Dylan Hickson

Ph.D. Candidate/Graduate Research Assistant
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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
  - Developed methodology for ground truthing surveys and digitization of data

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

47^{th} Lunar and Planetary Science Conference — *March 21-25, 2016*
The Woodlands, TX, USA

9^{th} 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, LaTeX

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, $2,000 . . . . . *2017 - 2018*

Ontario Graduate Scholarship (OGS), $15,000 . . . . . *2017 - 2018*

The Carswell Scholarship, $10,000 . . . . . *2016 - 2017*

York Graduate Scholarship, $3,000 . . . . . *2016 - 2017*

NSERC CREATE Graduate Student Fellowship, $2,000 . . . . . *2014 - 2016*

McMaster Deans Honour List . . . . . *2013 - 2014*

Memberships

Association of Professional Geoscientists of Ontario . . . . . *2013 - present*

American Geophysical Union . . . . . *2017 - present*

Volunteer & Extracurricular

- **MacBEAT: McMaster's Music Community** Hamilton, Canada
  Club President *2013 - 2014*
  - Oversaw weekly operation of club executive committee
  - Engaged with McMaster's student community with open meetups and performances
- **Hamilton Out of the Cold** Hamilton, Canada
  Serving/Kitchen Cleanup *2011 - 2012*
  - Helped set up dining room and serve meals to guests
  - Washed dishes/cutlery and cleaned kitchen

I've played in an adult recreational hockey league since 2013 and enjoy travelling, reading/writing, and the outdoors.