

Dylan Hickson

Ph.D. Candidate/Graduate Research Assistant
York University, Toronto, ON, Canada

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Education

- **York University** Toronto, Canada
Ph.D., Earth & Space Science *2014 - present*
 - PHD THESIS: Characterizing the Dielectric Behaviour of Asteroid Regolith Analogue Materials for Planetary Radar Interpretation
- **McMaster University** Hamilton, Canada
 - *B.Sc., Honours Earth and Environmental Science* *2009 - 2014*
 - *B.Sc., Physical Science* *2009 - 2014*
 - UNDERGRADUATE THESIS: 3-D Ground Penetrating Radar (GPR) survey of a White Pine (*Pinus Strobus*) root system: comparison of grid-based versus radial survey methods
 - Research Internship with the Environmental and Archaeological Geophysics Laboratory

Professional Experience

- **Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA)** Guelph, Canada
Agricultural Geomatics Assistant *2013 - 2014*
 - Performed ground truthing of remote sensing data throughout Southern Ontario to correlate with field classification schemes
 - Aided in development of methodology for ground truthing surveys

Projects and Collaborations

- **2015 CanMars MSR Analogue Mission (Western University)** London, Canada
LiDAR Instrument Science Team *November, 2015*
 - Analysis and processing of LiDAR point cloud data collected by rover
 - Interpretation of data relevant to mission objectives
 - Participation in planning rover operations
- **Stelida Naxos Archaeological Project (McMaster University)** Naxos, Greece
Database Developer / Field Worker *August, 2014*
 - Designed and implemented a database structure to store all data collected
 - Contributed to cartographic/geologic interpretation

Peer reviewed journal articles published, submitted, and in review

Hickson, D., Boivin, A., Daly, M.G., Ghent R., Nolan, M.C., Tait, K., Cunje, A., Tsai, C-A. (2017) Near surface bulk density estimates of NEAs from radar observations and permittivity measurements of powdered geologic material. *Submitted to Icarus*.

Hickson, D., Sotodeh, S., Daly, M., Ghent, R., Nolan, M.C. (2017) Improvements on effective permittivity measurements of powdered alumina: Implications for bulk permittivity properties of asteroid regoliths. *Advances in Space Research* 59.1, 472-482.

Selected conference poster presentations

Boivin, A., **Hickson, D.**, Cunje, A., Tsai, C-A., Ghent, R.R., Daly, M.G. (2016), Measurements in Vacuum of the Effect of Ilmenite on the Complex Dielectric Permittivity of Planetary Regolith Analog Materials. Abstract [P51C-2148] presented as a poster at *2016 Fall Meeting, AGU*, San Francisco, Calif., USA, 12-16 Dec.

Hickson, D., Sotodeh, S., Daly, M., Ghent, R. (2016), Boundary Conditions Modelling of Permittivity Measurements of Powders in Coaxial Airline. Abstract [2137] presented as a poster at *47th Lunar and Planetary Science Conference (LPSC)*, The Woodlands, TX, USA, 21-25 Mar.

Zylberman, W., **Hickson, D.**, Haid, T., Osinski, G.R. (2016), 2015 CanMars MSR Analogue Mission: The Key Role of LiDAR in Rover Navigation and Potential for Future Missions. Abstract [1041] presented as a poster at *47th LPSC*, The Woodlands, TX, USA, 21-25 Mar.

Boivin, A., **Hickson, D.**, Cunje, A., Ghent, R., Daly, M. (2016), Broadband Measurements of Dielectric Permittivity of Planetary Regolith Analogue Materials using a Coaxial Transmission Line in Vacuum. Abstract [2025] presented as a poster at *47th LPSC*, The Woodlands, TX, USA, 21-25 Mar.

Hickson, D., Daly, M., Ghent, R., Boivin, A., Cunje, A., Tsai, C-A. (2015), Complex Permittivity Measurements of Powders. Poster presented at *9th OSIRIS-REx Science Team Meeting*, John Hopkins Applied Physics Laboratory, Laurel, MD, USA, 20-22 Oct.

Boivin, A., Tsai, C-A., **Hickson, D.**, Ghent, R., Daly, M. (2015), Preliminary Broadband Measurements of Dielectric Permittivity of Planetary Regolith Analogue Materials Using a Coaxial Transmission Line. Abstract [2487] presented as a poster at *46th LPSC*, The Woodlands, TX, USA, 16-20 Mar.

Hickson, D., Nussli, E., Steckley, Z., Sweeney, S. (2014), Agricultural Landscapes of the City of Ottawa: Mobile Mapping Groundtruth Results 2014. Poster presented at *Canadian Association of Geographers-Ontario Division Annual Meeting (CAGONT)*, York University, Toronto, ON, Canada, 24-25 Oct.

Nussli, E., Anwar, S., Gardner, S., **Hickson, D.**, Shaw, A., Steckley, Z., Vanthof, V., Sweeney, S. (2014), Leamington Townships Agricultural Landscape Pre and Post the Heinz Company Tomato Supply Era: A Detailed Field-by-Field Comparison of the 2013 and 2014 Cropping Seasons. Poster presented at *CAGONT*, Toronto, ON, Canada, 24-25 Oct.

Anwar, S., Goodfellow, S., Caldwell, J., Gardner, S., **Hickson, D.**, Smith, D., Steckley, Z., Sweeney, S. (2014), The Northern Bruce Peninsula Agricultural Landscape: Multi-temporal Observations with Mobile Mapping Technology. Poster presented at *CAGONT*, York University, Toronto, ON, Canada, 24-25 Oct.

Oral Presentations

*Interpreting Planetary Radar with Complex
Permittivity Measurements for the Study of Asteroids*

November 2, 2017

Department of Earth and Space Science Colloquium Talk
York University, Toronto, ON, Canada

Using Radar to Probe the Inner Solar System

June 3, 2017

Solar System Social (Outreach) Talk
Burdock, Toronto, ON, Canada

*Radar observations and experimental validation
constraining regolith properties of planetary bodies*

January 26, 2017

Department of Earth and Space Science Colloquium Talk
York University, Toronto, ON, Canada

*Complex Permittivity Measurements of Planetary
Analogue Mixtures in Vacuum*

June 8, 2015

NSERC CREATE Annual Meeting Talk
Technologies and Techniques for Earth & Space Exploration
Queens University, Kingston, ON, Canada

Improved Radar Interpretations: Applications to Asteroids

June 12, 2014

NSERC CREATE Annual Meeting Talk
Technologies and Techniques for Earth & Space Exploration
University of Toronto Institute for Aerospace Studies (UTIAS), Toronto, ON, Canada

Conferences Attended

47th Lunar and Planetary Science Conference

March 21-25, 2016

The Woodlands, TX, USA

9th OSIRIS-REx Science Team Meeting

October 20-22, 2015

John Hopkins Applied Physics Laboratory, Laurel, MD, USA

NSERC CREATE Annual Meeting

June 7-8, 2015

Technologies and Techniques for Earth & Space Exploration
Queens University, Kingston, ON, Canada

CAGONT Annual Meeting

October 24-25, 2014

York University, Toronto, ON, Canada

NSERC CREATE Annual Meeting

June 12-13, 2014

Technologies and Techniques for Earth & Space Exploration
University of Toronto Institute for Aerospace Studies, Toronto, ON, Canada

Technical Skills

Programming Experience

MATLAB, Python, IDL, HTML/CSS, L^AT_EX

Software Proficiency

ArcGIS, JMARS, Microsoft Office, Git

Laboratory/Field Experience

- Geophysical surveying: GPR, gravimetric, seismic
- Geologic mapping and GPS point acquisition
- Experimental design/implementation of process control (vacuum chamber) and material measurements (dielectric characterization with VNA/coaxial transmission line, cylindrical resonant cavity)
- Experience with SEM/EDS, XRD, geologic sample processing/characterization

Awards, Grants & Honours

Mensa Canada Scholarship	2017 - 2018
Ontario Graduate Scholarship (OGS)	2017 - 2018
The Carswell Scholarship	2016 - 2017
York Graduate Scholarship	2016 - 2017
NSERC CREATE Graduate Student Fellowship	2014 - 2016
McMaster Deans Honour List	2013 - 2014

Memberships

Association of Professional Geoscientists of Ontario	2013 - present
American Geophysical Union	2017 - present