



SARAH THIELE

Princeton, NJ, USA

sarahthiele.me ◇ sarah.thiele@princeton.edu ◇ [ORCID](#) ◇ [Github](#)

EDUCATION

Princeton University

PhD in Astrophysical Sciences. Advisor: Gáspár Bakos *Expected 2027*

Doctoral Certificate in Science, Technology and Environmental Policy *Expected 2027*

M.A. in Astrophysical Sciences *2024*

University of British Columbia, Vancouver

BSc. Combined Honours Physics and Astronomy + Science Co-op *2022*

RESEARCH INTERESTS

Astronomy/astrophysics: satellite constellation impacts, software and pipeline development, survey science, time-domain and wide-field imaging, near-Earth asteroids, planetary defense, orbit determination and propagation, orbital dynamics simulations. **Space sustainability:** space debris mitigation, orbital conjunction and collision risks, dark and quiet sky protection, space security.

PUBLICATIONS

Refereed, First Author:

Thiele, S., Heiland, S.R., Boley, A.C., Lawler, S.M. (2026). An Orbital House of Cards: Frequent Satellite Close Conjunctions. *Acta Astronautica*, 248, 1289-1297.

Thiele, S., Teyssier, R. (2025). Comparing subgrid models for cosmic ray diffusion in a magnetized isolated galaxy simulation. *MNRAS*, 543(4), 4067-4091.

Thiele, S., Breivik, K., Sanderson, R.E., and Luger, R. (2023). Applying the metallicity-dependent binary fraction to double white dwarf formation: Implications for LISA. *ApJ*, 945(2), 162.

Thiele, S. and Boley, A.C. (2022). Investigating the risks of debris-generating ASAT Tests. *Journal of the Astronautical Sciences*, 69 (AMOS 2021 Special Issue), 1797–1820. (Invited submission in recognition of “outstanding contributions to the field of SDA/SSA research”).

Refereed, Co-authored:

Hartman, J. et al. (incl. **Thiele, S.**) (2026). HATPI Preperihelion Time-series Photometry of the Interstellar Comet 3I/ATLAS. *AJ*, 171(5), 270.

Delfavero, V., Breivik, K., **Thiele, S.**, O’Shaughnessy, R., Baker, J.G. (2025). Recovering Injected Astrophysics from the LISA Galactic Binaries. *ApJ*, 981(1), 66.

Soni, S. et al. (incl. **Thiele, S.**) (2025). LIGO Detector Characterization in the first half of the fourth Observing run. *Classical and Quantum Gravity*, 42(8), 085016.

Ashton, G., **Thiele, S.**, Lecoecueche, Y., McIver, J., and Nuttall, L.K. (2022). Parameterised population models of transient non-Gaussian noise in the LIGO gravitational-wave detectors. *Classical and Quantum Gravity*, 39(17), 175004.

Richer, H.B. et al. (incl. **Thiele, S.**), (2021). Massive White Dwarfs in Young Star Clusters. *ApJ*, 912(2), 165.

Caiazzo, I. et al. (incl. **Thiele, S.**) (2020). Intermediate-Mass Stars Become Magnetic White Dwarfs. *ApJL*, 901(1), L14.

Preprints:

Jarov, S., **Thiele, S.**, et al. (2024). A new method to distinguish gravitational-wave signals from detector noise transients with Gravity Spy. *arXiv:2307.15867v2*.

Policy Reports:

Boley, A.C., Rotola, G., Yakushina, Y. et al. (incl. **Thiele, S.**) (2024). The National and International Landscape Concerning Dark and Quiet Skies. *IAU CPS*. Available at doi:10.5281/zenodo.14579453.

Yakushina, Y., et al. (incl. **Thiele, S.**) (2024). National Approaches to the Protection of Dark and Quiet Skies. *IAU CPS*. Available at doi:10.5281/zenodo.14566125.

RESEARCH EXPERIENCE

UBC LIGO Group *2021 – 2022*
Undergraduate Researcher, advised by Jess McIver (Honours Thesis)

Outer Space Institute *2020 – 2021*
Research Assistant and Junior Research Fellow, advised by Aaron Boley and Michael Byers

Institute for Research on Exoplanets (iREx) *Summer 2021*
Undergraduate Intern, advised by Andrew Cumming

UBC LIGO Group *Fall 2020*
Research Assistant, advised by Jess McIver

Canadian Institute for Theoretical Astrophysics (CITA) *Summer 2020*
U. Toronto Summer Undergraduate Research Program Researcher, advised by Katelyn Breivik

UBC Department of Physics and Astronomy *Summer 2019*
Research Assistant, advised by Harvey Richer

PRESENTATIONS (* = INVITED)

Seminars and Guest Speaking:

***DARPA ELSI Orbital Sustainability Webinar Series** *Spring 2024*
Guest speaker for two seminars

***US Air Force Academy’s Law, Technology, and Warfare Research Cell Space Law Webinar** *Oct 2023*
“Space governance and the ongoing problem of orbital debris”

***OSI Webinar: Canada and the UN Open-Ended Working Group on Reducing Space Threats** *2022*
Panelist

***“Banning Space Weapons?” Centre for Global Law and Governance Roundtable, University of St Andrews [virtual]** *Oct 2021*
Panelist

Talks and Posters:

58th Annual Meeting of the Division for Planetary Sciences Poster: “From satellite trails to near-Earth objects: distinguishing artificial and fast-moving Solar System objects in HATPI wide-field imaging”	<i>Oct 2026</i>
UNOOSA/SKAO Workshop on Dark and Quiet Skies for Science and Society 2025 “Satellite Trails in the HATPI Survey: mitigation and analysis”	<i>Dec 2025</i>
Princeton School on Science and Global Security “The damaging effects of kinetic anti-satellite tests and the need for a multilateral test ban treaty”	<i>Oct 2023</i>
Princeton Undergraduate Astronomy Club “Dancing stars wave hello: White dwarf binaries as gravitational wave sources”	<i>Dec 2022</i>
UBC Physics and Astronomy Senior Thesis Presentations “Investigating uniqueness of transient noise in gravitational wave data using the Temporal Outlier Factor”	<i>May 2022</i>
239th American Astronomical Society Meeting [canceled due to COVID-19] Poster: “Applying the metallicity-dependent binary fraction to double white dwarf formation: Implications for LISA”	<i>Jan 2022</i>
AMOS Surveillance Technologies Conference 2021 Poster: “Investigating the risks of debris-generating ASAT Tests in the presence of megaconstellations”	<i>Sep 2021</i>
Institute for Research on Exoplanets “2D modelling of atmospheric recycling in planetary envelopes”	<i>Aug 2021</i>
Center for Computational Astrophysics Gravitational Wave Astronomy Group “Impacts of the Metallicity-Dependent Binary Fraction on the Galactic DWD Population”	<i>Aug 2021</i>
LIGO Scientific Collaboration January 2021 DetChar F2F meeting “Results of Gravity Spy Safety Investigation”	<i>Jan 2021</i>
UBC-TRIUMF-SFU Cosmology Meeting “Characterization and Mitigation Of Transient Noise in LIGO Data”	<i>Dec 2020</i>
UBC LIGO Group · “Characterized and Mitigated Transient Noise in aLIGO Data” · “Characterization And Mitigation Of Advanced LIGO Transient Noise from O3” · “Investigation and Mitigation of Glitches in Gravitational Wave Data”	<i>Fall 2020</i>
LIGO DetChar Telecons · “Investigating Safety of Gravity Spy Classifications for Injected CBC Signals” · “Glitch Samples Used for Population Studies: Follow-up and Recommendations” · “Follow-up on Glitch Samples Used For Population Studies”	<i>Fall 2020</i>
University of Toronto Summer Undergraduate Research Program · “Metallicity Dependence of Double White Dwarf Gravitational Wave Signals” · “Metallicity-dependent gravitational wave signals from white dwarf binary star populations”	<i>Summer 2020</i>
UBC Department of Physics and Astronomy Final Presentations “Using Gaia DR2 to Search for High-Mass White Dwarfs in Open Star Clusters”	<i>Aug 2019</i>

HONOURS AND AWARDS

Centennial Fellowship in the Natural Sciences and Engineering – \$20,000 <i>Princeton University Graduate School</i>	<i>Sep 2022</i>
2021 Trottier Excellence Grant – \$3,000 <i>Institute for Research on Exoplanets and Université de Montréal</i>	<i>May 2021</i>
NSERC Undergraduate Student Research Award 2021 – \$6,000 <i>Natural Sciences and Engineering Research Council (held at McGill University)</i>	<i>May 2021</i>
NSERC Undergraduate Student Research Award 2020 – \$4,500 <i>Natural Sciences and Engineering Research Council (held at the Canadian Institute for Theoretical Astrophysics)</i>	<i>May 2020</i>
NSERC Undergraduate Student Research Award 2019 – \$4,500 <i>Natural Sciences and Engineering Research Council (held at UBC)</i>	<i>May 2019</i>
Alexander Rutherford Scholarship – \$2,500 <i>Alberta Education</i>	<i>Sep 2017</i>
Governor General’s Academic Medal <i>Alberta Education</i>	<i>June 2016</i>

POLICY AND PUBLIC ENGAGEMENT

CRASH Clock · Presented in Thiele et al. (2026). Maintained by OSI at https://outerspaceinstitute.ca/crashclock/ ; introduced to UN COPUOS. · Lawler, S.M., Boley, A.C., Thiele, S. , Heiland, S.R. (2026). A new CRASH Clock measures the chance of satellite collisions, and it’s ticking down fast. <i>The Conversation</i> .	<i>2026</i>
Dark sky advocacy Advocacy against the space-based mirror company Reflect Orbital: wrote public comment template for submission to the FCC, wrote personal public comment, and compiled supporting information with Gáspár Bakos and Anthony Keyes at https://starryprinceton.org/DeflectOrbital/ .	<i>2026</i>
IAU CPS Policy Hub, Work Package 2 Working Group Analyzed national and international policies on orbital and ground-based light pollution; contributed to two IAU CPS reports (listed under Publications).	<i>2023 – 2024</i>
OSI Space Security Workshop Led to the OSI <i>International Open Letter on Kinetic Anti-Satellite (ASAT) Testing</i> (Sep 2021). Contributed to calculations, discussions, and was an early signatory.	<i>2021</i>

TEACHING (* = INVITED)

*Guest Lectures, Princeton SPI 353 (Science and Global Security: From Nuclear Weapons to Cyberwarfare and Artificial Intelligence) · “Crowded skies: Space weapons, debris, and security” · “Crowded skies: Space weapons, debris, and security” · “Space weapons, orbital debris, and the new space race”	<i>Nov 2025</i> <i>Oct 2024</i> <i>Oct 2023</i>
Princeton AST 205 (Planets in the Universe) <i>Teaching Assistant</i>	<i>Fall 2023</i>
Solfeo Music Academy/Private <i>Piano teacher</i> Taught 20+ students, age three to adult; lesson planning, solo and group instruction, recitals.	<i>2013 – 2017</i>

SERVICE AND VOLUNTEERING

Princeton Department of Astrophysical Science Astro-Coffee 2024 – 2025
Host

Princeton Department of Astrophysical Science AstroJustice Seminar 2023 – 2024
Co-lead

Co-ran monthly discussions on social justice issues related to academia.

Princeton Public Observing Program 2022 – 2024
Volunteer

Co-ran observing nights and educational events: gave talks, planned targets, and operated the telescope.

UBC Compact Objects Journal Club 2020-2021
Member/Session Facilitator

Beneath One Sky, UBC 2017 - 2021
Volunteer/Member

Public advocacy and outreach, including the 2021 Poverty Action Conference; distributed food and clothing to unhoused individuals; volunteered at soup kitchens.

PROFESSIONAL MEMBERSHIPS

IAU Centre for the Protection of the Dark and Quiet Sky from Satellite Constellation Interference (IAU CPS) 2026 – Present
Member, Policy and Sat Hubs

Outer Space Institute 2020 – Present
Junior Research Fellow

Signatory to OSI open letters, invited speaker, and participant in OSI workshops and retreats.

American Astronomical Society 2022 – Present
Member

ADDITIONAL TRAINING AND EXPERIENCE

Doctoral Training: Plasmas in Extreme Environments: from Astrophysics to the Laboratory May 2023

11-day summer program, École de Physique des Houches, France

Science communication training Summer 2021

- Best of Banff Science Communication Program (Banff Centre/Telus Spark/NSERC/Genome)
- AstroComm 2021

UBC International Student Initiative 2019 – 2022
Student Ambassador - Campus Tours Program

Deliver virtual/in-person tours of UBC campus to prospective students; outreach and recruitment; professional development workshops.

UBC Residence Life 2018 – 2019
Residence Advisor

Supported first-year students through their transition to university; ran community programming, upheld residence standards, and connected students with campus resources.

SKILLS

Programming & Analysis

Python (NumPy, SciPy, pandas, Astropy, scikit-learn, PyTorch), SQL, Fortran, MATLAB

Computing

Linux, HPC/SLURM clusters, cloud GPU computing, Git, L^AT_EX

Languages

English (native), ASL (conversational)