Jonathan G. Doyle

Atmospheric Physicist

☎ *+1 514 467 0540*
✉ *jonathan.g.doyle@gmail.com*
in *jonathangdoyle*
⊕ *doylejg*

Education

Doctorate*
of Science
Université du Québec à Montréal, **Québec**
Atmospheric Physics, 2012–2015 (*incomplete).
Cloud Processes and Impacts in a Changing Nunavik
Supervisor: Prof. J. M. Thériault

Master of
Science
Dalhousie University, **Nova Scotia**
Atmospheric Physics, 2007–2009.
Raman Lidar for Retrieval of Water-Vapour and Temperature Profiles in Eureka, Nunavut
Supervisor: Prof. T. J. Duck

Bachelor of
Science
Dalhousie University, **Nova Scotia**
Honours in Physics, 2003–2007.
Analytical pair potential for structural studies of alkali metals under high pressure
Supervisor: Prof S. A. Bonev

Research

2015–2017   **Research Assistant**, McGill University, Canada.
Evolution of NWP models towards higher resolution requires increasing computation time and power. Working with Environment Canada, a computationally more efficient model was developed by downscaling from the well characterized Regional Ensemble Kalman Filter (REnKF). Through collaboration with MEOPAR, the OLYMPEX ground verification field campaign (Dec 3–15, 2015) provided a unique opportunity to verify the downscaled model with in situ measurements from a suite of instruments, including rain/snow gauge and radar, in and around the Olympic Mountain region of Washington State and Vancouver Island. A comprehensive, multi-dimensional, statistical verification was implemented using several spatial verification techniques, including the robust intensity-scaled technique. Analysis of a 40 member ensemble of 48 h forecasts launched at 6 hour intervals, an assessment of model skill was characterized as a function of both spatial differences as well as temporal spread and model lag time, respectively.

2012–2015   **Doctoral Research**, Université du Québec à Montréal, Canada.
Primarily focused on studying the microphsyical and thermodynamical processes related to Arctic clouds, with particular focus on mixed-phase. A preliminary analysis of in situ lidar and radar data from eureka as well as various flight campaigns (e.g., ISDAC, MPACE) were presented at the 2013 CMOS (see Contributions). Research goals included the investigation of current and future cloud processes and climate feedback over the Northern Québec region of Nunavik. A pseudo-global warming model approach is used, driving the Weather Research and Forecasting (WRF) regional weather and climate model with reanalysis data for current climate and CRCM data for future climate scenarios. Climatological feedbacks and impacts of interest include the interaction between clouds, aerosols, precipitation type, and radiation.

2012 (7 mo.)	**Research Assistant**, Université du Québec à Montréal, Canada.

Studied a commonly observed correlation between the direction of valley flow and precipitation phase transition in complex terrain. Specifically, a case study from the Vancouver 2010 Winter Olympics was prepared to isolate the physical processes related to this correlation. Semi-idealized two-dimensional simulations using the Weather Research and Forecasting model with multiple microphysics schemes revealed that the cooling due to melting snow triggers a change in the valley flow direction. Results were presented at an international workshop and conference and a paper followed (see Contributions).

2009–2011 **Research Assistant**, Dalhousie University, Canada.

Remotely maintained and operated a lidar (laser radar) located in Eureka, Nunavut. Developed algorithms for analysis and characterization of certainty. Combining data from the lidar, other co-located instruments and several models, a case study of winter time water vapour intrusions was published (see Contributions). Work extending the published climatology involved characterizing the atmospheric phenomena in terms of water vapour, depolarization, and aerosol loading.

2007–2009 **Arctic Research**, Eureka, Nunavut, Canada.

Travelled twice to the High Arctic to commission and calibrate a new lidar system. Experience working with high powered lasers, various types of lab equipment, and solving problems in extreme and remote conditions.

2007–2009 **Masters Research**, Dalhousie University, Canada.

Implemented a scattering model sensitive to atmospheric N_2, O_2, H_2O and temperature. Model was used during the development, characterization, and optimization of the lidar receiver system. Simulated lidar signals were also used for the development of inversion algorithms and estimation of system performance. Finally, example data were presented and certainty in the inversion techniques were characterized as a function of spatial and temporal integration.

Awards

2012 **Alexander Graham Bell Canada Graduate Scholarships - Doctoral Program**, *NSERC-CRNSG*, *Tenure at Université du Québec à Montréal.*

Computer skills

Programming Languages	Python, MATLAB, Bash FORTRAN, C, Java	Productivity Packages	LaTeX, Microsoft/Libre-Office, Beamer, Scribus, XMind
Operating Systems	Linux, Windows, OSX	Other	MySQL, HDF5, NetCDF, Git, Mercurial, Redmine

Other Interests

Neural Networks	Developing a general model to identify music key using spectral analysis and a convolution neural network. Long term goal is the ability to identify music genre.
Cycling	Building, repairing, and salvaging bikes. Regular commuter as well as cyclotourist: Croatia (2011, 1000 km); United States (2012, 5800 km); Scandinavia (2017, 4000 km)
Music	Multi-insturmentalist producing YouTube videos featuring viola, guitar, mandolin.

References available upon request

Contributions

Publications

McCullough, E. M., Sica, R. J., Drummond, J. R., Nott, G., Perro, C., Thackray, C. P., Hopper, J., Doyle, J. G., Duck, T. J., and Walker, K. A. (2017), Depolarization measurements using the CANDAC Rayleigh-Mie-Raman Lidar at Eureka, Canada, *Atmos. Meas. Tech.*, 10(11), 4253–4277

Cookson-Hills, P., Kirshbaum, D. J., Surcel, M., Doyle, J. G., Fillion, L., Jacques, D., and Baek, S.-J. (2017). Verification of 24-h Quantitative Precipitation Forecasts over the Pacific Northwest from a High-Resolution Ensemble Kalman Filter System. *Weather and Forecasting*, 32(3), 1185–1208.

Thériault, J. M., J. A. Milbrandt, J. G. Doyle, J. R. Minder, G. Thompson, N. Sarkadie, I. Geresdie (2015), Impact of melting snow on the valley flow field and precipitation phase transition, *Atmos. Res.*, 156(Supplement C), 111–124.

Nott, G. J., T. J. Duck, J. G. Doyle, M. E. W. Coffin, C. Perro, C. P. Thackray, J. R. Drummond, P. F. Fogal, E. McCullough, and R. J. Sica, (2012), A remotely-operated lidar for aerosol, temperature, and water vapor profiling in the High Arctic, *J. Atmos. Oceanic Technol.*, 29(2), 221–234.

Doyle, J. G., G. Lesins, C. P. Thackray, C. Perro, G. J. Nott, T. J. Duck, R. Damoah, and J. R. Drummond (2011), Water vapor intrusions into the High Arctic during winter, *Geophys. Res. Lett.*, 38, L12806.

Presentations

J. Doyle, Thériault, J. M. (2013) Microphysical processes associated with the formation of Arctic mixed-phase clouds, CMOS, Saskatoon. (oral presentation)

J. M. Thériault*, J. A. Milbrandt and J. Doyle (2012), Case 5: Orographically-enhanced winter snowstorm, International Cloud Modeling Workshop, Warsaw, Poland. (oral presentation, *presenter)

J. Doyle, G. Nott, C. Perro, C. Pike-Thackray, T. Duck, J. Drummond (2010) Temperature, watervapour and clouds: Results from the CANDAC Raman lidar 2009-2010 winter campaign in Eureka, Nunavut, *Canadian Meteorological and Oceanographic Society (CMOS/SCMO) 44th Congress*, Ottawa, Canada. (oral presentation)

J. G. Doyle, G. Nott, C. Perro, C. Pike-Thackray, J. Hopper, L. Bourdages, G. Lesins, T. J. Duck, E. W. Eloranta, V. P. Walden and J. R. Drummond (2010), Tropospheric particles, temperatures and watervapour from two lidars located in Eureka, Nunavut, *IPY Canada Early Results Workshop*, Ottawa, Canada. (poster)

J. Doyle, G. Nott, C. Perro, and T. Duck (2009), Temperature and water vapour retrievals from the newly commissioned RMR lidar in Eureka Nunavut, *CMOS/SCMO 43rd Congress*, Halifax, Canada. (poster)

J. Doyle, G. Nott, and T. Duck (2008), Characterization and first measurements of the new CANDAC Raman Lidar (CRL), *Fall Meeting of the American Geophysical Union*, San Francisco, USA. (poster)

Workshops

O. Huziy*, J.G Doyle*, M. Deshaies-Jacques (2014), Data handling and visualization using Python, *CMOS/SCMO 48rd Congress*, Rimouski, Canada. (*presenters)