Anders Damsgaard

Email:	anders@andersdamsgaard.dk
Web:	https://andersdamsgaard.dk
ORCID:	https://orcid.org/0000-0002-9284-1709
Scopus:	https://www.scopus.com/authid/detail.uri?authorId=6602269102
Web of Science:	https://www.webofscience.com/wos/author/record/ABA-3996-2021

PROFESSIONAL EXPERIENCE

2025–Present **Geological Survey of Denmark and Greenland (GEUS)**
Senior Researcher in Quaternary Geology and 3D Modeling, Department of Near Surface Land and Marine Geology

- Quaternary processes and sedimentary environments
- Geological and hydrostratigraphical 3D modeling
- Ice-marginal sedimentation and glaciotectonics
- Methods development in remote sensing and geospatial data

2023–2025 **Geo**
Senior Specialist, Geodata, Aarhus

- Geological 3D modeling using geological, geotechnical, and geophysical field surveys and databases
- Software architecture and engineering: Microservice design, orchestration and monitoring
- Key technologies: Linux, Pub/sub via MQTT, containerization, Go, Python, Grafana, PostgreSQL, TimescaleDB, Redis, InfluxDB
- Automated processing of geophysical data (C, OpenMP, HPC Linux)
- InSAR analysis

2023–2025 **Aarhus University**
External lecturer
Department of Geoscience
B.Sc. course: Quaternary Geology (10 ECTS)

2020–2023 **Aarhus University**
Assistant Professor (tenure track) and Postdoc
Department of Geoscience

- High-performance computing (Linux, Nvidia CUDA)
- System administration, data analysis, scientific reporting
- Computational modeling of tunnel valley formation from sediment mechanics and groundwater flow
- Modeling of water flow

Courses: Quaternary Geology (10 ECTS), Greenland Field Course (5 ECTS)

2019–2020 **Stanford University**
Independent Consultant
Department of Geophysics

- Glacial sediment advection modeling
- Development of continuum methods for multi-phase granular flows
- High-performance computing (C, MPI/OpenMP, shell, UNIX)

– Continuum and discrete modeling of ice-water-sediment systems

Supervisor: Jenny Suckale

2018–2019 **Danish Environmental Protection Agency**
Academic Technician
Ministry of Environment of Denmark

– Automated quality control of geological, hydrological, and geochemical data
– Management and development of geospatial databases using PostgreSQL/PostGIS
– Development of Python plugins for QGIS

2017–2018 **Princeton University**
Postdoctoral Research Associate
Program in Atmospheric and Oceanic Sciences
Andlinger Center for Energy and the Environment
Geophysical Fluid Dynamics Laboratory (GFDL)
National Oceanographic and Atmosphere Administration (NOAA)

– Design of granular-mechanics methods for simulating sea-ice mechanics
– Python, Julia, and Fortran HPC software development

Supervisors: Alistair Adcroft and Olga Sergienko

2016–17 **Scripps Institution of Oceanography**
Green's Foundation Postdoctoral Scholar
Institute of Geophysics and Planetary Physics
University of California, San Diego

– Scientific software development
– Modeling hydrology and mechanics under the West Antarctic Ice Sheet
– Remote sensing data analysis
– Rate and state friction in discrete-element models

Supervisor: Helen A. Fricker

2015 **Aarhus University**
Research assistant
Department of Geoscience

– Markov-Chain Monte Carlo inversion of cosmogenic nuclide ages
– Linux automation, job scheduling, frontend and backend development

Supervisor: Mads F. Knudsen

EDUCATION

2013–15 **Aarhus University: Ph.D.**
Department of Geoscience. Courses in computer graphics and high-performance computing at Department of Computer Science.
Ph.D. thesis title: *"Numerical modeling of subglacial sediment deformation"*
Ph.D. project of the year within the Faculty and Science and Technology 2015.
Supervisors: David L. Egholm and Jan A. Piotrowski.
Thesis download: `https://andersdamsgaard.dk/pub/ad-phd-thesis.pdf`

2010–13 **Aarhus University: M.Sc.**, Department of Geoscience.

2006–10 **Aarhus University: B.Sc.**, Department of Geoscience.

AWARDS, GRANTS, AND SCHOLARSHIPS

2022–2025 Bundesgesellschaft für Endlagerung, Germany:
"Dynamical modelling of subglacial meltwater erosion during past and future glaciations".
A. Damsgaard, J. A. Piotrowski (AU), J. Winsemann (Leibniz University Hannover, LUH).
Funding for one two-year postdoc at AU, and one two-year postdoc at LUH. EUR 547.835.

2020 European Union/European Commission, Horizon 2020:
Marie Skłodowska-Curie Actions Individual Fellowship
H2020-MSCA-IF-2019, 24 months, EUR 207,000.
Project: *NEMOSID: NExt-generation MOdeling of Sedimentary Ice-sheet Dynamics*

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.

PUBLICATIONS (H-INDEX 10)

[14] Pedersen, L. L., K. Svennevig, C. Morino, A. S. Søndergaard, C. Pearce, L. F. Pérez, **A. Damsgaard**, J. Olsen, M. F. Knudsen, A. Noblet, N. K. Larsen, "A giant Early Holocene tsunamigenic rock-ice avalanche in South Greenland preconditioned by glacial thinning". *Geomorphology*, vol 492. https://doi.org/10.1016/j.geomorph.2025.110057. ISI WoS article.

[13] Svendsen, M. W., S. M. Kristiansen, V. K. Pedersen and **A. Damsgaard** 2024 "Mit livs dessert: 100-års jubilæet for Ellen Louise Mertz' studie af niveauforandringer i Danmark" (en: "The dessert of my life: the 100-year anniversary of Ellen Louise Mertz' studies of elevation changes in Denmark"). *Geologisk Tidsskrift*. https://2dgf.dk/publikationer/geologisk-tidsskrift/geologisk-tidsskrift-2024/#7

[12] Andersen, J. D., L. Bødker, J. Dolby, **A. Damsgaard**, and N. Okkels 2024 "Foundation on organic diatomite". *Proceedings of the 19th Nordic Geotechnical Meeting*.

[11] Kasmalkar, I., **A. Damsgaard**, L. Goren, and J. Suckale 2022 "Shear variation at the ice-till interface changes the spatial distribution of till porosity and meltwater drainage". *Journal of Geophysical Research: Earth Surface*. https://doi.org/10.1029/2021JF006460. ISI WoS article.

[10] **Damsgaard, A.**, O. Sergienko, and A. Adcroft 2021 "The effects of ice floe-floe interactions on pressure ridging in sea ice". *Journal of Advances in Modeling Earth Systems*, vol. 13. https://doi.org/10.1029/2020MS002336. ISI WoS article.

[9] **Damsgaard, A.**, L. Goren, and J. Suckale 2020 "Water pressure fluctuations control variability in sediment flux and slip dynamics beneath glaciers and ice streams". *Communications Earth & Environment*, vol. 1(66). https://doi.org/10.1038/s43247-020-00074-7. ISI WoS article.

[8] **Damsgaard, A.**, A. Adcroft, and O. Sergienko 2018 "Application of discrete-element methods to approximate sea-ice dynamics". *Journal of Advances in Modeling Earth Systems*, vol. 10, 2228–2244. https://doi.org/10.1029/2018MS001299. ISI WoS article.

[7] Bateman, M. D., D. A. Swift, J. A. Piotrowski, E. J. Rhodes, **Damsgaard, A.** 2018 "Can glacial shearing of sediment reset the signal used for luminescence dating?". *Geomorphology*, vol. 306, 90–101. https://doi.org/10.1016/j.geomorph.2018.01.017. ISI WoS article.

[6] **Damsgaard, A.**, J. Suckale, J. A. Piotrowski, M. Houssais, M. R. Siegfried, and H. A. Fricker 2017 "Sediment behavior controls equilibrium width of subglacial channels". *Journal of Glaciology*, vol. 63, 1034–1048. https://doi.org/10.1017/jog.2017.71. ISI WoS article.

[5] **Damsgaard, A.**, A. Cabrales-Vargas, J. Suckale, and L. Goren 2017 "The coupled dynamics of meltwater percolation and granular deformation in the sediment layer underlying parts of the big ice sheets". *Poromechanics VI*. https://doi.org/10.1061/9780784480779.024. ISI WoS proceedings.

[4] **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, 12 165–12 173. https://doi.org/10.1002/2016GL071579. ISI WoS article.

[3] **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://doi.org/10.5194/tc-9-2183-2015. ISI WoS article.

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

[1] **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://doi.org/10.1002/2013JF002830. ISI WoS article.

PRESENTATIONS

Invited talks

[13] **Damsgaard, A.**, D. Hansen, and L. Zoet "Subglacial landforms from variations in modeled sediment flux". Geological Society of America Annual Meeting 2022, Session EP015 - Landscape evolution beneath and beyond the ice, Chicago, IL, USA.

[12] **Damsgaard, A.** "Coupled modeling of ice, subglacial sediment, and glacier hydrology". 8th European Seminar on Computing (ESCO) June 2022, Pilsen, Czech Republic.

[11] **Damsgaard, A.** "Sediment transport in an ice flow model: Implications for marine-terminating ice sheets". European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), June 2022, Oslo, Norway.

[10] **Damsgaard, A.** "Glacial reshaping of the Earth Surface: From geological observations to modeling". University of Oxford Mathematical Geosciences seminar, 2022-03-11

[9] **Damsgaard, A.** "Interactions between ice and till: From geological observations to modeling" ETH Zürich, VAW Glaciology seminar, 2022-03-03

[8] **Damsgaard, A.**, J. A. Piotrowski, I. Madden, J. Suckale, and K. K. Sørensen "Approaches to modeling subglacial till deformation". Maths on Ice seminar, 2022-01-10

[7] **Damsgaard, A.**, O. Sergienko, and A. Adcroft "Sea-ice ridging in discrete element models". European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), June 2021, Valencia, Spain.

[6] **Damsgaard, A.**, J. Suckale, and L. Goren "The role of granular mechanics and porous flow for ice sheet behavior in a changing climate". 7th European Seminar on Computing (ESCO) 2020, Pilsen, Czech Republic.

[5] **Damsgaard, A.**, 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". Geological Society of America Annual Meeting 2017, Seattle, WA, USA.

[4] **Damsgaard, A.**, D. L. Egholm, J. Suckale, J. A. Piotrowski, M. Houssais, M. R. Siegfried, and H. A. Fricker "Grain-scale numerical modeling of granular mechanics and fluid dynamics". Week's lecturer at University of Wisconsin Madison, Department of Geoscience, November 2017.

[3] **Damsgaard, A.**, 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". American Geophysical Union Fall Meeting 2016, San Francisco, CA, USA.

[2] **Damsgaard, A.**, D. L. Egholm, S. Tulaczyk, N. K. Larsen, J. A. Piotrowski, M. R. Siegfried, L. H. Beem, J. Suckale, and L. Goren "Grain-scale numerical modeling of granular mechanics and fluid dynamics". Stanford University, Department of Geoscience, July 2016.

[1] **Damsgaard, A.**, 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". Keynote speaker at Community Surface Dynamics Modeling System (CSDMS) Annual Meeting, March 2016, Boulder, CO, USA.

Oral presentations

[29] Fälber, R., G. Jungdal-Olesen, V. K. Pedersen, **A. Damsgaard**, J. A. Piotrowski, C. Brandes, and J. Winsemann "Construction of hydrostratigraphic subsurface models of the Northwest German Basin: input for numerical simulation of subglacial erosion during past and future glaciations". European Geosciences Union, General Assembly 2025, Vienna, Austria, EGU25–1788.

[28] Jung, S., M. A. Weder, **A. Damsgaard**, and D. Farinotti "A parameterization for the closure rate of canals incised in subglacial till". European Geosciences Union, General Assembly 2024, Vienna, Austria, EGU24–2035.

[27] Jundgal-Olesen, G., J. A. Piotrowski, V. K. Pedersen, **A. Damsgaard**, R. Fälber, and J. Winsemann "Modelling tunnel valley erosion in northern Germany for the first ice-sheet advance (Elsterian, MIS 12)—a conceptual model and preliminary results". DEUQUA, Austria, Salzburg, 2024.

[26] Piotrowski, J. A., P. Hermanowski, G. Jungdal-Olesen, V. K. Pedersen, **A. Damsgaard**, R. Fälber, and J. Winsemann "Response of till to subglacial shear stress simulated in ring-shear experiments derived from X-ray computed microtomography". DEUQUA, Austria, Salzburg, 2024.

[25] I. Madden, **A. Damsgaard**, D. Hansen, L. Zoet, J. Suckale "Predicting maximal shear-layer thicknesses in subglacial till with adapted friction laws". American Geophysical Union Fall Meeting 2023, EP24B-08, USA.

[24] **Damsgaard, A.**, D. Hansen, and L. Zoet "Subglacial landforms from variations in modeled sediment flux". American Geophysical Union Fall Meeting 2022, EP33C-02, USA.

[23] **Damsgaard, A.**, J. A. Piotrowski, I. Madden, J. Suckale, K. K. Sørensen "Process-based modeling of glacial till advection". American Geophysical Union Fall Meeting 2021, New Orleans, LA, USA.

[22] **Damsgaard, A.**, O. Sergienko, and A. Adcroft "Floe-scale ridging in discrete element models for sea ice". Workshop: Modeling the Granular Nature of Sea Ice, 2021, Online, WA, USA.

[21] Suckale, J., I. Kasmalkar, **A. Damsgaard**, E. Mantelli, A. Cabrales-Vargas, D. Li, L. Goren, and C. Elsworth "Progress on understanding the subglacial hydrology over till beds with ramifications for ice dynamics and sediment transport". International Glaciological Society Meeting on Glacial Erosion and Sedimentation 2019, Madison, WI, USA.

[20] Piotrowski, J. A., M. B. Holdensen, **A. Damsgaard**, W. Narloch, S. Carr, and N. K. Larsen "The ice/bed interface in past ice sheets constrained by field, experimental and numerical studies". International Glaciological Society Meeting on Glacial Erosion and Sedimentation 2019, Madison, WI, USA.

[19] **Damsgaard, A.**, J. Suckale (presenting author), and L. Goren "A new continuum model for till consistent with granular mechanics". American Geophysical Union Fall Meeting 2019, San Francisco, CA, USA.

[18] I. Kasmalkar, **Damsgaard, A.**, L. Goren, J. Suckale, and A. Cabrales-Vargas "Subglacial sediment beds resist fast ice flow by facilitating meltwater drainage". American Geophysical Union Fall Meeting 2019, San Francisco, CA, USA.

[17] **Damsgaard, A.**, J. Suckale, D. Li, I. Kasmalkar, J. Amundson, L. Goren, A. Cabrales-Vargas "A new continuum model for subglacial till based on granular rheology". International Glaciological Society Meeting on Glacial Erosion and Sedimentation 2019, Madison, WI, USA.

[16] **Damsgaard, A.**, O. Sergienko, and A. Adcroft "Lagrangian methods for modeling compressive failure in sea ice across scales". American Geophysical Union Fall Meeting 2018, Washington, D.C., USA.

[15] Suckale, J., C. Wheeler Elsworth, I. Kasmalkar, E. Mantelli, **A. Damsgaard**, J. D. Platt, T. Perol, J. R. Rice, and L. Goren "The surface as a window into the subsurface: Lessons from Antarctica". American Geophysical Union Fall Meeting 2018, Washington, D.C., USA.

[14] Suckale, J., C. Wheeler Elsworth, E. Mantelli, I. Kasmalkar, **A. Damsgaard**, J. D. Platt, T. Perol, J. R. Rice, and L. Goren "Process-based models for ice-stream shear margins". American Geophysical Union Fall Meeting 2018, Washington, D.C., USA.

[13] Piotrowski, J. A., M. B. Holdensen, W. Narloch, S. Carr, and **A. Damsgaard** "Laboratory experiments on till deformation: constraining the subglacial processes". CANQUA/AMQUA, Ottawa, Canada.

[12] Piotrowski, J. A. M. B. Holdensen, W. Narloch, S. Carr, **A. Damsgaard**, N. K. Larsen "Subglacial till deformation constrained by laboratory experiments". European Geosciences Union, General Assembly 2018, Vienna, Austria, EGU2018–8662.

[11] Piotrowski, J. A. M. Bering Holdensen, W. Narloch, **A. Damsgaard**, N. K. Larsen "Subglacial till deformation: Lessons from laboratory experiments". Nordic Geological Winter Meeting 2018, Copenhagen, Denmark.

[10] **Damsgaard, A.**, A. Adcroft, O. Sergienko, and A. Stern "Discrete-element simulation of sea-ice mechanics: Contact mechanics and granular jamming". American Geophysical Union Fall Meeting 2017, New Orleans, LA, USA.

[9] Kasmalkar, I., **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.

[8] Suckale, J., 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". American Geophysical Union Fall Meeting 2016, San Francisco, CA, USA.

[7] **Damsgaard, A.**, 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.

[6] **Damsgaard, A.**, 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.

[5] **Damsgaard, A.**, 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.

[4] Piotrowski, J. A., 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.

[3] **Damsgaard, A.**, 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.

[2] Brædstrup, C. F., 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.

[1] Piotrowski, J. A., 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.

Poster presentations

[9] Kasmalkar, I., **A. Damsgaard**, L. Goren, J. Suckale, and A. Cabrales-Vargas "Subglacial Channelization Through Till Deformation and Failure at the Shear Margin". American Geophysical Union Fall Meeting 2018, Washington, D.C., USA.

[8] Li, D., 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.

[7] Cabrales-Vargas, A., 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.

[6] **Damsgaard, A.**, 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.

[5] **Damsgaard, A.**, D. L. Egholm, J. A. Piotrowski, S. Tulaczyk, and N. K. Larsen "Numerical modelling of granular subglacial deformation using the discrete element method". European Geosciences Union, General Assembly 2013, Vienna, Austria, EGU2013–4026.

[4] **Christensen, A. D.**, D. L. Egholm, J. A. Piotrowski, and S. Tulaczyk "Discrete element modelling of subglacial sediment deformation". European Geosciences Union, General Assembly 2012, Vienna, Austria, EGU2012–2931.

[3] Clausen, O. R., D. L. Egholm, R. Wesenberg, and **A. D. Christensen** (presenting author) "Salt movements and faulting of the overburden — can numerical modeling predict the fault patterns above salt structures". European Geosciences Union, General Assembly 2012, Vienna, Austria, EGU2012–1615.

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

[1] **Christensen, A. D.**, D. L. Egholm, and J. A. Piotrowski "Numerical modelling of subglacial sediment deformation". European Geosciences Union, General Assembly 2011, Vienna, Austria, EGU2011–7829.

PROFESSIONAL AFFILIATIONS

- Member, Danish Geotechnical Society (2022–present)
- Board Member, Geological Society of Denmark (2021–2023)
- Member, Geological Society of Denmark (2023–present)
- Member, American Geophysical Union (2013–present)
- Member, Geological Society of America (2017–present)
- Member, International Glaciological Society (2015–present)
- Member, European Geosciences Union (2011–present)
- Member, CICE Consortium (2017–2019)

SELECT ACTIVITIES IN PROGRAMMING AND HIGH-PERFORMANCE COMPUTING

For a full list of public projects, please see my Git repository at `https://src.andersdamsgaard.dk`.

- Proficient programmer in C, C++, OpenMP, MPI, Python, CUDA C, MATLAB, Julia, HTML, CSS, Javascript, Go, PostgreSQL, sh/sed/awk, LaTeX, and Linux/Unix operating system environments.
- Creator of **sphere**, a three-dimensional discrete element method algorithm with optional fluid coupling. Written in CUDA C, C++, and Python for GPU-based simulation of grain and fluid dynamics. Uses Doxygen software reference documentation and unit testing. Free and open-source licensed. `https://src.andersdamsgaard.dk/sphere`

- Creator of **Granular.jl**, a two-dimensional discrete element method algorithm for sea-ice simulation with coupling to NOAA ocean and atmosphere models. Written in Julia. Uses Travis-CI automated testing and is fully documented at https://anders-dc.github.io/Granular.jl/latest/. Free and open-source licensed. https://src.andersdamsgaard.dk/Granular.jl
- Creator of **cosmo.au.dk**, a webpage for inversion of cosmogenic nuclide concentrations. Consists of a responsive front end using HTML and Angular and JQuery Javascript libraries, backed by PHP for queuing and MATLAB for numerical inversion. The service is running on a Ubuntu GNU/Linux virtual machine. https://cosmo.au.dk
- Creator of **lbm-d3q19**, a three-dimensional lattice-Boltzmann solver for incompressible Navier-Stokes fluid flow. Written in C with OpenMP parallelization. Free and open-source licensed. https://src.andersdamsgaard.dk/lbm-d3q19
- Designed, constructed, and maintained a Dell/NVIDIA 192 CPU-core GPU cluster, Aarhus University. Debian GNU/Linux and Torque/MAUI resource management and scheduling.
- Technical reviewer for "Getting Started with Tmux", Packt Publishing 2014. Tmux is a software application for terminal multiplexing, useful for dealing with multiple programs from a command-line interface.
- Contributor to **Icepack** and **CICE**, numerical codes for sea-ice column physics and dynamics. Written in Fortran. https://github.com/CICE-Consortium
  Craig, T., E. Hunke, A. DuVivier, A. Dabail, **A. Damsgaard**, J. F. Lemieux, P. Blain, M. Turner, Mhrib, T. Rasmussen, N. Jeffery "CICE-Consortium: CICE version 6.0.0, Icepack version 1.1.0". https://doi.org/10.5281/zenodo.1900639
- Creator or the **scholarref** toolset for automated LaTeX reference management. Written in POSIX shell. Free and open-source licensed. https://andersdamsgaard.dk/scholarref.html
- Developer of QGIS plugins and experienced GeoScene3D user.

SERVICE TO THE FIELD

Reviewer for the following agencies and academic journals:

- National Science Foundation
- Nature Geoscience
- Communications Earth & Environment
- Journal of Glaciology
- Quaternary Science Reviews
- The Cryosphere
- Journal of Geophysical Research
- Ocean Modelling
- Boreas
- Earth Surface Processes and Landforms
- Journal of Advances Modeling Earth Systems
- E&G Quaternary Science Journal

TEACHING

- Lecturer, The Geology of Denmark. 5 ECTS, mandatory B.Sc. course. Lectures, hands-on exercises, field excursions. Aarhus University, spring semester 2020 and 2021.
- Lecturer, Equinor Field Course on Glacial Geology. Geo and GEUS, 2023–2024.
- Lecturer, Quaternary Geology, 10 ECTS, mandatory B.Sc. course. Lectures, laboratory exercises, field excursion. Aarhus University, 2020–2025.

- Advanced Water Cycle Management Ph.D. Course, Aarhus University. Lecture on "The geological settings in Denmark and their impact on the groundwater system", August 2021 and 2022.
- Completed the Aarhus University Teacher Training Program on pedagogy and learning design, providing a theoretical and practical basis for delivering excellence in university teaching. Spring 2021.
- Lecturer, workshop on granular modeling using the discrete element method. University of Wisconsin-Madison, Department of Geoscience, November 2017.
- Guest teacher in SIO 209 "Palaeoclimate seminar", Scripps Institution of Oceanography. Gave class on subglacial friction and ice sheet stability. April 2016.
- Guest teacher in SIO 115 "Ice in the Climate System", Scripps Institution of Oceanography. Gave class on glacier dynamics and subglacial mechanics and hydrology. March 2016.

SUPERVISION

- 2023: 7 B.Sc. students, Department of Geoscience, Aarhus University: Adam Petterson, Ahadi Ruganiza, Anders Sørensen, Frederick Hornung, Gitte Bertelsen, Lærke Ditlevsen, Lisbeth Pedersen.
- 2022: Morten Jessen: M.Sc. student, Department of Geoscience, Aarhus University.
- 2022: Franch Elbeck: B.Sc. student, Department of Geoscience, Aarhus University.
- 2021: Asger A. Larsen: M.Sc. student, Department of Geoscience, Aarhus University.
- 2021: Prayati Sharma: Erasmus Intern, Department of Geoscience, Aarhus University.
- 2021: Louise Lassen: B.Sc. student, Department of Geoscience, Aarhus University.
- 2021-24: Marie Winther: B.Sc. and M.Sc. student, Department of Geoscience, Aarhus University.
- 2020–2021: Ian Madden: Graduate student, Institute for Computational & Mathematical Engineering, Stanford University.
- 2017–2021: Indraneel Kasmalkar: Graduate student, Department of Geophysics, Stanford University.
- 2018: MonTre D. Hudson: Summer intern, Program in Atmospheric and Oceanic Sciences, Princeton University.

OUTREACH

- TV2 Go'Morgen Danmark, Danish national TV. Segment on quicksand physics and risk in Denmark. December 2023. https://play.tv2.dk/afspil/edfda123-6db6-46bb-b21b-c996fc1e6093
- First grade in Lystrup Skole elementary school, Lystrup, Denmark. Presentation on Greenland, fieldwork, and climate. May 2022.
- Forskningens døgn (The Festival of Research about Time), Aarhus University. "Tidens tand på Jordens overflade" (The toll of time on the Earth surface). Designed and staffed booth on Earth-surface processes and glaciations. April 2022.
- Aarhus University U-Days 2021 and 2022, one hour lecture "Fremtiden for jordens iskapper: Findes svaret i geologien eller supercomputeren?" on glaciology and climate change. February 2022.
- Geoscience internship days 2021, presentation and field trip with highschool students. November 2021.
- DR1 Viden (Danish Broadcasting Corporation, science section of public service radio and television broadcasting company) article on quicksand in Denmark. "Det bugner med kviksand i Danmark: Sådan kommer du op af de skjulte fælder". October 2021. https://www.dr.dk/nyheder/viden/natur/det-bugner-med-kviksand-i-danmark-saadan-kommer-du-op-af-de-skjulte-faelder
- Branbjerg Højskole, two hour lecture "Fra Is til Os" on glaciology and geomorphology in Denmark. Salary donated to charity *Branbjerg Højskole elevstøtteforening*. October 2020.
- Podcast interview (1 hour) "The Changelog" about climate science and my research in glaciology. January 2020. https://changelog.com/podcast/378

- Article (two full pages) in danish newspaper “Nordjyske Stifttidende” about my research on climate change and sediment mechanics. September 2015.
- Presentations about climate change and glaciology to high-school teachers. Department of Geoscience, Aarhus University. October 2013.
- Arranged introductory talks about the research activities of faculty members. Aarhus University, 2012–2013.
- “The Rolling University” (Danish: “Det Rullende Universitet”): Held a series of lectures at local high schools about climate change. Fall 2011.
- “Nature in the tent” (Danish: “Natur i teltet”): Public outreach in the city center in Aarhus, Denmark. Summer 2009.

Teaching assistance at Aarhus University during Ph.D. studies

- Theoretical Geophysics (exercises)
- Geophysical Methods (exercises and field excursions)
- Sedimentology (exercises)
- Numerical Modeling (exercises)
- Sedimentary Processes and Environments (classes, exercises, and field excursions)
- Introductory Petrology (classes and exercises)
- Basin analysis and modeling (classes and exercises)
- Geographical Information Systems (exercises)
- Quaternary Sediments (classes and field excursion)
- Geomodeling (exercises)
- Palaeontology and stratigraphy (exercises)
- Hydrology, soil processes, and dynamic geomorphology (classes, exercises, and field excursion)