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Mathieu Morlighem

Evans Family Professor, Dartmouth

Education

2008-2011 **Ph.D. in Mechanical Engineering**, *École Centrale Paris*, Châtenay-Malabry, France,
Thesis Title: Ice sheet properties inferred by combining numerical modeling and remote sensing data

2005-2008 **Master's Degree in Engineering**, *École Centrale Paris*, Châtenay-Malabry, France,
Major in Mechanical and Aerospace Engineering (Specialization: Computational Mechanics and Design) with first class honors

2007-2008 **Research Master's Degree in Structural Dynamics and Coupled Systems**, *École Centrale Paris*, France,
Double degree program with honors

2005-2006 **Bachelor of Science in fundamental physics**, *University of Paris*, Orsay, France,
Double degree program at the University of Paris in partnership with École Centrale with honors

2003-2005 **Classes préparatoires (preparatory classes)**, *lycée Sainte Geneviève*, Versailles, France,
Two-year preparation for entrance examinations to the Grandes Ecoles

Professional Experiences

2021 - present **Dartmouth**, *Hanover NH, United States*,
Evans Family Distinguished Professor of Earth Sciences

2020 - 2023 **Victoria University of Wellington**, *Wellington, New Zealand*,
Honorary Research Associate

2018 - 2021 **University of California Irvine**, *Irvine CA, United States*,
Associate Professor, department of Earth System Science

2014 - 2018 **University of California Irvine**, *Irvine CA, United States*,
Assistant Professor, department of Earth System Science

2011 - 2014 **University of California Irvine**, *Irvine CA, United States*,
Project Scientist, department of Earth System Science

2008 - 2011 **NASA Jet Propulsion Laboratory**, *Pasadena CA, United States*,
Research Affiliate, Development of the Ice Sheet System Model, a massively parallel finite element ice sheet model

Research Interests

- Polar climate change
- Ice sheet contribution to sea level rise
- Ice-ocean interactions
- Ice sheet numerical modeling
- Data assimilation and inverse modeling in geosciences
- Finite element method and high-performance computing

Honors and Awards

Apr. 2023 **International Glaciological Society**, *Richardson Medal, Awarded to the ISMIP6 Team for its academic and leadership activities in the design and production of future sea-level projections.*

2022–2023 **Computational Infrastructure for Geodynamics (CIG)**, *Distinguished Speaker*

Nov. 2022 **Research.com**, *Rising Star of Science Award*

May 2020 **UCI Physical Sciences**, *Outstanding Contributions to Undergraduate Education Award*

Jan. 2020 **Guinness World Records**, *Discovery of the deepest point on land underneath Denman Glacier, East Antarctica*

Oct. 2019 **NASA Honor Award**, *Group achievement award (Ice Sheet System Model Team)*, for achievements in the modeling and projection of the evolution of polar ice sheets and corresponding sea-level change

Apr. 2018 **European Geosciences Union Award: Arne Richter Award for Outstanding Early Career Scientists**, for his outstanding research in the field of ice-sheet modelling and his contribution to the dissemination of modelling methods and knowledge in the cryospheric community

Apr. 2015 **International Association of Cryospheric Sciences (IACS) 2015 Early Career Scientist Prize**

Jan. 2015 **NASA Cryospheric Sciences Most Valuable Player for 2014**, for outstanding work improving our knowledge of the Greenland ice sheet and underlying bed

Jul. 2011 **NASA Honor Award**, *Group achievement award (Ice Sheet System Model Team)*, for outstanding accomplishment in the development of the Ice Sheet System Model that models and simulates ice sheet systems flowing and melting in our warming environment

Publications

Peer-reviewed Publications

* denotes advised graduate students and postdocs

180. G. Cheng*, **M. Morlighem**, and G. H. Gudmundsson. Numerical stabilization methods for level-set-based ice front migration. *Geosci. Model Dev.*, 17(16):6227–6247, 2024. [link]

179. **Mathieu Morlighem**, Daniel Goldberg, Jowan M. Barnes, Jeremy N. Bassis, Douglas I. Benn, Anna J. Crawford, G. Hilmar Gudmundsson, and Hélène Seroussi. The West Antarctic Ice Sheet may not be vulnerable to marine ice cliff instability during the 21st century. *Science Advances*, 10(34):eado7794, 2024. [link]

178. A. N. Sommers*, C. R. Meyer, K. Poinar, J. Mejia, **M. Morlighem**, H. Rajaram, K. L. P. Warburton, and W. Chu. Velocity of Greenland's Helheim Glacier Controlled Both by Terminus Effects and Subglacial Hydrology With Distinct Realms of Influence. *Geophys. Res. Lett.*, 51(15):e2024GL109168, 2024. [link]

177. Gong Cheng*, **Mathieu Morlighem**, and Sade Francis. Forward and Inverse Modeling of Ice Sheet Flow Using Physics-Informed Neural Networks: Application to Helheim Glacier, Greenland. *J. Geophys. Res. Machine Learning and Computation*, 1(3):e2024JH000169, 2024. [link]

176. Shivani Ehrenfeucht*, Eric Rignot, and **Mathieu Morlighem**. Seawater Intrusion in the Observed Grounding Zone of Petermann Glacier Causes Extensive Retreat. *Geophys. Res. Lett.*, 51(12):e2023GL107571, 2024. [link]

175. Joseph A. MacGregor, William T. Colgan, Guy J. G. Paxman, Kirsty J. Tinto, Beáta Csathó, Fiona A. Darbyshire, Mark A. Fahnestock, Thomas F. Kokfelt, Emma J. MacKie, **Mathieu Morlighem**, and Olga V. Sergienko. Geologic provinces beneath the greenland ice sheet constrained by geophysical data synthesis. *Geophys. Res. Lett.*, 51(8):e2023GL107357, 2024. [link]

174. I.-W. Park, E. K. Jin, **M. Morlighem**, and K.-K. Lee. Impact of boundary conditions on the modeled thermal regime of the Antarctic ice sheet. *Cryosphere*, 18(3):1139–1155, 2024. [link]

173. E. Y. H. Lippert, **M. Morlighem**, G. Cheng*, and S. A. Khan. Modeling a Century of Change: Kangerlussuaq Glacier's Mass Loss From 1933 to 2021. *Geophys. Res. Lett.*, 51(4):e2023GL106286, 2024. [link]

172. Edward Hanna, Dániel Topál, Jason E. Box, Sammie Buzzard, Frazer D. W. Christie, Christine Hvidberg, **Mathieu Morlighem**, Laura De Santis, Alessandro Silvano, Florence Colleoni, Ingo Sasgen, Alison F. Banwell, Michiel R. van den Broeke, Robert DeConto, Jan De Rydt, Heiko Goelzer, Alexandra Gossart, G. Hilmar Gudmundsson, Katrin

Lindbäck, Bertie Miles, Ruth Mottram, Frank Pattyn, Ronja Reese, Eric Rignot, Aakriti Srivastava, Sainan Sun, Justin Toller, Peter A. Tuckett, and Lizz Ultee. Short- and long-term variability of the Antarctic and Greenland ice sheets. *Nat. Rev. Earth Environ.*, Feb 2024. [link]

171. A. Sandip, L. Räss, and **M. Morlighem**. Graphics-processing-unit-accelerated ice flow solver for unstructured meshes using the Shallow-Shelf Approximation (FastIceFlo v1.0.1). *Geosci. Model Dev.*, 17(2):899–909, 2024. [link]

170. Atefeh Jebeli, Bayu Adhi Tama, Vandana P. Janeja, Nicholas Holschuh, Claire Jensen, **Mathieu Morlighem**, Joseph A. MacGregor, and Mark A. Fahnestock. TSSA: Two-Step Semi-Supervised Annotation for radargrams on the Greenland Ice Sheet. In *IGARSS 2023 - 2023 IEEE INTERNATIONAL GEOSCIENCE AND REMOTE SENSING SYMPOSIUM*, IEEE International Symposium on Geoscience and Remote Sensing IGARSS, pages 56–59, . IEEE; Inst Elect & Elect Engineers, Geoscience & Remote Sensing Soc, 2023. [link]

169. Katherine Yi, Angelina Dewar, Tartela Tabassum, Jason Lu, Ray Chen, Homayra Alam, Omar Faruque, Sikan Li, **Mathieu Morlighem**, and Jianwu Wang. Evaluating Machine Learning and Statistical Models for Greenland Subglacial Bed Topography. In *2023 International Conference on Machine Learning and Applications (ICMLA)*, pages 659–666, 2023. [link]

168. Y. Choi*, H. Seroussi, **M. Morlighem**, N.-J. Schlegel, and A. Gardner. Impact of time-dependent data assimilation on ice flow model initialization and projections: a case study of Kjer Glacier, Greenland. *Cryosphere*, 17(12):5499–5517, 2023. [link]

167. Kristian Svennevig, Matthew J. Owen, Michele Citterio, Tove Nielsen, Salik Rosing, Jan Harff, Rudolf Endler, **Mathieu Morlighem**, and Eric Rignot. Holocene gigascale rock avalanches in Vaigat strait, West Greenland—Implications for geohazard. *Geology*, 12 2023. [link]

166. H. Seroussi, V. Verjans, S. Nowicki, A. J. Payne, H. Goelzer, W. H. Lipscomb, A. Abe-Ouchi, C. Agosta, T. Albrecht, X. Asay-Davis, A. Barthel, R. Calov, R. Cullather, C. Dumas, B. K. Galton-Fenzi, R. Gladstone, N. R. Golledge, J. M. Gregory, R. Greve, T. Hattermann, M. J. Hoffman, A. Humbert, P. Huybrechts, N. C. Jourdain, T. Kleiner, E. Larour, G. R. Leguy, D. P. Lowry, C. M. Little, **M. Morlighem**, F. Pattyn, T. Pelle*, S. F. Price, A. Quiquet, R. Reese, N.-J. Schlegel, A. Shepherd, E. Simon, R. S. Smith, F. Straneo, S. Sun, L. D. Trusel, J. Van Breedam, P. Van Katwyk, R. S. W. van de Wal, R. Winkelmann, C. Zhao, T. Zhang, and T. Zwinger. Insights into the vulnerability of Antarctic glaciers from the ISMIP6 ice sheet model ensemble and associated uncertainty. *Cryosphere*, 17(12):5197–5217, 2023. [link]

165. J. A. Wilner*, **M. Morlighem**, and G. Cheng*. Evaluation of four calving laws for antarctic ice shelves. *Cryosphere*, 17(11):4889–4901, 2023. [link]

164. T. Pelle*, J. S. Greenbaum, C. F. Dow, A. Jenkins, and **M. Morlighem**. Subglacial discharge accelerates future retreat of Denman and Scott Glaciers, East Antarctica. *Science Advances*, 9, 2023. [link]

163. T. D. dos Santos*, **M. Morlighem**, J. C. Simões, and P. R. B. Devloo. Sensitivity analysis of a King George Island outlet glacier, South Shetlands, Antarctica. *Anais da Academia Brasileira de Ciências*, 95:e20210560, 2023. [link]

162. Martim Mas e Braga, Richard S. Jones, Jorge Bernales, Jane Lund Andersen, Ola Fredin, **Mathieu Morlighem**, Alexandria J. Koester, Nathaniel A. Lifton, Jonathan M. Harbor, Yusuke Suganuma, Neil F. Glasser, Irina Rogozhina, and Arjen P. Stroeven. A thicker Antarctic ice stream during the mid-Pliocene warm period. *Nature Commun. Earth Environ.*, 4(1):321, Sep 2023. [link]

161. William Kochtitzky, Luke Copland, Michalea King, Romain Hugonnet, Hester Jiskoot, **Mathieu Morlighem**, Romain Millan, Shfaqat Abbas Khan, and Brice Noël. Closing Greenland's Mass Balance: Frontal Ablation of Every Greenlandic Glacier From 2000 to 2020. *Geophys. Res. Lett.*, 50(17), 2023. [link]

160. A. C. Frémand, P. Fretwell, J. A. Bodart, H. D. Pritchard, A. Aitken, J. L. Bamber, R. Bell, C. Bianchi, R. G. Bingham, D. D. Blankenship, G. Casassa, G. Catania, K. Christianson, H. Conway, H. F. J. Corr, X. Cui, D. Damaske, V. Damm, R. Drews, G. Eagles, O. Eisen, H. Eisermann, F. Ferraccioli, E. Field, R. Forsberg, S. Franke, S. Fujita, Y. Gim, V. Goel, S. P. Gogineni, J. Greenbaum, B. Hills, R. C. A. Hindmarsh, A. O. Hoffman, P. Holmlund, N. Holschuh, J. W. Holt, A. N. Horlings, A. Humbert, R. W. Jacobel, D. Jansen, A. Jenkins, W. Jokat, T. Jordan, E. King, J. Kohler, W. Krabill, M. Kusk Gillespie, K. Langley, J. Lee, G. Leitchenkov, C. Leuschen, B. Luyendyk, J. MacGregor, E. MacKie, K. Matsuoka, **M. Morlighem**, J. Mouginot, F. O. Nitsche, Y. Nogi, et al.. Antarctic bedmap data: Findable, accessible, interoperable, and reusable (fair) sharing of 60 years of ice bed, surface, and thickness data. *Earth Syst. Sci. Data*, 15(7):2695–2710, 2023. [link]

159. Aleah Sommers*, Colin Meyer, **Mathieu Morlighem**, Harihar Rajaram, Kristin Poinar, Winnie Chu, and Jessica Mejia. Subglacial hydrology modeling predicts high winter water pressure and spatially variable transmissivity at Helheim Glacier, Greenland. *J. Glaciol.*, pages 1–13, 2023. [link]

158. G. H. Gudmundsson, J. M. Barnes, D. N. Goldberg, and **M. Morlighem**. Limited Impact of Thwaites Ice Shelf on Future Ice Loss From Antarctica. *Geophys. Res. Lett.*, 50(11), 2023. [link]

157. Hilde Oliver, Donald Slater, Dustin Carroll, Michael Wood, **Mathieu Morlighem**, and Mark J. Hopwood. Greenland Subglacial Discharge as a Driver of Hotspots of Increasing Coastal Chlorophyll Since the Early 2000s. *Geophys. Res. Lett.*, 50(10):e2022GL102689, 2023. [link]

156. Nicole Abib, David A. Sutherland, Jason M. Amundson, Dan Duncan, Emily F. Eidam, Rebecca H. Jackson, Christian Kienholz, **Mathieu Morlighem**, Roman J. Motyka, Jonathan D. Nash, and et al.. Persistent overcut regions dominate the terminus morphology of a rapidly melting tidewater glacier. *Ann. Glaciol.*, pages 1–12, 2023. [link]

155. Indrani Das, **Mathieu Morlighem**, Jowan Barnes, G. Hilmar Gudmundsson, Daniel Goldberg, and Thiago Dias dos Santos*. In the Quest of a Parametric Relation Between Ice Sheet Model Inferred Weertman's Sliding-Law Parameter and Airborne Radar-Derived Basal Reflectivity Underneath Thwaites Glacier, Antarctica. *Geophys. Res. Lett.*, 50(10), 2023. [link]

154. William Kochtitzky, Luke Copland, Wesley Van Wychen, Regine Hock, David R. Rounce, Hester Jiskoot, Ted A. Scambos, **Mathieu Morlighem**, Michalea King, Leo Cha, and et al.. Progress towards globally complete frontal ablation estimates of marine-terminating glaciers. *Ann. Glaciol.*, pages 1–10, 2023. [link]

153. Emily Schwans, Byron R. Parizek, Richard B. Alley, Sridhar Anandakrishnan, and **Mathieu M. Morlighem**. Model Insights into Bed Control on Retreat of Thwaites Glacier, West Antarctica. *J. Glaciol.*, pages 1–19, 2023. [link]

152. Shivani Ehrenfeucht*, **Mathieu Morlighem**, Eric Rignot, Christine F. Dow, and Jeremie Mouginot. Seasonal Acceleration of Petermann Glacier, Greenland, From Changes in Subglacial Hydrology. *Geophys. Res. Lett.*, 50(1):e2022GL098009, 2023. [link]

151. Shfaqat A. Khan, Youngmin Choi*, **Mathieu Morlighem**, Eric Rignot, Veit Helm, Angelika Humbert, Jérémie Mouginot, Romain Millan, Kurt H. Kjær, and Anders A. Bjørk. Extensive inland thinning and speed-up of Northeast Greenland Ice Stream. *Nature*, 611(7937):727–732, Nov 2022. [link]

150. F. Baldacchino*, **M. Morlighem**, N. R. Golledge, H. Horgan, and A. Malyarenko. Sensitivity of the Ross Ice Shelf to environmental and glaciological controls. *Cryosphere*, 16(9):3723–3738, 2022. [link]

149. Jacob Downs, Douglas Brinkerhoff, and **Mathieu Morlighem**. Inferring time-dependent calving dynamics at Helheim Glacier. *J. Glaciol.*, pages 1–16, 2022. [link]

148. J. K. Cuzzone*, N. E. Young, **M. Morlighem**, J. P. Briner, and N.-J. Schlegel. Simulating the Holocene deglaciation across a marine-terminating portion of southwestern Greenland in response to marine and atmospheric forcings. *Cryosphere*, 16(6):2355–2372, 2022. [link]

147. D. A. Slater, D. Carroll, H. Oliver, M. J. Hopwood, F. Straneo, M. Wood, J. K. Willis, and **M. Morlighem**. Characteristic depths, fluxes and timescales for Greenland's tidewater glacier fjords from subglacial discharge-driven upwelling during summer. *Geophys. Res. Lett.*, 49(10), 2022. [link]

146. Boris Dorschel, Laura Hehemann, Sacha Viquerat, Fynn Warnke, Simon Dreutter, Yvonne Schulze Tenberge, Daniela Accettella, Lu An, Felipe Barrios, Evgenia Bazhenova, Jenny Black, Fernando Bohoyo, Craig Davey, Laura De Santis, Carlota Escutia Dotti, Alice C. Fremand, Peter T. Fretwell, Jenny A. Gales, Jinyao Gao, Luca Gasperini, Jamin S. Greenbaum, Jennifer Henderson Jencks, Kelly Hogan, Jong Kuk Hong, Martin Jakobsson, Laura Jensen, Johnathan Kool, Sergei Larin, Robert D. Larter, German Leitchenkov, Benoît Loubrieu, Kevin Mackay, Larry Mayer, Romain Millan, **Mathieu Morlighem**, Francisco Navidad, Frank O. Nitsche, Yoshifumi Nogi, Cécile Pertuisot, Alexandra L. Post, Hamish D. Pritchard, Autun Purser, Michele Rebesco, Eric Rignot, Jason L. Roberts, Marzia Rovere, Ivan Ryzhov, Chiara Sauli, Thierry Schmitt, Alessandro Silvano, Jodie Smith, Helen Snaith, Alex J. Tate, Kirsty Tinto, Philippe Vandenbossche, Pauline Weatherall, Paul Wintersteller, Chunguo Yang, Tao Zhang, and Jan Erik Arndt. The International Bathymetric Chart of the Southern Ocean Version 2. *Nature Sci. Data.*, 9(1):275, Jun 2022. [link]

145. Gong Cheng*, **Mathieu Morlighem**, Jérémie Mouginot, and Daniel Cheng*. Helheim Glacier's Terminus Position Controls Its Seasonal and Inter-Annual Ice Flow Variability. *Geophys. Res. Lett.*, 49(5):e2021GL097085, 2022. [link]

144. Henning Åkesson*, **Mathieu Morlighem**, Johan Nilsson, Christian Stranne, and Martin Jakobsson. Petermann ice shelf may not recover after a future breakup. *Nat. Comm.*, 13(1):2519, May 2022. [link]

143. Y. Fischler, M. Rückamp, C. Bischof, V. Aizinger, **M. Morlighem**, and A. Humbert. A Scalability Study of the Ice-sheet and Sea-level System Model (ISSM, Version 4.18). *Geosci. Model Dev.*, 15(9):3753–3771, 2022. [link]

142. D. Felikson, S. Nowicki, I. Nias, **M. Morlighem**, and H. Seroussi. Seasonal tidewater glacier terminus oscillations bias multi-decadal projections of ice mass change. *J Geophys. Res.*, 127(2):e2021JF006249, 2022. [link]

141. T. Frank, H. Åkesson*, B. de Fleurian, **M. Morlighem**, and K. H. Nisancioglu. Geometric controls of tidewater glacier dynamics. *Cryosphere*, 16(2):581–601, 2022. [link]

140. Romain Millan, Jérémie Mouginot, Antoine Rabatel, and **Mathieu Morlighem**. Ice velocity and thickness of the world's glaciers. *Nat. Geosci.*, Feb 2022. [link]

139. T. D. dos Santos*, **M. Morlighem**, and D. Brinkerhoff. A new vertically integrated, MOno-Layer Higher-Order ice flow model (MOLHO). *Cryosphere*, 16(1):179–195, 2022. [link]

138. **Mathieu Morlighem**, Daniel Goldberg, Thiago Dias dos Santos*, Jane Lee*, and Max Sagebaum. Mapping the Sensitivity of the Amundsen Sea Embayment to Changes in External Forcings Using Automatic Differentiation. *Geophys. Res. Lett.*, 48(23):e2021GL095440, 2021. [link]

137. Julia Christmann, Veit Helm, Shfaqat Abbas Khan, Thomas Kleiner, Ralf Müller, **Mathieu Morlighem**, Niklas Neckel, Martin Rückamp, Daniel Steinhage, Ole Zeising, and Angelika Humbert. Elastic deformation plays a non-negligible role in Greenland's outlet glacier flow. *Nature Commun. Earth Environ.*, 2(1):232, Nov 2021. [link]

136. Thiago Dias dos Santos*, Jowan M. Barnes, Daniel N. Goldberg, G. Hilmar Gudmundsson, and **Mathieu Morlighem**. Drivers of Change of Thwaites Glacier, West Antarctica, Between 1995 and 2015. *Geophys. Res. Lett.*, 48(20), 2021. [link]

135. M. O'Regan, T. M. Cronin, B. Reilly, A. K. O. Alstrup, L. Gemery, A. Golub, L. A. Mayer, **M. Morlighem**, M. Moros, O. L. Munk, J. Nilsson, C. Pearce, H. Detlef, C. Stranne, F. Vermassen, G. West, and M. Jakobsson. The holocene dynamics of ryder glacier and ice tongue in north greenland. *Cryosphere*, 15(8):4073–4097, 2021. [link]

134. T. Pelle*, **M. Morlighem**, Y. Nakayama, and H. Seroussi. Widespread Grounding Line Retreat of Totten Glacier, East Antarctica, Over the 21st Century. *Geophys. Res. Lett.*, 48(17), 2021. [link]

133. Henning Åkesson*, **Mathieu Morlighem**, Matt O'Regan, and Martin Jakobsson. Future Projections of Petermann Glacier Under Ocean Warming Depend Strongly on Friction Law. *J. Geophys. Res. - Earth Surface*, 126(6):e2020JF005921, 2021. [link]

132. Felicity S. McCormack, Jason Roberts, D. Gwyther, **Mathieu Morlighem**, Tyler Pelle*, and Benjamin Galton-Fenzi. The Impact of Variable Ocean Temperatures on Totten Glacier Stability and Discharge. *Geophys. Res. Lett.*, 48(10), 2021. [link]

131. T. D. dos Santos*, **M. Morlighem**, and H. Seroussi. Assessment of numerical schemes for transient, finite-element ice flow models using ISSM v4.18. *Geosci. Model Dev.*, 14(5):2545–2573, 2021. [link]

130. J. M. Barnes, T. D. dos Santos*, D. Goldberg, G. H. Gudmundsson, **M. Morlighem**, and J. De Rydt. The transferability of adjoint inversion products between different ice flow models. *Cryosphere*, 15(4):1975–2000, 2021. [link]

129. T. Payne, S. Nowicki, A. Abe-Ouchi, C. Agosta, P. Alexander, T. Albrecht, X. S. Asay-Davis, A. Barthel, R. Calov, C. Chambers, Y. Choi*, R. Cullather, J. Cuzzone*, C. Dumas, T. Edwards, D. Felikson, X. Fettweis, H. Goelzer, R. Gladstone, N. Golledge, J. Gregory, R. Greve, T. Hatterman, M. Hoffman, A. Humbert, P. Huybrechts, N. C. Jourdain, T. Kleiner, E. Larour, S. Le Clec'h, V. Lee, G. Leguy, W. Lipscomb, C. Little, D. Lowry, **M. Morlighem**, I. Nias, F. Pattyn, T. Pelle*, S. Price, A. Quiquet, R. Reese, M. Rückamp, N. Schlegel, H. Seroussi, A. Shepherd, E. Simon, R. Smith, D. Slater, F. Straneo, S. Sun, L. Tarasov, L. D. Trusel, J. Van Breedam, R. S. W. Van De Wal, M. van den Broeke, R. Winkelmann, C. Zhao, T. Zhang, and T. Zwinger. Future sea level change under coupled model intercomparison project phase 5 and phase 6 scenarios from the Greenland and Antarctic ice sheets. *Geophys. Res. Lett.*, 48, 2021. [link]

128. Christine Indrigo, Christine F. Dow, Jamin S. Greenbaum, and **Mathieu Morlighem**. Drygalski Ice Tongue stability influenced by rift formation and ice morphology. *J. Glaciol.*, 67(262):243–252, 2021. [link]

127. Eric Rignot, Lu An, Nolwenn Chauché, **Mathieu Morlighem**, Seongsu Jeong, Michael Wood, Jeremie Mouginot, Josh K. Willis, Ingo Klaucke, Wilhelm Weinrebe, and Andreas Muenchow. Retreat of Humboldt Gletscher, North Greenland, Driven by Undercutting From a Warmer Ocean. *Geophys. Res. Lett.*, 48(6):e2020GL091342, 2021. e2020GL091342 2020GL091342. [link]

126. Youngmin Choi*, **Mathieu Morlighem**, Eric Rignot, and Michael Wood. Ice dynamics will remain a primary driver of Greenland ice sheet mass loss over the next century. *Nature Commun. Earth Environ.*, 2(1):26, Feb 2021. [link]

125. T. Edwards, S. Nowicki, H. Goelzer, H. Seroussi, B. Marzeion, C. E. Smith, N. C. Jourdain, D. Slater, C. McKenna, E. Simon, A. Abe-Ouchi, J. Gregory, R. Hock, E. Larour, W. Lipscomb, A. Payne, A. Shepherd, C. Agosta, P. Alexander, T. Albrecht, B. Anderson, X. Asay-Davis, A. Aschwanden, A. Barthel, R. Calov, C. Chambers, N. Golledge, R. Greve, T. Hatterman, M. Hoffman, A. Humbert, M. Huss, P. Huybrechts, W. Immerzeel, T. Kleiner, P. Kraaijenbrink, S. Le Clec'h, V. Lee, G. Leguy, C. Little, D. Lowry, J.-H. Malles, F. Maussion, **M. Morlighem**, I. Nias, F. Pattyn, T. Pelle*, S. Price, A. Quiquet, V. Radic, R. Reese, D. Rounce, M. Rückamp, A. Sakai, N. Schlegel, L. D. Trusel, J. Van Breedam, R. S. W. Van De Wal, M. van den Broeke, R. Winkelmann, et al.. Quantifying uncertainties in the land ice contribution to sea level rise this century. *Nature*, 593, 2021. [link]

124. William Colgan, Joseph A. MacGregor, Kenneth D. Mankoff, Ryan Haagenson, Harihar Rajaram, Yasmina M. Martos, **Mathieu Morlighem**, Mark A. Fahnestock, and Kristian K. Kjeldsen. Topographic Correction of Geothermal Heat Flux in Greenland and Antarctica. *J. Geophys. Res.*, 126(2):e2020JF005598, 2021. [link]

123. Daniel Farinotti, Douglas J. Brinkerhoff, Johannes J. Fürst, Prateek Gantayat, Fabien Gillet-Chaulet, Matthias Huss, Paul W. Leclercq, Hansruedi Maurer, **Mathieu Morlighem**, Ankur Pandit, Antoine Rabatel, RAAJ Ramsankaran, Thomas J. Reerink, Ellen Robo*, Emmanuel Rouges, Erik Tamre, Ward J. J. van Pelt, Mauro A. Werder, Mohod Farooq Azam, Huilin Li, and Liss M. Andreassen. Results from the Ice Thickness Models Intercomparison eXperiment Phase 2 (ITMIX2). *Front. Earth Sci.*, 8:484, 2021. [link]

122. Michael Wood, Eric Rignot, Ian Fenty, Lu An, Anders Bjørk, Michiel van den Broeke, Cilan Cai, Emily Kane, Dimitris Menemenlis, Romain Millan, **Mathieu Morlighem**, Jeremie Mouginot, Brice Noël, Bernd Scheuchl, Isabella Velicogna, Josh K. Willis, and Hong Zhang. Ocean forcing drives glacier retreat in Greenland. *Sci. Adv.*, 7(1), 2021. [link]

121. Denis Felikson, Ginny Catania, Timothy C. Bartholomaus, **Mathieu Morlighem**, and Brice P. Y. Noël. Steep glacier bed knickpoints mitigate inland thinning in Greenland. *Geophys. Res. Lett.*, 48(2):e2020GL090112, 2021. [link]

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2. H. Seroussi, **M. Morlighem**, E. Rignot, E. Larour, D. Aubry, H. Ben Dhia, and S. S. Kristensen. Ice flux divergence anomalies on 79north Glacier, Greenland. *Geophys. Res. Lett.*, 38(L09501):1–5, 2011. [link]

1. **M. Morlighem**, E. Rignot, H. Seroussi, E. Larour, H. Ben Dhia, and D. Aubry. Spatial patterns of basal drag inferred using control methods from a full-Stokes and simpler models for Pine Island Glacier, West Antarctica. *Geophys. Res. Lett.*, 37(L14502):1–6, JUL 2010. [link]

Book Chapters

1. **Mathieu Morlighem** and Daniel Goldberg. *Data Assimilation in Glaciology*. Cambridge University Press, June 2023.

Other Publications

12. **Mathieu Morlighem**. Thwaites Glacier won't collapse like dominoes as feared, study finds, but that doesn't mean the 'Doomsday Glacier' is stable. *The Conversation*, 2024. August 21, 2024. [link]

11. AGU Editorial Network. Challenges Facing Scientific Publishing in the Field of Earth & Space Sciences. *AGU Advances*, 5(4):e2024AV001334, 2024. [link]

10. Winnie Chu, Timothy Bartholomaus, Joseph MacGregor, **Mathieu Morlighem**, and Von Walden. Report on the 2023 Future of Greenland ice Sheet Science (FOGSS) Workshop: Unifying Themes, Cross-Cutting Priorities, and Future Directions. Technical report, Arctic Data Center, 2023. [link]

9. **M. Morlighem** and A. Khan. Greenland's Largest Ice Stream Likely to Lose Ice Six Times Faster than Thought. *ARCUS Witness Community Highlights*, 24 March 2023, 2023. [link]

8. Shfaqat A. Khan and **Mathieu Morlighem**. Research Briefings: Deep-inland thinning of the northeast Greenland glacier predicts fast sea-level rise. *Nature*, 2022. [link]

7. K. Matsuoka, R. Forsberg, F. Ferraccioli, G. Moholdt, and **M. Morlighem**. Circling Antarctica to unveil the bed below its icy edge. *Eos*, 103, 2022. [link]

6. Winnie Chu, Timothy Bartholomaus, Joseph MacGregor, **Mathieu Morlighem**, and Von Walden. Future of Greenland Ice Sheet Science (FOGSS) Workshop 2022: Summary report. Technical report, Arctic Data Center, 2022. [link]

5. **Mathieu Morlighem**. Mountain glaciers may hold less ice than previously thought – here's what that means for 2 billion downstream water users and sea level rise. *The Conversation*, 2022. February 7, 2022. [link]
4. Olga Sergienko, **Mathieu Morlighem**, Sophie Nowicki, and Laurence Padman. Modeling: A Powerful and Versatile Tool in Glaciology. *Eos*, 101, Jul 2020. [link]
3. **Mathieu Morlighem**. The secrets hidden under the antarctic ice sheet. The Science Breaker, 2020. [link]
2. **Mathieu Morlighem**. The landscape under Antarctica revealed. Nature Research Sustainability Community, 2020. [link]
1. E. Larour, N. Schlegel, and **M. Morlighem**. Modeling the Evolution of Polar Ice Sheets. *Eos*, 95(45):411, 2014. [link]

Presentations

Dec. 2023 **American Geophysical Union**, *San Francisco, CA*, Transient calibration of the Amundsen sea embayment using twenty years of satellite interferometry and altimetry

Nov. 2023 **Stanford University**, *Palo Alto, CA*, How much and how fast are the ice sheets going to raise sea level?, (invited seminar)

Jul. 2023 **International Union of Geodesy and Geophysics**, *Berlin, Germany*, Transient calibration of the Amundsen sea embayment using twenty years of satellite interferometry and altimetry

Apr. 2023 **SD School of Mines**, *Rapid City, SD*, How much and how fast are the ice sheets going to raise sea level?, (invited seminar)

Mar. 2023 **Virginia Tech**, *Blacksburg, VA* , How much and how fast are the ice sheets going to raise sea level?, (invited seminar)

Mar. 2023 **Appalachian State University**, *Boone, NC*, How much and how fast are the ice sheets going to raise sea level?, (invited seminar)

Dec. 2022 **American Geophysical Union**, *Chicago, IL*, ICESat-2 time series improve the accuracy of subglacial bed topography mapping

Oct. 2022 **NASA ICESat-2 Science Team Meeting**, *Austin, TX*, ICESat-2 time series improve the accuracy of subglacial bed topography mapping

Sep. 2022 **Land-Ice/Ocean Network Exploration with Semiautonomous Systems (LIONESS) project meeting**, *Virtual*, How important is Thwaites Ice Shelf for the future mass loss of the West Antarctic Ice Sheet?, (invited)

Aug. 2022 **International Symposium on Ice, Snow and Water in a Warming World**, *Reykjavík, Iceland*, Investigating the role of Marine Ice Cliff Instability for glacier retreat in the Amundsen Sea Sector over the next century

Jul. 2022 **JuliaCon 2022**, *Virtual*, Universal Differentiation applied to Ice Sheet Modeling dJUICE

Jun. 2022 **Antarctic RINGS, first international workshop**, *Tromsø, Norway*, Combining subglacial bed topography and ocean bathymetry in BedMachine, (invited)

May 2022 **NASA ICESat-2 Science Team Meeting**, *Boulder, CO*, Using ICESat-2 observations to reduce uncertainty in bed mapping and reassess Greenland's vulnerability to ocean warming

Jun. 2022 **University of Grenoble Alpes, Institut des Géosciences de l'Environnement**, *Grenoble, France*, Marine Ice Cliff Instability, Myth or reality?, (invited seminar)

Mar. 2022 **Arctic-Antarctic and North Pacific Mapping Meeting**, *Virtual*, Combining subglacial bed topography and ocean bathymetry in BedMachine, (invited)

Dec. 2021 **American Geophysical Union**, *New Orleans LA, USA*, Investigating the role of Marine Ice Cliff Instability for glacier retreat in the Amundsen Sea Sector over the next century

Dec. 2021 **Scientific Computing Seminar (invited)**, *Technische Universität Kaiserslautern, Germany*, The challenges of modeling the ice sheets in a changing climate

Oct. 2021 **TEDx**, *Vienna, Austria*, The secret landscape buried under the Antarctic ice sheet, (invited)

Sep. 2021 **Interagency Arctic Research Policy Committee (IARPC) - Meeting**, *Virtual*, Using mass conservation to inform ice penetrating radar campaigns, (invited)

Feb. 2021 **NASA Goddard Institute for Space Studies, sea level seminar series**, *Remote seminar*, Can we (yet) predict how fast Greenland is going to melt?, (invited seminar)

Jan. 2021 **IceCube Polar Science Workshop**, *Virtual conference*, BedMachine: mapping the bed under the Antarctic ice sheet by combining sparse radar data and mass conservation, (invited)

Dec. 2020 **American Geophysical Union**, *Virtual conference*, Sensitivity of the Amundsen Sea Embayment to changes in external forcings using Automatic Differentiation

Nov. 2020 **Denman-Scott: Observations, Modeling, and Future Change**, *Virtual conference*, How deep is the bed under Denman Glacier?

Aug. 2020 **Dartmouth, Earth Sciences Geolunch Series Seminar**, *Hanover, NH*, Can we (yet) predict how fast the ice sheets are going to melt?, (invited seminar)

Jan. 2020 **Mathematical Modeling in Glaciology Workshop**, *Banff, Canada*, From optimal control to automatic differentiation: challenges in data assimilation in ice sheet modeling, (invited)

Dec. 2019 **American Geophysical Union**, *San Francisco CA, USA*, Deep glacial troughs and stabilizing ridges hidden beneath the ice around the coast of Antarctica

Jul. 2019 **International Symposia on Antarctic Earth Sciences**, *Incheon, South Korea*, BedMachine Antarctica v1, a new subglacial bed topography and ocean bathymetry dataset of Antarctica, (keynote)

Jul. 2019 **International Union of Geodesy and Geophysics**, *Montreal, Canada*, BedMachine Antarctica v1, a new subglacial bed topography and ocean bathymetry dataset of Antarctica

Jun. 2019 **University of Grenoble Alpes, Institut des Géosciences de l'Environnement**, *Grenoble, France*, To understand how ice sheets respond to climate change, look at the bed..., (invited seminar)

May 2019 **Land-Ice/Ocean Network Exploration with Semiautonomous Systems (LIONESS) project meeting**, *Incheon, South Korea*, Can basal melting under ice shelves be parameterized?

Apr. 2019 **California Institute of Technology Environmental Science and Engineering Seminar Series**, *Pasadena, CA*, To understand how ice sheets respond to climate change, look at the bed..., (invited seminar)

Jan. 2019 **Program for Arctic Regional Climate Assessment**, *University of Maryland MD, USA*, Modeling the response of Northwest Greenlandto enhanced ocean thermal forcing and subglacial discharge

Dec. 2018 **American Geophysical Union**, *Washington DC, USA*, BedMachine Antarctica v1: a new subglacial bed topography and ocean bathymetry dataset of Antarctica combining mass conservation, gravity inversion and streamline diffusion

Dec. 2018 **American Geophysical Union**, *Washington DC, USA*, Modeling the response of Northwest Greenland to enhanced ocean thermal forcing and subglacial discharge, (invited)

Nov. 2018 **The Future of Earth System Modeling: Polar Climates**, *California Institute of Technology, Pasadena CA*, Modeling the Future of the Ice Sheets: Lessons Learned from the Development of ISSM, (invited)

Oct. 2018 **Korea Polar Research Institute (KOPRI)**, *Incheon, South Korea*, Can we (yet) predict how fast Greenland is going to melt?, (invited seminar)

Jul. 2018 **13th World Congress in Computational Mechanics**, *New-York City, NY*, Implementation of higher-order vertical finite elements in ISSM for improved ice sheet flow modeling over paleoclimate timescales, (invited)

May 2018 **Scripps Institution of Oceanography, UC San Diego**, *La Jolla, CA*, Can we (yet) predict how fast Greenland is going to melt?, (invited seminar)

Apr. 2018 **European Geosciences Union**, *Vienna, Austria*, Modeling the response of Northwest Greenland to enhanced ocean thermal forcing and subglacial discharge, (award lecture)

Dec. 2017 **American Geophysical Union**, *New Orleans LA, USA*, Modeling the response of Northwest Greenland to enhanced ocean thermal forcing and subglacial discharge

Sept. 2017 **NSF Workshop: How Stable is the Greenland Ice Sheet?**, *Buffalo, NY*, Modeling the response of Northwest Greenland to enhanced ocean thermal forcing and subglacial discharge

Jun. 2017 **Oceans Melting Greenland science team meeting**, *University of California, Irvine*, BedMachine Greenland v3

Jun. 2017 **IceBridge Land Ice science team meeting**, *University of California, Irvine*, BedMachine Greenland v3, an update

Jan. 2017 **Program for Arctic Regional Climate Assessment**, *Goddard Space Flight Center MD, USA*, Modeling ice front Dynamics of Northwest Greenland in response to ocean thermal forcing using ISSM and OIB/OMG data

Dec. 2016 **American Geophysical Union**, *San Francisco CA, USA*, Modeling ice front Dynamics of Northwest Greenland in response to ocean thermal forcing, using ISSM and OMG data

Sep 2016 **University of Texas, Institute for Geophysics**, *Austin, TX*, The challenge of modeling the ice sheets in a changing climate, (invited seminar)

May 2016 **Institute for Marine and Antarctic Studies**, *Hobart, Tasmania, Australia*, The challenge of modeling the ice sheets in a changing climate, (invited seminar)

Dec. 2015 **American Geophysical Union**, *San Francisco CA, USA*, Modeling ice front Dynamics of Greenland outlet glaciers using ISSM

Dec. 2015 **American Geophysical Union**, *San Francisco CA, USA*, Bed topography under Antarctic outlet glaciers revealed by mass conservation and radar data, (invited)

Jun. 2015 **International Union of Geodesy and Geophysics**, *Prague, Czech Republic*, The present and future challengesof modeling ice sheetsin a changing climate, (invited)

Jun. 2015 **International Union of Geodesy and Geophysics**, *Prague, Czech Republic*, Modeling ice front dynamics of Greenland outlet glaciers using the Ice Sheet System Model

Mar. 2015 **SIAM Conference on Computational Science and Engineering**, *Salt Lake City, USA*, Assessment of Finite Element Schemes for Accurate Modeling of the Grounding Line

Jan. 2015 **IceBridge Land Ice science meeting**, *Goddard Space Flight Center MD, USA*, OIB BedMachine for Greenland and Antarctica, and update

Sept. 2014 **Nansen Environmental and Remote Sensing Center Seminar**, *NERSC, Bergen, Norway*, Modeling ice sheets in a changing climate, (invited)

Jun. 2014 **International Glaciological Society - Symposium on Observations, Modelling and Prediction of the Cryospheric Contribution to Sea Level Change**, *Chamonix, France*, Bed topography under the Greenland ice sheet

Mar. 2014 **Earth System Science Seminar**, *UC Irvine, Irvine, CA, USA*, The challenges of modeling ice sheets in a changing climate, (invited seminar)

Jan. 2014 **IceBridge Land Ice science meeting**, *Goddard Space Flight Center MD, USA*, OIB BedMachine for the Greenland Ice Sheet, (invited)

Dec. 2013 **American Geophysical Union**, *San Francisco CA, USA*, Bed topography under the Greenland outlet glaciers based on mass conservation

Sep. 2013 **International Glaciological Society - Symposium on Radioglaciology**, *Lawrence KS, USA*, Bed topography under Greenland outlet glaciers revealed by Operation IceBridge data

Jun. 2013 **SIAM Conference on Mathematical and Computational Issues in the Geosciences**, *Padua, Italy*, Ice Sheet Properties Inferred by Combining Numerical Modeling and Remote Sensing Data

Mar. 2013 **Dix Seismo Lab Seminar**, *California Institute of Technology, Pasadena CA, USA*, Modeling the Ice Sheets in a changing climate, (invited seminar)

Jan. 2013 **Program for Arctic Regional Climate Assessment**, *Goddard Space Flight Center MD, USA*, Bed topography under Greenland outlet glaciers

Dec. 2012 **American Geophysical Union**, *San Francisco CA, USA*, Bed topography under Greenland outlet glaciers, revealed by Operation IceBridge data

Nov. 2012 **ECCO2 meeting**, *Pasadena CA, USA*, Modeling the response of Pine Island Glacier, West Antarctica, to external forcings for the next 50 years

Mar. 2012 **Radar forum - Jet Propulsion Laboratory**, *Pasadena CA, USA*, Monitoring and Modeling the Ice Sheets in a Changing Climate, (invited seminar)

Feb. 2012 **Community Earth System Model (CESM) - Land Ice Working Group meeting**, *Boulder CO, USA*, The Ice Sheet System Model: an update, (invited)

Dec. 2011 **American Geophysical Union**, *San Francisco CA, USA*, Enhanced inverse method for ice-sheet model calibration technique based on mass conservation, (invited)

Dec. 2011 **American Geophysical Union**, *San Francisco CA, USA*, A mass conservation approach for mapping glacier ice thickness, (invited)

Jul. 2011 **11th US National Congress for Computational Mechanics**, *Minneapolis MN, USA*, Basal drag estimation of Antarctic glaciers using inverse method

Jan. 2011 **Program for Arctic Regional Climate Assessment**, *Goddard Space Flight Center MD, USA*, Jakobshavn balance thickness

Dec. 2010 **American Geophysical Union**, *San Francisco CA, USA*, Constructing high-resolution, consistent and seamless ice thicknesses using a new data assimilation technique based on mass conservation

Dec. 2009 **American Geophysical Union**, *San Francisco CA, USA*, Spatial patterns of basal drag inferred using control methods from three ice flow models for Pine Island Glacier, West Antarctica

Nov. 2009 **ECCO2 meeting**, *Pasadena CA, USA*, Ice Sheet System Model, (invited seminar)

Dec. 2008 **American Geophysical Union**, *San Francisco CA, USA*, Basal drag evolution of Pine Island Glacier in the wake of its retreat

Grants

2022-2026 **NSF - Harnessing the Data Revolution**, *HDR Institute: HARP- Harnessing Data and Model Revolution in the Polar Regions*, (Co-I, Dartmouth: $1,000,000 Award #2118285)

2021-2025 **NSF - Cyberinfrastructure for Sustained Scientific Innovation (CSSI)**, *Collaborative Research: Frameworks: Convergence of Bayesian inverse methods and scientific machine learning in Earth system models through universal differentiable programming*, (Co-I, Dartmouth: $462,000 Award #2147601)

2021-2025 **NSF - ARCSS-Arctic System Science**, *Collaborative Research: GRate – Integrating data and modeling to quantify rates of Greenland Ice Sheet change, Holocene to future*, (Co-I, Dartmouth: $175,000 Award #2105960)

2021-2024 **NASA Research Opportunities in Space and Earth Sciences (ROSES) - Studies With ICESat-2**, *BedMachine v4: Using ICESat-2 observations to reduce uncertainty in bed mapping and reassess Greenland's vulnerability to ocean warming*, (PI, $530,000)

2019-2023 **Heising Simons Foundation**, *Eyes at the Front: numerical modeling of Helheim's ice-ocean-atmosphere interactions*, (PI, $403,000)

2018-2023 **NSF-NERC - International Thwaites Glacier Collaboration**, *International Thwaites Glacier Collaboration: PROcesses, drivers, Prediction: modeling the History and Evolution of Thwaites (PROPHET)*, (PI, $1,157,000 Award #1739031 and Award #2152622)

2015-2019 **NSF - ARCSS-Arctic System Science**, *Collaborative Research: Ice sheet sensitivity in a changing Arctic system - using data and modeling to test the stable Greenland Ice Sheet hypothesis*, (Co-I, $692,000 Award #1504230)

2015-2018 **NASA Jet Propulsion Laboratory**, *Assimilation of Altimetry Data in NE Greenland using ISSM*, (PI, $215,005)

2015-2019 **NSF - Antarctic Glaciology**, *Collaborative Research: Evaluating retreat in the Amundsen Sea Embayment: Assessing controlling processes, uncertainties, and projections*, (Co-I, UCI $117,000 Award #1443229)

2014-2018 **NASA Research Opportunities in Space and Earth Sciences (ROSES) - Cryospheric Science**, *Greenland Bed Mapping using mass conservation, IceBridge and InSAR data*, (PI, $304,000)

2014-2016 **NASA Research Opportunities in Space and Earth Sciences (ROSES) - Sea Level Rise**, *Mass balance and bed topography datasets of ice sheets for sea level studies*, (Co-I, $263,158)

2014-2016 **NASA Operation IceBridge Science Definition Team (ROSES)**, *Coastal land ice dynamics with OIB data*, (co-I, $150,000)

2012-2015 **NASA Research Opportunities in Space and Earth Sciences (ROSES) - IceBridge Research**, *Improved mapping of glacier thickness using IceBridge data combined with radar interferometry data*, (co-I, $330,000)

Teaching

EARS 6.05 **Modeling the Earth System**, Spring 2022, Spring 2023

EARS 88 **The Earth System**, Winter 2022, Winter 2023

EARS 107 **Mathematical Modeling of Earth Processes**, *Graduate course*, Fall 2022

EARS 202	**Critical Analysis in Earth Sciences**, *Graduate course*, Winter 2022
ESS 19	**Introduction to modeling the Earth System**, *General Education*, 2015–2020 (∼80 students enrolled)
ESS 30B	**Environmental Issues Affecting the Sustainability of Societies I**, *(co-taught with 3 other instructors)*, Winter 2018
ESS 30C	**Environmental Issues Affecting the Sustainability of Societies II**, *(co-taught with 3 other instructors)*, Spring 2018
ESS 40C	**Earth System Physics**, Spring 2021 (∼70 students enrolled)
ESS 116	**Introduction to Data Analysis in Earth Science**, 2015–2020 (∼60 students enrolled)
ESS 191	**Introduction to Research in Earth System Science**, *Lecture on "Modeling ice sheets in a changing climate"*, Fall 2014, Spring 2017, Spring 2018
ESS 280	**Cryosphere Topics**, 2014–2020

Professional activities

Since 2019	Editor for Geophysical Research Letters
Since 2008	Co-founder, core developer and user support of the Ice-sheet and Sea-level System Model (ISSM)
Since 2011	Co-organizer of the annual Ice-sheet and Sea-level System Model workshop
Since 2012	Development of NASA's BedMachine Greenland, a high-resolution bed topography dataset of the Greenland ice sheet (first public release in 2014)
Since 2018	Development of BedMachine Antarctica, a high-resolution bed topography dataset of the Antarctic ice sheet (first public release in 2019)
Since 2023	President Elect of the International Association of Cryospheric Sciences
Since 2023	Member of the U.S. National Committee for the International Union of Geodesy and Geophysics
Since 2022	Co-director of the HDR Institute: iHARP - Harnessing Data and Model Revolution in the Polar Regions
Since 2023	Organizer and coordinator of 2025 Kavli Institute For Theoretical Physics (KITP) Program on The Physics of Changing Polar Climate
Since 2022	Organizer and Convener of the Future of Greenland ice Sheet Science (FOGSS) Workshop
Since 2021	Member of the RINGS Action Group of the Scientific Committee on Antarctic Research (Collaborative international effort to map all Antarctic ice-sheet margins)
Since 2020	Member of the INSTANT steering committee of the Scientific Committee on Antarctic Research (The INStabilities & Thresholds in ANTarctica)
Since 2020	Core Member of the Bedmap3 Action group of the Scientific Committee on Antarctic Research
Since 2016	Participating in the Ice Sheet Model Intercomparison for CMIP6 (ISMIP6) project to explore the sea level rise contribution from the Greenland and Antarctic ice sheets
2010 – 2012	Participating in the SeaRISE experiments, which consists of assessing ice sheet contributions to Sea Level through the 21st Century with numerical models
Since 2008	Member of the American Geophysical Union
Since 2016	Member of the European Geosciences Union
Since 2021	Member of the NASA ICESat-2 Science Team
Since 2022	Member of the American Association for the Advancement of Science (AAAS)
Journal review	Science Magazine, Nature, Nature Geoscience, Geophysical Research Letters, Earth and Planetary Science Letters, Journal of Geophysical Research, Frontiers in Geoscience, Journal of Glaciology, Annals of Glaciology, The Cryosphere, Geoscientific Model Development, and Research in Geophysics
Proposal review	NASA Earth and Space Science Fellowship, National Science Foundation, Natural Environment Research Council (UK), Belgian Remote Sensing Research Programme, Icelandic Research Fund

Updated: August 22, 2024