PAUL T. SUMMERS

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PUBLICATIONS

Summers, P.T.; Schroeder, D. M.; May, D. F.; Suckale, J. "Evidence for and against temperate ice in Antarctic shear margins from radar-depth sounding data," *Geophysical Research Letters*, 2024, https://doi.org/10.1029/2023GL106893

Summers, P.T.; Elseworth, C.W.; Dow, C.F.; Suckale, J. "Migration of the Shear Margins at Thwaites Glacier: Dependence on Basal Conditions and Testability Against Field Data," *Journal of Geophysical Research: Earth Surface*, 2023, https://doi.org/10.1029/2022JF006958

Siegfried, M.; Venturelli, R; Patterson, M; Arnuk, W.; Campbell, T.; Gustafson, C.; Michaud, A.; Galton-Fenzi, B.; Hausner, M.; Holzschuh, S.; Huber, B.; Mankoff, K.; Schroeder, D.; **Summers, P. T.**; Tyler, S.; Carter, S.; Fricker, H.; Harwood, D.; Leventer, A.; Rosenheim, B.; Skidmore, M.; Priscu, J. and SALSA Science Team. "The life and death of a subglacial lake in West Antarctica," *Geology* , 2023, https://doi.org/10.1130/G50995.1

Bienert, N.; Schroeder D. M.; **Summers, P.T.** "Bistatic Radar Tomography of Shear Margins: Simulated Temperature and Basal Material Inversions," *IEEE Transactions on Geoscience and Remote Sensing*, 2022, https://doi.org/10.1109/TGRS.2022.3213047

Summers, P.T.; Dustin M. Schroeder, Matthew R. Siegfried. "Constraining Ice Sheet Basal Sliding and Horizontal Velocity Profiles Using a Stationary Phase Sensitive Radar Sounder," *IEEE International Geoscience and Remote Sensing Symposium*, 2021, https://doi.org/10.1109/IGARSS47720.2021.9554535

RESEARCH AND PROFESSIONAL EXPERIENCE

Rutgers University & Georgia Institute of Technology — August 2024 - present
Postdoctoral Researcher — *Atlanta, Georgia*
Numerical modeling of ice Mélange and interactions with ocean currents and glacial dynamics.
Extending existing numerical modeling packages `MITgcm` and `icepack` in python, C, Fortran.

Stanford University Department of Geophysics — September 2018 - June 2024
PhD Candidate — *Stanford, CA*
Physical processes controlling Antarctic Shear margin locations, applied to Thwaites Glacier and other ice streams.
Thermomechanical ice flow modeling and ice sounding radar processing techniques focused on Antarctic shear margins.
Physical modeling using finite element analysis in Matlab. Worked with satellite, atmospheric, radar sounding data sets.

Dropbox Inc. — August 2014 - July 2018
Salesforce Developer — *San Francisco, CA*
Designed, built and tested custom solutions with Sales, Finance and Product to meet business requirements.

Stanford University Department of Geophysics — June 2013 - June 2014
Researcher, M.S. Candidate — *Stanford, CA*
Authored article investigating mechanics of pre-explosive harmonic tremor in the 2009 Redoubt Volcano eruption.
Physical modeling using finite element analysis and PDEs in Matlab.

Stanford University Department of Physics — June 2012 - September 2012
Research Intern — *Stanford, CA*
Investigated magnetic properties of translation metal oxides in search of a new superconductor or novel magnet.
Experience working with strong acids, toxic chemicals, air sensitive materials, worked with vacuum hoods.

Stanford Stem Cell Institute — June 2011 - September 2011
Research Intern — *Stanford, CA*
Investigated antibody treatment of various forms of cancer both *in vivo* and *in vitro*.

EDUCATION

Stanford University, Stanford California — *September 2018 - June 2024*
PhD Candidate in Geophysics — GPA: 3.94

Stanford University, Stanford California — *September 2010 - June 2014*
B.S in Physics, M.S. in Geophysics — GPA: 3.81, 3.89

TEACHING AND MENTORING

Mentor Graduate Student October 2019 - present
Peer Mentor for Stanford 1st year PhD students (1 hours per week)

Tutor Graduate Student October 2022 - June 2023
1:1 Tutor Master's student for upper level math and engineering courses (2 hours per week)

SESUR Program Assistant April 2022 - October 2022
Stanford Doerr School of Sustainability
Coordinate Stanford Earth Summer Undergraduate Research Program including field trips, weekly seminars, various social events. (10 hours per week)

Mentor for Undergraduate Intern April 2022 - August 2022
Stanford Department of Geophysics
Mentored Stanford undergraduate modeling subglacial meltwater routing at Thwaites Glacier, Antarctica. Student will present work at AGU 2022 (3 hours per week)

Teaching Assistant April 2022 - June 2022
Stanford University Department of Geophysics
Undergraduate geophysical methods course for imaging and characterizing groundwater systems. Partnership with community decision makers to recharge ground water. (12 hours per week)

Co-Mentor for Undergraduate Intern June 2021 - August 2021
Stanford University Department of Geophysics
Mentored Stanford undergraduate on processing ice sounding radar film archive. (3 hours per week)

Teaching Assistant January 2019 - April 2019
Stanford University Department of Geophysics
Undergraduate and Graduate course. Continuum mechanics applied to ice sheets and glaciers, water waves and tsunamis, and volcanoes. (6 hours per week)

Teaching Assistant April 2013 - June 2013
Stanford University Department of Physics
Mid-level electricity and magnetism course. (6 hours per week)

Instructor September 2011 - June 2012
Stanford Outdoor Education Program
Instructor for introductory to intermediate backpacking courses. (4 hours per week)

Assistant Coach Jan 2011 - June 2011
Gunn High School
Distance Coach for Track & Field (10 hours per week)

PROFESSIONAL DEVELOPMENT

CIRTL@Stanford Teaching Certificate Program August 2023
Associate Level *Stanford, CA*
Recognition of commitment to undergraduate education, demonstrated through independent and collaborative learning at Stanford University and through the multi-institution Center for the Integration of Research, Teaching, and Learning (CIRTL) Network.

Outdoor Leadership Apprenticeship March 2023 - June 2024
Apprentice *Stanford, CA*
Apprenticeship in Outdoor Leadership, focused on rock climbing skills through experiential learning. Co-instructed 2x week long, field-based traditional rock climbing courses for 8 students in Joshua Tree National Park, as well as multiple vertical self-rescue clinics on campus.

Preparing Future Professors November 2022 - Jan 2023
Mentee *West Valley College, Saratoga, CA*
10 week shadowing program gave the opportunity to experience faculty life first-hand at a comprehensive, teaching-focused university or community college.

Center for Teaching and Learning Course Design Institute June 2022 - July 2022
Student *Stanford, CA*
6 week summer course on drafting curricula using evidence-based frameworks. Developed framework of Glacial Dynamics course focused on Mass Conservation Methods.

FIELD EXPERIENCE

Thwaites Interdisciplinary Margin Evolution Oct 2023 - Feb 2024
Field Scientist *Thwaites Glacier, West Antarctica*
Wide offset (up to 4 km) bistatic, polarimetric radar survey using wireless and fiber optic synchronization techniques using modified pRES radar. Assisted with 2-D and 3-D active seismic survey. Surveyed and Deployed seismic nodes with GPS, assisted in active seismic explosive sources. 7 weeks in the deep field in a team of 16 with 2 guides.

Near-Surface Geophysics: Imaging Groundwater Systems May 2022
Teaching Assistant *Coyote Valley, California*
Co-lead a class of 20 undergraduates to completed a 100 m seismic (hammer and betsy gun), 200 m electrical resistivity tomography, and towed transient electromagnetic survey imaging ground water connectivity in the top 40 meters of the subsurface. Worked with community decision makers to inform development of newly acquired public lands.

Thwaites Interdisciplinary Margin Evolution Oct 2021 - Jan 2022
Field Scientist *Thwaites Glacier, West Antarctica*
Completed a 5 km offset bistatic, polarimetric radar survey. Deployed and recovered seismic nodes in an active seismic survey using hammer source. Recovered passive seismic nodes and GPS stations. 3 weeks in the deep field in a team of 4 scientists and 2 guides.

AWARDS

ARCS Scholar 2022 - 2024
Northern California Chapter of the Achievement Rewards for College Scientists, 2x recipient for total of $101,000

Best Graduate Poster May 2023
Research Review Symposium *Stanford Doerr School of Sustainability*
Radar Attenuation Signature of Temperate Antarctic Shear Margins

Stanford Earth Graduate Student Research Grant Sept 2021
Grant of $575 for field supplies for 2021-22 Antarctic field work.

TECHNICAL STRENGTHS

Computer Languages	MATLAB, Python, JAVA, SQL, APEX, SOQL, Javascript
Tools	HPC, Git, vim, MATLAB, LaTeX, Sublime IDE
Field Skills	ApRES, Seismic Surveying (Ice and Land), ERT, GPS, Digging in Snow, Roped Travel, Snowmobiling, Crevasse Rescue, Vertical Rock Rescue
First Aid	Red Cross AED, CPR, Basic First Aid Certified (exp March 2024), WFA (lapsed)

OPEN SOURCE CODE REPOSITORIES

Zenodo For Publications
`https://zenodo.org/record/7106136` (Summers, et. al. 2023)
`https://zenodo.org/records/10783426` (Summers, et. al. 2024)

Github Ongoing Research and Personal Projects
`https://github.com/somonesummers`

COMMUNITY BUILDING

Graduate Student Advisory Council Member 2019 - 2020
Liaison between graduate students in the School of Earth and department and school level administration. (1 hour per week)

School of Earth Social Czar 2018 - 2019
Host weekly social events for the School of Earth. (2 hours per week)

PERSONAL INTERESTS

Stanford Climbing Wall June 2022 - Present
Route Setter, set boulders, top rope, and lead climbs (6 hours per week)

Stanford Club Cycling July 2011 - June 2014
Recruitment Officer, Equipment Manager, Mountain Bike Captain

Outdoor Activities
Cycling, Road and MTB
Running, Trail Ultramarathons
Backpacking and Camping, Rock/Alpine Climbing
Skiing, Resort, Backcountry Touring

Other Interests
Ceramics, Tea Pots, Bowls, Mugs, Display art
Photography, Digital, Landscapes
Sewing, Tents, Packs, Clothing, Accessories.

CONFERENCE ABSTRACTS

EGU 2024 Apr 18, 2024
Emma C. Smith; **et. al.** (2024, April). Icequakes beneath Thwaites Glacier eastern shear margin.

EGU 2024 Apr 19, 2024
Daniel May; **et. al.** (2024, April). Multi-Offset Radio-Echo Sounding for Estimation of Englacial and Subglacial Thermal Conditions and Material Properties.

WAIS 2023 Meeting Sept 26, 2023
Summers, P. T.; Andrew Hoffman; et. al. (2023, May). Historic Shear Margin Migration at Conway Ice Rise: An Integrated Data-Model Approach.

SDSS 2023 Research Review May 26, 2023
Summers, P. T.; Schroeder, D.; Suckale, J. (2023, May). Radar Attenuation Signature of Temperate Antarctic Shear Margins.

AGU 2022 Meeting Dec 13, 2022
Summers, P. T.; et. al. (2022, Dec). Response of Thwaites Glacier's Shear Margins to Ice Sheet Thinning and Surface-Slope Steepening. In AGU Fall Meeting Abstracts.

AGU 2022 Meeting Dec 13, 2022
Cheng, C. **et. al.**. (2022, Dec). Sensitivity of Subglacial Streams to Bed Topography: Introducing Small-Scale Bed Roughness Suggests Large Water Routing Uncertainties for Thwaites Glacier. In AGU Fall Meeting Abstracts.

AGU 2022 Meeting Dec 13, 2022
Teisberg, T. **et. al.**. (2022, Dec). Methods for Constraining Englacial Velocity Fields using Airborne Ice-penetrating Radar Data. In AGU Fall Meeting Abstracts.

WAIS 2022 Meeting Sep 27, 2022
Summers, P. T.; Schroeder, D. (2022, Sep). Evidence for Temperate Ice in Shear Margins of Antarctic Ice Streams from Airborne Radar Surveys.

AGU 2021 Meeting Dec 14, 2021
Siegfried, M. R.; **et. al.** (2021, Dec). The life and death of a subglacial lake in West Antarctica. In AGU Fall Meeting Abstracts.

AGU 2021 Meeting Dec 14, 2021
Sandra, R.; **et. al.** (2021, Dec). Informing Bistatic Radar Experiments at Thwaites Glacier Using Bistatic Data from Greenland and West Antarctica. In AGU Fall Meeting Abstracts.

WAIS Workshop 2021 Sep 22, 2021
Summers, P.T.; Elseworth, C.W.; Suckale, J.; TIME Science Team (2021, Sep). Inward Migration of the Shear Margins at Thwaites Glacier in Response to Thinning.

WAIS Workshop 2021 Sep 23, 2021
Summers, P.T.; Schroeder, D ;Suckale, J(2021, Sep). Evidence for Temperate Ice in Shear Margins of Antarctic Ice Streams from Airborne Radar Surveys.

IEEE International Geoscience and Remote Sensing Symposium 2021 July 11, 2021
Summers, P.T.; Schroeder, D.; Siegfried, M.R. (2021, July). Constraining Ice Sheet Basal Sliding and Horizontal Velocity Profiles Using A Stationary Phase Sensitive Radar Sounder.

AGU 2020 Meeting Dec 16, 2020
Summers, P.T.; Elseworth, C.W.; Suckale, J; TIME Science Team (2020, Dec). Processed-Based Models in the Wild: A Forward Model Approach to Constraining the Processes Governing Basal Strength at Thwaites Glacier. In AGU Fall Meeting Abstracts.

WAIS Workshop 2020 Sep 29, 2020
Summers, P.T.; Elseworth, C.W.; Suckale, J; TIME Science Team (2020, Sep). Investigating Mechanisms of Basal Strength at Thwaites Glacier using a Forward Model Approach. Recording of talk on `waisworkshop.org`

AGU 2019 Meeting Dec 13, 2019
Summers, P.T.; Elseworth, C.W.; Suckale, J (2019, Dec). Potential Formation of a New Shear Margin at Thwaites Glacier. In AGU Fall Meeting Abstracts.

AGU 2019 Meeting Dec 13, 2019
Liu, W.; Räss, L.; **Summers, P.**; Papula, A.; Suckale, J. (2019, Dec). Impact of Complex Topography on Thermomechanical Coupled Ice Flow Using the Immersed Boundary Method. In AGU Fall Meeting Abstracts.

SSA 2014 Meeting May 2, 2014
Summers, P.T. & Dunham, E. M.D. (2014, May). Conduit Processes Driving Pre-explosive Harmonic Tremor in the 2009 Redoubt Volcano Eruption. In SSA 2014 Annual Meeting Announcement.

AGU 2013 Fall Meeting Dec 2013
Summers, P. & Dunham, E. M. (2013, December). Conduit Processes Driving Pre-explosive Harmonic Tremor in the 2009 Redoubt Volcano Eruption. In AGU Fall Meeting Abstracts.