

## Virtual FRISP 2020 meetings

**Title:** Investigation of recent oceanic contributions to instability of the Thwaites and Pine Island Glaciers

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### Abstract

The Antarctic ice shelves around the Amundsen Sea has experienced the fastest melting together with the rapid grounding line retreat in recent decades driven by the incursion of relatively warm Circumpolar Deep Water (CDW) into the sub-ice shelves. The Thwaites and Pine Island Glaciers have had attentions due to the most apparent thinning among the western Antarctic ice shelves.

The Antarctic survey was done in the Pine Island Bay from January 29 to February 15, 2020 aboard the ice-breaking research vessel ARAON to evaluate recent oceanic contributions to instability of the Thwaites and Pine Island Glaciers. Through this survey, in-situ data from 89 full-depth CTD/LADCP profiling were collected near and off the ice shelves where we considered small basins, ridges, and troughs found based on high-resolution bathymetry data along with sea ice distributions. In this presentation, we propose three key findings: 1) CDW pathways below 700 m and heat transport into the two sub-ice shelves are primarily controlled by bed topography; 2) Horizontal ocean circulation in the Pine Island Bay plays an important role in distributing and redistributing heat within the bay and into the ice shelves that is changed due to the Pine Island Glacier ice front retreat. 3) The glacial meltwater flowing out from the two glaciers shape spatial and temporal variability of meltwater fraction at the upper (shallower than 500 m) ocean near and off the ice shelves. We discuss the observational results from 2020 survey in the context of the decadal variability.

## **Forum for Research into Ice Shelf Processes (FRISP)**

Virtual conference 2020 - Time is given in CEST

Shortcuts to zoom links:

### **Plenary Sessions**

Contact: frisp2020@pik-potsdam.de

<https://uni-potsdam.zoom.us/j/97903933041> (Password: 67025545)

### **Parallel Sessions - Room 1**

Contact: torsten.albrecht@pik-potsdam.de

<https://uni-potsdam.zoom.us/j/95658487524> (Password: 82932157)

### **Parallel Session - Room 2**

Contact: julius.garbe@pik-potsdam.de

<https://uni-potsdam.zoom.us/j/93166898175> (Password: 97531806)

### **Parallel Session - Room 3**

Contact ronja.reese@pik-potsdam.de

<https://uni-potsdam.zoom.us/j/96659699309> (Password: 29477475)

### **Parallel Sessions - Room 4**

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### **Early Career Get Together**

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## Tuesday 16 June

- 13:30 – 14:00**      [Check-in](#) (Password: 67025545)
- 14:00 – 14:10**      [Welcome & introduction](#) (Password: 67025545)
- 14:10 – 14:55**      [Plenary Session 1](#) (Password: 67025545)
- 14:10 – 14:25      Olaf Eisen “Relevance of field observations as boundary conditions for understanding ice-sheet–ocean interactions”
- 14:25 – 14:40      Sammie Buzzard “A 3-D Model of Antarctic Ice Shelf Surface Hydrology”
- 14:40 – 14:55      Anna Crawford “Investigations of marine ice-cliff instability with high-fidelity modeling”
- 14:55 – 15:40**      [Plenary Session 2](#) (Password: 67025545)
- 14:55 – 15:10      Ute Hausmann “The role of tides in ocean/ice-shelf interactions in the southwestern Weddell Sea”
- 15:10 – 15:25      Tore Hattermann “Recent atmospheric anomalies reduce threat of warm water to World’s largest ice shelf”
- 15:25 – 15:40      Kaitlin Naughten “Two-timescale response of the Filchner-Ronne Ice Shelf to climate change”
- 15:40 - 15:55**      **Break**
- 15:55 – 16:15**      **Parallel Session 1**
- [Room 1](#) (Password: 82932157)      Kjersti Dae “Necessary Conditions for Warm Inflow Towards the Filchner Ice Shelf, Weddell Sea”
- [Room 2](#) (Password: 97531806)      Tanja Schlemm “Mélange buttressing of calving glaciers may mitigate marine ice cliff instability”
- [Room 3](#) (Password: 29477475)      Matthew Hoffman “Could increased melting from East Antarctic ice shelves trigger runaway melting beneath Filchner-Ronne Ice Shelf?”
- [Room 4](#) (Password: 67025545)      Bradley Lipovsky “3D models of ice shelf rift propagation illuminate a connection with ice shelf margins”
- 16:15 – 16:35**      **Parallel Session 2**
- [Room 1](#) (Password: 82932157)      Ryan Patmore “Details of z-level modelling of the ice-ocean boundary layer”
- [Room 2](#) (Password: 97531806)      Ben Yaeger “Modeled ocean circulation and melt rates near an idealized ice shelf grounding line”
- [Room 3](#) (Password: 29477475)      Xylar Asay-Davis “Does increased stratification on the Weddell continental shelf prime the Filchner-Ronne Ice Shelf for a runaway melt instability?”
- [Room 4](#) (Password: 67025545)      Adrian Jenkins “Shear, Stability and Mixing within the Ice-Shelf-Ocean Boundary Current”
- 16:35 – 17:00**      [General discussion: Modeling ice-ocean boundary layer processes \(Hartmut Hellmer\)](#) (Password: 67025545)
- 17:00 – 18:00**      [Early Career Get Together](#) (Password: 29477475)

## Wednesday 17 June

- 07:30 – 08:00**      [Check-in](#) (Password: 67025545)
- 08:00 – 08:10**      [Welcome & introduction](#) (Password: 67025545)
- 08:10 – 08:55**      [Plenary Session 1](#) (Password: 67025545)
- 08:10 – 08:25      Mohammadreza Ershadi “Application of polarimetric radar to infer ice fabric anisotropy (also on ice shelves)”
- 08:25 – 08:40      Yoshihiro Nakayama “Ice-shelf ocean interactions of West Antarctic and East Antarctic ice shelves”
- 08:40 – 08:55      Natalie Robinson “Ice Shelf Cavity Estuarine Hydrodynamics at the Kamb Ice Stream Grounding Line”  
Craig Steward “Basal Melting at the Kamb Ice Stream (Ross Ice Shelf) Grounding Line”
- 08:55 – 09:40**      [Plenary Session 2](#) (Password: 67025545)
- 08:55 – 09:10      Maren Elisabeth Richter “The ups and downs of sea ice thickness in front of ice shelves”
- 09:10 – 09:25      Leo Middleton “Numerical Simulations of Double-Diffusive Convection in a Turbulent Boundary Layer beneath a Melting Ice Shelf”
- 09:25 – 09:40      Suchithra Sundaram “Antarctic ice shelf impact on Indian Ocean sea surface temperature patterns”
- 09:40-09:55**      **Break**
- 09:55 – 10:15**      **Parallel Session 1**
- [Room 1](#) (Password: 82932157)      Kofan Lu “Fresh Meltwater Feedback to Pine Island Glaciers Melt Rate Evaluated by Amundsen Regional Model”
- [Room 3](#) (Password: 29477475)      Irena Vankova “Observing ice shelf basal melt at sites with complex basal geometries at the Totten Ice Shelf”
- [Room 4](#) (Password: 67025545)      Jennifer Arthur “Distribution and seasonal evolution of supraglacial lakes on Shackleton Ice Shelf, East Antarctica”
- 10:15 – 10:35**      **Parallel Session 2**
- [Room 1](#) (Password: 82932157)      Shuntaro Hyogo “Modeling Circumpolar Deep Water intrusion onto the Bellingshausen Sea continental shelf ”
- [Room 3](#) (Password: 29477475)      Reinhard Drews “Grounding-zone dynamics of Priestley Glacier, Antarctica, observed on hourly timescales with terrestrial radar interferometry”
- [Room 4](#) (Password: 67025545)      Laura Herraiz-Borreguero “On the Link between the Southern Ocean Fronts and Antarctic Ice Shelves Thinning”
- 10:35 – 11:00**      [General discussion: Upcoming expeditions & key observational needs \(Tore Hattermann\)](#) (Password: 67025545)

**Wednesday 24 June:**

- 16:30 – 17:00**      [Check-in](#) (Password: 67025545)
- 17:00 – 17:10**      [Welcome & introduction](#) (Password: 67025545)
- 17:10 – 17:55**      [Plenary Session 1](#) (Password: 67025545)
- 17:10 – 17:25      Nicolas Jourdain “Ice-shelf melting projection in the Amundsen Sea, Antarctica”
- 17:25 – 17:40      Indrani Das “Comparisons of Ice Sheet Model Inferred Friction with Basal Reflectivity from Airborne Radar for Thwaites Glacier, West Antarctica”
- 17:40 – 17:55      Peter Davis “Turbulence Observations in the Grounding Zone Region of Thwaites Glacier”
- 17:55 – 18:40**      [Plenary Session 2](#) (Password: 67025545)
- 17:55 – 18:10      Bradley Lipovsky / Rick Aster “Swell-Triggered Seismicity within the Ross Ice Shelf”
- 18:10 – 18:25      Estee Barin “Analysis of stability of icebergs and glacier frontal ablation of Hariot, Seller, Fleming Glacier and former Wordie Ice Shelf, Antarctica”
- 18:25 – 18:40      Jan De Rydt “Drivers of Pine Island Glacier retreat from 1996 to 2016”
- 18:40 - 18:55**      **Break**
- 18:55 – 19:15**      **Parallel Session 1**
- [Room 1](#) (Password: 82932157)      Yixi Zheng “Idealized Model of Ocean Gyres in Front of Pine Island Ice Shelf and Thwaites Ice Shelf”
- [Room 3](#) (Password: 29477475)      Stef Lhermitte “Channelized Antarctic ice shelf melting from high-resolution remote sensing”
- [Room 4](#) (Password: 67025545)      Paul Holland “Modelling decadal ocean variability in the Amundsen Sea”
- 19:15 – 19:35**      **Parallel Session 2**
- [Room 1](#) (Password: 82932157)      Tasha Snow “Mechanisms modulating warm Atlantic Water temperatures flowing toward Helheim Glacier in southeastern Greenland”
- [Room 3](#) (Password: 29477475)      William Scott “Implementing a new model for sub-ice shelf ocean dynamics in the Firedrake framework: verification against MITgcm and preliminary adjoint calculations”
- [Room 4](#) (Password: 67025545)      Nadine Steiger “Dynamics of a barotropic current across an ice shelf front”
- 19:35 – 20:00**      [General discussion: Ice-ocean tipping points \(Ricarda Winkelmann\)](#) (Password: 67025545)

## Thursday 25 June

- 09:30 – 10:00**      [Check-in](#) (Password: 67025545)
- 10:00 – 10:10**      [Welcome & introduction](#) (Password: 67025545)
- 10:10 – 10:55**      [Plenary Session 1](#) (Password: 67025545)
- 10:10 – 10:25      Rupert Gladstone “FISOC: A Framework for Ice Sheet - Ocean Coupling”
- 10:25 – 10:40      Jamie Izzard “Recent dynamic behaviour of Ferrigno Ice Stream and neighbouring glacial systems”
- 10:40 – 10:55      Seung-Tae Yoon “Investigation of recent oceanic contributions to instability of the Thwaites and Pine Island Glaciers”
- 10:55 – 11:40**      [Plenary Session 2](#) (Password: 67025545)
- 10:55 – 11:10      Alice Barthel “Using clustering to evaluate Antarctic continental shelf seas in climate models”
- 11:10 – 11:25      Jowan Barnes “The transferability of adjoint inversion products between different ice-flow models”
- 11:25 – 11:40      Johannes Feldmann “A scaling law for similar ice sheet flow”
- 11:40-11:55**      **Break**
- 11:55 – 12:15**      **Parallel Session 1**
- [Room 1](#) (Password: 82932157): Vjeran Visnjevic “Constraining basalt melting rates from isochrone data”
- [Room 2](#) (Password: 97531806): Inka Koch “Ice shelf internal reflection horizons reveal past ice dynamics and oceanic”
- [Room 3](#) (Password: 29477475): Simon Schöll “Characteristic buttressing of Antarctic ice shelves” melt”
- [Room 4](#) (Password: 67025545): Moritz Kreuzer “Coupling the Parallel Ice Sheet Model (PISM) with the Modular Ocean Model v5 (MOM5) via the Ice-shelf Cavity module (PICO) applied to the Antarctic Ice Sheet”
- 12:15 – 12:35**      **Parallel Session 2:**
- [Room 1](#) (Password: 82932157): Tian Li “Mapping the Antarctic Grounding Zone from ICESat-2 Laser Altimetry”
- [Room 3](#) (Password: 29477475): Ronja Reese “The role of history and strength of the oceanic forcing in sea-level projections from Antarctica with the Parallel Ice Sheet Model”
- [Room 4](#) (Password: 67025545): Bertie Miles “Highly temporally and spatially variable Antarctic Ice Discharge throughout the 21st century”
- 12:35 – 13:00**      [General discussion: MIPS, IPCC & sea-level projections \(Xylar Asay-Davis\)](#) (Password: 67025545)

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전체 회신 |

Dear Seung-Tae Yoon,

Your registration for the following event has been received:

### **Virtual FRISP 2020 meetings - Forum for Research into Ice Shelf Processes Tuesday, 16 June 2020 to Thursday, 25 June 2020**

You will find a summary of your booking data below.

For further information about the event, simply reply to this email.

Visit the [Booking Center](#). There you will receive information about your booking and, if allowed, you can change or cancel your reservation.

First Name:	Seung-Tae
Last Name:	Yoon
Affiliation:	Korea Polar Research Institute
E-Mail:	styoon@kopri.re.kr
Career level:	Early Career Scientist (PhD/MSc/BSc within the past 7 yrs)
Available dates (multiple choices are possible and desired):	16 June 2020 (Tuesday) 2pm -5pm CET
Available dates (multiple choices are possible and desired):	17 June 2020 (Wednesday) 8am - 11am CET
Available dates (multiple choices are possible and desired):	25 June (Thursday) 10am - 1pm CET

Data protection: I hereby consent to the storage and processing of my data for registration and participation in this event. I received the privacy policy for my information.

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