# Anders Damsgaard – CV

## Personal information


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| Current address: | Geophysical Fluid Dynamics Laboratory<br>Program for Atmospheric and Ocean Sciences, Princeton University<br>201 Forrestal Rd, Room 316. Princeton, NJ 08540, USA |
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## Education

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| 2013–2015 | Ph.D.: "Numerical modeling of subglacial sediment deformation", Department of Geoscience, Aarhus University (AU). *Supervisors:* David L. Egholm and Jan A. Piotrowski. Thesis download: https://adamsgaard.dk/ad-thesis.pdf. |
| 2010–2013 | M.Sc. equivalent: Subglacial geology and sedimentology, Department of Geoscience, AU. *Supervisors:* David L. Egholm and Jan A. Piotrowski. |
| 2006–2010 | B.Sc.: Quaternary geology, Department of Geoscience, AU. *Supervisors:* Christian Kronborg and Niels T. Knudsen. |

## Professional experience

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| 2017 | Postdoctoral research associate, Geophysical Fluid Dynamics Laboratory (GFDL), National Oceanographic and Atmosphere Administration (NOAA), Program for Atmospheric and Ocean Sciences, Princeton University, New Jersey, USA. *Supervisors:* Alistair Adcroft and Olga Sergienko. |
| 2016–2017 | Postdoctoral scholar, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, University of California, San Diego, USA. *Supervisor:* Helen A. Fricker. |
| 2015 | Research assistant, Department of Geoscience, AU. "Development of tools for Markov-Chain Monte Carlo inversion of cosmogenic nuclide ages". *Supervisor:* Mads F. Knudsen. |

## Awards, grants, and scholarships

2016 Aarhus University Research Foundation: Award for outstanding Ph.D. research in Science and Technology.

2016 XSEDE Startup Allocation, Principal Investigator: "Grain and fluid dynamics: Governors of glacier flow and earthquake initiation", 48,000 CPU hours on GPU clusters Stampede, Comet and Bridges.

2016 NVIDIA Corporation, hardware grant (Tesla K40).

2016 Community Surface Dynamics Modeling System (CSDMS) Student Modeler Award 2016, University of Colorado Boulder, USA, for innovative model development in the field of earth-surface dynamics.

2015 Cecil H. and Ida M. Green Foundation for Earth Sciences scholarship, 50% of salary for two years.

2015 Department of Geoscience, AU, Annual Geoscience Day, best faculty or student presentation.

## Peer-reviewed publications

J6 **Damsgaard, A.**, J. Suckale, J. A. Piotrowski, M. Houssais, M. R. Siegfried, and H. A. Fricker 2017 "Sediment plasticity controls channelization of subglacial meltwater in soft beds". *Journal of Glaciology* (submitted).

J5 **Damsgaard, A.**, A. Cabrales-Vargas, J. Suckale, and L. Goren 2017 "Grain-scale investigation of grain and melt-water interaction and implications for the dynamics of ice flow over soft sediments". *Poromechanics VI*. https://dx.doi.org/10.1061/9780784480779.024.

J4 **Damsgaard, A.**, D. L. Egholm, L. H. Beem, N. K. Larsen, S. Tulaczyk, J. A. Piotrowski, and M. R. Siegfried 2016 "Ice flow dynamics forced by water pressure variations in subglacial granular beds". *Geophysical Research Letters*, vol. 43. https://dx.doi.org/10.1002/2016GL071579.

J3 **Damsgaard, A.**, D. L. Egholm, J. A. Piotrowski, S. Tulaczyk, N. K. Larsen, and C. F. Brædstrup 2015 "A new methodology to simulate subglacial deformation of water-saturated granular material". *The Cryosphere*, vol. 9, 2183–2200. https://dx.doi.org/10.5194/tc-9-2183-2015.

J2 Brædstrup, C. F., **A. Damsgaard**, and D. L. Egholm 2014 "Ice-sheet modelling accelerated by graphics cards". *Computers & Geosciences*, vol. 72, 210–220. https://dx.doi.org/10.1016/j.cageo.2014.07.019.

J1 **Damsgaard, A.**, D. L. Egholm, J. A. Piotrowski, S. Tulaczyk, N. K. Larsen, and K. Tylmann 2013 "Discrete element modeling of subglacial sediment deformation". *Journal of Geophysical Research: Earth Surface*, vol. 118, 2230–2242. https://dx.doi.org/10.1002/2013JF002830.

## Conference presentations

C20 **A. Damsgaard**, J. Suckale, J. A. Piotrowski, M. Houssais, M. R. Siegfried, and H. A. Fricker "Subglacial channelized drainage on soft beds and implications for grounding-line dynamics" (invited). Geological Society of Ameria Annual Meeting, 2017, Seattle, WA, USA.

C19 I. Kasmalkar, **A. Damsgaard**, A. Cabrales-Vargas, J. Suckale, and L. Goren "Grain-scale investigation of grain and melt-water interaction and implications for the dynamics of ice flow over soft sediments". 6th Biot Conference on Poromechanics 2017, Paris, France.

C18 **A. Damsgaard**, D. L. Egholm, S. Tulaczyk, J. A. Piotrowski, N. K. Larsen, M. R. Siegfried, L. H. Beem, and J. Suckale "Subglacial sediment mechanics investigated by computer simulation of granular material" (invited). American Geophysical Union Fall Meeting 2016, San Francisco, CA, USA.

C17 D. Li, J. Suckale, A. Cabrales, and **A. Damsgaard** "Till dynamics underneath ice streams with a nonlocal dense granular flow model". American Geophysical Union Fall Meeting 2016, San Francisco, CA, USA.

C16 J. Suckale, C. W. Elsworth, **A. Damsgaard**, L. Goren, A. Cabrales, D. Li, I. Kasmalkar, and S. Maldonado "Taking advantage of the predictive potential of process-based models for ice exploration" (invited). American Geophysical Union Fall Meeting 2016, San Francisco, CA, USA.

C15 A. Cabrales-Vargas, J. Suckale, **A. Damsgaard**, and L. Goren "Spatially variable till deformation and water transport in ice-stream shear margins from numerical simulations". American Geophysical Union Fall Meeting 2016, San Francisco, CA, USA.

C14 **A. Damsgaard**, D. L. Egholm, L. H. Beem, S. Tulaczyk, N. K. Larsen, J. A. Piotrowski, and M. R. Siegfried "Creep and stick-slip in subglacial granular beds forced by variations in water pressure". West Antarctic Ice Sheet Workshop 2016, VA, USA.

C13 **A. Damsgaard**, D. L. Egholm, L. H. Beem, S. Tulaczyk, N. K. Larsen, J. A. Piotrowski, and M. R. Siegfried "Creep and stick-slip in subglacial granular beds forced by ocean tides". International Glaciological Society, International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean, 2016, La Jolla, CA, USA.

C12 **A. Damsgaard**, D. L. Egholm, L. H. Beem, S. Tulaczyk, N. K. Larsen, J. A. Piotrowski, and M. R. Siegfried "Grain-scale numerical modeling of granular mechanics and fluid dynamics and application in a glacial context" (invited). Keynote speaker at Community Surface Dynamics Modeling System (CSDMS) Annual Meeting, 2016, Boulder, CO, USA.

C11 **A. Damsgaard**, D. L. Egholm, J. A. Piotrowski, S. Tulaczyk, and N. K. Larsen "Oscillations in till strength due to particle-fluid feedbacks". International Union for Quaternary Research Congress, 2015, Nagoya, Japan.

C10 **A. Damsgaard**, D. L. Egholm, J. A. Piotrowski, S. Tulaczyk, N. K. Larsen, and C. F. Brædstrup "Numerical modeling of particle-fluid mixtures in a subglacial setting". American Geophysical Union Fall Meeting 2014, San Francisco, CA, USA.

C9 J. A. Piotrowski, K. Tylmann, W. Narloch, W. Wysota, **A. Damsgaard**, D. L. Egholm, N. K. Larsen, and J. Lesemann. "A soft-bed system under the Scandinavian Ice Sheet : Mosaic of stable and deforming spots". Abstract from 31st Nordic Geological Winter Meeting 2014, Lund, Sweden.

C8 C. F. Brædstrup, D. L. Egholm, S. V. Ugelvig, **A. Damsgaard**, and J. L. Andersen "Feedbacks between subglacial dynamics and long-term glacial landscape evolution". American Geophysical Union Fall Meeting 2013, San Francisco, CA, USA.

C7 **A. Damsgaard**, D. L. Egholm, J. A. Piotrowski, S. Tulaczyk, and N. K. Larsen "Discrete element modeling of subglacial sediment deformation". American Geophysical Union Fall Meeting 2013, San Francisco, CA, USA.

C6 **A. Damsgaard**, D. L. Egholm, J. A. Piotrowski, S. Tulaczyk, and N. K. Larsen "Numerical modelling of granular subglacial deformation using the discrete element method". Geophysical Research Abstracts. 15, EGU2013–4026.

C5 J. A. Piotrowski, K. Tylmann, W. Narloch, W. Wysota, **A. Damsgaard**, D. L. Egholm, N. K. Larsen, and J. Lesemann "Subglacial mosaic of stable and deforming spots under the Scandinavian Ice Sheet: field, laboratory and numerical data". Canadian Quaternary Association biannual meeting, August 2013, Edmonton, Canada.

C4 **A. D. Christensen**, D. L. Egholm, J. A. Piotrowski, and S. Tulaczyk "Discrete element modelling of subglacial sediment deformation". Geophysical Research Abstracts. 14, EGU2012–2931.

C3 O. R. Clausen, D. L. Egholm, R. Wesenberg, and **A. D. Christensen** "Salt movements and faulting of the overburden — can numerical modeling predict the fault patterns above salt structures?" EGU2012–1615.

C2 **A. D. Christensen**, D. L. Egholm, and J. A. Piotrowski "Numerical modelling of sediment deformation by glacial stress". International Union for Quaternary Research Congress 2011, Bern, Switzerland.

C1 **A. D. Christensen**, D. L. Egholm, and J. A. Piotrowski "Numerical modelling of subglacial sediment deformation". Geophysical Research Abstracts. 13, EGU2011–7829.

## Other activities and skills

EGU, AGU and IGS Member. Proficient programmer in C, C++, Python, CUDA C, Octave/Matlab, and POSIX operating system environments. Designed, constructed, and maintained a 192 CPU-core GPU cluster, AU. Experienced operator of unmanned aerial vehicles for photogrammetric reconstruction. Experienced with fieldwork and laboratory sedimentological analyses. Technical reviewer for "Getting Started with Tmux", Packt Publishing 2014. Reviewer for the *National Science Foundation*, *Journal of Glaciology*, *Quaternary Science Reviews*, and *Journal of Geophysical Research*.