Rachelson, C Russell, D Pierce, D Dearborne, THEMIS Ground Based Observatories, poster at the AGU fall meeting, San Francisco USA, 59 December 2005.

(10) E Donovan, E Spanswick, M Syrjasuo, S Marple, **B Jackel**, K Kauristie, F Honary, S Mende, A Weatherwax, J Moen, I Sandahl, GAIA - A Virtual Auroral Observatory, presentation at the AGU fall meeting, San Francisco USA, 59 December 2005.

(11) **B. Jackel** and E.F. Donovan, Geospace Sensor Networks, presentation at the session on Distributed Arrays of Small Instruments (DASI) during the combined CEDAR/GEM meeting, Santa Fe USA, June 26-July 1 2005.

(12) **B. Jackel**, E.F. Donovan, M. Greffen, S. Harris, S. Mende, V. Angelopoulos, Infrastructure and autonomy: a comparison of the new CGSM and THEMIS-GBO instrument arrays, poster at the fall AGU meeting, San Francisco USA, 13-17 December 2004.

(13) **B. Jackel**, E.F. Donovan, and L.L. Cogger, Detached arcs observed by the InterBall-2 Ultra-Violet Imager, presentation at the 31st Annual European Meeting on Atmospheric Studies by Optical Methods, Ambleside England, August 2004.

(14) E. Donovan, **B. Jackel**, M.T. Syrjäsuo, T. Trondsen, S. Mende and H. Nielsen, Real-time merged images of auroral luminosity from distributed arrays of all-sky imagers, presentation at the 31st Annual European Meeting on Atmospheric Studies by Optical Methods, Ambleside England, August 2004.

(15) M.T. Syrjäsuo, **B. Jackel**, E. Donovan, RAINBOW: the color imager, presentation at the 31st Annual European Meeting on Atmospheric Studies by Optical Methods, Ambleside England, August 2004.

(16) E. Spanswick, E. Donovan, G. Baker, D. Wallis and **B. Jackel**, Pc5 modulation of high-energy electron precipitation, presentation at the 31st Annual European Meeting on Atmospheric Studies by Optical Methods, Ambleside England, August 2004.

(17) **B. Jackel**, E.F. Donovan, G.J. Baker, D.D. Wallis, D.H. Boteler, Auroral zone GIC proxy dependence on solar wind speed, poster at the AGU fall meeting, San Francisco, USA, December 8-12 2003.

(18) E.F. Donovan, M. Syrjasuo, **B. Jackel**, T. Trondsen, M. Greffen, L. Cogger, E. Spanswick, S. Mende, S. Harris, M. Connors, H. Frey, V. Angelopoulos, The THEMIS all-sky imager array, poster at the AGU fall meeting, San Francisco USA, December 8-12 2003.

(19) M. Connors, E.F. Donovan, M. Syrjasuo, M. Greffen, S.B. Mende, C.T. Russell, **B.J. Jackel**, T. Trondsen, An evening sector Ps6-Omega band event, poster at the AGU fall meeting, San Francisco USA, December 8-12 2003.

(20) E.F. Donovan, D. Knudsen, R. Rankin, G. Baker, **B. Jackel**, L. Cogger, and D. Wallis, The Anticorrelation of Auroral Arc and Pc5 Pulsation Occurrence, presentation at the European Geophysical Society annual meeting, Nice France, 2003.

(21) **B.J. Jackel**, E.F. Donovan, T.S. Trondsen Imaging the polar cap red-line shelf, poster at the AGU fall meeting, San Francisco USA, December 6-10 2002.

(22) E.L. Spanswick, E.F. Donovan, G. Baker, **B.J. Jackel**, D. Wallis and D. Knudsen (2002) Modulation of >30 KeV Electron Precipitation by Pc5 Magnetic Pulsations, poster at the AGU fall meeting, San Francisco USA, December 6-10 2002.

(23) T.S. Trondsen, E.F. Donovan, N. Nicholson, **B.J. Jackel**, L.L. Cogger and D. Lummerzheim (2002) Multipoint Observations of the Ion Isotropy/b2i Boundary, poster at the AGU fall meeting, San Franciso USA, December 6-10 2002.

(24) **B. J. Jackel** and E. F. Donovan (2002) Azimuthal substorm propagation inferred from an L-shell chain of ground-based magnetometers, poster at the International Conference on Substorms 6, March 25-29 2002, Seattle, U.S.A.

(25) N. A. Nicholson, E. F. Donovan, **B. J. Jackel**, L. L. Cogger D. Lummerzheim, F. Creutzberg, T. Sotirelis and I. Voronkov (2002) Using the optical b2i as a tool for event timing, presentation at the International Conference on Substorms 6, March 25-29 2002, Seattle, U.S.A.

(26) **B. J. Jackel**, F. Creutzberg, E. F. Donovan, and L. L. Cogger (2001) Triangulation of auroral red-line emission heights, poster at 28th Annual European Meeting on Atmospheric Studies by Optical Methods, 19 - 24. 8. 2001, Oulu, Finland.

(27) N. A. Nicholson, E. F. Donovan, **B. J. Jackel**, L. L. Cogger, D. Lummerzheim, T. Sotirelis, I. Voronkov, F. Creutzberg (2001) Monitoring the Ion Isotropy Boundary with Multipoint Proton Auroral Measurements, talk at 28th Annual European Meeting on Atmospheric Studies by Optical Methods, 19 - 24. 8. 2001, Oulu, Finland.

(28) E. F. Donovan, T. S. Trondsen, L. L. Cogger, and **B. J. Jackel** (2001) All-sky imaging within the Canadian CANOPUS and NORSTAR projects, talk at 28th Annual European Meeting on Atmospheric Studies by Optical Methods, 19 - 24. 8. 2001, Oulu, Finland.

(29) P. Eglitis, **B. J. Jackel**, E. Boralv, A. Vaivads, E. Donovan, H.J. Opgenoorth, and J. Watermann (2001) Multi-point measurements of global responses in the magnetosphere, talk at EGS meeting in Europe, February.

(30) **B. J. Jackel**, P. Eglitis, E. F. Donovan, and L. L. Cogger (2000), Global response observed by widely separated magnetometers, poster at the AGU fall meeting, December.

(31) N. A. Nicholson, E.F. Donovan, T. Sotirelis, I. Voronkov, **B.J. Jackel**, L.L. Cogger, F. Creutzberg (2000) The Ion Isotropy Boundary as Seen in Proton Auroral Measurements, poster at AGU December 2000, San Francisco.

(32) P. Eglitis, **B. J. Jackel**, E. Donovan and H.J. Opgenoorth (2000) Non-local responses in ionospheric convection to solar wind effects, talk at SRAMP meeting in Japan, October.

(33) **B. J. Jackel**, E. F. Donovan, and L. L. Cogger (1999), Auroral regions and boundaries, poster at the AGU fall meeting, December.

(34) Voronkov, I., E. F. Donovan, **B. J. Jackel**, and J. C. Samson (1999), Large-scale auroral vortex dynamics, talk at the AGU fall meeting, December.

(35) Knudsen, D. J., E. F. Donovan, L. L. Cogger, **B. J. Jackel**, and W. Shaw (1999), Statistical properties of stable auroral arcs from all-sky imager observations, talk at the AGU fall meeting, December.

(36) **B. Jackel** (1998) Spectral characteristics of UHF radar aurora, poster at the AGU Fall Meeting, December.

(37) E.F. Donovan, **B. Jackel**, G. Baker, L. L. Cogger (1998) A statistical study of transient north-south auroral structures in the CANOPUS ASI data set, Presented at the AGU Fall Meeting, December.

(38) E.F. Donovan, **B. Jackel** and L.L. Cogger (1998) Detached auroral arcs as seen by the InterBall UVAI imager. Presented at the GEM Workshop, Snomass Colorado, June.

(39) **B. Jackel**, D. Moorcroft, J.C Foster and P. Ericson (1995) Bistatic coherent backscatter from the auroral E-region at 440 Mhz, talk at the workshop on E-region plasma instabilities, Max-Planck Institut für Aeronomie, Katlenburg-Lindau, Germany, 24-26 October.

(40) E.F. Donovan, G. Rostoker, and **B. Jackel** (1992) The effects of field-aligned currents on mapping from the ionosphere to the magnetosphere. ESA publication SP-355:19-24

(41) **B. Jackel**, D. Moorcroft (1991) Height profiles of EISCAT coherent scatter from the auroral E-region, talk at the AGU fall meeting December.

(42) E.F. Donovan, G. Rostoker, **B. Jackel** (1990) Adding field-aligned currents to the Tsyganenko 1987 magnetic field model: effects on mapping in the CPS, talk at the AGU fall meeting December.

Other non-refereed contributions

(1) **B.J. Jackel**, E. Donovan, S. Mende, H. Frey, M. Syrjäsuo, S. Harris, M. Greffen, L. Peticolas, I. Voronkov, T. Trondsen, N. Partamies, M. Connors, Vassilis Angelopoulos The THEMIS All-Sky Imager Program, talk at DASP meeting, Kingston, 2006.

(2) M. Connors, J. Ponto, P. Chi, **B.J. Jackel** Initial results from the AUTUMN Alberta array, talk at DASP meeting, Kingston, 2006.

(3) N. A. Nicholson, E. F. Donovan, **B. J. Jackel**, L. L. Cogger, F. Creutzberg and D. Lummerzheim, A Two-point Study of the Proton Aurora and the Ion Isotropy Boundary, presentation at SEW, Banff, 2001.

(4) E. Spanswick, E. Donovan and **B. J. Jackel**, Multipoint CANOPUS riometer data and future applications, presentation at SEW, Banff, 2001.

(5) N. A. Nicholson, E. F. Donovan, **B. J. Jackel**, L. L. Cogger, T. Sotirelis, I. Voronkov and F. Creutzberg, Multipoint Measurements of the Ion Isotropy Boundary, talk at the DASP meeting, Saskatoon, February 2001.

(6) **B. J. Jackel** and E. F. Donovan, Quiet proton aurora, presentation at the DASP meeting, February 2000.

(7) **B. J. Jackel**, E. F. Donovan and L. L. Cogger, Auroral heights obtained by triangulation, poster at the DASP meeting, February 2000.

(8) **B. Jackel**, D. Steele, L.L. Cogger and E.F. Donovan, Multiple views of polar cap arcs. Presentation at the DASP meeting, February 1999.

(9) E.F. Donovan, **B. Jackel**, T. Trondsen, L.L. Cogger, I. Voronkov, P. Eglitas and H. Opgenoorth, Some thoughts on ground-based supra-mesoscale auroral imaging: ten years of Gillam ASI data and a look to the future. Presentation at the DASP meeting, February 1999.

(10) I. Voronkov, E. Friedrich, J.C. Samson, R. Rankin, E.F. Donovan and **B. Jackel**, Growth phase elements and pre-onset conditions observed by CANOPUS and SuperDarn, Presentation at the DASP meeting, February 1999.

(11) M. Lessard, T. Trondsen, **B. Jackel**, E.F. Donovan, L.L. Cogger, F. Creutzberg (1999) A description of the smart auroral multiscale imager (SAMI) for the CANOPUS array. Presented at the DASP meeting, February.

(12) **B. Jackel** (1998) Reconstruction of UVAI images with parametric de-smearing. Technical report to the Canadian Space Agency, November.

(13) E.F. Donovan, **B. Jackel**, L.L. Cogger and T. Trondsen, NORSTAR: an array of digital all-sky imagers in the Canadian North, project proposal to the Canadian Space Agency, November 1998.

(14) **B. Jackel**, E.F. Donovan and L.L. Cogger, Detached auroral arcs in InterBall auroral probe UVAI images, poster at the DASP meeting, February 1998.

(15) **B. Jackel** and D. Moorcroft, Designing bistatic radar experiments, presentation at the DASP meeting, February 1996.

(16) **B. Jackel**, D. Moorcroft and J.C. Foster, MidasC, a Canadian-American In/Coherent scatter radar, presentation at the DASP meeting, February, 1995.

(17) **B. Jackel**, D. Moorcroft and K. Schlegel Spatial structure of E-region coherent backscatter from an EISCAT rapid beam-scanning experiment, presentation at the DASP meeting, February 1993.

(18) **B. Jackel** and D. Moorcroft, Height profiles of large aspect angle coherent backscatter at 933 Mhz, presentation at the DASP annual meeting, February 1993.

(19) **B. Jackel**, D. Moorcroft and K. Schlegel, Modelling coherent backscatter from the auroral E-region at 933 MHz, presentation at the Canadian Network for Space Research general meeting October, 1991.

Direct Funding

- 2008-2012 Canadian Space Agency: $60k/year
- 2008-2011 NSERC discovery grant: $19k/year
- 2008 University of Calgary start-up: $90k

Academic Awards

- Faculty of Science Research Fellowship for Physics and Astronomy, UCalgary (1999)
- Excellence in Teaching Award, Department of Physics, UWO (1994)
- Ontario Graduate Scholarship, UWO (1993, 95)
- Best Student Paper, DASP Winter Workshop (1992, 93, 95)
- University of Western Ontario Entrance Scholarship, UWO (1991, 92)
- NSERC Postgraduate Scholarship, UWO (1991, 92)
- Norcen Energy Resources Scholarship, UAlberta (1989)
- NSERC Undergraduate Student Research Award, UAlberta (1989, 90)
- Amoco Canada undergraduate Scholarship, UAlberta (1989)
- APEGGA Scholarship in Geophysics, UAlberta (1988)
- University of Alberta Matriculation Scholarship, UAlberta (1985)

Other evidence of impact

- science team member for CFI funded RISR project: $9 million (2009)
- organizing chair for the DASP workshop in Banff (2009)
- science team member for NSERC MRS funded PolarDarn Facility: $682k (2008-2013)
- managing scientist for NORSTAR project (2000-2005)
- co-investigator of CSA funded THEMIS program (2004-07)
- co-investigator of CSA funded NORSTAR program (2001-06)
- planned and executed major upgrade to CSA funded CGSM program (2003-2005)
- referee for the Journal of Geophysical Research
- referee for the European Geophysical Union publications
- organizer of CGSM operations meeting in Saskatoon (May 2005)
- invited participant at the University of Calgary Physics and Astronomy department planning retreat in Banff (2003)
- examiner for Greg Baker's M.Sc. thesis defence (2002)
- co-author of NORSTAR NSERC CRO proposal with E. Donovan (2000)
- co-author of NORSTAR CSA proposal with E. Donovan, T. Trondsen, and L. Cogger (1998)

Public outreach

I have appeared in numerous news articles in national and local radio, television and newspapers. Real-time images from NORSTAR and THEMIS GBO field sites provide an compelling visual representation of sun-earth coupling. The October 2006 launch of the THEMIS satellites also resulted in greatly increased levels of media attention and public interest.