

We propose the continuation of the Penn State Ice and Climate Exploration Center (PSICE) as a component of EESI. Since our inception, we have become a recognized entity in the department and college, and in the wider world, with much of the credit going to EESI for fostering us.

Director: Sridhar Anandakrishnan

Associate Director: Richard Alley

Participants: B Parizek, L Trusel, S Wang, D Pollard, P LaFemina, S Bilen, J Urbina, C Marone. Non-faculty: D Voigt, Students: Emily Schwans, Lizzy Clyne, Jessica Kromer, Sierra Melton, Ian Lee, Rob Fuller.

PSICE is strengthening its position as a world-leading group in ice science, with S Anandakrishnan co-leading one of the major collaborations in the largest ongoing glaciological experiment, as well as a major effort on Helheim Glacier with foundation funding, and additional important projects. Many of the major experiments are now run in large part by graduates of our group, attesting to the successful use of prior EESI funding to support students and community-building. PhD graduate Kiya Riverman directed major field work in West Antarctica again this year, while PhD graduates Luke Zoet (Wisconsin) and Knut Christianson (Washington) move along the tenure line and Nick Holschuh assumes a new tenure-line position at Amherst, and postdoc Atsu Muto advances at Temple. Many of our other PhD graduates (e.g., Sarah Das) continue to have major impact, and John Fegyveresi just got a new position at Northern Arizona.

We propose to continue to focus PSICE funding on student development. With a strong and diverse group of graduate students facing grave uncertainty in the age of COVID 19, we propose to meet the additional challenges of providing the experiences and resources necessary to continue this record of student success. Historically, we have worked hard to support our students attending the leading summer schools and workshops, including the Karthaus workshop, the University of Alaska Glaciology field school, the UNAVCO GPS/InSAR bootcamps, and the PGC (Polar Geospatial Center) bootcamp. We anticipate that these will return within the duration of this proposal. These organizations typically supply some funding, but it must be supplemented by funds for the graduate students; this is particularly true for Karthaus, which is a Euro-centric workshop. We have made opportunities available for our students to participate in research projects or instruction at important but poorly funded programs such as the Juneau Icefields Research Project, gaining valuable teaching and research experience, conducting research leading to publications, but requiring travel funds.

Until travel resumes normally, our students face serious challenges shifting activities online. Some PSICers have been driving to the Deike Building parking lot to tap into the wireless there to enable sufficient download speeds to obtain data necessary for research. Funding for a laptop, for storage media, for faster routers for home wireless networks, or other purposes will be necessary.

Funding Opportunities: Most of the current PSICE researchers target NSF OPP and NASA for funding, as well as foundation funding. We anticipate that will remain the

same in the next cycle. Note that early-career researchers such as S. Wang and L. Trusel are well-positioned to leverage the resources of PSICE in their applications.

Management: Anandkrishnan and Alley will disperse travel funds to the students for ice-related travel, once travel returns, and for computer-related remote-productivity purchases.

Past budgets: previous budgets have been for student support for travel and meetings; for website support; for postdoc “ancillary” support – laptops and travel that couldn’t be put on NSF funds. During that time, we have maintained our cohesiveness, and allowed students the opportunity to attend important workshops.

Budget: partial support for 2 students/year to a workshop at \$600/student = \$1200/year  
Computing/laptop for incoming students, and related computer resources: \$1800/year  
Shipping/travel to field sites: \$500/year  
Total: \$3500/year



Byron R. Parizek  
Professor  
Mathematics and Geosciences  
Graduate Faculty, Department of Geosciences  
Pennsylvania State University  
College Place  
DuBois, PA 15801  
Tel: (814) 375 4834; (814) 865 9319  
Email: [parizek@psu.edu](mailto:parizek@psu.edu)

April 17, 2020

Selection Committee  
EESI Center Proposals

Dear Selection Committee:

I look forward to a successful proposal for ESSI funding and maintenance of the internationally recognized PSICE: Penn State Ice and Climate Exploration Center. The Center provides a "home" for interdisciplinary ice-centric research at University Park and beyond. Additionally, as we further our mission to retain and educate the next generation of Earth scientists, our weekly PSICE meetings have not only provided my graduate students within the Department of Geosciences but also my undergraduate researchers from Penn State DuBois with the opportunity to participate in thorough and collegial discussions of current studies as well as an invaluable introduction to UP, which, for the undergraduates, has been the campus to which they transfer after their first two years. To date, these undergraduate researchers have contributed to 22 co-authored professional presentations and 3 co-authored peer-reviewed manuscripts which currently have 63 citations. Furthermore, the exciting and thought-provoking discussions that we share within PSICE often find their way into my classrooms at both DuBois and University Park as well as outreach presentations within the community.

In large part because of the administration at Penn State DuBois, the Department of Geosciences, PSICE, ESSI, the University College, and EMS, I can honestly say that Penn State has truly been one University geographically dispersed. The research home that has been provided for me at PSICE helps bridge the geographical gap and affords me the opportunity to keep abreast of and contribute to cutting-edge research pertaining to the Earth system. In further support of the validity of this Penn State mantra, since the last PSICE renewal, my involvement with both graduate and undergraduate education has led to a dual academic appointment that covers both undergraduate and graduate classes at University Park during the fall semesters and undergraduate classes at DuBois during the spring semester.

As a collective group that successfully unites data and theory, PSICE has remained competitive at bringing external grants into our University. Our sum is truly stronger than its parts. However, continued budgetary support for computing and additional travel resources for incoming students is essential to bridge the gap left by external-funding restrictions.

I look forward to continuing my active involvement with undergraduate, graduate, and post-doctoral fellows within PSICE and sincerely hope that you agree that your continued support will be well utilized.

Best regards,

A handwritten signature in black ink, appearing to read "B. Parizek".

Byron Richard Parizek



**PennState**

**Luke D. Trusel, Ph.D.**  
Assistant Professor  
Department of Geography  
Pennsylvania State University

212 Walker Building  
University Park, PA 16802  
trusel@psu.edu

April 20, 2020

Sridhar Anandakrishnan, Ph.D.  
Department of Geosciences  
513 Deike Building  
Pennsylvania State University  
University Park, PA 16802

Dear Sridhar,

I am very happy to support your EESI Center proposal to maintain funding for the Penn State Ice and Climate Exploration Center (PSICE). Having a dedicated, cross-disciplinary center with scholars at the forefront of ice sheet and climate sciences is without question a strong asset to EESI and Penn State.

Since arriving at Penn State Geography last fall, I have enjoyed being a part of PSICE. The group has been welcoming and supportive to me as well as current and prospective students in my group. And though I've only been here for a short time, I personally know the importance of student support from PSICE. Indeed, my own academic trajectory was shaped by PSICE as I worked closely with PSICE alumna Dr. Sarah Das at Woods Hole Oceanographic Institution during my postdoc.

Continued funding from EESI for PSICE would ensure students are able to attend important field courses and meetings while also supporting their evolving computational needs. As I look forward to soon welcoming my first graduate students to Penn State, I am pleased that they will be able to join the supportive intellectual environment fostered by PSICE.

Sincerely,

Luke D. Trusel, Ph.D.

# Lamont-Doherty Earth Observatory

COLUMBIA UNIVERSITY | EARTH INSTITUTE

Dr. Shujie Wang

Lamont-Doherty Earth Observatory, Columbia University

Email: swang@ldeo.columbia.edu

Ph: 513-356-2421

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Dr. Sridhar Anandkrishnan

Department of Geosciences

Penn State

513 Deike Building

University Park, PA 16802

April 16, 2020

Dear Dr. Anandkrishnan,

I am writing in support of your proposal on continuation of the Penn State Ice and Climate Exploration Center (PSICE) as a component of EESI.

I will be joining Penn State as a new faculty member in the Department of Geography as well as an associate at EESI on July 1st, 2020. My research expertise and teaching interest are cryosphere sciences, remote sensing, and data analytics. I am very happy to join PSICE. I believe this will be a great opportunity for me to build connections with the PSU community, foster future collaborations, and develop research proposals. I am very willing to contribute to student development and commit to any service activities as needed.

Sincerely,



Shujie Wang

Postdoctoral Research Scientist

Lamont-Doherty Earth Observatory, Columbia University



## Peer-reviewed publications

- Holschuh, N., Christianson, K., Paden, J., Alley, R. B., & Anandakrishnan, S. (2020). Linking postglacial landscapes to glacier dynamics using swath radar at Thwaites Glacier, Antarctica. *Geology*, *48*(3), 268–272.
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## **Other Publications**

C. A. Finn, S. Anandkrishnan, J. Goodge, J. Panter, C. Siddoway, and T. Wilson, Remote views and exploration of the Antarctic lithosphere, *Eos*, in press.

Science and Implementation plan for the Amundsen Sea Embayment Project. Multiple authors, but main authors are R. Bindshadler, S. Anandkrishnan, and D. D. Blankenship.

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