

Curriculum Vitae | Philipp S Arndt

PhD Candidate, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, University of California San Diego, 9500 Gilman Drive, La Jolla CA 92093-0225
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Education

Scripps Institution of Oceanography: *Ph.D. Earth Sciences*, expected Spring 2024

“Exploitation of ICESat-2’s Unique Capabilities and Machine Learning for Improved Understanding of Mass Balance Processes Across all Antarctic Ice Shelves”

UC San Diego, La Jolla, CA, USA

Scripps Institution of Oceanography: *M.Sc. Earth Sciences*, Jan 2020

UC San Diego, La Jolla, CA, USA (cumulative GPA: 3.97)

Chalmers University of Technology: *M.Sc. Complex Adaptive Systems*, Jun 2018

“Detection of Multi-Level Hierarchies in Multi-View Cancer Networks”

Gothenburg, Sweden (cumulative GPA: 4.55)

Yale University: *B.A. Economics & Mathematics*, May 2016

New Haven, CT, USA (cumulative GPA: 3.66)

Stanford University: *Summer Studies*, 2011

Stanford, CA, USA (cumulative GPA: 3.89)

Selected Coursework

Graduate: International Summer School in Glaciology 2022 • Satellite Remote Sensing • Ice Sheet-Ocean Interactions • Seismology • Fluid Mechanics • Geophysical Fluid Dynamics • Atmospheric Thermodynamics • Dynamic Meteorology • Climate Dynamics & Climate Change • Physical Oceanography • Analysis of Physical Oceanographic Data • Marine Chemistry • Statistical Learning for Big Data • Artificial Neural Networks • Data Science for Engineers & Scientists • Simulation of Complex Systems • Stochastic Optimization Algorithms • Dynamical Systems • Computational Physics • Information Theory • Computational Biology • Systems Biology • Leadership for Sustainability Transitions • Environmental Risk Assessment • Science Writing

Undergraduate: Ice and the Climate System • Observational Methods in Physical Oceanography • Natural Disasters • Global Tectonics • Paleoclimatology • Earth Surface Processes • Organic Chemistry • Multivariate Calculus • Linear Algebra & Matrix Theory • Real Analysis • Vector Analysis and Differential Geometry • Combinatorics & Graph Theory • Algebraic Topology & Knot Theory • Probability Theory & Statistics • Econometrics • General Equilibrium Theory • Mathematical Game Theory • Micro- & Macroeconomics • World Finance • Conservation Biology • Global Environmental Governance

Skills

Computer: Python • Jupyter • Git • bash • Singularity/Docker • HTCondor • Spark • MATLAB • R • C • Java • STATA • Mathematica • Google Earth Engine • PostGIS • QGIS • \LaTeX

Languages: German • English • French • Portuguese

Research & Work Experience

Chalmers Environmental Unit | Sustainability Ambassador

Aug 2017 - Jun 2018, Gothenburg, Sweden

Publicity and science communication

Yale Graduate School of Arts and Sciences | Visiting Assistant in Research

Jun 2017 - Aug 2017, New Haven, CT, USA

Application of econometric methods to climate data & machine learning algorithms for spatio-temporal data interpolation

Fraunhofer Chalmers Centre | Student Researcher

Jan 2017 - Dec 2017, Gothenburg, Sweden

Systems and data analysis: machine learning, big data (project for a large truck manufacturer based on GPS tracking data)

Potsdam Institute for Climate Impact Research | COPAN Guest Researcher

May 2015 – Aug 2015, Potsdam, Germany

Socio-ecological systems research: The Great Acceleration & Anthropocene

Munich Re | Client Management and Underwriting Intern

May 2014 – Jul 2014, Munich, Germany

Risk modeling, XL treaty pricing, solvency analysis, business strategy

Yale Office of Public Affairs & Communications | Social Media Intern

Aug 2013 – May 2015, New Haven, CT, USA

Photography, outreach strategy & official representation of Yale University on social media

Field Experience

UC San Diego Alpine Club | Field Team Lead (Independent Research)

April 2023, San Bernardino National Forest, CA

Ski-Based ICESat-2 Ground-Validation Campaign for Snow Depth Measurements on San Geronio Mountain

University of Alaska Fairbanks / National Science Foundation | Field Assistant

May 2022 - Jun 2022, McCarthy, AK

Anticipating Rates of Deglaciation in Alaska: Controls on The Mass Loss and Morphology of The Debris Covered Terminus of Kennicott Glacier, Wrangell - St. Elias National Park (NSF Award ID 1917536)

National Science Foundation / United States Antarctic Program | Field Work (Grantee)

Oct 2019 - Dec 2019, McMurdo Station / Siple Dome, Antarctica

Subglacial Antarctic Lakes Scientific Access (SALSA) project, Geophysics (event number C-533)

Bavarian Academy of the Sciences, Geodesy & Glaciology | Glacier Field Work Course

Jul 2010, Vernagt Ferner Glacier, Ötztal Alps, Austria

Personal Recreation on Snow and Ice | Mountaineering, Ski Touring, Ice Climbing

Ongoing, includes training as a Wilderness First Responder (WFR) and Single Pitch Rock Climbing Instructor (SPI), crevasse rescue and avalanche education

Teaching and Mentorship

University of Washington eScience ICESat-2 Hackweek | Tutorial Developer, Tutorial Lead

Mar 2022 (virtual) & Aug 2023, Seattle, WA, USA

Data Discovery and Interactive Visualization with OpenAltimetry and Google Earth Engine

Scripps Institution of Oceanography | Undergraduate Mentoring

March 2023 – July 2023, La Jolla, USA

SIO 199 (Independent Research), supervised two student projects:

- Morphology and Timing of a Recent Calving Event on Filchner-Ronne Ice Shelf
- Characterizing Seasonal Fluctuations in Ice-Marginal Lake Levels in Northwestern Greenland

Scripps Institution of Oceanography | Teaching Assistant

Jan 2020 – Mar 2020, La Jolla, USA

SIO 115: Ice in the Climate System, taught by Helen A Fricker

Instituto Dois Irmãos | English Teacher

Jun 2013 – Aug 2013, Favela da Rocinha, Brazil

Trinity International School | Resident Teacher

May 2012 – Jul 2012, Tirunelveli, India

Awards & Fellowships

- 2020-24 *Future Investigators in NASA Earth and Space Science and Technology* research award
- 2023 *ECR Travel Grant* for WAIS Workshop (Cloquet, MN)
- 2020-23 *Wyer Family Endowed Fellowship* for PhD stipend supplement
- 2020-23 *Katzin Fellowship* for PhD program tuition supplement
- 2022 *ECR Travel Grant* for WAIS Workshop (Estes Park, CO)
- 2022 *WSL ECR Travel Grant* for The Cryosphere in a Changing Climate (Davos, Switzerland)
- 2021 *Scripps Departmental Travel Grant* for AGU Fall Meeting (New Orleans, LA)
- 2021 *ECR Travel Grant* for WAIS Workshop (Sterling, VA)
- 2019 *Scholar-Athlete Award*, National Association of Intercollegiate Gymnastics
- 2019 *Academic Excellence Award*, UC San Diego Club Sports
- 2018-19 *Scripps Fellowship* for outstanding incoming graduate students
- 2015 *Richter Fellowship* for climate research in Germany
- 2015 *Larry Coben Fellowship* for academic work in Brazil
- 2015 *E-fellows Scholarship*, awarded for academic merit

Publications

Warner, R. C., Fricker, H. A., Adusumilli, S., **Arndt, P.**, Kingslake, J., & Spergel, J. (2021). Rapid formation of an ice doline on Amery Ice Shelf, East Antarctica. *Geophysical Research Letters*, e2020GL091095.

Fricker, H. A., **Arndt, P.**, Brunt, K. M., Datta, R. T., Fair, Z., Jasinski, M. F., ... & Wouters, B. (2021). ICESat-2 Meltwater Depth Estimates: Application to Surface Melt on Amery Ice Shelf, East Antarctica. *Geophysical Research Letters*, 48(8), e2020GL090550.

Storelvmo, T., Heede, U. K., Leirvik, T., Phillips, P. C., **Arndt, P.**, & Wild, M. (2018). Lethargic response to aerosol emissions in current climate models. *Geophysical Research Letters*, 45(18), 9814-9823.

Presentations

Arndt, P. & Fricker, H. A. (2023). Supraglacial Lakes across Greenland and Antarctica - New Insights from Five Years of ICESat-2 Meltwater Depth Measurements. *ICESat-2 Science Team Meeting*, 2 and 3 October 2023, La Jolla, CA, USA. [Oral Lightning Talk and Poster Presentation].

Arndt, P. & Fricker, H. A. (2023). ICESat-2 Measurements of Supraglacial Lake Depths Across the Antarctic and Greenland Ice Sheets 2018-2023. *2023 West Antarctic Ice Sheet Initiative Workshop*, 28 September 2023, Cloquet, MN, USA. [Oral Presentation]. URL: https://youtu.be/d_7S17gLrgE?si=46ykUKY6h0_9idfv&t=1366

Arndt, P. (2023). Interactive Data Visualization with Open Altimetry & Contextualization of ICESat-2 Photon Data using Sentinel-2 Cloud Masking in Google Earth Engine. *University of Washington eScience ICESat-2 Hackweek*, 9 August 2022, Seattle, WA, USA [Hybrid Tutorial]. URL: <https://youtu.be/HKIQqiHAwsA>

Arndt, P., Roberts, C. & The UCSD Alpine Club (2023). We Skied Southern California To Show that Mountain Snowpack Can Be Measured from Space. *Scripps Fellowship Luncheon*, 20 June 2023, La Jolla, CA, USA. [Poster & Oral Presentation, Panel Discussion]

Arndt, P., Roberts, C. & The UCSD Alpine Club (2023). Skiing SoCal for Science – Preliminary Results from Ground-Validating ICESat-2 Satellite Laser Altimetry Data for Snow Depth Retrievals in the San Bernardino Mountains. *Scripps Polar Center Town Hall*, 1 June 2023, La Jolla, CA, USA. [Oral Presentation]

Arndt, P. & Fricker, H. A. (2022). Towards Automated Generation of Ice-Sheet-Wide Supraglacial Lake Depth Measurements from ICESat-2 Data, Using Distributed High Throughput Computing *American Geophysical Union Fall Meeting 2022*, 14 December 2022, Chicago, IL, USA. [Poster Presentation]

Arndt, P. & Fricker, H. A. (2022). Towards Automated Retrieval of Supraglacial Lake Depth Measurements from ICESat-2 Data Across Antarctica's Ice Shelves. *ICESat-2 Science Symposium and Science Team Meeting*, 27 October 2022, Austin, TX, USA. [Graduate Student Spotlight / Oral Presentation]

Arndt, P. & Fricker, H. A. (2022). Automated Detection of Supraglacial Lakes in ICESat-2 Data Over The West Antarctic Ice Sheet 2018-2022. *2022 West Antarctic Ice Sheet Initiative Workshop*, 29 September 2022, Estes Park, CO, USA. [Oral Presentation]. URL: <https://www.youtube.com/watch?v=u5-i6uNmD7o&t=5767s>

Arndt, P., Dundovic, D. & Bueler, E. (2022). Stokes modelling of glacier flow: The effects of surface mass perturbations. *International Summer School in Glaciology Public Presentations*, 23 June 2022, McCarthy, AK, USA. [Oral Presentation]

Arndt, P. (2022). Interactive Data Visualization with Open Altimetry & Google Earth Engine *University of Washington eScience ICESat-2 Hackweek*, 23 March 2022, virtual [Online Tutorial]. URL: <https://www.youtube.com/watch?v=fpcBFsy6Kso>.

Arndt, P. & Fricker, H. A. (2021). We found many examples of melt lakes draining through ice shelves around Antarctica. *American Geophysical Union Fall Meeting 2021*, 16 December 2021, New Orleans, LA, USA. [Poster Presentation].

Arndt, P., Fricker, H. A., Warner, R., Adusumilli, S., Kingslake, J. & Spergel, J. J. (2021). Through-ice-shelf drainage of surface meltwater lakes and its implications for ice shelf stability.

2021 West Antarctic Ice Sheet Initiative Workshop, 22 September 2021, Sterling, VA, USA [Oral Presentation]. URL: <https://www.youtube.com/watch?v=bPKHG8AaM5A&t=1889s>.

Arndt, P. (2021). How to survey supraglacial melt lakes in Antarctica, from your home office. *Scripps Polar Center Virtual Research Town Hall*, 4 February 2021 [Virtual Lightning Talk]. URL: <https://www.youtube.com/watch?v=0kLTPv5XIRM>.

Arndt, P., Fricker, H. A., Brunt, K. M., Datta, R. T., Fair, Z., Jasinski, M. F., Kingslake, J., Magruder, L. A., Moussavi, M., Pope, A., Spergel, J. J., Stoll, J. D., Wouters, B. & Warner, R. (2020). A new technique for measuring the depths of surface melt features on ice sheets from ICESat-2. *2020 West Antarctic Ice Sheet Initiative Workshop*, 24 September 2020. [Virtual Oral Presentation]. URL: <https://www.youtube.com/watch?v=Sd041clFsMA&t=2630>.