

Dr. Emily Deibert

Gemini Science Fellow

Gemini Observatory/NSF's NOIRLab
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Academic Positions

Postdoctoral Science Fellow

2022 – Present

Gemini Observatory/NSF's NOIRLab

Education

University of Toronto

2017 — 2022

PhD in Astronomy & Astrophysics

Advisors: Prof. Suresh Sivanandam, Prof. Ray Jayawardhana

University of Toronto, Victoria College

2012 — 2017

HBSc. in Astrophysics, English, and Mathematics (*High Distinction*)

Advisor: Prof. Chris Matzner

Refereed Publications

First Author

1. **Deibert**, de Mooij, Jayawardhana, et al., “ExoGemS High-Resolution Transmission Spectroscopy of WASP-76b with GRACES”, 2023, submitted to AJ.
2. **Deibert**, de Mooij, Jayawardhana, et al., “Detection of Ionized Calcium in the Atmosphere of the Ultra-Hot Jupiter WASP-76b”, 2021, [ApJL](#), **919**, L15.
3. **Deibert**, de Mooij, Jayawardhana, et al., “A Near-Infrared Chemical Inventory of the Atmosphere of 55 Cancri e”, 2021, [AJ](#), **161**, 209.
4. **Deibert**, de Mooij, Jayawardhana, et al., “High-resolution Transit Spectroscopy of Warm Saturns”, 2019, [AJ](#), **157**, 58.

Contributing Author

4. Flagg, Turner, **Deibert**, et al. “ExoGems Detection of a Metal Hydride in an Exoplanet Atmosphere at High Spectral Resolution”, 2023, [accepted by ApJL](#).
5. Allart et al. incl. **Deibert**, “Homogeneous search for helium in the atmosphere of 11 gas giant exoplanets with SPIRou”, 2023, [accepted by A&A](#).
6. Bolin et al. incl. **Deibert**, “Keck, Gemini, and Palomar 200-inch visible photometry of red and very-red Neptunian Trojans”, 2023, [MNRAS Letters](#), **521**, 29.
7. Ridden-Harper et al. incl. **Deibert**, “High-Resolution Transmission Spectroscopy of the Terrestrial Exoplanet GJ 486b”, 2023, [AJ](#), **165**, 170.
8. Sivanandam et al. incl. **Deibert**, “Astrophotonic Solutions for Spectral Cross-Correlation Techniques”, 2022, [SPIE Proceedings](#).
9. Boucher et al. incl. **Deibert**, “Characterizing Exoplanetary Atmospheres at High Resolution with SPIRou: Detection of Water on HD 189733 b”, 2021, [AJ](#), **162**, 223.

10. Jindal, de Mooij, Jayawardhana, **Deibert**, et al., “Characterization of the Atmosphere of Super-Earth 55 Cancri e Using High-resolution Ground-based Spectroscopy”, 2020, [AJ](#), **160**, 101.
11. Petrovich, **Deibert**, & Wu, “Ultra-Short-Period Planets from Secular Chaos”, 2019, [AJ](#), **157**, 180.
12. Huang, Petrovich, & **Deibert**, “Dynamically Hot Super-Earths from Outer Giant Planet Scattering”, 2017, [AJ](#), **153**, 5.
13. Percy & **Deibert**, ”Studies of the Long Secondary Periods in Pulsating Red Giants”, 2016, [JAAVSO](#), **44**, 2.

Fellowships & Awards

NSERC Postdoctoral Fellowship NSERC <i>\$ 90,000</i>	2022 — 2024
Vanier Canada Graduate Scholarship NSERC/University of Toronto <i>\$ 150,000</i>	2019 — 2022
Fieldus Award Department of Astronomy & Astrophysics, University of Toronto <i>\$ 1000</i>	2021 – 2022
Dean’s Doctoral Award of Excellence Faculty of Arts & Sciences, University of Toronto <i>\$ 10,000</i>	2020
Alumni Association Scholar (Graduate) University of Toronto <i>\$ 1000</i>	2020
Astronomy & Astrophysics Graduate Program Award University of Toronto <i>\$ 1000</i>	2020
NSERC Canada Graduate Scholarship - Doctoral NSERC/University of Toronto <i>\$ 105,000</i>	2019 — 2022 (Declined)
Faculty of Arts & Sciences Program-Level Fellowship University of Toronto <i>\$ 2300</i>	2018 — 2020
NSERC Canada Graduate Scholarship - Master’s NSERC/University of Toronto <i>\$ 17,500</i>	2018 — 2019
U of T Fellowship, Faculty of Arts & Sciences University of Toronto <i>\$ 12,375</i>	2017 — 2018
Ontario Graduate Scholarship OGS/University of Toronto <i>\$ 15,000</i>	2017 — 2018

Faculty of Arts & Sciences Graduate Admissions Fellowship University of Toronto \$ 5000	2017 — 2018
Alumni Association Scholar (Undergraduate) University of Toronto \$ 1000	2017
Highly Commended (Literature) The Undergraduate Awards	2017
Summer Undergraduate Research Fellowship University of Toronto \$ 10,000	2016
Gerald Allen Hollingshead Memorial Scholarship University of Toronto \$ 20,000	2012 — 2016
Summer Undergraduate Research Fellowship Canadian Institute for Theoretical Astrophysics \$ 8000	2015
The Arthur Irwin Prize Victoria College \$ 1000	2014
Dr John Knowles Colling Memorial Scholarship Victoria College \$ 585	2013
Faculty of Arts & Sciences Entrance Scholarship University of Toronto \$ 2000	2013
University of Toronto Scholars Award University of Toronto \$ 5000	2012

Conference Presentations & Seminars

1. “*Results from the Exoplanets with Gemini Spectroscopy (ExoGems) Survey*”, Contributed Talk, **SOCHIAS Annual Meeting**, Universidad de la Frontera, Temuco, Chile (March 2023).
2. “*Updates on the Gemini High-resolution Optical SpecTrograph (GHOST)*”, Contributed Talk, **SOCHIAS Annual Meeting**, Universidad de la Frontera, Temuco, Chile (March 2023).
3. “*Astrophotonics Solutions for Spectral Cross-Correlation Techniques*”, Contributing Author on Talk by Suresh Sivanandam, **SPIE 12184**, Montreal, Canada (July 2022).
4. “*Results from the ExoGemS Survey*”, Contributing Author on Talk by Laura Flagg, **Exoplanets 4**, Las Vegas/AAS (June 2022). *Proceedings*: Bulletin of the AAS, [54, 5, #102.412](#).
5. “*The Extreme Atmosphere of an Exotic World: Detection of Ionized Calcium in WASP-76b*”, Dissertation Talk, **53rd Annual Meeting of the AAS Division for Planetary Sciences (DPS)**, Virtual/AAS (October 2021). *Proceedings*: Bulletin of the AAS, [53, 7, #302.04D](#).

6. “*A Near Infrared Chemical Inventory of the Atmosphere of 55 Cancri e*”, Contributed Talk, **Emerging Researchers in Exoplanetary Sciences (ERES) 2021**, Virtual/Princeton University, USA (May 2021).
7. “*A Near Infrared Chemical Inventory of the Atmosphere of 55 Cancri e*”, Invited Seminar, **APEX ExoCoffee**, Max Planck Institute for Astronomy, Heidelberg, Germany (March 2021).
8. “*Remote Sensing of Extreme Worlds: High-Resolution Spectroscopy of Exoplanet Atmospheres*”, Contributing Author on Talk by Ray Jayawardhana, **Extreme Solar Systems IV**, Reykjavik, Iceland (August 2019). *Proceedings*: AAS Extreme Solar Systems, [51](#), [201.01](#).
9. “*High-Resolution Spectroscopy of Exoplanet Atmospheres*”, Contributed Talk, **ERES V**, Cornell University, USA (June 2019).
10. “*High-Resolution Ground-Based Transmission Spectroscopy of Warm Saturns*”, Contributed Talk, **ERES IV**, Penn State University, USA (June 2018).
11. “*High-Resolution Ground-Based Transmission Spectroscopy of Warm Saturns*”, Contributed Talk, **Technologies for ExoPlanetary Sciences (TEPS) 2018**, University of British Columbia, Canada (May 2018).
12. “*High-Resolution Ground-Based Transmission Spectroscopy of Warm Saturns*”, Contributed Talk, **The Canadian Astronomical Society (CASCAS) 2018 Meeting**, University of Victoria, Canada (May 2018).
13. “*Detached Ultra-Short Period Planets from Secular Chaos*”, Contributed Talk, **Diversis Mundi: The Solar System in an Exoplanetary Context**, ESO Santiago, Chile (March 2018). *Proceedings*: [10.5281/zenodo.1317487](#).
14. “*Detached Ultra-Short Period Planets from Secular Chaos*”, Invited Seminar, **Stars & Planets Seminar Series**, Canadian Institute for Theoretical Astrophysics, Toronto, Canada (March 2018).
15. “*Ultra-Short Period Planets*”, Invited Seminar, **Centre for Planetary Sciences Seminar Series**, University of Toronto Scarborough, Canada (March 2018).
16. “*Long Secondary Periods of Pulsating Red Giant Stars*”, Contributed Talk, **Canadian Conference for Undergraduate Women in Physics**, Dalhousie University, Canada (January 2016).

Conference Posters

1. “*A Near-Infrared Chemical Inventory of the Atmosphere of 55 Cancri e*”, Contributed Poster, **CASCA 2021 Meeting**, Virtual/University of British Columbia, Canada (June 2021).
2. “*A Near-Infrared Chemical Inventory of the Atmosphere of 55 Cancri e*”, Contributed Poster, **Exoplanets III**, Virtual/Heidelberg, Germany (July 2020).
3. “*A Near-Infrared Chemical Inventory of the Atmosphere of 55 Cancri e*”, Contributed Poster, **CASCA 2020 Meeting**, Virtual/York University, Canada (June 2020).
4. “*Near-Infrared Transit Spectroscopy of 55 Cancri e*” Contributed Poster, **Extreme Solar Systems IV**, Reykjavik, Iceland (August 2019). *Proceedings*: AAS Extreme Solar Systems, [51](#), [327.03](#).

5. “*One Hit Wonders: Recovering the Longest Period TESS Planets*”, Contributing Author on Poster by Carl Ziegler, **Extreme Solar Systems IV**, Reykjavik, Iceland (August 2019). *Proceedings: AAS Extreme Solar Systems*, 51, 302.01.
6. “*Investigating the Presence of HCN in the Atmosphere of 55 Cancri e*”, Contributed Poster, **ExoClimes V**, University of Oxford, UK (August 2019).
7. “*Characterizing the Atmosphere of HAT-P-12b with Transmission Spectroscopy*”, Contributed Poster, **Women in Planetary Science and Exploration**, University of Toronto, Canada (March 2018).
8. “*Dynamically Hot Super-Earths from Outer Giant Planet Scattering*”, Contributed Poster, **Canadian Conference for Undergraduate Women in Physics**, McMaster University, Canada (January 2017).
9. “*Investigating Long Secondary Periods of Pulsating Red Giant Stars*”, Contributed Poster, **Department of Physics Undergraduate Research Fair**, University of Toronto, Canada (April 2016).

Observing Proposals

Principal Investigator	
<i>Chemical Gradients & Heat Transport in an Ultra-Hot Jupiter Atmosphere</i>	2022B
MAROOON-X/Gemini North	
4 Hours (<i>Fast Turnaround</i>)	
<i>Molecular Signatures in the Dayside Emission of an Ultra-Hot World</i>	2022B
SPIRou/CFHT	
20 Hours	
<i>Detecting the Magnetic Field of a Hot Jupiter via Spectropolarimetry</i>	2022B
SPIRou/CFHT	
12 Hours (<i>Followup to 2020A/2021B Proposals</i>)	
<i>First Detailed Characterization of an Exceptional New Earth-Sized World</i>	2021B
SPIRou/CFHT	
2.5 Hours (<i>Ranked #1 of 39 by CanTAC</i>)	
<i>Detecting the Magnetic Field of a Hot Jupiter via Spectropolarimetry</i>	2021B
SPIRou/CFHT	
12 Hours (<i>Followup to 2020A Proposal</i>)	
<i>Detecting the Magnetic Field of a Hot Jupiter via Spectropolarimetry</i>	2020A
SPIRou/CFHT	
20 Hours (<i>Ranked #1 of 40 by CanTAC</i>)	
<i>Constraining the Ephemerides of a New Young Planetary System</i>	Cycle 1 (2019)
NEOSSat	
<i>Constraining the Carbon Abundance of a Super-Earth Atmosphere</i>	2019A
SPIRou/CFHT	
10 Hours	

Co-Investigator	
<i>Exploring the Diversity of Exoplanet Atmospheres at High Resolution</i>	2020 — 2023
GRACES/Gemini North	
224 Hours	
<i>First Detailed Characterization of an Exceptional New Earth-Sized World</i>	2021A
IGRINS/Gemini South	
2.5 Hours (<i>Director's Discretionary Time</i>)	
<i>Observing CO & CO₂ in Solar System Planets at High Spectral Resolution</i>	2020A
GIANO/TNG	
0.5 Nights	
<i>Characterizing the Atmosphere of the Extremely Hot Jupiter Kepler-13Ab</i>	2019A
GRACES/Gemini North	
10 Hours	
<i>The Chemical Inventory of Exoplanet tau Bootis b</i>	2019A
SPIRou/CFHT	
10 Hours (<i>Ranked #1 of 28 by CanTAC</i>)	
<i>Understanding How Tight Binaries Affect TESS Planets</i>	2019A
SOAR	
4 Nights	

Workshop Attendance

ESO Atmospheres Workshop	Summer 2021
ESO Garching/Virtual	
Early Release Science Pre-Launch Data Hackathon	Summer 2021
JWST/Virtual	
Helping Astronomers: A Workshop on Teaching Climate Change	Fall 2019
CASCA/Virtual	
ComSciConCAN: Science Communication Workshop	Summer 2019
McMaster University, Canada	
Multi-Dimensional Characterization of Distant Worlds	Fall 2018
University of Michigan, Ann Arbor	

Additional Research Experience

Graduate Research Experience	
Graduate Research Course	Summer 2018
University of Toronto	
Advisor: Diana Valencia	
<i>Modelling tidal dissipation in super-Earth interiors.</i>	
Graduate Research Course	2017 — 2018
University of Toronto	
Advisor: Ray Jayawardhana	
<i>High-resolution optical spectroscopy of warm Saturn atmospheres.</i>	

Undergraduate Research Experience

Undergraduate Research Assistant	Summer 2017
Canadian Institute for Theoretical Astrophysics	
Advisor: Cristobal Petrovich	
<i>Simulating the origins and dynamics of ultra-short period planets.</i>	
Undergraduate Research Thesis	2016 — 2017
University of Toronto	
Advisor: Chris Matzner	
<i>Observing starforming regions in the Dragonfish Nebula.</i>	
Undergraduate Research Assistant	Summer 2016
Dunlap Institute for Astronomy & Astrophysics	
Advisors: Chelsea Huang & Cristobal Petrovich	
<i>Simulating the dynamics of Kepler super-Earths with outer giant planets.</i>	
Undergraduate Research Assistant	2015 — 2016
University of Toronto	
Advisor: John Percy	
<i>Studying the long secondary periods of pulsating red giant stars.</i>	
Undergraduate Research Assistant	Summer 2015
University of Toronto	
Advisors: Marten van Kerkwijk & Ue-Li Pen	
<i>Observing and studying giant pulses and scintillation from the Crab pulsar.</i>	

Teaching Experience

Teaching Assistant	Fall 2021
AST101: The Sun and its Neighbours (U of T)	
Teaching Assistant	Fall 2020
AST301: Observational Astronomy (U of T)	
Course Development Support	Summer 2020
AST301: Observational Astronomy (U of T)	
<i>Hired to redesign course content for online format during COVID-19</i>	
Summer Teaching Assistant	Summer 2020
AST101: The Sun and its Neighbours (U of T)	
Senior Teaching Assistant	Winter 2020
AST201: Stars and Galaxies (U of T)	
Senior Teaching Assistant	Fall 2019
AST101: The Sun and its Neighbours (U of T)	
Summer Teaching Assistant	Summer 2019
AST201: Stars and Galaxies (U of T)	
Head Teaching Assistant	Winter 2019
AST201: Stars and Galaxies (U of T)	
<i>Head TA for a team of 30+ TAs</i>	
Head Teaching Assistant	Fall 2018
AST101: The Sun and its Neighbours (U of T)	
<i>Head TA for a team of 30+ TAs</i>	

Summer Teaching Assistant AST251: Life on Other Worlds (U of T)	Summer 2018
Teaching Assistant AST251: Life on Other Worlds (U of T) <i>Helped redesign course content</i>	Winter 2018
Teaching Assistant ASTC25: Astrophysics of Planetary Systems (U of T Scarborough)	Winter 2018
Senior Teaching Assistant AST201: Stars and Galaxies (U of T)	Winter 2018
Teaching Assistant AST101: The Sun and its Neighbours (U of T)	Fall 2017
Undergraduate Teaching Assistant AST201: Stars and Galaxies (U of T)	Winter 2017
Undergraduate Teaching Assistant AST201: Stars and Galaxies (U of T)	Winter 2016

Relevant Work Experience

Science Communications Associate Research2Reality	2018 — Present
Public Outreach Support Dunlap Institute for Astronomy & Astrophysics	2021 — 2022
Astronomy Library Assistant University of Toronto	2017

Outreach

Public Lectures, Panels, Workshops, & Presentations

Workshop on Science Writing Canadian Association of Physicists	June 2022
Planet Gazing Party Host Dunlap Institute for Astronomy & Astrophysics	September 2021
Panel Discussion on Creating a CV U of T Summer Undergraduate Research Program	Summer 2021
Public Talk: The Extraordinary Worlds of Exoplanets Richmond Hill Public Library	February 2021
Planet Gazing Party Panelist Dunlap Institute for Astronomy & Astrophysics	September 2020
Public Talk: Astronomy Night David Dunlap Observatory/RASC Toronto Centre	July 2020
Astro at Home Talk: Extraordinary Exoplanets Discover the Universe	April 2020
Panel Discussion on Astronomy Toronto Astronomy & Space Exploration Society	November 2019
Astronomy on Tap: An Astronomer's Guide to Finding Exoplanets Astronomy on Tap Toronto	June 2019

Lecturer for Discover the Universe Teacher's Workshop Discover the Universe	April 2019
Panel Discussion on Graduate School Astronomy Undergraduates Union	January 2019
NSERC Scholarship Application Workshop University of Toronto (Created, organized & led workshop)	November 2018
Science Writing Workshop University of Toronto (Created, organized & led workshop)	September 2018
Public Talk: A New Window on Exoplanet Atmospheres Graduate Speaker Series, University of Toronto	April 2018
Public Talk for the Canadian Space Society January Meeting Canadian Space Society	January 2018

Mentorship

Graduate-Undergraduate Mentor Mentor to undergraduate student.	2020 — 2021
Girls SySTEM Women in STEM Mentor Mentor to high school student.	2019 — 2020
Graduate Peer Mentor Mentor to incoming graduate students.	2018 — 2020

Other Outreach Work

ComSciConGTA Conference Organizing Committee Communicating Science Conference (ComSciCon) Series	2019 — 2020
SpaceTime Event Volunteer Dunlap Institute for Astronomy & Astrophysics	2019 — Present
“Ask an Astronomer” Email Account Manager University of Toronto	2018 — 2020
“Science Around Town” Weekly Columnist <i>The Varsity</i> Newspaper, University of Toronto	2018 — 2019
Staff Science Writer <i>The Varsity</i> Newspaper, University of Toronto	2017 — 2020
Solar Eclipse Event Volunteer Canadian National Exhibition	2017
Telescope Coordinator & Event Volunteer Toronto Chinatown Festival	2017
Astronomy on Tap Volunteer Astronomy on Tap Toronto	2015 — Present
AstroTours Volunteer University of Toronto	2015 — Present

Service Work

Referee CFHT Time Allocation Committee	2022 — Present
President Graduate Astronomy Students Association, University of Toronto	2019 — 2020

Director Search Committee Member Dunlap Institute for Astronomy & Astrophysics	2020
<i>Elemental</i> Mental Health Magazine Executive Editor Grad Minds, University of Toronto	2019 — 2020
Department Chair Search Committee Member Department of Astronomy & Astrophysics, University of Toronto	2019 — 2020
Science Discussion Group Facilitator Department of Astronomy & Astrophysics, University of Toronto	2018 — 2019
CASCA Student Representative Canadian Astronomical Society	2018 — 2019
Mental Health Committee Member Department of Astronomy & Astrophysics, University of Toronto	2017 — 2019
Astronomy Undergraduates Liaison Graduate Astronomy Students Association	2017 — 2019
Astronomy Undergraduates Union (AU) Co-Founder University of Toronto	2017

Professional Development

Graduate Professional Skills Development Certification School of Graduate Studies, University of Toronto	2017 — Present
Advanced Undergraduate Teaching Certification Teaching Assistant Training Program, University of Toronto	2018 — 2020
SafeTALK Suicide Awareness & Intervention Training University of Toronto/Living Works	2019
Teaching Fundamentals Certification Teaching Assistant Training Program, University of Toronto	2017 — 2018

Select Media Appearances

1. *“Researchers investigate an ‘ultra-hot Jupiter’ with iron rain and calcium wind”*, Quirks & Quarks, CBC Radio, October 2021.
2. *“Bizarre, scorching exoplanet WASP-76 b may be even hotter than we thought”*, SPACE.com, October 2021.
3. *“Inferno-like WASP-76b exoplanet where iron gets vaporized and falls from the sky like rain is even HOTTER than first thought, study finds”*, The Daily Mail, October 2021.
4. *“This exoplanet rains iron. And scientists say temperatures can hit a scorching 4,000 degrees”*, USA Today, October 2021.
5. *“Planet with iron rainfall is even more extreme than scientists thought”*, CNN, October 2021.
6. *“Quirks & Quarks Listeners’ Questions Episode”*, Quirks & Quarks, CBC Radio, June 2021.
7. *“Astronomy PhD student Emily Deibert awarded A&S Doctoral Excellence Scholarship”*, U of T News, November 2020.
8. *“Wander the Night Sky”*, CIBC Private Wealth Newsletter, August 2020.

9. *"A Faraway Solar System Looks Eerily Similar to Our Own"*, The Atlantic, July 2020.
10. *"Catching Up With 'Award of Excellence' Winner Emily Deibert"*, Dunlap Institute for Astronomy & Astrophysics, April 2020.
11. *"Astronomy PhD Student Named a 2019 Vanier Scholar for Research on Exoplanets"*, The Varsity, University of Toronto, October 2019.
12. *"Meteor Sighting Lights up Night Sky"*, The Manitoulin Expositor, December 2018.
13. *"Solar Telescopes and Solar Eclipse Viewing"*, CTV News Broadcast Interview, August 2017.
14. *"Solar Eclipse Glasses and Safety"*, CTV News Broadcast Interview, August 2017.
15. *"Starfinders: The Campaign for U of T Astronomy"*, Dunlap Institute for Astronomy & Astrophysics, February 2017.

Press Releases

1. *"Spectrum reveals extreme exoplanet is even more exotic"*, Dunlap Institute for Astronomy & Astrophysics, University of Toronto, October 2021.
2. *"Spectrum reveals extreme exoplanet is even more exotic"*, Cornell Chronicle, Cornell University, October 2021.
3. *"Scientists reveal extreme exoplanet is even more exotic than they thought"*, Queen's University Belfast, October 2021.

Select Science Writing

100+ science news articles written for a range of media outlets. Full portfolio available [online](#).

1. *"Einstein Was Right, and Now We Have the Proof"*, Research2Reality, July 2021.
2. *"How Much Stuff is There in the Universe?"*, New Scientist, August 2020.
3. *"Was the Milky Way a Quasar?"*, PBS Space Time, April 2020.
4. *"Astronomers Now Have Some Idea of How the First Stars Died"*, Massive Science, June 2019.