December 20, 2024

CURRICULUM VITAE

1. **NAME: Catherine Neish**

   RANK: Associate Professor

   DATE TENURED: July 1, 2021

2. **EDUCATION:**

PhD	University of Arizona	Planetary Sciences	2008
BSc	University of British Columbia	Physics and Astronomy	2004

3. **EMPLOYMENT HISTORY:**

2021 – present	Associate Professor	Dept. of Earth Sciences, Western University
2015 – 2021	Assistant Professor	Dept. of Earth Sciences, Western University
2013 – 2015	Assistant Professor	Dept. of Physics and Space Sciences, Florida Tech
2012 – 2013	Postdoctoral Fellow	NASA Goddard Space Flight Center
2009 – 2012	Postdoctoral Fellow	Johns Hopkins University Applied Physics Laboratory

4. **HONORS AND AWARDS:**

2024 NASA Group Achievement Award to the International Mars Ice Mapper Measurement Definition Team
Award given to groups in recognition of accomplishments contributing to NASA's mission.

2021 The College of New Scholars, Artists and Scientists, The Royal Society of Canada (RSC)
I was elected to the College's Class of 2021, which represents fifty of the top mid-career leaders in Canada.

2017 Minor Planet 16972 Neish
An asteroid was named in my honour by the International Astronomical Union in December 2017.

2017 Early Researcher Award, Ontario Ministry of Research & Innovation
This award provides funding to help new professors build a research team. It is based on the excellence of the researcher, the quality of the proposal, the development of research talent, and benefits for the province of Ontario.

2015 NSERC Discovery Accelerator Supplement
The DAS program provides resources for up to 130 researchers who have a superior research program that is highly rated in terms of originality, and who show strong potential to become international leaders within their field.

2014 AGU Ronald Greeley Early Career Award in Planetary Science
One prize awarded each year, for significant contributions to planetary science within six years of PhD.

5. TEACHING

a. Courses

I have designed several new courses over my career, including one in introductory astronomy, one covering upper level atmospheric physics, one covering upper level planetary science, one covering upper level remote sensing, and one covering upper level astrobiology.

Undergraduate courses:

ES3001B: Astrobiology is an optional course for upper level students in the Faculty of Science, and can be used towards the Minor in Planetary Science and Space Exploration. It covers the origin of life on Earth and the possibility of life elsewhere in the solar system and universe. I developed all lectures and labs for this course, requiring students to participate in an interactive classroom environment. It remains one of the most popular third year courses taught in the Department of Earth Sciences. (2 hrs/week lecture and 2 hrs/week lab for 13 weeks)

- ES3001B – Astrobiology – UWO – Winter 2024
  - 0.5 credit course, 19 students
- ES3001B – Astrobiology – UWO – Winter 2022
  - 0.5 credit course, 38 students
- ES3001B – Astrobiology – UWO – Winter 2021
  - Taught online during COVID-19 pandemic
  - 0.5 credit course, 29 students
- ES3001B – Astrobiology – UWO – Winter 2018
  - 0.5 credit course, 38 students
- ES3001B – Astrobiology – UWO – Winter 2017
  - 0.5 credit course, 36 students
- ES3001B – Astrobiology – UWO – Winter 2016
  - 0.5 credit course, 16 students

ES1023A: Planet Earth: Shaken and Stirred is co-taught with **ES2123A: The Dynamic Earth**. It is an introductory course in geophysics for both non-science majors (ES1023) and geology majors (ES2123). Dr. Rick Secco designed the course, and I taught it in his absence in Fall 2016. I updated the lecture notes, including more interactive elements into the curriculum, such as Think-Pair-Share multiple choice questions and in-class worksheets. I also supervised the TAs, who were in charge of running the laboratory sections. (2 hrs/week lecture for 13 weeks)

- ES1023A – Planet Earth: Shaken and Stirred – UWO – Fall 2016
  - Taught jointly with ES2123A
  - 0.5 credit course, 36 students
- ES2123A – The Dynamic Earth – UWO – Fall 2016
  - Taught jointly with ES1023A
  - 0.5 credit course, 38 students

ES4450Y: Regional Field Geology is the fourth year field course, led by Dr. Guy Plint, to discover the regional geology of Nova Scotia and New Brunswick. In Fall 2016, I volunteered to assist Dr. Plint on the field course. I assisted groups of students while completing class assignments, drove a van, and helped with general logistics. (10 day field course)

- ES4450Y – Regional Field Geology – UWO – Fall 2016
  - Secondary instructor, for volunteer credit; 0.5 credit course, 15 students

SPS 4030: Physics of the Atmosphere is a fourth year course required for students completing a degree in Planetary Science at Florida Tech. It was co-taught with the graduate level course,

SPS 5031: Planetary Science – Atmospheres. The course provides an overview of the fundamental physical processes that govern the structure and behavior of atmospheres. Topics covered included atmospheric thermodynamics, radiative transfer, atmospheric dynamics, and comparative planetology. I developed all of the lectures, homework assignments, and exams for this course. (3 hrs/week lecture for 16 weeks)

- SPS 4030 – Physics of the Atmosphere – Florida Tech – Spring 2015
  - 0.5 credit course, 12 students
- SPS 4030 – Physics of the Atmosphere – Florida Tech – Spring 2014
  - 0.5 credit course, 29 students

SPS 4035: Comparative Planetology is a fourth year course required for students completing a degree in Planetary Science at Florida Tech. The course introduces the geologic processes operating on the solid surfaces in the solar system, including a survey of the terrestrial planets, large asteroids and comets, and the satellites of the outer solar system. I developed all of the lectures, homework assignments, and exams for this course, based on the textbook *Planetary Surface Processes* by H. J. Melosh. I also developed and implemented a two day field excursion for the students to various locations around Florida, to understand planetary analogue environments. (3 hrs/week lecture for 16 weeks, plus 2 day field excursion)

- SPS 4035 – Comparative Planetology – Florida Tech – Spring 2015
  - 0.5 credit course, 17 students

SPS 1010: Introduction to Astronomy is an introductory course for both non-majors (~2/3 of the class) and majors in astronomy (~1/3 of the class). It covers stellar structure and evolution, the interstellar medium, galactic formation and evolution, and cosmology. I developed all of the lectures, homework assignments, and exams for this course, using resources from *The Cosmic Perspective* by Bennett *et al.* and *Lecture Tutorials for Introductory Astronomy* by Prather *et al*. Students participated in an interactive classroom environment, using Think-Pair-Share multiple choice questions and in-class worksheets. (3 hrs/week lecture for 16 weeks)

- SPS 1010 – Introduction to Astronomy – Florida Tech – Spring 2014
  - 0.5 credit course, 67 students

Graduate courses:

PS9605L: Planetary Surface Processes Field School is the graduate level field course, led by Dr. Gordon Osinski, to study the geology of various planetary analogue sites in North America. The course focuses on sites in northern Arizona and southern Utah, including stops related to impact cratering (e.g., Meteor Crater, AZ), volcanism (e.g., Sunset Crater volcanic field, AZ), and canyon and valley formation (e.g., Canyonlands National Park, UT). In Summer 2018, I assisted Dr. Osinski on the field course. I assisted groups of students while completing class assignments, drove a van, and helped with general logistics. (12 day field course)

- PS9605L – Planetary Surface Processes Field School – Summer 2018
  - Secondary instructor
  - 0.5 credit course, 14 students

PS9606L: Remote Sensing and Image Analysis for Earth and Planetary Science is a short course offered to graduate students at Western and other institutions in Canada. The students take the course in person for five full days over the summer. The course consists of five three hour lectures, and five hands-on lab exercises, covering topics in infrared spectroscopy, visible image processing, thermal infrared data, radar remote sensing, and topographic data. Dr. Livio

Tornabene designed the original course, which I helped to teach in Summer 2016. In Summer 2018, I led the course, and developed three new lectures and two new labs. In Summer 2020, the course was expanded to include undergraduate students, and I developed one new lecture and three new labs. (15 hrs lecture and 20 hrs lab over five days) In Winter 2024, the course was adapted to run as a full semester course. (3 hrs/week for 13 weeks)

- PS9606B – Remote Sensing and Image Analysis for Earth and Planetary Science – UWO – Winter 2024
  - 0.5 credit course, 4 undergraduate and 10 graduate students
- PS9606L – Remote Sensing and Image Analysis for Earth and Planetary Science – UWO – Summer 2020
  - Taught online during COVID-19 pandemic
  - 0.5 credit course, 9 undergraduate and 15 graduate students
- PS9606L – Remote Sensing and Image Analysis for Earth and Planetary Science – UWO – Summer 2018
  - Co-taught with Dr. Tornabene
  - 0.5 credit course, 11 students
- PS9606L – Remote Sensing and Image Analysis for Earth and Planetary Science – UWO – Summer 2016
  - Co-taught, for volunteer credit
  - 0.5 credit course, 11 students

PS9603A: Introduction to Planetary Science is a short course offered to graduate students at Western and other institutions in Canada. This course is mandatory for those enrolled in the collaborative specialization in Planetary Science at Western. The students take the course in person for seven full days at the start of the Fall semester. The course consists of eight three hour lectures, and three hands-on lab exercises, covering topics in solar system formation, planetary geology, astromaterials, planetary atmospheres, astrobiology, exoplanets, and planetary data sets. The course typically has several guest lectures; in 2024, I led the course, with assistance from 4 other faculty members. (24 hrs lecture and 10 hrs lab over seven days)

- PS9603A – Introduction to Planetary Science – UWO – Fall 2024
  - 0.5 credit course, 7 students
- PS9603A – Introduction to Planetary Science – UWO – Fall 2023
  - 0.5 credit course, 12 students
- PS9603A – Introduction to Planetary Science – UWO – Fall 2021
  - 0.5 credit course, 17 students
- PS9603A – Introduction to Planetary Science – UWO – Fall 2020
  - 0.5 credit course, 12 students (online)

PS9600Y: Planetary Seminar is a pass/fail course offered to graduate students in the collaborative specialization in Planetary Science at Western. This course is intended to help the students with their career development, to improve their skills in critical thinking and science communication, and to foster collaboration within the planetary science graduate community. In 2020, I led the course for the first time. Prior to the start of the fall term, I surveyed students to determine what topics they wished to cover, and encouraged everyone in the collaborative specialization to participate (it had previously been limited to those in their first and second years). The topics covered how to obtain grant funding, how to read scientific papers, how to apply for a job, how to participate in conferences, and how to foster a diverse community. (1 hr/week lecture for 12 weeks)

- PS9600Y – Planetary Seminar – UWO – Fall 2021
  - 0.25 credit course, 34 students
- PS9600Y – Planetary Seminar – UWO – Fall 2020
  - Taught online during COVID-19 pandemic
  - 0.25 credit course, 27 students

GEOL9635B: Planetary Surface Processes is a graduate course in geology cross-listed with an upper division undergraduate course (Earth Sciences 4435B). The course introduces the geologic processes operating on the solid surfaces in the solar system, including a survey of the terrestrial planets, large asteroids and comets, and the satellites of the outer solar system. I developed the lectures, homework assignments, and exams for this course, based on the textbook *Planetary Surface Processes* by H. J. Melosh. (3 hrs/week lecture for 13 weeks)

- GEOL9635B – Planetary Surface Processes – UWO – Winter 2022
  - 0.5 credit course, 3 undergraduate and 16 graduate students

b. Student and Postdoctoral Fellow supervision

Postdoctoral Fellows (4):

Michael Zanetti (UWO – 2015-18), in co-supervision with Dr. Osinski. I worked with Dr. Zanetti on the characterization of geologic surface roughness, using a combination of radar remote sensing and high-resolution LiDAR data. He is now a planetary scientist at NASA Marshall Space Flight Center.

Nora Weitz (UWO – 2017-18), in co-supervision with Dr. Osinski. I worked with Dr. Weitz on landscape evolution modeling of terrestrial impact craters.

Byung-Hun Choe (UWO – 2018). I worked with Dr. Choe on the radar properties of lava flows at Craters of the Moon National Monument and Preserve in Idaho. He is now a postdoctoral fellow at the Canada Centre for Mapping and Earth Observation (CCMEO), Natural Resources Canada.

Ethan Schaefer (UWO – 2019-2021). Dr. Schaefer was awarded a Western Postdoctoral Fellowship in 2019. I work with Dr. Schaefer on understanding the geology of lava flows from the geometry of their margins, using remote sensing and field data. He is now a staff member at the Planetary Data Systems Geosciences Node.

Graduate students (21):

Masters theses:

Rebeca Kinser (Florida Tech – 2014-16), thesis "*Geological conditions required for fluvial erosion of Titan's craters"*. I supervised and trained this student in remote sensing of planetary surfaces, and landscape evolution modeling.

Elise Harrington (UWO – 2016-18), thesis "*Polarimetric SAR as a tool for remote sensing salt diapirs, Axel Heiberg Island, Nunavut"*. I supervised and trained this student in the principles of radar remote sensing. She is now a PhD student at the University of Southampton.

Alyssa Werynski (UWO – 2016-18), thesis "*Compositional variations of Titan's impact crater indicates active surface erosion".* I supervised and trained this student in infrared and radar remote sensing of Titan. She is now a Staff Scientist at the Space Telescope Science Institute.

Jeffrey Daniels (UWO – 2016-18), thesis "*Impact melt emplacement on Mercury".* I supervised and trained this student in remote sensing and topographic analysis of Mercury.

Joshua Hedgepeth (UWO – 2016-18), thesis "*Impact craters on Titan: Finalizing Titan's crater population".* I supervised and trained this student in remote sensing and topographic analysis of Titan. He is now a postdoctoral fellow at Curtin University.

Carolina Rodriguez (UWO – 2018-19), thesis "*Quantification of surface roughness of lava flows on Mars".* I supervised and trained this student in the remote sensing of Mars, and the production of digital terrain models. She is now a Staff Scientist at the Space Telescope Science Institute.

Rachel Yingling (UWO – 2018-20), thesis "*Impact melt emplacement on Mars",* in co-supervision with Dr. Livio Tornabene*.* I supervised and trained this student in the remote sensing of Mars, and the production of digital terrain models. She is now a Mission Operations Specialist at Malin Space Science Systems.

Anthony Dicecca (UWO – 2020-2022), research topic "*Mapping Fe-Mg Phyllosilicates in northwest Noachis Terris, Mars"*, in co-supervision with Dr. Livio Tornabene. I supervised and trained this student in the remote sensing of Mars.

Taylor Duncan (UWO – 2021-2023), thesis "*Terrestrial craters as analogues for degraded craters on Titan*". I supervised and trained this student in the remote sensing of impact craters on the Earth and Saturn's moon Titan. She defended her thesis in August 2023.

Samuel Gagnon (U. Sherbrooke – 2021-2023), thesis "*Nouvelles identifications d'impact melts au pôle Sud lunaire et évaluation de leur accessibilité pour de futures missions d'exploration lunaire*", in co-supervision with Dr. Myriam Lemelin. I supervised and trained this student in the remote sensing of planetary surfaces, and the use of Geographic Information Systems. He is now an instructor at CEGEP de Sherbrooke.

Sharini Kanni Suresh Babu (UWO – 2023-present), thesis "*The optical properties of lunar impact melt deposits*," in co-supervision with Dr. Gordon Osinski. I supervise and train this student in the remote sensing of the Moon, and the use of Geographic Information Systems. She is expected to defend her thesis in August 2025.

Doctoral theses:

Byung-Hun Choe (UWO – 2013-2017), thesis "*Polarimetric SAR application for geological mapping and resource exploration in the Canadian Arctic*", in co-supervision with Dr. Osinski and Dr. Tornabene I supervised this student in radar remote sensing of the Earth.

Gavin Tolometti (UWO – 2016-2021), thesis "*The physical and rheological properties of volcanic and impact melt rocks*", in co-supervision with Dr. Osinski. I supervised and trained this student in radar remote sensing and field work. He is now a Customer Support Engineer at Skywatch.

Joshua Hedgepeth (UWO – 2018-2022), thesis "*Using craters to study carbon and nitrogen compounds on Icy Worlds*". I supervise this student in the physical modelling of freezing melt deposits on Titan. He is now a postdoctoral fellow at Curtin University.

Jahnavi Shah (UWO – 2018-2024), thesis "*The study of Titan's surface using impact craters and analogues*". I supervised and trained this student in remote sensing of the Earth and Titan. She defended her dissertation in March 2024.

Ashka Thaker (UWO – 2020-present), thesis "*Radar dark halo craters on the Moon".* I supervise and train this student in the remote sensing of the Moon, and investigation of impact craters there. She is expected to defend her thesis in August 2025.

Leah Sacks (UWO – 2021-present), thesis "*Tectonic processes on icy satellites*". I supervise and train this student in observations of the icy satellites in the outer solar system. She is expected to defend her dissertation in February 2025.

Cailin Gallinger (UWO – 2021-present), thesis "*The physical properties of lunar impact melt deposits*". I supervise and train this student in observations of impact melt deposits on the Moon. She is expected to defend her dissertation in August 2025.

Reid Perkins (UWO – 2021-present), thesis "*Radar and LiDAR observations of terrestrial analogue sites*". I supervise and train this student in remote sensing observations and fieldwork at sites on Earth that act as analogues to planetary processes. He is expected to defend his dissertation in August 2025.

Sashank Vanga (UWO – 2022-present), thesis "*Geologic interpretation of human landing sites on the Moon*." I supervise and train this student in remote sensing observations and fieldwork at sites on Earth that act as analogues to planetary processes. He is expected to defend his dissertation in August 2026.

Elisa Dong (York University – 2022-present), thesis "*Planetary atmosphere interactions*", in co-supervision with Dr. John Moores. I supervise and train this student in the remote sensing of planetary atmospheres. She is expected to defend her thesis in August 2026.

Undergraduate students (14):

Jack Madden (NASA GSFC – 2013), summer research intern, *"The discovery of new impact melts using Mini-RF on LRO"*, in co-supervision with Dr. Lynn Carter. I trained this student in radar remote sensing of the Moon.

Ryan Ripper (Florida Tech – 2013-14), senior capstone project, "*Emplacement of Venusian crater impact melts*". I supervised and trained this student in remote sensing of planetary surfaces, and the use of Geographic Information Systems.

Deirdre Fey (Florida Tech – 2014-15), senior capstone project "*Sand dune elevations on Earth, Mars, and Titan".* I supervised and trained this student in remote sensing of the Earth and planets. She is now an Assistant Staff Scientist at Malin Space Science Systems.

Derek Smith (UWO – 2015-16), Bachelor research thesis, "*Analyzing the role of pre-impact topography on impact melt emplacement."* I supervised and trained this student in remote sensing of planetary surfaces, and the use of Geographic Information Systems.

Maria Shaposhnikova (UWO – 2016), summer research intern, "*Spectral mapping of salt diapirs on Axel Heiberg Island, NU".* With the assistance of Dr. Livio Tornabene, I supervised this student in infrared remote sensing of the Canadian Arctic.

Rachel Maj (UWO – 2016), summer research intern, "*Using radar data to identify areas of interest and plan traverses in volcanic terrains".* With the assistance of Dr. Livio Tornabene, I supervised this student in the remote sensing of Craters of the Moon National Monument in Idaho. She also participated in my lab's summer field work in Idaho.

Nilushi Mahathantila (UWO – 2016-17), Bachelor research thesis, "*Characteristics and distribution of patterned ground features, Haughton Impact Structure, Devon Island, Canada".* With the assistance of my PDF, Dr. Michael Zanetti, I supervised this student in the analysis of high-resolution topographic data sets and radar images.

Serenity Fan (UWO – 2017), summer research intern, "*An improved methodology for the 3-dimensional characterization of surface roughness as applied to lava flows".* With the assistance of my PDF, Dr. Michael Zanetti, I supervised this student in the analysis of high-resolution topographic data sets of lava flows. They also participated in my lab's summer field work in Idaho. They are now a Masters student at Georgetown University.

Émilie Laflèche (UWO – 2020), summer research intern, "*Characterizing the properties of lunar impact melt deposits*." Émilie was part of the first cohort of summer undergraduate interns for the Institute for Earth and Space Exploration. She researched the physical properties of lunar impact melt deposits, using data from the Lunar Reconnaissance Orbiter. I trained her in the use of planetary data sets and GIS software. She is now a PhD student at Purdue University.

Sophia Trozzo (UWO – 2021), summer research intern, *"Crowd-sourcing crater detections on Earth and Titan*". Sophia was part of the second cohort of summer undergraduate interns for the Institute for Earth and Space Exploration. She developed a crowd-sourcing platform for users to identify impact craters in radar images of Earth. I trained her in the use of radar data sets and GIS software. She is now a MSc candidate at Western University in Medical Biophysics.

Samuel Gagnon (UWO – 2021), summer research intern, *"Optical properties of lunar impact melt deposits*". Samuel was part of the second cohort of summer undergraduate interns for the Institute for Earth and Space Exploration. He mapped impact melt deposits around lunar impact craters and analyzed their optical properties. I trained him in the use of planetary data sets and GIS software. He is now an instructor at CEGEP de Sherbrooke.

Leah Davis-Purcell (UWO – 2021-22), Bachelor research thesis, "*Global roughness properties of Saturn's moon Titan".* I supervised this student in the analysis of topographic data sets and radar images of Titan. She is now a Mission Systems and Outreach Specialist at Avalon Space.

Nima Abbaszadeh (UWO – 2023-24), Bachelor research thesis, "*Food Crop Growth for Sustainable Agriculture in Lunar and Martian Soil Simulants*". I supervise this student in the experimental design of a research program that considers the ability for extraterrestrial soils to support plant life.

Sophia Slabon (UWO – 2024), summer research intern, "*Radar properties of tornado tracks*." I co-supervised Sophia along with Dr. Connell Miller from the Northern Tornadoes Project. I trained her in the use of radar remote sensing data, for use in the characterization of tornado tracks.

c. Graduate examination committees

Graduate student thesis examiner (25):

- Examiner, MSc Defense (R. Schwegman), Dept. of Earth Sciences, 2015
- Examiner, PhD Defense (M. Mader), Dept. of Earth Sciences, 2015
- Examiner, PhD Defense (P. Patel), Dept. of Physics and Astronomy, 2016
- Examiner, PhD Defense (T. Harrison), Dept. of Earth Sciences, 2016
- Examiner, MSc Defense (T. Haid), Dept. of Earth Sciences, 2016
- Examiner, MSc Defense (A. Waz), Dept. of Geography, 2016
- Examiner, PhD Defense (M. Tabeshian), Dept. of Physics and Astronomy, 2017
- Examiner, MSc Defense (K. Marion), Dept. of Earth Sciences, 2018
- Examiner, MSc Defense (V. Houde), Dept. of Earth Sciences, 2018
- Examiner, MSc Defense (A. Bina), Dept. of Earth Sciences, 2018
- Examiner, PhD Defense (A. Jalali), Dept. of Physics and Astronomy, 2018
- Examiner, PhD Defense (C. Caudill), Dept. of Earth Sciences, 2020
- External Examiner, PhD Defense (M. Aufaristama), University of Iceland, 2020
- Examiner, MSc Defense (C. Andres), Dept. of Earth Sciences, 2020
- Examiner, MSc Defense (N. Posnov), Dept. of Earth Sciences, 2021
- Examiner, MSc Defense (E. Lenhart), Dept. of Earth Sciences, 2021
- Examiner, PhD Defense (M. Tannock), Dept. of Physics and Astronomy, 2021
- External Examiner, PhD Defense (M. Armour), McMaster University, 2022
- Examiner, MSc Defense (L. Louwerse), Dept. of Earth Sciences, 2023
- Examiner, PhD Defense (F. Cao), Dept. of Earth Sciences, 2023
- Examiner, PhD Defense (J. Kissi), Dept. of Electrical and Computer Engineering, 2024

- Examiner, MSc Defense (S. Shaigec), Dept. of Geography and Environment, 2024
- External Examiner, PhD Defense (P. Acharya), York University, 2024
- Examiner, PhD Defense (C. Ryan), Dept. of Earth Sciences, 2024
- Examiner, PhD Defense (X. Zhou), Dept. of Geography and Environment, 2024

Chair of thesis examination (6):
- Chair, MSc Defense (B. Zhao), Dept. of Earth Sciences, 2018
- Chair, MSc Defense (Y. Li), Dept. of Earth Sciences, 2018
- Chair, MSc Defense (L. Innis), Dept. of Earth Sciences, 2018
- Chair, PhD Defense (G. Salehipourshirazi), Dept. of Biology, 2018
- Chair, MSc Defense (J. Lee), Dept. of Earth Sciences, 2020
- Chair, MSc Defense (M. Fyfe), Dept. of Earth Sciences, 2023

Chair of comprehensive examination (3):
- Chair, PhD Qualifying Exam (G. Binyamini), Dept. of Earth Sciences, 2015
- Chair, PhD Qualifying Exam (F. Cao), Dept. of Earth Sciences, 2018
- Chair, PhD Qualifying Exam (S. Hibbard), Dept. of Earth Sciences, 2020

Member of graduate student committee (8):
- PhD Committee, Z. Morse, Dept. of Earth Sciences, 2016 – 2018
- MSc Committee, Z. Guo, Dept. of Earth Sciences, 2018 – 2019
- MSc Committee, L. Dorn, University of Alaska Fairbanks, 2018 – 2023
- PhD Committee, N. Chinchalkar, Dept. of Earth Sciences, 2020 – 2023
- PhD Committee, V. Rangarajan, Dept. of Earth Sciences, 2020 – 2023
- MSc Committee, S. Shaigec, Dept. of Geography and Environment, 2022 – 2024
- PhD Committee, J. Burley, Dept. of Earth Sciences, 2022 – 2024
- PhD Committee, F. Wróblewski, University of Idaho, 2023 – present

6. **PUBLICATIONS:**

a) Summary:

To date, I have published 81 papers in peer-reviewed journals and 3 chapters in books, including 22 as first author and 13 with a trainee as first author. My publications have been cited over 4200 times by my peers. I have an h-index of 40 as of December 2024.

Note: In planetary science, publication authors are listed in descending order of contribution; alphabetical listing implies equal contributions. There is generally no significance to being the last-named author.

b) Details:

Authorship in order of original publication, <u>underline</u> indicates student or postdoctoral trainee.

<u>Chapters in Books and Symposia (3)</u>

1. Vance, S., Crósta, A., Melwani Daswani, M., Fagents, S., Journaux, B., and **Neish. C.** Exchange processes between surface, atmosphere, and interior. In: Lopes, R., Elachi, C., Mueller-Wodarg, I., and Solomonidou, A. (Eds.) <u>Titan After Cassini-Huygens</u>, Elsevier, 2025.

   This book provides a summary of our knowledge of Saturn's moon Titan after the Cassini-Huygens mission, which operated from 2004-2017. I contributed text to the chapter on exchange processes on the topic of impact cratering.

2. Osinski, G.R., Melosh, H.J., Andrews-Hanna, J., Baker, D., Denevi, B., Dhingra, D., Ghent, R., Hayne, P.O., Hill, P., James, P.B., Jaret, S., Johnson, B., Kenkmann, T., Kring, D., Mahanti, P., Minton, D., **Neish, C.D.**, Neumann, G., Plescia, J., Potter, R.W.K., Richardson, J., Silber, E., Soderblom, J.M., Zanetti, M., Zellner, N. Lunar Impact Features and Processes. In: Neal, C., Gaddis, L., Jolliff, B., Lawrence, S., Mackwell, S., Shearer, C., and Valencia, S. (Eds.) New Views of the Moon 2. Reviews in Mineralogy and Geochemistry 89, 2023.

   This book updates the information provided in "New Views of the Moon," originally published in 2006, with the new knowledge gained from the armada of spacecraft that visited in the Moon in the last decade. I contributed text to the chapter on impact cratering on the topic of lunar impact melt.

3. **Neish, C.D**., and Carter, L.M. Planetary radar. In: Spohn, T., Breuer, D., Johnson, T. (Eds.) Encyclopedia of the Solar System, 3rd Edition (pp. 1133-1159). Elsevier, Waltham, MA. 2014

   This encyclopedia provides an overview of the current understanding of the origin and evolution of the solar system. I was invited to write a chapter on the techniques used in planetary radar, and recent discoveries in this field.

Submitted for Publication/Under Review (5)

1. Shah, J., **Neish, C.**, and Trozzo, S. A comparative study of impact craters on Earth and Titan: Implications for the surface age of Titan. Icarus, in review, 2024.

2. Wakita, S., Johnson, B.C., Soderblom, J.M., Steckloff, J.K., Johnson, A.V., **Neish, C.D.**, and Shah, J. Impacts into Titan's methane-clathrate crust as a source of atmospheric methane. Journal of Geophysical Research – Planets, in review, 2024.

3. Affholder, A., Higgins, P.M., Cockell, C.S., **Neish, C.**, Soderlund, K.M., Malaska, M.J., Farnsworth, K.K., Lopes, R.M.C., Nixon, C.A., Daswani, M.M., Miller, K.E., and Sotin, C. The viability of glycine fermentation in Titan's subsurface ocean. The Planetary Science Journal, in review, 2024.

4. Stack, K., Francis, R., Calef, F.J., Gwizd, S.J., Schroeder, J.F., Voigt, J.R.C., Kristinsson, T., Schroedl, P., Shah, J., Varnam, M., **Neish, C.D.,** Perkins, R.P., Vanga, S., Bramble, M.S., Donnellan, A., Osterhout, J., Tuite, M., Carr, B.B., Hamilton, C.W. Simulating Science Operations for a Joint Rover-Helicopter Mission Architecture in a Mars Analog Setting. The Planetary Science Journal, submitted, 2024.

5. Thaker, A., and **Neish, C.** Assessing the depth of the regolith around radar-dark halo craters on the Moon. Icarus, submitted, 2024.

Papers in Peer-Reviewed Journals (81)

1. Gallinger, C.L., Williams, J-P., **Neish, C.D.**, Powell, T.M., Elder, C.M., Ghent, R.R., Hayne, P.O., and Paige, D.A. Thermophysical diversity of young lunar crater ejecta revealed with LRO Diviner observations. The Planetary Science Journal, in press, 2024.

   This paper develops a new approach to classifying lunar impact ejecta using thermal infrared data from Diviner on the Lunar Reconnaissance Orbiter. The technical approach was developed and implemented by my PhD student, C.

Gallinger. I advised her over the course of the project, and provided detailed comments on the interpretations of the results.

2. Carr, B.B., Varnam, M., Hadland, N., Shah, J., Voigt, J.R.C., Gwizd, S., Stack, K.M., Calef, F., Francis R., Basu, U., Björnsson, B., Chen, C.X., Dong, E., Moersch J.E., Phillips M., Springer, J., **Neish, C.D.**, and Hamilton, C.W. Evaluating the use of Unoccupied Aircraft Systems (UAS) for planetary exploration in Mars-analog terrain. The Planetary Science Journal 5, 231, 2024.

   This paper summarizes the UAS analogue mission conducted in Iceland in 2022 as a part of the RAVEN (Rover–Aerial Vehicle Exploration Network) project. I participated in the associated field work, supervised several key HQP involved in the project, and provided general comments on the interpretations of the results.

3. Logozzo, A., Vennes, B., Kaur Kohli, R., Davies, J., Castillo-Pazos, D., Li, C.-J., **Neish, C.**, and Preston, T. Photochemically driven peptide formation in supersaturated aerosol droplets. Angewandte Chemie International Edition, 63, e202409788, 2024.

   This paper was completed in collaboration with colleagues at McGill University. I contributed context to the paper's implications for prebiotic chemistry.

4. Rivera-Valentín, E., Fassett, C., Denevi, B., Meyer, H., Neish, C., Morgan, G., Stickle, A., and Patterson, G.W. Mini-RF *S*-band Radar Characterization of a Lunar South Pole–crossing Tycho Ray: Implications for Sampling Strategies. The Planetary Science Journal 5, 94, 2024.

   This paper discusses Mini-RF observations of the south pole of the Moon, and suggests that a ray of the Tycho impact crater passes over the proposed Artemis landing sites. This work was led by E. Rivera-Valentín, with input from the Mini-RF team. I provided information about previous work conducted in this area, and general comments on the text.

5. Kalousová, K., Wakita, S., Sotin, C., **Neish, C.D.**, Soderblom, J.M., Souček, O., Johnson, B.C. Evolution of impact melt pools on Titan. Journal of Geophysical Research: Planets, 129, e2023JE008107, 2024.

   This paper models the movement of impact melt deposits on Titan through its ice crust. I conceived of the idea for this paper during a discussion with the lead author (K. Kalousová) at a workshop in Switzerland. She executed the model runs and wrote the paper, while I contributed text on the implications of the results for Titan's habitability and the upcoming Dragonfly mission.

6. Fassett, C. I., Bramson, A. M., Cahill, J. T. S., Harris, C. P., Morgan, G. A., **Neish, C. D.**, Nypaver, C. A., Patterson, G. W., Rivera-Valentin, E., Taylor, P., Thomson, B. J., and the Mini-RF Team. Improved Orthorectification and Empirical Reduction of Topographic Effects in Monostatic Mini-RF S-band Observations of the Moon. The Planetary Science Journal 5, 4, 2024.

   This article was a collaboration with my colleagues on the Mini-RF science team. Lead author C. Fassett conceived of an approach to remove the influences of topography on the Mini-RF global data set, allowing us to better understand the differences in the physical properties of the lunar surface. I consulted with Dr. Fassett on his approach, and provided input on the text of the paper.

7. **Neish, C.D.**, Malaska, M.J., Sotin, C., Lopes, R.M.C., Nixon, C.A., Affholder, A., Chatain, A., Cockell, C., Farnsworth, K.K., Higgins, P.M., Miller, K.E., and Soderlund, K.M. Organic input to Titan's subsurface ocean through impact cratering. Astrobiology 24(2), 2024.

   This article determined the amount of organic compounds that could be transferred from Titan's surface to its interior through impact cratering, to assess the habitability of its subsurface ocean. It was conceived during an International Space Science Institute (ISSI) workshop help in Switzerland in 2022. I completed all necessary calculations and wrote the manuscript, with input from all co-authors.

8. Virkki, A. K., **Neish, C. D.**, Rivera-Valentín, E., Bhiravarasu, S. S., Hickson, D. C., Nolan, M. C., Orosei, R. Planetary Radar – State-of-the-Art Review. Remote Sensing 15(23), 5605, 2023. [*Article highlighted on front page of the journal*]

   This article presents a state-of-the-art review of our present knowledge of planetary radar. Dr. Virkki led the effort, organizing who would write which section. I wrote several sections in the review, provided several figures, and read over the entire manuscript for clarity and cohesion.

9. Hedgepeth, J., **Neish, C**., and Bray, V. Impact Crater Degradation on Pluto. Planetary Science Journal 4, 190, 2023.

   This article measured the topography of Pluto's impact craters to determined how degraded they were, and how this varied across Pluto's surface. The project was conceived and executed by my former student, Dr. Hedgepeth. I advised Dr. Hedgepeth during the project, and provided critical feedback on the paper.

10. Wakita, S., Johnson, B.C., Soderblom, J. M., Shah, J., **Neish, C.D.**, and Steckloff, J. K. Modeling the formation of Selk impact crater on Titan: Implications for Dragonfly. Planetary Science Journal 4, 51, 2023.

    This work is the result of a NASA-funded project of which I am a Collaborator, to understand Titan's surface by modelling its impact craters. S. Wakita conducted the modelling work and wrote the first draft of the paper, with input from all other co-authors.

11. Es-sayeh, M., S. Rodriguez, M. Coutelier, P. Rannou, B. Bézard, L. Maltagliati, T. Cornet, S.B. Grieger, E. Karkoschka, S. Le Mouélic, C. Sotin, A. Coustenis, A. Solomonidou, and **C. Neish.** Updated radiative transfer model for Titan in the near-infrared wavelength range: Validation against Huygens atmospheric and surface measurements and application to the Cassini/VIMS observations of the Dragonfly landing area. Planetary Science Journal 4, 44, 2023.

    This work was led and executed by my French colleagues, to understand the composition of the terrain around the Dragonfly landing site, Selk crater. I provided text on the implications of their work for crater degradation on Titan, and critical feedback on the rest of the manuscript.

12. Tolometti, G. D., **Neish, C.**, Hamilton, C., Osinski, G., Kukko, A., Voigt, J. Differentiating Fissure-Fed Lava Flow Types and Facies Using RADAR and LiDAR: An Example from the 2014-2015 Holuhraun Lava Flow-field. Journal of Geophysical Research – Solid Earth 127, e2021JB023419, 2022.

This article examined the ability of radar remote sensing data to quantify the surface roughness of a lava field. The effort was led by my former PhD student, G. Tolometti, using A. Kukko's LiDAR system to characterize surface roughness in-situ. The fieldwork in Iceland was led by C. Hamilton and his student, J. Voigt. The idea for the paper was mine, and I advised Dr. Tolometti throughout the project.

13. Tolometti, G. D., Erickson, T. M., Osinski, G. R., Cayron, C., **Neish, C**. Hot Rocks: Constraining the Thermal Conditions of the Mistastin Lake Impact Melt Deposits Using Zircon Grain Microstructures. Earth and Planetary Science Letters 584, 117523, 2022.

    This article identified minerals indicative of high temperatures in the Mistastin Lake Impact Structure. The effort was led by my former PhD student, G. Tolometti, using T. Erickson's experimental facilities and C. Cayron's analytical techniques. G. Osinski and I advised Dr. Tolometti during the project, and provided feedback on the paper.

14. Wakita, S., Johnson, B. C., Soderblom, J. M., Shah, J., **Neish, C. D.** Methane-saturated layers limit the observability of impact craters on Titan. The Planetary Science Journal 3, 50, 2022.

    This article tested a hypothesis I put forward in Neish and Lorenz (2014), that impacts into methane saturated sediments would not be recognizable by the Cassini spacecraft. S. Wakita conducted the modelling work and wrote the first draft of the paper, with input from all other co-authors.

15. Hedgepeth, J.E., Buffo, J.J., Chivers, C.J., **Neish, C.D**., Schmidt, B.E. Modeling the distribution of HCN in impact crater melt on Titan. The Planetary Science Journal 3, 51, 2022.

    This article sought to determine the distribution of organic compounds in impact melt deposits on Saturn's moon Titan. This effort was led by my PhD student, Mr. Hedgepeth, using models adapted from J. Buffo and C. Chivers in Dr. Schmidt's lab. As Mr. Hedgepeth's advisor, I provided critical feedback on the work.

16. Lev, E., Hamilton, C., Voigt, J. Stadermann, A., Zhan, Y., **Neish, C**. Emplacement conditions of lunar impact melt flows. Icarus 369, 114578, 2021.

    This article constrains the initial conditions of lunar impact melt flows, in terms of temperature and height, by comparing flow models to observed melt flows on the Moon. The idea was developed by E. Lev, C. Hamilton, and myself for a successful NASA Solar System Workings proposal. Dr. Lev conducted the modeling work, Dr. Hamilton and his students mapped the lunar melt flows, and I provided my expertise in lunar melt deposits. We wrote the paper together.

17. Barnes, J. W. *et al*. Science Goals and Objectives for the Dragonfly Titan Rotorcraft Relocatable Lander. The Planetary Science Journal 2, 130, 2021.

    This article outlines the science goals of NASA's Dragonfly mission. It was written by the members of the Dragonfly science team, and led by Dr. Jason Barnes, Deputy PI.

18. Schaefer, E., Hamilton, C., **Neish, C**., Sori, M., Bramson, A., Beard, S. Reexamining the potential to classify lava flows from the fractality of their margins. Journal of Geophysical Research – Solid Earth 126, e2020JB020949, 2021.

This article presents examines the potential to determine a lava flow's properties from its margin geometry. Dr. Schaefer led this effort, with critical feedback from C. Hamilton and C. Neish.

19. Morse, Z. R., G. R. Osinski, L. L. Tornabene, **C. Neish**. Morphologic mapping and interpretation of ejecta deposits from Tsiolkovskiy Crater. Meteoritics and Planetary Science 56, 767-793, 2021.

    This article presents a highly-detailed geologic map of Tsiolkovskiy crater on the far side of the Moon. From this map, we were able to determine the original direction of the impactor, and the sequence of events that took place during the emplacement of its ejecta. Dr. Morse completed the analysis and wrote the paper, with the assistance of his co-supervisors, Drs. Osinski and Tornabene. I provided radar images of the crater for the manuscript, and my expertise in the geology of the Tsiolkovskiy region.

20. **Neish, C.D.**, K. Cannon, L. Tornabene, R. Flemming, M. Zanetti, E. Pilles. Spectral properties of lunar impact melt deposits from Moon Mineralogy Mapper (M^3) data. Icarus 361, 114392, 2021.

    This article presents the first systematic investigation into the spectral properties of lunar impact melt deposits, to help understand their unique surface roughness properties. I conceived of the idea, processed the remote sensing data, and wrote the paper. Dr. Cannon ran the data through his spectral unmixing model, provided experimental spectra and text. Dr. Flemming provided XRD data for the samples we examined. Dr. Tornabene and Dr. Zanetti provided expert input regarding the interpretations, and Dr. Pilles provided aid in georeferencing the remote sensing data sets.

21. Lorenz, R. D., MacKenzie, S. M., **Neish, C. D**., Le Gall, A., Turtle, E. P., Barnes, J. W., Trainer, M. G., Werynski, A., Hedgepeth, J., and Karkoschka, E. Selection and Characteristics of the Dragonfly Landing Site near Selk Crater, Titan. The Planetary Science Journal 2, 24, 2021.

    This article describes the process undertaken to identify the ideal landing site for the Dragonfly mission to Titan. I provided a geologic map of the landing site and surrounding area using Cassini RADAR images of Titan. The paper was written by Dr. Lorenz, with input from all co-authors.

22. Rodriguez Sanchez-Vahamonde, C., **C. Neish**. The emplacement style of Martian lava flows as inferred from their decimeter- and meter-scale roughness. The Planetary Science Journal 2, 15, 2021.

    This article uses meter-scale topography data of Mars to constrain the surface roughness of lava flows. The aim of this work is to use the roughness data to infer the lava flow emplacement style. I conceived of the idea, and wrote the computer code to process the data. Ms. Rodriguez, my MSc student, processed and analyzed all the data. We wrote the manuscript together.

23. Solomonidou, A., **C. Neish**, A. Coustenis, M. Malaska, A. Le Gall, R.M.C. Lopes, A. Werynski, K. Lawrence, N. Atlobelli, O. Witasse, A. Shoenfeld, C. Matsoukas, I. Baziotis, P. Drossart. The chemical composition of impact craters on Titan: Implications for exogenic processing. Astronomy & Astrophysics 641, A16, 2020.

This article expands on the work of Werynski et al. (2019), providing spectra of impact craters on Titan with full atmospheric corrections applied. The goal of this paper is to understand how Titan craters evolve over time, as they are subject to erosion and weathering. I conceived of the idea, and reached out to Dr. Solomonidou to use her radiative transfer model to process the data. Dr. Solomonidou processed the data, with my input, and we wrote the manuscript together. Additional input on the text was provided by the other co-authors.

24. Tolometti, G., **C. Neish**, G. Osinski, S. Hughes, S. Nawotniak. Interpretations of lava flow properties from radar remote sensing data. Planetary and Space Science 190, 104991, 2020.

    This article presents the first comparison between the radar remote sensing properties of lava flows with their measured compositions. The aim of this work is to help interpret lava flow compositions on other planets. My PhD student, Mr. Tolometti, collected and analyzed the samples from the field, processed the remote sensing data, and wrote the paper. I conceived of the idea, led the field work to collect the samples, and provided extensive contributions to the text. Dr. Hughes and Nawotniak helped to lead the field investigations, collected samples, and provided expert geochemical input. Dr. Osinski (Mr. Tolometti's co-supervisor) provided input to the written manuscript.

25. J. Hedgepeth, **C. Neish**, E. Turtle, B. Stiles, R. Kirk, R. Lorenz. Titan's impact crater population after Cassini. Icarus 344, 113664, 2020.

    This article was written by my (then) Master's student, Josh Hedgepeth (Mr. Hedgepeth is now my PhD student). The aim of the paper was to compile the final list of impact craters on Titan, at the end of the Cassini mission. The idea for the paper was mine, and I helped Mr. Hedgepeth learn the techniques needed to complete the work. Dr. Stiles and Dr. Kirk provided topography data for the analyses in the paper, and Dr. Turtle and Dr. Lorenz provided their expertise in impact cratering. Mr. Hedgepeth wrote the paper, with input from the other co-authors.

26. B-H. Choe, G.R. Osinski, **C.D. Neish**, L.L. Tornabene. A modified semi-empirical radar scattering model for weathered rock surfaces. Canadian Journal of Remote Sensing 46, 1-14, 2020.

27. B-H. Choe, G.R. Osinski, **C.D. Neish**, L.L. Tornabene. Polarimetric SAR signatures for characterizing geological units in the Canadian Arctic. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 12, 4406-4414, 2019.

    These two articles were written by my PhD student, Hun Choe (co-supervised by Dr. Osinski and Dr. Tornabene). The idea for the papers were conceived by Dr. Choe, with input from his advisors. Dr. Choe wrote the papers, with input and edits provided by his advisors.

28. C. A. Griffith, P. F. Penteado, J. D. Turner, **C. D. Neish**, G. Mitri, N. J. Montiel, A. Schoenfeld, and R. M. C. Lopes. Ice-rich corridor exposed on Titan's surface of organic sediments. Nature Astronomy 3, 643-648, 2019.

    This article uses a principal component analysis of infrared data to determine locations of water ice enrichment on Saturn's moon Titan. The idea for the work was developed by Dr. Griffith. I provided interpretations of the results as they pertained to impact craters on Titan. Dr. Griffith wrote the paper, with input from all co-authors.

29. E. M. Harrington, M. Shaposhnikova, **C. D. Neish**, L. L. Tornabene, G. R. Osinski, B-H. Choe, M. Zanetti. A polarimetric SAR and multispectral remote sensing approach for mapping salt diapirs: Axel Heiberg Island, NU, Canada. Canadian Journal of Remote Sensing 45, 54-72, 2019.

    This article was written by my Master's student, Elise Harrington. The idea for the paper was jointly conceived by Ms. Harrington and myself, and I helped Ms. Harrington learn the techniques needed to complete the work (with assistance from my postdoctoral fellows, Dr. Choe and Dr. Zanetti). My undergraduate researcher, Ms. Shaposhnikova, conducted significant amounts of data analysis that were key to the results presented in this paper. Ms. Harrington wrote the paper, with input from all co-authors.

30. G. Wei, X. Li, H. Gan, D. Blewett, **C. Neish**, B. Greenhagen. A new method for simulation of microwave brightness temperatures and recalibration of Chang'e-2 MRM data using thermal constraints from Diviner. Journal of Geophysical Research Planets 124, 1433-1450, 2019.

    This article aimed to calibrate the *Chang'E 2* microwave radiometry data, using thermal constraints from the LRO Diviner instrument. Dr. Wei completed the data analysis, and wrote the paper, with significant input from all co-authors, especially Dr. Blewett and myself.

31. R. Lopes *et al*. Titan as revealed by the Cassini RADAR. Space Science Reviews 215, 33, doi:10.1007/s11214-019-0598-6, 2019.

    This article summarizes the results of the Cassini RADAR instrument, over the thirteen years it was in Saturn orbit. Dr. Lopes led the effort, acquiring text from different experts on the RADAR team. I contributed text regarding impact craters on Titan. Dr. Lopes edited the final manuscript, with input from the other co-authors.

32. Werynski, A., **C. Neish**, A. Le Gall, M. Janssen. Compositional variations of Titan's impact craters indicates active surface erosion. Icarus 321, 508-521, 2019.

    This article was written by my Master's student, Alyssa Werynski. The idea for the paper was mine, and I helped Ms. Werynski learn the techniques needed to complete the work. Dr. Le Gall conducted data analysis for the manuscript as well. Ms. Werynski wrote the paper, with input from the other co-authors.

33. Zheng, Y.-C., K.L. Chan, K. T. Tsang, Y.-C. Zhu, G. P. Hu, D. T. Blewett, **C. Neish**. Analysis of *Chang'E-2* brightness temperature data and production of high spatial resolution microwave maps of the Moon. Icarus 319, 627-644, 2019.

    This article presents global microwave maps of the Moon, as acquired by the passive radiometer on the Chinese spacecraft *Chang'E-2*. Dr. Zheng completed the data analysis and wrote the paper, with significant input from all co-authors, especially Dr. Blewett and myself.

34. Morrison, A., M. Zanetti, C. Hamilton, E. Lev, **C. Neish**, A. Whittington. Rheological investigation of lunar highland and mare impact melt simulants. Icarus 317, 307-323, 2019.

    This article presents experimentally derived values for the viscosity and melting temperatures of various lunar simulants, to aid in our understanding of the

emplacement of impact melt on the lunar surface. The idea for the paper was outlined in a proposal written by myself, Dr. Hamilton, and Dr. Lev. Mr. Morrison and Dr. Zanetti carried out the experiments, in Dr. Whittington's laboratory. Mr. Morrison completed the data analysis, and wrote the paper, with comments from all co-authors.

35. Osinski, G. R. Grieve, J.E. Bleacher, **C. Neish**, E. Pilles, L. Tornabene. Igneous rocks formed by hypervelocity impact. Journal of Volcanology and Geothermal Research 353, 25-54, 2018.

    This article discusses the difficulties in distinguishing igneous rocks formed by impact from those formed by volcanism. Dr. Osinski wrote the paper, and I provided feedback and comments on the manuscript.

36. **Neish, C.D.,** R.D. Lorenz, E.P. Turtle, J.W. Barnes, M.G. Trainer, B. Stiles, R. Kirk, C.A. Hibbitts, and M.J. Malaska. Strategies for detecting biological molecules on Titan. Astrobiology 18, 571-585, 2018.

    This article explores the best approach for locating and analyzing biomolecules such as amino acids on the surface of Saturn's moon Titan, in support of future robotic exploration of that world. The idea for the paper was conceived jointly by myself and Dr. Lorenz. I completed all data analysis and wrote the paper, with comments from the co-authors.

37. Bray, V. J., C. Atwood-Stone, **C. D. Neish**, A. McEwen, N. Artemieva, J. N. McElwaine. Lobate impact melt flows within the extended ejecta blanket of Pierazzo crater. Icarus 301, 26-36, 2018.

    This article explores the idea that impact melt can be emplaced ballistically around lunar craters. The initial discovery of the impact melt was made jointly by myself and Dr. Bray. Dr. Bray wrote the majority of the paper, and I provided supplementary text and interpretations.

38. **Neish, C.D.**, R. R. Herrick, M. Zanetti, D. Smith. The role of pre-impact topography in impact melt emplacement on terrestrial planets. Icarus 297, 240-251, 2017.

    This article compares the emplacement of impact melt on the Moon and Venus, to determine how the impact cratering process may differ on planets of differing sizes. The idea for the manuscript was mine, I completed the data analysis for Venus, and I wrote the majority of the manuscript. Dr. Herrick provided digital elevation models for Venus and some supporting text for the manuscript. Mr. Smith was an undergraduate student who completed the majority of the lunar data analysis, with support from Dr. Zanetti.

39. Carter, L.M., B.A. Campbell, **C.D. Neish**, M.C. Nolan, G.W. Patterson, J.R. Jensen, D.B.J. Bussey. A Comparison of Radar Polarimetry Data of the Moon from the LRO Mini-RF Instrument and Earth-based Systems. IEEE Transactions on Geoscience and Remote Sensing 55, 1915-1927, 2017.

    This article was written in collaboration with the Mini-RF science team. The article discusses fundamental issues in the processing and analysis of polarimetric radar data. I conceived of the idea behind the paper, after noting a discrepancy in data returned from two separate instruments that should have been identical. Dr. Carter wrote the paper, and I contributed select images and text.

40. **Neish, C.D.,** C. W. Hamilton, S. S. Hughes, S. Kobs Nawotniak, W. B. Garry, J. R. Skok, R. C. Elphic, E. Schaefer, L. M. Carter, J. L. Bandfield, G. R. Osinski, D. Lim, J. L. Heldmann. Terrestrial analogues for lunar impact melt flows. Icarus 281, 73-89, 2017.

    This work was developed through discussions with my colleague Dr. Christopher Hamilton, and much of the work was completed in collaboration with the FINESSE node of NASA's Solar System Exploration Research Virtual Institute. This is the first work to directly compare the properties of impact melt flows on the Moon to lava flows on the Earth, integrating the fields of impact cratering and volcanology. I wrote the majority of the paper and completed most of the data analysis, Dr. Hamilton and Dr. Bandfield contributed several figures and text, with minor comments from the rest of the co-authors.

41. Patterson, G.W., A.M. Stickle, F.S. Turner, J.R. Jensen, D.B.J. Bussey, P. Spudis, R.C. Espiritu, R.C. Schulze, D.A. Yocky, D.E. Wahl, M. Zimmerman, J.T.S. Cahill, M. Nolan, L. Carter, **C.D. Neish**, R.K. Raney, B. Thomson, R. Kirk, T.W. Thompson, B.L. Tise, I.A. Erteza, C.V. Jakowatz. Bistatic Radar Observations of the Moon using Mini-RF on LRO and the Arecibo Observatory. Icarus 283, 2-19, 2017.

    This article was written in collaboration with the Mini-RF science team, for the LRO special issue in Icarus. The article presents the first ever bistatic radar images of another planet, and provides tantalizing evidence for water ice near the south pole of the Moon. Dr. Patterson wrote the paper, and I helped with the initial data processing and interpretations.

42. Bandfield, J., J.T. Cahill, L.M. Carter, **C. D. Neish**, G.W. Patterson, J.-P. Williams, and D.A. Paige. Distal ejecta from lunar impacts: Extensive regions of rocky deposits. Icarus 283, 282-299, 2017.

    This article was a joint publication of the Diviner and Mini-RF instrument teams on the Lunar Reconnaissance Orbiter (LRO), for the LRO special issue in Icarus. In this article, the Diviner team noted regions of increased rock abundance antipodal to the young, fresh lunar crater Tycho. The morphology of the deposits in the Mini-RF data was consistent with an origin of impact melt. Dr. Bandfield wrote the paper, and I contributed select images and text.

43. Domagal-Goldman, S., *et al.* The Astrobiology Primer v2.0. Astrobiology 16, 561-653, 2016.

    This was a multi-year effort, undertaken by multiple authors, to update The Astrobiology Primer. The primer is meant as an introduction to scientists new to the field of astrobiology. I wrote the section on Saturn's moon Titan.

44. Greenhagen, B., **C. D. Neish**, J.-P. Williams, J. T. Cahill, R. R. Ghent, P. O. Hayne, S. J. Lawrence, N. E. Petro, J. L. Bandfield. Origin of anomalously rocky appearance of Tsiolkovskiy crater. Icarus 273, 237-247, 2016. [*Selected to be on the cover of Icarus*]

    This article was a joint publication of the Diviner and Mini-RF instrument teams on the Lunar Reconnaissance Orbiter (LRO), for the LRO special issue in Icarus. In this article, the Diviner team noted an anomalous region near Tsiolkovskiy crater on the Moon. Using overlapping Mini-RF data, I was able to infer that it was a massive impact melt deposit. Dr. Greenhagen wrote the paper, and I contributed select images and text. This work was featured on the cover of Icarus.

45. **Neish, C.D.,** J.L. Molaro, J. Lora, A.D. Howard, R.L. Kirk, P. Schenk, V.J. Bray, R.D. Lorenz. Fluvial erosion as a mechanism for crater modification on Titan. Icarus 270, 114-129, 2016.

    The work for this article was done in collaboration with two former graduate students at the University of Arizona (Dr. Molaro and Dr. Lora). Together, we applied Dr. Howard's landscape evolution model – originally designed to model fluvial erosion of the Earth – to Saturn's moon Titan, using topography data provide by Drs. Kirk, Schenk, and Bray. We determined that a small difference in weathering rates between Titan's equator and poles could account for the almost complete lack of impact craters observed near Titan's poles. I wrote the paper, with comments from the co-authors.

46. Birch, S.P.D., A.G. Hayes, W. Dietrich, A.D. Howard, C. Bristow, M.J. Malaska, J. Moore, M. Mastrogiuseppe, J.D. Hofgartner, D.A. Williams, O. White, J. Soderblom, J.W. Barnes, E. Turtle, J.I. Lunine, C. Wood, **C. Neish**, R. Kirk, E. Stofan, R. Lorenz, and R.M.C. Lopes. Geomorphologic mapping of Titan's polar terrains: Constraining Surface Processes and Landscape Evolution. Icarus 282, 214-236, 2016.

    This article was written in collaboration with members of the Cassini RADAR Team. I contributed insight to the data interpretation in the manuscript.

47. Janssen, M.A., A. Le Gall, R.M. Lopes, R.D. Lorenz, M.J. Malaska, A.G. Hayes, **C.D. Neish**, A. Solomonidou, K.L. Mitchell, J. Radebaugh, S. J. Keihm, M. Choukroun, C. Leyrat, P.J. Encrenaz, M. Mastrogiuseppe. Titan's surface at 2.18 cm wavelength imaged by the Cassini RADAR radiometer: Results and interpretations through the first ten years of observation. Icarus 270, 443-459, 2016.

48. Malaska, M.J., R.M. Lopes, D.A. Williams, **C.D. Neish**, A. Solomonidou, J.M. Soderblom, A.M. Schoenfeld, S.P. Birch, A.G. Hayes, A. Le Gall, M.A. Janssen, T.G. Farr, R.D. Lorenz, J. Radebaugh, and E.P. Turtle. Geomorphological map of the Afekan Crater region, Titan: Terrain relationships in the equatorial and mid-latitude regions. Icarus 270, 130-161, 2016.

49. Lopes, R.M.C., M.J. Malaska, A. Solomonidou, A. Le Gall, M.A. Janssen, **C.D. Neish**, E.P. Turtle, S.P.D. Birch, A.G. Hayes, J. Radebaugh, A. Coustenis, A. Schoenfeld, B.W. Stiles, R.L. Kirk, K.L. Mitchell, E.R. Stofan, K.J. Lawrence. Nature, distribution, and origin of Titan's undifferentiated plains. Icarus 270, 162-182, 2016.

50. Liu, Z.Y.C., J. Radebaugh, E. H. Christiansen, R.A. Harris, **C.D. Neish**, R.L. Kirk, and R.D. Lorenz. The tectonics of Titan: Global structural mapping from Cassini RADAR. Icarus 270, 14-29, 2016.

    These four articles were written in collaboration with members of the Cassini RADAR Team, for the Icarus special issue on Titan's Surface and Atmosphere. I contributed topography data and expertise on impact cratering to these articles.

51. **Neish, C.D**., J.W. Barnes, C. Sotin, S. MacKenzie, J.M. Soderblom, S. Le Mouélic, R.L. Kirk, B.W. Stiles, M.J. Malaska, A. Le Gall, R.H. Brown, K.H. Baines, B. Buratti, R.N. Clark, P.D. Nicholson. Spectral properties of Titan's impact craters imply chemical weathering of its surface. Geophysical Research Letters 42, doi:10.1002/2015GL063824, 2015.

    The work for this article was done in collaboration with the Cassini VIMS team (the team requires that all original members be listed as co-authors). I noticed an

anomalous trend in the spectral properties of Titan's impact craters, and suggested that it was the result of chemical weathering on Titan. This implies that Titan's crust is not entirely composed of water ice, as water ice is in insoluble in liquid hydrocarbons. I wrote the paper after discussions with Dr. Barnes, comments from the co-authors, and some assistance with image preparation from Dr. Barnes' student, S. MacKenzie.

52. Cahill, J.T.S., B.J. Thomson, G.W. Patterson, D.B.J. Bussey, **C.D. Neish**, N.R. Lopez, F.S. Turner, T. Aldridge, M. McAdam, H.M. Meyer, R.K. Raney, L.M. Carter, P.D. Spudis, H. Hiesinger, J.H. Pasckert. The miniature radio frequency instrument's (Mini-RF) global observations of Earth's Moon. Icarus 243, 173-190, 2014.

    This article is the product of the Mini-RF instrument team on LRO. I helped to acquire and process the data used to produce the global mosaic presented in this work. Dr. Cahill wrote the paper, and I provided interpretations of the results.

53. **Neish, C.D**., J. Madden, L.M. Carter, B.R. Hawke, T. Giguere, V.J. Bray, G.R. Osinski, J.T.S. Cahill. Global distribution of lunar impact melt flows. Icarus 239, 105-117, 2014.

    This work is the first global catalogue of lunar impact melt flows produced since Dr. Hawke's seminal work in 1977. I discovered that impact melt flows are incredibly bright at radar wavelengths, and with the help of undergraduate intern J. Madden, compiled a global data set of these features using Mini-RF data. We discovered that impact melt flows are much more common than previously thought, and found a strong correlation between the flow direction of the melt and the lowest point of the crater rim, implying that topography plays a dominant role in melt emplacement. I wrote the paper, with comments from co-authors.

54. Cleaves, H.J., **C. Neish**, M.P. Callahan, E. Parker, F.M. Fernandez, J.P. Dworkin. Amino acids generated from hydrated Titan tholins: Comparison with Miller-Urey electric discharge products. Icarus 237, 182-189, 2014.

    This article presents important follow up data to the work completed in my PhD dissertation. Dr. Cleaves and I used liquid chromatography mass spectrometry (LC/MS) to identify the presence of small amino acids in a hydrolyzed tholin sample, which was several years old. Dr. Cleaves wrote the first draft of the paper, with significant changes based on my suggestions.

55. **Neish, C.D**., R.D. Lorenz. Elevation distribution of Titan's craters suggests extensive wetlands. Icarus 228, 27-34, 2014. [*Selected to be on the cover of Icarus*]

    This article provides the first explanation for the observed lack of craters near Titan's poles. Using Dr. Lorenz's global topographic map of Titan, I was able to determine that Titan's impact craters were found preferentially at higher elevations. I used this information to suggest that craters at lower elevations were formed in a marine environment, in a former polar ocean of liquid hydrocarbons. This result has been crucial to our understanding of Titan's geologic history. I came up with the original idea and wrote the paper, with comments from Dr. Lorenz. This work was featured on the cover of Icarus.

56. Ivanov, M. A., Abdrakhimov, A. M., Basilevsky, A. T., Dixon, J. L., Head, J. W., Chick, L., Vitten, J., Zuber, M. T., Simt, D. E., Mazarico, E., **Neish, C. D**., Bussey, D. B. J. Geological context of potential landing site of the Luna-Glob mission. Solar System Research 48, 391-402, 2014.

This article describes potential landing sites for Russia's proposed Luna-Glob program. I provided radar mosaics of the potential landing sites for the manuscript.

57. **Neish, C.D.** D.T. Blewett, J.K. Harmon, E.I. Coman, J.T.S. Cahill, C.M. Ernst. A comparison of rayed craters on the Moon and Mercury. Journal of Geophysical Research 118, 1-15, doi:10.1002/jgre.20166, 2013.

    This article compares rayed craters on the Moon and Mercury, using optical and radar remote sensing data. Dr. Blewett provided optical data for Mercury, Dr. Harmon provided radar data for Mercury, and I processed all optical and radar data for the Moon. Using this data, I was able to infer that rays are formed primarily by secondary cratering. I wrote the paper, with comments from co-authors.

58. **Neish, C.D**., R.L. Kirk, R.D. Lorenz, V.J. Bray, P. Schenk, B. Stiles, E. Turtle, K. Mitchell, A. Hayes, the Cassini RADAR Team. Crater topography on Titan: Implications for landscape evolution. Icarus 223, 82-90, 2013.

    This article provides the first quantitative evidence for the modification of Titan's surface. Using topography data of impact craters from Drs. Kirk, Stiles, Bray, and Schenk, I determined that impact craters on Titan are all uniformly shallower than similarly sized craters on airless satellites of the same composition and surface gravity. I analyzed the data and wrote the paper, with comments from co-authors and the Cassini RADAR team.

59. Shankar, B., G.R. Osinski, I. Antonenko, **C.D. Neish**. A multispectral geological study of the Schrödinger impact crater. Canadian Journal of Earth Sciences 50, 44-63, 2013.

    The work for this article was done in collaboration with a former graduate student at Western (Dr. Shankar). Dr. Shankar wrote the paper, and I provided Mini-RF radar data of the study sight and comments on the text.

60. Lorenz, R.D. B.W. Stiles, O. Aharonson, A. Lucas, A.G. Hayes, R.L. Kirk, H.A. Zebker, E.P. Turtle, F. Nimmo, **C.D. Neish**, J.W. Barnes, E.R. Stofan. A global topographic map of Titan. Icarus 225, 367-377, 2013.

61. Lopes, R.M.C., R.L. Kirk, K.L. Mitchell, A. LeGall, J.W. Barnes, A. Hayes, J. Kargel, L. Wye, J. Radebaugh, E.R. Stofan, M. Janssen, **C. Neish**, S. Wall, C.A. Wood, J.I. Lunine. Cryovolcanism on Titan: New results from Cassini RADAR and VIMS. Journal of Geophysical Research 118, 1-20, doi:10.1002/jgre.20062, 2013.

    These two articles were written in collaboration with members of the Cassini RADAR Team. I contributed topography data and expertise on impact cratering to these articles.

62. Carter, L.M., **C.D. Neish**, D.B.J. Bussey, P.D. Spudis, M.S Robinson, G.W. Patterson, J.T. Cahill, R.K. Raney. Initial observations of lunar impact melts and ejecta flows with the Mini-RF radar. Journal of Geophysical Research 117, E00H09, 2012.

    This article is the product of the Mini-RF instrument team on LRO, led by my former postdoctoral advisor Dr. Carter. I discovered several new impact melt flows on the Moon, and Dr. Carter expanded upon these initial results.

63. Thomson, B.J., D.B.J. Bussey, **C.D. Neish**, J.T.S. Cahill, E. Heggy, R.L. Kirk, G.W. Patterson, R.K. Raney, P.D. Spudis, T.W. Thompson, E. Ustinov. An upper limit for ice in Shackleton crater as revealed by LRO Mini-RF orbital radar. Geophysical Research Letters 39, L14201, 2012.

    This article is the product of the Mini-RF instrument team on LRO. Dr. Thomson wrote the paper, and I contributed my interpretations of the results.

64. Bell, S.W., B.J. Thomson, M.D. Dyar, **C.D. Neish**, J.T. Cahill, D.B.J. Bussey. Dating small fresh lunar craters with Mini-RF observations of ejecta blankets. Journal of Geophysical Research 117, E00H30, 2012.

    The work for this article was done in collaboration with a former undergraduate intern at APL. Mr. Bell wrote the paper with input from his direct supervisor, Dr. Thomson. I contributed expertise on radar and impact cratering to this article.

65. Moores, J.E., and 44 colleagues. A Mission Control Architecture for Lunar Sample Return as Field Tested in an Analogue Deployment to the Sudbury Impact Structure. Advances in Space Research 50, 1666-1686, 2012.

    The work for this article was done in collaboration with a team from Western working on a lunar analogue mission funded by the Canadian Space Agency. I worked on that team in 'mission control'. Dr. Moores wrote the paper, with input from the team.

66. **Neish, C.D**., L. Prockter, G.W. Patterson. Observational constraints on the identification and distribution of chaotic terrain on icy satellites. Icarus 221, 72-79, 2012.

    This article determined the best observing strategies for identifying an unusual type of terrain found on icy satellites, in preparation for NASA's upcoming Europa Flagship mission. Dr. Prockter approached me with the idea for this work, and I conducted the image analysis (with some assistance from Dr. Patterson) and wrote the paper.

67. **Neish, C.D.,** R.D. Lorenz. Titan's global crater population: A new assessment. Planetary and Space Science 60, 26-33, 2012.

    This article provided an updated assessment of Titan's impact crater inventory, and produced a widely cited estimate for the age of its surface. I came up with the idea for the paper, completed the majority of the data analysis, and wrote the manuscript. Dr. Lorenz calculated a correction factor for the incomplete coverage of Titan's surface, and provided comments on the manuscript.

68. **Neish, C.D**., D.T. Blewett, D.B.J. Bussey, S.J. Lawrence, M. Mechtley, B.J. Thomson. The surficial nature of lunar swirls as revealed by the Mini-RF instrument. Icarus 215, 186-196, 2011.

    This article presents the first radar observations of the mysterious lunar swirls. I determined that these features are surficial in nature, suggestive of an interaction between the solar wind and lunar magnetic anomalies. Dr. Blewett inspired my interest in lunar swirls, and contributed a list of the most relevant study sites. Dr. Lawrence and Mr. Mechtley provided corresponding optical images of the regions of interest. Dr. Thomson provided expertise in crater counting. I wrote the paper, with input from co-authors.

69. Raney, R.K., P. Spudis, B. Bussey, J. Crusan, J.R. Jensen, W. Marinelli, P. McKerracher, **C. Neish**, M. Palsetia, R. Schulze, H. Sequeira, H. Winters. The Lunar Mini-RF Radars: Hybrid Polarimetric Architecture and Initial Results. Proceedings of the IEEE 99, 808-823, 2011.

    This article is the product of the Mini-RF instrument team on LRO. Dr. Raney wrote the paper, and I provided several of the figures.

70. **Neish, C.D.**, D.B.J. Bussey, P. Spudis, W. Marshall, B.J. Thomson, G.W. Patterson, L.M. Carter. The nature of lunar volatiles as revealed by Mini-RF observations of the LCROSS impact site. Journal of Geophysical Research 116, E01005, 2011.

    This article discusses the first complete radar images of the lunar south pole, and the search for changes due to the impact of the LCROSS spacecraft in October 2009. I completed the image analysis and wrote the paper, with assistance from the Mini-RF science team.

71. Bussey, D.B.J., J.A. McGovern, P.D. Spudis, **C.D. Neish**, H. Noda, Y. Ishihara, S-A. Sorensen. Illumination conditions of the south pole of the Moon derived using Kaguya topography. Icarus 208, 558-564, 2010.

    This work aimed to determine the areas of permanent shadow near the Moon's south pole. Dr. Bussey initiated the work and wrote the paper, and I provided several figures and comments on the results.

72. **Neish, C.D**., R.D. Lorenz, R.L. Kirk, L.C. Wye. Radarclinometry of the sand seas of Africa's Namibia and Saturn's moon Titan. Icarus 208, 385-394, 2010.

    In this article, we used radar images of sand dunes in the Namib sand sea to verify a technique used to determine the height of sand dunes on Titan. Dr. Lorenz initiated the work, Dr. Kirk provided input on the technique, and Dr. Wye provided a radar scattering model for Titan. I completed the data analysis and wrote the paper, with input from co-authors.

73. **Neish, C.D.**, A. Somogyi, M.A. Smith. Titan's primoridal soup: Formation of amino acids via low temperature hydrolysis of tholins. Astrobiology 10, 337-347, 2010.

    This article was a follow-up study to the work presented in my PhD dissertation. We characterized the structure of hydrolyzed Titan haze molecules, and found evidence for several amino acids. I conducted the experiments in Dr. Smith's lab, with assistance from Dr. Somogyi. I completed the data analysis and wrote the paper, with input from both co-authors.

74. Spudis, P.D., and 29 colleagues. Initial results for the north pole of the Moon from Mini-SAR, Chandrayaan-1 mission. Geophysical Research Letters 37, L06204, 2010.

    This article is the product of the Mini-SAR instrument team on Chandrayaan-1, led by my colleague Dr. Spudis. Dr. Spudis wrote the paper, and I provided several of the figures.

75. Coustenis, A., and 154 colleagues. TandEM: Titan and Enceladus mission. Experimental Astronomy 23, 893-946, 2009.

    This article summarized a mission concept proposed to the European Space Agency. Dr. Coustenis wrote the article, with input from the study team.

76. **Neish, C.D.,** A. Somogyi, J.I. Lunine, M.A. Smith. Low temperature hydrolysis of laboratory tholins in ammonia-water solutions: Implications for prebiotic chemistry on Titan. Icarus 201, 412-421, 2009.

77. **Neish, C.D**., A. Somogyi, H. Imanaka, J.I. Lunine, M.A. Smith. Rate measurements of the hydrolysis of organic polymers in cold aqueous solutions: Implications for prebiotic chemistry on the early Earth and Titan. Astrobiology 8, 273-287, 2008.

    These two articles formed a large portion of my PhD dissertation. This work aimed to determine if prebiotic molecules could form in transient liquid water environments found on the surface of Titan. We found that the hydrolysis reactions are very fast compared to the freezing timescales of liquid water environments on Titan. I conducted the experiments in Dr. Smith's lab, with assistance from Dr. Somogyi and Dr. Imanaka. I completed the data analysis and wrote the papers, with input from all co-authors.

78. **Neish, C.D**., R.D. Lorenz, R.L. Kirk. Radar topography of domes on planetary surfaces. Icarus 196, 552-564, 2008.

    This article used radar images to determine the heights of domes observed on the Earth, Venus, and Titan. Dr. Lorenz initiated the work, and Dr. Kirk provided input on the technique. I completed the data analysis and wrote the paper, with input from co-authors.

79. Lopes, R.M.C., K.L. Mitchell, E.R. Stofan, J. I. Lunine, R. Lorenz, F. Paganelli, R. L. Kirk, C.A. Wood, S.D. Wall, L. Robshaw, A.D. Fortes, **C.D. Neish**, and 32 colleagues. Cryovolcanic features on Titan's surface as revealed by the Cassini Radar Mapper. Icarus 186, 395-412, 2007.

    This article was written in collaboration with the Cassini RADAR team. Dr. Lopes led the effort, and I contributed a paragraph describing the freezing of a putative cryovolcanic dome on Titan.

80. **Neish, C.D.**, R.D. Lorenz, D.P. O'Brien, the Cassini RADAR Team. The potential for prebiotic chemistry in the possible cryovolcanic dome Ganesa Macula on Titan. The International Journal of Astrobiology 5, 57-65, 2006.

    This article formed a portion of my PhD dissertation. Using a heat conduction code, I determined the cooling timescales for cryovolcanic domes of different sizes. I used this information to infer the extent to which prebiotic chemistry could proceed on Titan. Dr. Lorenz (who was my PhD advisor at the time) initiated the work, and Dr. O'Brien provided the cooling code for our use. I ran the simulations and wrote the paper, with input from co-authors.

81. Gregory, P.C., **C.D. Neish**. Density and velocity structure of the Be star equatorial disk in the binary LS I +61 303, a probable microquasar. The Astrophysical Journal 580, 1133-1148, 2002.

    This article analyzed the disk structure of a Be star. I completed the data analysis during a summer undergraduate internship (NSERC USRA), and my advisor, Dr. Gregory, wrote the paper.

Non-Refereed Publications (6)

1. Reconnaissance/Science Measurement Definition Team. International Mars Ice Mapper Mission Final Report. Posted online August 2022: https://smd-

cms.nasa.gov/wp-content/uploads/2023/10/i-mim-mdt-final-report-31-aug-2022-final-hi-qual-copy-tagged.pdf

2. Zanetti, M. A. Kukko, C. Brown, W.B. Garry, and **C. Neish**. Finessing Lunar Exploration: A role for LiDAR in the future of lunar exploration. LiDAR Magazine 9, 23-34, 2019.

3. Hendrix, A. *et al*. The NASA Roadmap to Ocean Worlds. Astrobiology 19, 1-27, 2019.

4. Zanetti, M., A. Kukko, **C. Neish**, and G. Osinski. Comparative Planetology: Lidar Unveils Similarities of Earth and Mars. LiDAR Magazine 8, 22-33, 2018.

5. **Neish, C**. Research Focus: MESSENGER Into Darkness. Geology 42, 1111-1112, 2014.

6. **Neish, C**. News and Views: Titan's Nitrogenesis. Nature Geosciences 4, 356-357, 2011.

Abstracts, Presentations to Professional Meetings (103)

1. **Neish, C.**, Wakita, S., Schurmeier, L., Brouwer, G., Johnson, B., and Soderblom, J., 2024. Effects of methane clathrate on the depth of Titan's craters. The American Astronomical Society, DPS meeting #56, #408.06. Oral presentation.

2. **Neish, C.**, 2024. Utilizing ungrading in a university course on astrobiology. The American Astronomical Society, DPS meeting #56, #414.07. Poster presentation.

3. Sacks, L., Phillips, C.B., Patthoff, A., Bland, M., Hoppa, G., and **Neish, C.D.**, 2024. Reflectance changes over time on Saturnian moons. The Geological Society of America Connects 2024, #276-8. **Oral presentation (invited).**

4. Vanga, S., Perkins, R., **Neish, C.**, Zanetti, M., and Hamilton, C.W., 2024. Ground based LiDAR as an instrument for small scale change detection at Mars analog environments. The 55th Lunar and Planetary Science Conference, Abstract 2559. Poster presentation.

5. Dong, E., **Neish, C.**, Moores, J.E., Collins, G.S., Brown, P., and Lorenz, R., 2024. Detection of airbursts on Titan with Dragonfly pressure and seismic instruments. The 55th Lunar and Planetary Science Conference, Abstract 1955. Oral presentation.

6. Neish, C., 2023. Science Overview for the Radar Instrument on the International Mars Ice Mapper Mission. The Advanced SAR Workshop, Canadian Space Agency. Oral presentation.

7. **Neish, C.D.**, Malaska, M.J., Sotin, C., Lopes, R.M.C., Nixon, C.A., Affholder, A., Chatain, A., Cockell, C., Farnsworth, K.K., Higgins, P.M., Miller, K.E., and Soderlund, K.M., 2023. Organic input to Titan's subsurface ocean through impact cratering. The American Astronomical Society, DPS meeting #55, #216.06. Oral presentation.

8. Sacks, L., Phillips, C., Patthoff, A., Bland, M., Hoppa, G., and **Neish, C.**, 2023. Change detection on Enceladus. The American Astronomical Society, DPS meeting #55, #303.05. Oral presentation.

9. Dong, E., **Neish, C.**, Moores, J., Collins, G.S., Brown, P., and Lorenz, R., 2023. Potential for airburst detection on Titan with Dragonfly. The American Astronomical Society, DPS meeting #55, #204.01. Poster presentation.

10. **Neish, C.D.**, Virkki, A.K., 2023. The unusual surface texture of Venusian impact ejecta. The 54th Lunar and Planetary Science Conference, Abstract 1052. Oral presentation.

11. Duncan, T., **Neish, C**., Hedgepeth, J., 2023. Terrestrial craters as analogs for degraded craters on Titan. The 54th Lunar and Planetary Science Conference, Abstract 2776. Poster presentation.

12. Perkins, R.P., Trainer, M.G., **Neish, C.D.**, and Osinski, G.R., 2023. Characterization of impact melt at the Haughton Impact Structure: Applications for the Dragonfly mission to Titan. The 54th Lunar and Planetary Science Conference, Abstract 2575. Poster presentation.

13. Shah, J., Carr, B.B., Hadland, N., Varnam, M., Voigt, J.R.C., Basu, U., Björnsson, B., Chen, C., Dong, E., Graff, J., Hibbard, S.M., Moersch, J.E., Phillips, M., Springer, J., **Neish, C.D.**, and Hamilton, C.W., 2023. Evaluating the use of Unoccupied Aircraft Systems (UAS) for planetary surface exploration in analog terrain. The 54th Lunar and Planetary Science Conference, Abstract 1732. Poster presentation.

14. Thaker, A. D., **Neish, C. D.,** 2023**.** Regolith depth estimations around radar-dark halo craters on the Moon. The 54th Lunar and Planetary Science Conference, Abstract 1117. Poster presentation.

15. Sacks L.E., **Neish C.D.**, Rhoden AR, and Ferguson S.N. 2022. The Relationship Between Fractures and Impact Craters on Tethys. AGU Fall Meeting, P55G-1665. Poster presentation.

16. Shah, J., **Neish, C.**, Soderblom, J., and Wakita, S., 2022. The effects of thermal gradient of the ice crust on the morphology of Titan's craters. The American Astronomical Society, DPS meeting #54, #509.05. Oral presentation.

17. Hedgepeth, J., **Neish, C.**, and Bray, V., 2022. Impact crater degradation on Pluto. The American Astronomical Society, DPS meeting #54, #303.02. Oral presentation.

18. Sacks, L., **Neish, C.**, and Rhoden, A., 2022. The relationship between fractures and impact craters on Tethys. The American Astronomical Society, DPS meeting #54, #106.04. Oral presentation.

19. Gallinger, C., **Neish, C.**, and Tolometti, G., 2022. Re-analysis of the Surveyor 7 landing site with multi-wavelength synthetic aperture radar and thermal infrared observations. The American Astronomical Society, DPS meeting #54, #316.05. Poster presentation.

20. Thaker, A.D., and **Neish, C.**, 2022. Assessing the depth of the regolith around radar-dark halo craters on the Moon. The American Astronomical Society, DPS meeting #54, #405.04. Oral presentation.

21. Perkins, R. and **Neish, C.**, 2022. The effects of sedimentation on radar backscatter: Insights from the Holuhraun lava flow-field in Iceland and implications for Mars. The American Astronomical Society, DPS meeting #54, #503.04. Oral presentation.

22. Duncan, T., Hedgepeth, J., and **Neish, C.**, 2022. Terrestrial craters as analogs for degraded craters on Titan. The American Astronomical Society, DPS meeting #54, #509.04. Oral presentation.

23. Dicecca, A., Tornabene, L., **Neish, C.**, Thomas, N., Cremonese, G., and McEwen, A., 2022. Mapping Fe-Mg phyllosilicates and adjacent stratigraphy in Her Desher Vallis and Nirgal Vallis in northwest Noachis Terra, Mars. The American Astronomical Society, DPS meeting #54, #503.02. Oral presentation.

24. Thaker, A. D., **Neish, C. D.**, Blewett, D. T., and Zheng, Y. C., 2022. A Multi-Wavelength Analysis of Radar-Dark Halo Craters on the Moon. The 53rd Lunar and Planetary Science Conference, Abstract 1243. Oral presentation.

25. Gagnon, S., **Neish, C. D.,** Lemelin, M., and Gallinger, C., 2022. The Relative Radiance of Lunar Impact Melt Deposits: Evidence for Glass? The 53rd Lunar and Planetary Science Conference, Abstract 2955. Poster presentation.

26. Sacks, L., **Neish, C**., and Rhoden, A., 2021. Canyon Formation on Charon and Tethys. The American Astronomical Society, DPS meeting #53, #106.05. Oral presentation. [*Meeting held virtually*]

27. Shah, J., **Neish, C.**, Soderblom, J., Wakita, S., and Johnson, B., 2021. Investigation of fresh impact crater depths on Titan. The American Astronomical Society, DPS meeting #53, #405.05. Oral presentation. [*Meeting held virtually*]

28. Hedgepeth, J., Buffo, J., **Neish, C**., and Schmidt, B., 2021. Modeling the emplacement of amino acids in impact melt on Titan. The American Astronomical Society, DPS meeting #53, #405.07. Oral presentation. [*Meeting held virtually*]

29. **Neish, C.D.,** Lorenz, R., MacKenzie, S., Hedgepeth, J.E., 2021. The Haughton Impact Structure as a Titan Impact Crater Analogue: Applications to the Dragonfly Mission. Workshop on Terrestrial Analogs for Planetary Exploration. Oral presentation. [*Meeting held virtually*]

30. **Neish, C.D.,** 2021. Mini-RF Observes the Moon. 2021 Canadian Lunar Workshop, Abstract 1. Oral presentation. *[Meeting held virtually]*

31. Hedgepeth, J., **Neish, C. D.**, and Bray, V. J., 2021. Nitrogen's role in the degradation of craters on Pluto. The 52nd Lunar and Planetary Science Conference, Abstract 2555. Oral presentation. [*Meeting held virtually*]

32. Schaefer, E.I., **Neish, C. D.**, and Hamilton, C.W., 2021. Strong variability in the decameter-scale geometries of lava flow margins. The 52nd Lunar and Planetary Science Conference, Abstract 2401. Oral presentation. [*Meeting held virtually*]

33. **Neish, C. D.**, Laflèche, É. A., and Patterson, G.W., 2021. Physical properties of lunar impact melt deposits. The 52nd Lunar and Planetary Science Conference, Abstract 1589. Oral presentation. [*Meeting held virtually*]

34. Laflèche, É. A., Kells, K.P.J., Lambier, S.J., **Neish, C. D.**, Osinski, G.R., Cross, M., and Tornabene, L., 2021. Proposed lunar sample return mission at Tsiolkovskiy crater. The 52nd Lunar and Planetary Science Conference, Abstract 1363. Poster presentation. [*Meeting held virtually*]

35. Hedgepeth, J., Buffo, J., **Neish, C**., Chivers, C., and Schmidt, B., 2020. Tracking HCN Molecules in Crater Melt Ponds on Titan. The American Astronomical Society, DPS meeting #52, #408.04. Oral presentation. [*Meeting held virtually*]

36. Shah, J., and **Neish, C.,** 2020. Comparative Study of Impact Craters on Earth and Titan Using Radar Images. The American Astronomical Society, DPS meeting #52, #218.02. Oral presentation. [*Meeting held virtually*]

37. Yingling, W. A., **Neish, C. D.**, and Tornabene, L. L., 2020. Impact Melt Emplacement on Terrestrial Bodies**.** The 7th Annual NASA Exploration Science Forum. Oral presentation. [*Meeting held virtually*]

38. Tolometti, G. D., **Neish, C. D**., Osinski, G. R., Kukko, A., Voigt, J. R. C., and Hamilton, C.W., 2020. Studying Lunar Lava Flow Emplacement by Quantifying the Surface Roughness of the Holuhraun Lava Flowfield. The 7th Annual NASA Exploration Science Forum. Poster presentation. [*Meeting held virtually*]

39. Shah, J., and **Neish, C. D.,** 2020. Comparative study of impact craters on Earth and Titan using radar images. The 51st Lunar and Planetary Science Conference, Abstract 1727. Oral presentation. [*Canceled due to COVID-19*]

40. Tolometti, G. D., **Neish, C. D**., Osinski, G. R., Kukko, A., Voigt, J. R. C., and Hamilton, C.W., 2020. Quantifying the Surface Roughness of the 2014–2015 Holuhraun Lava Flow Using Radar and LiDAR Remote Sensing**.** The 51st Lunar and Planetary Science Conference, Abstract 1417. Poster presentation. [*Canceled due to COVID-19*]

41. Tolometti, G. D., Osinski, G. R., **Neish, C. D.**, Grieve, R. A. F., and Erickson, T. M. Constraining the Temperature of Impact Melt from the Mistastin Lake Impact Structure Using Zircon Crystal Structures, 2020**.** The 51st Lunar and Planetary Science Conference, Abstract 1577. Oral presentation. [*Canceled due to COVID-19*]

42. Hedgepeth, J. E., Buffo, J., **Neish, C. D.**, Schmidt, B. E., and Chivers, C., 2020. Tracking Organic Molecules in Crater Melt Ponds on Titan**.** The 51st Lunar and Planetary Science Conference, Abstract 2084. Oral presentation. [*Canceled due to COVID-19*]

43. Yingling, W. A., **Neish, C. D.**, and Tornabene, L. L., 2020. Impact Melt-Bearing Deposits Around Martian Craters**.** The 51st Lunar and Planetary Science Conference, Abstract 2672. Oral presentation. [*Canceled due to COVID-19*]

44. Schaefer, E. I., **Neish, C. D.**, Hamilton, C. W., Scheidt, S. P., and Rodriguez Sanchez-Vahamonde, C. D., 2020. The Effects of Sedimentation on the Measured Fractality of Lava Flow Margins**.** The 51st Lunar and Planetary Science Conference, Abstract 2457. Poster presentation. [*Canceled due to COVID-19*]

45. Shah, J., and **Neish, C. D.,** 2019. Comparative study of impact craters on Earth and Titan using radar. The 70th International Astronautical Congress, IAC-19-A7.2.6x53930. Oral presentation.

46. **Neish, C.D.,** 2019. Impact melt deposits on terrestrial planets. Large Meteorite Impacts and Planetary Evolution VI, Abstract 5089. **Keynote (invited)**. [*Invited and accepted but later unable to attend*]

47. Rodriguez Sanchez-Vahamonde, C. D., **Neish, C.D**., and Tornabene, L. L., 2019. Quantification of Surface Roughness of Lava Flows on Mars. The 50th Annual Lunar and Planetary Science Conference, Abstract 2807. Oral presentation.

48. **Neish, C.D.,** D.T. Blewett, Z. Morse, Y.-C. Zheng, 2019. Unusual rocky deposits around large Imbrian lunar impact craters. The 50th Annual Lunar and Planetary Science Conference, Abstract 1542. Poster presentation.

49. **Neish, C.D.,** K. Cannon, L. Tornabene, M. Zanetti, E. Pilles, and K. Young, 2018. Evidence for glass-rich surfaces on lunar impact melt deposits. The Geological Society of America, 130th Annual Meeting, #18-2. **Oral presentation (invited)**.

50. **Neish, C.D.,** K. Cannon, L. Tornabene, M. Zanetti, and E. Pilles, 2018. Evidence for glass-rich surfaces on lunar impact melt deposits. The American Astronomical Society, DPS meeting #50, #103.03. Oral presentation.

51. Daniels, J. W., and **Neish, C. D.,** 2018. Impact Melt Emplacement on Mercury. Mercury: Current and Future Science of the Innermost Planet, LPI Contribution No. 2047, Abstract 6018. Poster presentation.

52. Fan, K. A., **Neish, C. D**., Zanetti, M., and Kukko, A., 2018. An Improved Methodology for the 3-Dimensional Characterization of Surface Roughness as Applied to Lava Flows. The 49th Annual Lunar and Planetary Science Conference, Abstract 2083. Poster presentation.

53. Zanetti, M., **Neish, C. D**., Kukko, A., Choe, B.-H., Osinski, G., Tolometti, G., Fan, K., Maj, R., and Heldmann, J., 2018. Surface Roughness and Radar Scattering Properties of Volcanic Terrain: Geologic Application of Kinematic Mobile LiDAR Scanning. The 49th Annual Lunar and Planetary Science Conference, Abstract 2361. Poster presentation.

54. Weitz, N., and **Neish, C.,** 2018. Landscape Evolution of Terrestrial Impact Craters: Constraining Erosion Rates and Processes. The 49th Annual Lunar and Planetary Science Conference, Abstract 2307. Poster presentation.

55. Hedgepeth, J. E., **Neish, C. D**., Turtle, E. P., and Stiles, B. W., 2018. Impact Craters on Titan: Finalizing Titan's Crater Population. The 49th Annual Lunar and Planetary Science Conference, Abstract 2105. Oral presentation.

56. Tolometti, G. D., Flemming, R. L., **Neish, C. D**., and Osinski, G. R., 2018. Redox Conditions and the Surface Roughness of Lava Flows. The 49th Annual Lunar and Planetary Science Conference, Abstract 1382. Poster presentation.

57. Daniels, J. W., and **Neish, C. D.,** 2018. Impact Melt Emplacement on Mercury. The 49th Annual Lunar and Planetary Science Conference, Abstract 1380. Poster presentation.

58. **Neish, C.D.,** 2018. Titan: Ingredients for Life. Gordon Conference on the Origins of Life. **Oral presentation (invited)**.

59. Werynski, A., **Neish, C**., Le Gall, A., and Janssen, M. A., 2017. Compositional Variations of Titan's Impact Craters Indicates Active Surface Erosion. The American Astronomical Society, DPS meeting #49, #301.04. Oral presentation.

60. Harrington, E., 2017. Polarimetric synthetic aperture radar for remotely mapping salt diapirs. The 68th International Astronautical Congress, IAC-17.B1.IP.11. Poster presentation.

61. **Neish, C.D.**, R.D. Lorenz, E.P. Turtle, J.W. Barnes, M.G. Trainer, R. Kirk, B. Stiles, and C.A. Hibbitts, 2017. Strategies for detecting the products of aqueous chemistry on Titan. Astrobiology Science Conference 2017, #3081. Poster presentation.

62. Zanetti, M., **Neish, C. D**., Kukko, A., Choe, B.-H., Osinski, G. R., and Mahathantila, N., 2017. Surface Roughness and Radar Scattering Properties of Periglacial Terrain: Geologic Applications of Personal Mobile LiDAR Scanning. The 48th Annual Lunar and Planetary Science Conference, Abstract 2775. Oral presentation.

63. Maj, R. M., **Neish, C. D**., Zanetti, M., and Tornabene, L. L., 2017. Using Radar Data to Identify Areas of Interest and Plan Traverses in Volcanic Terrains. The 48th Annual Lunar and Planetary Science Conference, Abstract 2771. Poster presentation.

64. Tolometti, G. D., **Neish, C. D**., Osinski, G. R., Zanetti, M., Maj, R., Hughes, S. S., and Kobs Nawotniak, S. E., 2017. Variation in Petrography of Basaltic Lava Flows with Similar Surface Roughness. The 48th Annual Lunar and Planetary Science Conference, Abstract 1643. Poster presentation.

65. **Neish, C.D.**, R.D. Lorenz, E.P. Turtle, J.W. Barnes, M.G. Trainer, R. Kirk, B. Stiles, and C.A. Hibbitts., 2017. Strategies for detecting the products of aqueous chemistry on Titan. The 48th Annual Lunar and Planetary Science Conference, Abstract 1457. Oral presentation.

66. Shaposhnikova, M., Tornabene, L. L., Zanetti, M., Harrington, E. M., **Neish, C**., and Osinski, G. R., 2016. Visible Near-Infrared (VNIR) and Thermal Spectral Mapping of Salt Diapirs on Axel Heiberg Island, NU, Canada. American Geophysical Union, Fall General Assembly, Abstract EP53C-0995. Poster presentation.

67. Harrington, E. M., **Neish, C**., Choe, B. H., Zanetti, M., Tiampo, K. F., Samsonov, S. V., Budkewitsch, P., Zentilli, M., Osinski, G. R., Shaposhnikova, M., and Tornabene, L. L., 2016. InSAR Investigations of Salt Diapir Motion on Axel Heiberg Island, Canada. American Geophysical Union, Fall General Assembly, Abstract P54B-01. Oral presentation.

68. Kinser, R., **Neish, C**., Howard, A., Schenk, P., and Bray, V., 2016. Geologic Conditions Required for the Fluvial Erosion of Titan's Craters. The 47th Annual Lunar and Planetary Science Conference, Abstract 2627. Oral presentation.

69. Zanetti, M., **Neish, C.,** Choe, B. H., Heldmann, J. L., and the SSERVI FINESSE Team, 2016. Mapping Fresh Lava Flows with Multi-Wavelength Radar Imagery in Support of Planetary Analogue Studies. The 47th Annual Lunar and Planetary Science Conference, Abstract 2429. Poster presentation.

70. **Neish, C.D.**, R.R. Herrick, D. Smith, R. Ripper, and J. Lashley, 2016. The role of pre-impact topography in impact melt emplacement on terrestrial planets. The 47th Annual Lunar and Planetary Science Conference, Abstract 1520. Oral presentation.

71. **Neish, C.D**., S. S. Hughes, C. W. Hamilton, S. Kobs Nawotniak, W. B. Garry, J. R. Skok, R. C. Elphic, L. M. Carter, J. L. Bandfield, G. R. Osinski, D. Lim, and J. L. Heldmann, 2015. Transitional lava flows as potential analogues for lunar impact melts. The American Astronomical Society, DPS meeting #47, #107.08. Oral presentation.

72. Kinser, R., **Neish, C**., Howard, A., Schenk, P., and Bray, V., 2015. Geologic Conditions Required for the Fluvial Erosion of Titan's Craters. The American Astronomical Society, DPS meeting #47, #310.01. Poster presentation.

73. **Neish, C.,** 2015. Using polarimetric SAR to infer the surface properties of lunar impact melts. The Advanced SAR Workshop, Canadian Space Agency. Oral presentation.

74. **Neish, C.D.**, R.R. Herrick, R. Ripper, and J. Lashley, 2015. The role of pre-impact topography in impact melt emplacement on terrestrial planets. Bridging the Gap III: Impact Cratering in Nature, Experiments, and Modeling, Abstract 1072. Oral presentation.

75. **Neish, C.D.**, and J.W. Barnes, 2015. Spectral properties of Titan's impact craters imply chemical weathering of its surface. The 46th Annual Lunar and Planetary Science Conference, Abstract 1097. Oral presentation.

76. **Neish, C.D.,** 2014. Transitional lava flows as potential analogues for lunar impact melts. AGU Fall Meeting, P12B-06. **Oral presentation (invited)**.

77. **Neish, C.D.**, J.L. Molaro, J. Lora, A.D. Howard, R.L. Kirk, P. Schenk, and V.J. Bray, 2014. Fluvial erosion of craters on Titan. The American Astronomical Society, DPS meeting #46, #115.03. Oral presentation.

78. **Neish, C.D.**, J. Madden, L.M. Carter, V.J. Bray, B.R. Hawke, T. Giguere, G.R. Osinski, and J.T. Cahill, 2014. Global distribution of lunar impact melt flows. The 45th Annual Lunar and Planetary Science Conference, Abstract 1159. Oral presentation.

79. **Neish, C.D.**, and R.D. Lorenz, 2013. Elevation distribution of Titan's craters suggests extensive wetlands. The American Astronomical Society, DPS meeting #45, #302.07. Oral presentation.

80. **Neish, C.D.**, R. D. Lorenz, J. L. Molaro, J. Lora, A. D. Howard, R. L. Kirk, J. W. Barnes, J. Radebaugh, E. P. Turtle, V. J. Bray, and P. M. Schenk, 2013. The unusual crater Soi on Titan: Possible formation scenarios. The 44th Annual Lunar and Planetary Science Conference, Abstract 2079. Oral presentation.

81. **Neish, C.D.**, B. T. Greenhagen, G. W. Patterson, J. T. S. Cahill, J. L. Bandfield, N. E. Petro, and B. R. Hawke, 2013. Impact melt deposits at Tsiolkovskiy crater: Constraints on crater age. The 44th Annual Lunar and Planetary Science Conference, Abstract 1585. Poster presentation.

82. **Neish, C.D.**, L.M. Carter, V.J. Bray, B.R. Hawke, T. Giguere, G.R. Osinski, and J.T. Cahill, 2012. Impact melt emplacement on the Moon: New results from Mini-RF on LRO. AGU Fall Meeting, P13D-08. Oral presentation.

83. **Neish, C.D.**, D.T. Blewett, J.K. Harmon, E.I. Coman, and J.T.S. Cahill, 2012. Secondary cratering as the primary mechanism for ray formation on the Moon and Mercury. The American Astronomical Society, DPS meeting #44, #509.01. Oral presentation.

84. **Neish, C.D.**, L. Carter, V. Bray, N. Glines, B.R. Hawke, and D.B. Bussey, 2012. New lunar impact melt flows as revealed by Mini-RF on LRO. The 34th International Geological Congress, Abstract #2965. Oral presentation.

85. **Neish, C.D.**, C. Robinson, S. Kinahan, A. Marziali, J. DiRuggiero, and C. Bradburne, 2012. A new approach for DNA detection in Mars analogue soils using SCODA. Astrobiology Science Conference 2012, #1421. Poster presentation.

86. **Neish, C.D.**, N. Glines, L.M. Carter, V.J. Bray, B.R. Hawke, D.B.J. Bussey, and the Mini-RF Team, 2012. New lunar impact melt flows as revealed by Mini-RF on LRO. The 43rd Annual Lunar and Planetary Science Conference, Abstract 2388. Oral presentation.

87. **Neish, C.D.**, R.L. Kirk, R.D. Lorenz, V.J. Bray, P. Schenk, B. Stiles, E. Turtle, and the Cassini RADAR Team, 2012. Crater topography on Titan: Implications for landscape evolution. The 43rd Annual Lunar and Planetary Science Conference, Abstract 2412. Oral presentation.

88. **Neish, C.D.**, L. Prockter, and G.W. Patterson, 2011. The identification of chaotic terrain on Europa. EPSC-DPS Joint Meeting, Vol. 6, EPSC-DPS2011-259. Oral presentation.

89. **Neish, C.D.**, L. Carter, D.B.J. Bussey, J. Cahill, B. Thomson, O. Barnouin, and the Mini-RF Science Team, 2011. Correlation between surface roughness and slope on a lunar impact melt. The 42nd Annual Lunar and Planetary Science Conference, Abstract 1881. Poster presentation.

90. **Neish, C.D.**, and R.D. Lorenz, 2011. Titan's global crater population: A new assessment. The 42nd Annual Lunar and Planetary Science Conference, Abstract 1412. Poster presentation.

91. **Neish, C.D.,** 2010. The formation of oxygen-containing molecules in liquid water environments on the surface of Titan. AGU Fall Meeting, P22A-08. **Oral presentation (invited)**.

92. **Neish, C.D.**, D.T. Blewett, D.B.J. Bussey, S.J. Lawrence, M. Mechtley, B.J. Thomson, and M.S. Robinson, 2010. The surficial nature of lunar swirls as revealed by the Mini-RF instrument. The American Astronomical Society, DPS meeting #42, #18.06. Oral presentation.

93. **Neish, C.D.**, D.B.J. Bussey, P. Spudis, W. Marshall, B. Thomson, G.W. Patterson, L. Carter, and the Mini-RF Science Team, 2010. The nature of lunar volatiles as revealed by Mini-RF observations of the LCROSS impact site. NASA Lunar Science Forum. Oral presentation.

94. **Neish, C.D.**, D.B.J. Bussey, P. Spudis, B. Thomson, G.W. Patterson, L. Carter, and the Mini-RF Science Team, 2010. Mini-RF observations in support of LCROSS. The 41st Annual Lunar and Planetary Science Conference, Abstract 2075. Poster presentation.

95. **Neish, C.D.**, A. Somogyi, and M.A. Smith, 2009. Titan's primoridal soup: Formation of amino acids via low temperature hydrolysis of tholins. The American Astronomical Society, DPS meeting #41, #30.02. Oral presentation.

96. **Neish, C.D.**, R.D. Lorenz, and R.L. Kirk, 2009. Out of Africa: Radarclinometry of the sand seas of Namibia and Titan. The 40th Annual Lunar and Planetary Science Conference, Abstract 1071. Poster presentation.

97. Sotin, C., R. Mielke, M. Choukroun, **C. Neish**, M. Barmatz, J. Castillo, J. Lunine, and K. Mitchell, 2009. Ice-hydrocarbon interactions under Titan-like conditions: Implications for the carbon cycle on Titan. The 40th Annual Lunar and Planetary Science Conference, Abstract 2088. Oral presentation.

98. **Neish, C.D.**, A. Somogyi, J.I. Lunine, and M.A. Smith, 2008. Hydrolysis of laboratory made tholins in aqueous solutions: Implications for prebiotic chemistry on Titan. The American Astronomical Society, DPS meeting #40, #34.09. Oral presentation.

99. **Neish, C.D.**, A. Somogyi, J.I. Lunine, and M.A. Smith, 2008. Hydrolysis of laboratory made tholins in solutions of varying pH: Implications for prebiotic chemistry on Titan. The 5th Astrobiology Science Conference, #23.12. Oral presentation.

100. **Neish, C.D.** and 15 colleagues, 2007. VEIL (Venus Exploration In-situ Landers): A New Frontiers Class Mission Design Concept. The American Astronomical Society, DPS meeting #39, #34.13. Poster presentation.

101. **Neish, C.D.**, R.D. Lorenz, and R.L. Kirk, 2006. Radar topography of dome volcanoes on Venus and Titan. The 37th Annual Lunar and Planetary Science Conference, Abstract 2151. Poster presentation.

102. **Neish, C.D.**, R.D. Lorenz, D.P. O'Brien, and the Cassini RADAR Team, 2005. Shape and thermal modeling of the possible cryovolcanic dome Ganesa Macula on Titan: Astrobiological implications. The American Astronomical Society, DPS meeting #37, #46.11. Poster presentation.

103. **Neish, C.D.**, M.C. Nolan, E.S. Howell, and A.S. Rivkin, 2004. Radar Observations of Binary Asteroid 5381 Sekhmet. The American Astronomical Society Meeting 203, #134.02. Oral presentation.

7. RESEARCH FUNDING:

Principal Investigator (13)

1. CSA Research Opportunities in Space Science 2023, “Exploring the science of landing sites on the Moon with the Lunar Reconnaissance Orbiter”, $150,000 CAD awarded to C. Neish in 2024 to cover a period of three years ($50k per year). This grant supports the participation of two Canadian students on the science team for the Mini-RF instrument on the Lunar Reconnaissance Orbiter.

2. NSERC Discovery Grants Program, “Home from Away: The Earth as an Analogue for Understanding Planetary Geologic Processes”, $232,420 CAD awarded to C. Neish in 2022 to cover a period of five years ($46.5k per year). This grant supports my 5-year research program.

3. CSA Flights & Fieldwork for the Advancement of Science and Technology, “Canadian Participation in the Rover-Aerial Vehicle Exploration Network (RAVEN)”, $100,000 CAD awarded to C. Neish and G. Osinski in 2022 to cover a period of two years ($50k per year). This grant funds field work in Iceland, conference travel, and stipends for two graduate students and one PDF.

4. John R. Evans Leaders Fund, Canada Foundation for Innovation, “Mobile LiDAR System for Geologic Applications”, $485,000 CAD awarded to C. Neish in 2020 to cover a period of one year ($485k per year). This grant will fund a high-resolution backpack LiDAR system.

5. Postdoctoral Fellowship Program, Western University, “Geologic characterization of lava flows from the geometry of their margins”, $45,200 CAD awarded to C. Neish and E. Schaefer to cover a period of two years ($22.6k per year). This grant supported half the salary of my PDF.

6. CSA Flights & Fieldwork for the Advancement of Science and Technology, “Volcanic analogues for the exploration of Mars”, $100,000 CAD awarded to C. Neish and G. Osinski in 2018 to cover a period of two years ($50k per year). This grant funds field work in Iceland, conference travel, and stipends for one graduate student and PDF.

7. Early Researcher Award, Ontario Ministry of Research and Innovation, “Radar remote sensing of the Earth and Planets,” $140,000 CAD awarded to C. Neish in 2017 to cover a period of five years ($29k in Year 1, $33k in Year 2, $30k in Year 3, $31k in Year 4, and $16k in Year 5). This grant funds graduate student stipends, conference travel, and outreach supplies.

8. NSERC Engage Grants for Universities, “Geologic applications of mobile and tripod LiDAR systems”, $24,260 CAD awarded to C. Neish and M. Zanetti in 2017 to cover a period of six months ($24.3k per year). This grant funded salary for my PDF, and his field work in the Arctic.

9. CSA Flights & Fieldwork for the Advancement of Science and Technology, “Volcanic analogue mission for planetary exploration (VAMPE)”, $200,000 CAD awarded to C. Neish, G. Osinski, L. Tornabene, C. Samson, and R. Francis in 2016 to cover a period of two years ($100k per year). This grant funded stipends for three graduate students and two undergraduate students, conference travel, and field work in Idaho.

10. CSA Science and Operational Applications Research for RADARSAT-2, “Monitoring salt diapir evolution on Axel Heiberg Island with InSAR”, $50,000 CAD awarded to C. Neish, G. Osinski, K. Tiampo, and S. Samsonov in 2016 to cover a period of one year ($50k per year). This grant funded stipends for two graduate students and one undergraduate student, and conference travel.

11. NSERC Discovery Grants Program, “Landscape evolution of planetary surfaces: Comparative analysis of craters in the solar system”, $135,000 CAD awarded to C. Neish in 2015 to cover a period of five years ($27k per year). This grant supports my 5-year research program.

12. NSERC Discovery Accelerator Supplement, “Landscape evolution of planetary surfaces: Comparative analysis of craters in the solar system”, $120,000 CAD awarded to C. Neish in 2015 to cover a period of three years ($40k per year). This grant provided supplementary support for my NSERC Discovery grant, enabling me to hire a PDF.

13. NASA Outer Planets Research Program, “Erosion on Titan as revealed by its crater population”, $232,697 USD awarded to C. Neish and V. Bray in 2014 to cover a period of three years ($73k in Year 1, $79.2k in Year 2, and $80.6k in Year 3). This grant covered salary for myself and Co-I, as well as stipend for one graduate student, and associated conference travel.

Co-Principal Investigator (1)

1. New Frontiers in Research Fund, “Understanding Titan: Supramolecular Chemistry beyond Earth”, $250,000 CAD awarded to T. Preston, C. Neish, and T. Friscic in 2020 to cover a period of two years ($125k per year). This grant funded one of my graduate students, and their associated lab work at McGill.

Co-Investigator (13)

1. Subcontract to Western University from York University and the Canadian Space Agency, “International Mars Ice Mapper Phase 0 Study,” $34,414.38 CAD awarded to C. Neish in 2024 to cover a period of one year. This grant covers salary for research assistants.

2. NASA Cassini Data Analysis Program, “Effects of methane clathrate on the depth of Titan’s craters,” $592,167 USD awarded to J. Soderblom, S. Wakita, C. Neish, B. Johnson, and L. Schurmeier in 2023 to cover a period of three years ($188k in Year 1, $198k in Year 2, $206k in Year 3). This grant covers salary for the PI, Science PI, and Co-Is, plus associated travel.

3. CSA Lunar Exploration Accelerator Program Planetary Science Investigation Grants, “A Canadian Lunar Research Network for Geology, Geophysics and Prospecting”, $900,000 CAD awarded to G. Osinski, C. Neish, C. Herd, M. Lemelin, L. Tornabene, E. Walton, and R. Flemming in 2021 to cover a period of five years ($135k in Year 1, $225k in Year 2, $229k in Year 3, $225k in Year 4, and $86k in Year 5). This grant will support six graduate students and one postdoctoral fellow each year, along with their accompanying travel and research expenses.

4. NSERC Research Tools and Instruments, “The Western Interdisciplinary Drone Laboratory”, $124,299 CAD awarded to G. Osinski, C. Neish, S. Molnar, and K. Goda in 2020 to cover a period of one year ($124.3k per year). This grant funded the purchase of four drones and their associated instruments and accessories.

5. CSA Flights & Fieldwork for the Advancement of Science and Technology, “Soil and Snow: Aerial Truthing of Enhanced Radar Backscatter Inversion for the Arctic (SATERBIA)”, $300,000 CAD awarded to B. Rabus, C. Neish, G. Osinski, and S. Gruber in 2020 to cover a period of three years ($100k per year). This grant will fund one of my graduate students, and their associated field work in the Arctic.

6. NASA Cassini Data Analysis Program, “The impact of Titan’s impacts,” $673,824 USD awarded to J. Soderblom, C. Neish, B. Johnson, J. Steckloff, and A. Hayes in 2019 to cover a period of three years ($257.6k in Year 1, $195.2k in Year 2, and $221.0k in Year 3). This grant covers salary for the PI, Co-Is, and students, plus associated travel.

7. CSA Fieldwork for the Advancement of Science and Technology – Lunar Exploration Analogue Deployment, “CanLunar – A Canadian Lunar Sample Return Analogue Mission”, $135,275 CAD awarded to G. Osinski, C. Neish, and K. McIsaac in 2019 to cover a period of one year ($135.3k per year). This grant supported the participation of one of my graduate students in the analogue mission.

8. NASA New Frontiers 4, “Dragonfly”, ~$1,000,000,000 USD awarded to E. Turtle and Co-Is in 2019 to cover a period of seventeen years. This grant supports the salaries and hardware required to construct a rotorcraft spacecraft to be sent to Saturn’s moon Titan.

9. CSA NeMO SAR Contract, $300,000 CAD awarded to G. Osinski, C. Neish, and Co-Is in 2017 to cover a period of one year ($300k per year). This grant supported salaries for commercial engineers and one PDF, plus associated travel.

10. NSERC CREATE, “Technologies for Exo-Planetary Science (TEPS)”, $1,650,000 awarded to R. Jayawardhana and nine Co-Is in 2016 to cover a period of six years ($275k per year). This grant has funded four of my graduate students, and one PDF.

11. NASA Lunar Data Analysis Program, “Analysis of Chang’E orbital and surface data,” $219,000 USD awarded to D. Blewett, C. Neish, E. Cloutis, and Y. Zheng in 2016 to cover a period of three years ($73k per year). This grant supported the PI’s salary and associated travel.

12. CSA Science and Operational Applications Research for RADARSAT-2, “Application of RADARSAT-2 polarimetric SAR for geological mapping and resource exploration in the Canadian Artic”, $200,000 CAD awarded to G. Osinski, L. Tornabene, C. Neish, and J. Wang

in 2015 to cover a period of two years ($100k per year). This grant supported one of my graduate students, and travel for students and Co-Is to the Canadian Arctic.

13. NASA Solar System Workings Program, "Lunar impact melt flows: Geological mapping, experimental simulation, numerical modelling," $479,495 USD awarded to C. Hamilton, C. Neish, and E. Lev in 2015 to cover a period of three years ($141.5k in Year 1, $168.1k in Year 2, and $169.9k in Year 3). This grant supported the salary of the PI, Co-I, and students, and associated travel.

8. OTHER SCHOLARLY AND PROFESSIONAL ACTIVITIES:

Spacecraft Involvement:

- Instrument Scientist, I-MIM Phase 0 Study (2024 – present)
- Science Team Member, Canada's Lunar Rover Mission (2023 – present)
- Co-Investigator, Dragonfly New Frontiers Mission (2019 – present)
    - Astrobiology and Habitability Working Group Lead (2019 – 2023)
- Co-Investigator, Lunar Reconnaissance Orbiter Mini-RF Instrument (2009 – 2014, 2017 – present)
- Science Team Member & Task Leader, International Mars Ice Mapper MDT (2021 – 2022)
- Associate Team Member, Cassini RADAR Science Team (2010 – 2018)

Scientific Collaborations:

- Collaborator, NASA Rover-Aerial Vehicle Exploration Network (2021 – present)
- Collaborator, FINESSE Node, NASA Solar System Exploration Research Virtual Institute (2014 – 2019)

Invited Seminars:

2024:
- Space Society of London, "Dragonfly: A Rotorcraft Lander at Titan"
- Canadian Association of Physicists Plenary Lecture, "Dragonfly: A Rotorcraft Lander at Titan"

2023:
- Kenneth M. Molson Lecture, Canada Aviation and Space Museum, "Dragonfly: A Rotorcraft Lander at Titan"
- Department of Atmospheric and Oceanic Sciences, McGill University, "Dragonfly: A Rotorcraft Lander at Titan"
- First Friday Astronomy, Boise State University, "Dragonfly: A Rotorcraft Lander at Titan"

2022:
- Florida Tech Public Science Lecture Series, "Dragonfly: A Rotorcraft Lander at Titan"

2021:
- Lunar and Planetary Institute (LPI) Seminar Series, "Dragonfly: A Rotorcraft Lander at Titan"

2020:
- Western Retired Academics Lecture, The University of Western Ontario, "Saturn's Moon Titan: Earth in the Freezer Aisle?"

2019:
- Western Senior Alumni Lecture, The University of Western Ontario, "Saturn's Moon Titan: Earth in the Freezer Aisle?"

2018:
- Department of Physics and Astronomy, The University of Western Ontario, “Titan: Ingredients for Life”
- Department of Astronomy and Astrophysics, The University of Toronto, “Extreme Makeover: Titan Edition”
- Department of Earth and Planetary Sciences, The Johns Hopkins University, “Extreme Makeover: Titan Edition”
- Origins Institute, McMaster University, “Titan: Ingredients for Life”

2017:
- Department of Physics and Astronomy, University of Delaware, “Extreme Makeover: Titan Edition”

2016:
- Department of Astronomy, Cornell University, “Extreme Makeover: Titan Edition”
- Planetary Science Institute, “Extreme Makeover: Titan Edition”
- Department of Earth Sciences, University of Western Ontario, “Extreme Makeover: Titan Edition”

2015:
- Southwest Research Institute, “Extreme Makeover: Titan Edition”

2014:
- Department of Physics, University of Central Florida, “Titan: Ingredients for Life”
- Binghamton Geomorphology Symposium, University of Tennessee, “Extreme Makeover: Landscape Modeling of Planetary Surfaces”
- Department of Earth Sciences, University of Western Ontario (*interview*), “Radar Love: Observing the Planets with SAR”
- Planets, Life, and the Universe Lecture Series, The Johns Hopkins University, “Titan: Ingredients for Life”

2013:
- Department of Earth, Atmospheric, and Planetary Sciences, Purdue University, “Titan’s Crater Makeover”
- Department of Physics, University of Idaho, “Radar Love: Observing the Planets with SAR”
- Department of Planetary Sciences, University of Arizona, “Titan’s Crater Makeover”
- Department of Physics and Space Sciences, Florida Institute of Technology, “Radar Love: Observing the Planets with SAR”

2012:
- NASA Museum Alliance, “The Enigmatic Lunar Swirls”
- NASA Goddard Space Flight Center, “Radar Love: Mini-RF Observes the Moon”
- Carnegie Institution, Department of Terrestrial Magnetism, “Radar Love: Mini-RF Observes the Moon”

2010:
- Department of Astronomy, Univ. of Maryland, “Radar Love: Mini-RF Observes the Moon”
- Night Sky Network, Astronomical Society of the Pacific, “Radar Love: Mini-RF Observes the Moon”
- NASA Goddard Space Flight Center, “Titan: Ingredients for Life”

2009:
- Carnegie Institution, Department of Terrestrial Magnetism, “Titan: Ingredients for Life”

Professional Memberships:

- American Geophysical Union
- Division for Planetary Science, American Astronomical Society

9. **UNIVERSITY ADMINISTRATIVE DUTIES:**

Departmental Committees:

- Member, Promotion and Tenure Committee, Dept. of Earth Sciences, 2023 – present
    - Evaluated one tenure application
- Member, Graduate Affairs Committee, Dept. of Earth Sciences, 2015 – 2018, 2020 – 2021, 2024 – 2025
    - Read over NSERC and OGS scholarships for roughly 20-30 students per year. Read over graduate applications for ~50 prospective students per year.
- Member, MinEx Faculty Search Committee, Dept. of Earth Sciences, 2016-2017
    - Read over ~30 applications for a faculty position and participated in two day interviews for three short-listed candidates.
- Member, Colloquium Committee, Dept. of Earth Sciences, 2015 – 2017, 2020 – 2022
    - Provided suggestions for invited speakers. Hosted roughly one to two speakers per semester.
- Member, Retreat Planning Committee, Dept. of Earth Sciences, 2015
    - Assisted the chair in planning the agenda for a one day department retreat held in Fall 2015
- Member, Workload Committee, 2015, 2018, 2023
    - Reviewed workload policy for the Department of Earth Sciences

Faculty Committees:

- Associate Director, The Institute for Earth and Space Exploration, 2023 – present
    - Serve on the Executive Committee for the Institute. Provide guidance for training and innovation.
- Member, Executive Council, The Institute for Earth and Space Exploration, 2020 – 2022
    - Attend monthly meetings. Provide feedback on the goals of the Institute, and input on our outreach, undergraduate, and graduate programs.
- Member, International Advisory Committee, Faculty of Science, 2018 – 2019
    - Attend biweekly meetings. Provide feedback on international issues related to research, undergraduate, and graduate education.
- Member, Executive Council, The Centre for Planetary Science and Exploration, 2015 – 2019
    - Attend monthly meetings. Provide feedback on the Institute proposal, and input on our outreach, undergraduate, and graduate programs.

10. COMMUNITY SERVICE:

External Committees:

- Vice-Chair (2021 – 2022), Chair (2022 – 23) and Past Chair (2023 – 2024), Division for Planetary Sciences (DPS) of the American Astronomical Society Committee
    - DPS is the world's largest professional society of planetary scientists. I was elected by the society's membership to serve as Vice-Chair (2021-22), Chair (2022-23), and Past Chair (2023-24) of the division. In this role, I led biweekly online meetings, two in person all-day meetings, and Chaired our annual meeting in 2023.

- Chair, DPS Publications Subcommittee, 2020 – 2021
- Member, DPS Publications Subcommittee, 2019 – 2020
    - Provide monthly advice to the DPS Committee regarding issues pertaining to publishing in planetary sciences. Topics include our relationships with planetary science journals, identifying editors for those journals, and helping to establish the new AAS Planetary Science Journal.
- Member, Outer Solar System Task Group, IAU Working Group for Planetary System Nomenclature, 2018 – present
    - Provide monthly feedback via e-mail regarding requests to name objects and features in the outer solar system.
- Member, Division for Planetary Sciences (DPS) of the American Astronomical Society Committee, 2016 – 2019
    - Attend bi-weekly telecons and bi-yearly in person meetings to conduct society business. This includes planning our yearly meeting, lobbying for our community to the US government, and awarding prizes to extraordinary members of our community.
- Member, "Roadmaps for Ocean Worlds", NASA Outer Planets Assessment Group, 2016 – 18
    - Attended telecons and in person meetings to draft a new roadmap for NASA's exploration of the icy satellites in our solar system. Led the Titan working group, wrote the section on Titan, and edited the broader document submitted to the Outer Planets Assessment Group.
- Member, CSA Planetary Geology, Geophysics, and Prospecting Topical Team, 2016 – 2017
    - Provided input to the team lead to write a report of updated community science priorities for the Canadian Space Agency.

Peer Review:

- Review panel member for the STScI Telescope Allocation Committee (2023)
    - Reviewed science proposals for JWST observations over 4 days
    - Primary or secondary reviewer for 14 proposals, grader for 64 proposals
- Review panel member for NASA (2008, 2009, 2012, 2013, 2015, 2017, 2024)
    - Primary reviewer for 3-4 proposals, secondary reviewer for 3-4 proposals
    - Five day meeting to discuss merits of ~20 proposals
- Review panel member for NSERC RTI (2017)
    - Reviewed ~30 RTI proposals, and provided feedback to NSERC remotely
- External reviewer, Arecibo Scheduling Advisory Committee (2012 -2017)
    - Primary reviewer for ~5 telescope proposals each semester
- Reviewer for Planetary Data System, Lunar Radar Data (2010)
- Manuscript reviewer for *Icarus*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *Planetary and Space Sciences*, *ApJ Letters, Advances in Space Research, Nature Geosciences, Earth and Planetary Science Letters, Geology, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, IEEE Transactions on Geoscience and Remote Sensing, Planetary Science,* and *Eos* [~2 reviews per year]

Meeting Organization:

- Member, SOC, American Geophysical Union Annual Meeting (2024)
    - Organized sessions and abstracts for the Planetary Science section.
- Co-organizer, Impact Processes as a Path to Habitability of Planetary Bodies (06/2023)
    - Helped to organize a small workshop in Campinas, Brazil (~30 attendees).
- Chair, LOC, DPS Meeting 2022 (10/2022)
    - Serving as Chair of the Local Organizing Committee (LOC) for the annual meeting of the AAS Division for Planetary Sciences (~600 attendees).
    - In charge of assembling the LOC and coordinating their efforts with the AAS and DPS Committee.

- Member, LOC, GAC-MAC Meeting 2021 (11/2021)
    - Serving as Chair of the Finance committee for the annual meeting of the Geological and Mineralogical Association of Canada (~500 attendees).
- Lead organizer, Summer Skills Series, TEPS CREATE program (05/2018)
    - Organized yearly meeting of CREATE node for roughly 45 people
    - Designed schedule for workshop, invited speakers to workshop, and helped administrative assistant coordinate the logistics.
- Lead organizer, Summer Skills Series, TEPS CREATE program (06/2017)
    - Organized yearly meeting of CREATE node for roughly 45 people
    - Designed schedule for workshop, invited speakers to workshop, and helped administrative assistant coordinate the logistics.
- Member, SOC, 5th Annual NASA Exploration Science Forum (06/2018)
    - Sent chair suggestions for invited speakers and reviewed the abstracts for the meeting.
- Member, SOC, Cryovolcanism in the Solar System (06/2018)
    - Sent chair suggestions for invited speakers and reviewed the abstracts for the meeting. Helped to assemble the meeting schedule.
- Member, SOC, Titan Through Time IV (04/2017)
    - Sent chair suggestions for invited speakers and reviewed the abstracts for the meeting.
- Member, SOC, 2nd Annual NASA Exploration Science Forum (07/2015)
    - Sent chair suggestions for invited speakers and reviewed the abstracts for the meeting.

Media Relations:

"Gender Parity in Research: Progress and Persistent Challenges," Guest on The World We Want podcast series, broadcast on October 16, 2024. https://sdgresources.relx.com/podcasts/gender-parity-research-progress-and-persistent-challenges

"Scientists Are Very Worried About NASA's Mars Plan," article for The Atlantic, https://www.theatlantic.com/science/archive/2024/05/mars-sample-return-nasa/678441/, May 21, 2024.

Guest on Cosmic Coffee Time with Andrew Prestage, broadcast on May 1, 2024. https://cosmiccoffeetime.buzzsprout.com/322577

"Low Oxygen May Smother Life's Prospects on Europa, Jupiter's Ocean Moon," article for Scientific American, https://www.scientificamerican.com/article/europa-jupiters-ocean-moon-may-lack-oxygen-for-life/, March 4, 2024.

Radio interview for NPR's All Things Considered, "The space missions that aim to explore distant moons", broadcast on February 29, 2024. https://www.npr.org/2024/02/29/1234998832/the-space-missions-that-aim-to-explore-distant-moons

"Finding life on Saturn's moon Titan may be more difficult than previously thought," article for CBC, https://www.cbc.ca/news/science/saturn-titan-life-oceans-1.7123936, February 24, 2024.

"Saturn's ocean moon Titan may not be able to support life after all", article for Space.com, https://www.space.com/titan-ocean-saturn-moon-inhospitable-life-earth-study, February 15, 2024.

"Cold Water Thrown on Hope of Life in Ocean of Saturn's Icy Moon Titan", article for Newsweek, https://www.newsweek.com/saturn-moon-titan-no-life-ocean-1870217, February 15, 2024.

“Saturn’s largest moon most likely non-habitable”, article for Western News, https://news.westernu.ca/2024/02/titan-non-habitable/, February 14, 2024.

“Mars rover and drone prototypes brave strong Iceland winds in analog test”, article for Space.com, https://www.space.com/mars-rover-drone-prototype-iceland-test, September 13, 2022.

“International collaboration advances drones as next big step in planetary exploration,” article for Western News, https://news.westernu.ca/2022/09/drone-planetary-exploration/, September 1, 2022.

“This little Mars helicopter has opened a new frontier in space exploration”, article for Grid News, https://www.grid.news/story/science/2022/07/04/this-little-mars-helicopter-has-opened-a-new-frontier-in-space-exploration/, July 4, 2022.

“An Artist Sketches the Giant Gender Gap on the Moon”, article for The New York Times, https://www.nytimes.com/2021/04/27/science/moon-craters-women.html, April 27, 2021.

“The Arecibo Observatory in Puerto Rico Collapses,” article for The New York Times, https://www.nytimes.com/2020/12/01/science/space/arecibo-telescope-puerto-rico.html, December 1, 2020.
“China has launched its most advanced mission to the moon yet,” article for New Scientist magazine, https://www.newscientist.com/article/2260575-china-has-launched-its-most-advanced-mission-to-the-moon-yet/, November 23, 2020.

Radio interview for CBC’s Fresh Air, “Water on the Moon”, broadcast on November 1, 2020.

Radio interview for The Tom McConnell Show on News/Talk 610 CKTB, “Impact Craters on Titan”, broadcast on October 30, 2020.

“Recipe is different, but Saturn’s moon Titan has ingredients for life”, article for Western News, https://news.westernu.ca/2020/10/recipe-is-different-but-saturns-moon-titan-has-ingredients-for-life/, October 29, 2020.

Radio interview for The Tom McConnell Show on News/Talk 610 CKTB, “Life on Venus”, http://fw.to/k8L1DkH, broadcast on September 14, 2020.

“NASA chooses flying drone to explore surface of Titan, Saturn’s largest moon”, article for Global News, https://globalnews.ca/news/5442091/nasa-dragonfly-mission-titan/, June 28, 2019.

“Where to look for life on Titan,” article for Air and Space Magazine, https://www.airspacemag.com/daily-planet/where-look-life-titan-180969409/, June 19, 2018.

“Lava flow look-a-likes”, article for Planetary Science Research Discoveries CosmoSparks, http://www.psrd.hawaii.edu/CosmoSparks/Jan17/lunar-impact-melt-flows.html, January 2017.

Radio interview for CBC’s Quirks and Quarks, “Titan’s Craters Swallowed by Swamps”, broadcast on January 18, 2014.

“Swampy Terrain May Explain Titan's Smooth Complexion”, article for Science magazine, http://www.sciencemag.org/news/2013/11/swampy-terrain-may-explain-titans-smooth-complexion, November 27, 2013.

“Soggy bogs swallow craters on Titan”, article for New Scientist magazine, https://www.newscientist.com/article/dn24430-astrophile-soggy-bogs-swallow-craters-on-titan/, October 18, 2013.

“Saturn’s largest moon undergoes crater makeover”, article for CBC News, http://www.cbc.ca/news/technology/saturn-s-largest-moon-undergoes-crater-makeover-1.1335244, January 18, 2013.

“Titan gets a dune ‘makeover’”, NASA press release, http://www.nasa.gov/mission_pages/cassini/whycassini/titan-makeover.html, January 17, 2013.

“Life’s ingredients could form on Titan’s surface”, article for Space.com, http://www.space.com/10488-life-ingredients-form-titan-surface.html, December 14, 2010.

Interview for Women in Planetary Science blog, “Exercise your communication skills”, https://womeninplanetaryscience.wordpress.com/2010/10/15/catherine-neish/, October 15, 2010.

Guest on The Titanium Physicists Podcasts, Episodes 5, 28, 40, and 63, http://titaniumphysicists.brachiolopemedia.com.

Interview for Discovery Channel special, “Are we alone?”, aired on July 16, 2009. I was interviewed to discuss my knowledge of the formation of prebiotic molecules on Saturn’s moon Titan.