

# Julius Garbe

PhD candidate and researcher at the Potsdam Institute for Climate Impact Research (PIK) at  
Potsdam, Germany

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## Education

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- **Ph.D. in Climate Physics, University of Potsdam**
  - **Date:** expected
  - **Dissertation:** "Interactions of the Greenland and Antarctic ice sheets"
  - **Advisors:** Prof. Ricarda Winkelmann and Dr. Jonathan F. Donges
- **M.Sc. in Integrated Climate System Sciences, School of Integrated Climate System Sciences at the University of Hamburg**
  - **Date:** March 2017
  - **Thesis:** "Long-term evolution and critical thresholds of the Antarctic Ice Sheet"
  - **Advisors:** Dr. Georg Feulner, Prof. Ricarda Winkelmann, and Prof. Lars Kaleschke
- **B.Sc. in Physics (major) and Mathematics (minor), Humboldt University of Berlin**
  - **Date:** December 2013
  - **Thesis:** "An overview of explanations for the problem of weak temperature gradients in warm climates in Earth history"
  - **Advisors:** Prof. Jürgen Kurths and Dr. Georg Feulner

## Relevant Academic Positions

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- **PhD candidate and researcher**, Potsdam Institute for Climate Impact Research, Potsdam, Germany (since 2017)
  - Embedded within the Leibniz project [DominoES](#) and the FutureLab on [Earth Resilience in the Anthropocene](#)
  - *Methods:* numerical simulations with the Parallel Ice Sheet Model ([PISM](#)), model development and implementation with focus on ice-ocean interaction

## Scientific Background

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- **Physics courses:** classical/analytical/fluid mechanics, thermodynamics, electrodynamics, optics, special relativity, quantum mechanics, particle physics, solid-state physics
- **Mathematics courses:** analysis, complex analysis, linear algebra
- **Climate physics courses:** ocean physics and modeling, atmospheric physics, ice dynamics, sea-ice physics and modeling
- **Programming languages:** Python, R, Matlab, C++, Fortran, Bash/Unix, LaTeX, HTML, CSS, Markdown

## Research Interests

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- Climate and social tipping interactions
- Antarctic ice-sheet / ice-shelf stability and future sea-level change
- Hysteresis behavior of the Antarctic Ice Sheet and Antarctic tipping points
- Response of the Antarctic Ice Sheet to Greenland ice loss via ocean dynamics

## Publications

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- **Projecting Antarctica's contribution to future sea level rise from basal ice-shelf melt using linear response functions of 16 ice sheet models (LARMIP-2)**  
Levermann, A., Winkelmann, R., Albrecht, T., Goelzer, H., Golledge, N. R., Greve, R., Huybrechts, P., Jordan, J., Leguy, G., Martin, D., Morlighem, M., Pattyn, F., Pollard, D., Quiquet, A., Rodehacke, C., Seroussi, H., Sutter, J., Zhang, T., Van Breedam, J., DeConto, R., Dumas, C., **Garbe, J.**, Gudmundsson, G. H., Hoffman, M. J., Humbert, A., Kleiner, T., Lipscomb, W., Meinshausen, M., Ng, E., Perego, M., Price, S. F., Saito, F., Schlegel, N.-J., Sun, S., and van de Wal, R. S. W.: *"Projecting Antarctica's contribution to future sea level rise from basal ice-shelf melt using linear response functions of 16 ice sheet models (LARMIP-2)"*, Earth Syst. Dynam. Discuss., in review (2019). DOI: [10.5194/esd-2019-23](https://doi.org/10.5194/esd-2019-23)
- **Long-term evolution and critical thresholds of the Antarctic Ice Sheet**  
**Garbe, J.:** *"Long-term evolution and critical thresholds of the Antarctic Ice Sheet"*, M.Sc. Thesis, Department of Earth Sciences, University of Hamburg (2017).

- **An overview of explanations for the problem of weak temperature gradients in warm climates in Earth history**

**Garbe, J.:** *"Ein Überblick über Erklärungsversuche für das Problem der flachen Temperaturgradienten in Warmzeiten der Erdgeschichte"*, B.Sc. Thesis, Department of Physics, Humboldt University of Berlin (2013).

## Talks and Conference Presentations

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- **Projecting Antarctica's contribution to future sea level rise from basal ice-shelf melt using linear response functions of 16 ice sheet models (LARMIP-2)**

🕒 April 09, 2019

Poster at EGU General Assembly 2019, Vienna, Austria

- **Hysteresis of the Antarctic Ice Sheet**

🕒 April 09, 2019

Poster at EGU General Assembly 2019, Vienna, Austria

- **Hysteresis Behavior of the Antarctic Ice Sheet**

🕒 November 14, 2018

Talk at Potsdam Institute for Climate Impact Research, Potsdam, Germany

- **Hysteresis behaviour of the Antarctic Ice Sheet with the Parallel Ice Sheet Model**

🕒 April 09, 2018

PICO presentation at EGU General Assembly 2018, Vienna, Austria

- **Tipping of the Antarctic Ice Sheet influenced by Greenland ice loss**

🕒 October 26, 2017

Talk at Potsdam Institute for Climate Impact Research, Potsdam, Germany

## Teaching

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- **Theory of ocean dynamics (Summer 2018)**
- **Ice dynamics in Greenland and Antarctica (Summer 2018)**

