

# Aleksi Nummelin

## Curriculum Vitae, September 2021

Email: [aleksi.h.nummelin@gmail.com](mailto:aleksi.h.nummelin@gmail.com)  
Web: <https://aleksinummelin.github.io/>

Skype: aleksi.nummelin  
GitHub: [github.com/AleksiNummelin](https://github.com/AleksiNummelin)

### Education

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- 10/2016 PhD, climate dynamics and physical oceanography, Geophysical Institute, University of Bergen.  
Thesis: [The Arctic Ocean in a Fresh and Warm Future](#)  
Supervisors: Prof. C. Li, Prof. L. H. Smedsrud and Dr. B. Risebrobakken
- 4/2012 Master of Science (major: geophysics, minors: meteorology, methodological sciences), Department of Physics, University of Helsinki.  
Thesis: [Convection in the Greenland Sea: model and observations.](#)  
Supervisor: Prof. B. Rudels
- 6/2010 Bachelor of Science (major: geophysics, minors: physics, meteorology), Department of Physics, University of Helsinki.  
Thesis: Denmark Strait Overflow  
Supervisor: Prof. B. Rudels

### Work Experience

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- 12/2018 – Senior Researcher, NORCE Norwegian Research Centre AS, Bergen, Norway. Development of the Norwegian Earth System Model (NorESM).
- 1/2020 – Scientist (adjunct, 45 %), Department of Geosciences, University of Oslo, Oslo, Norway. Simulations of Eocene-Oligocene transition sensitivity to changing topography with NorESM and development of a topography aware mesoscale parameterization for ocean models.
- 1/2019 – 12/2019 Scientist (adjunct, 20 %), Department of Geosciences, University of Oslo, Oslo, Norway. Simulations of Eocene-Oligocene transition sensitivity to changing topography with NorESM.
- 1/2017 – 12/2018 Postdoctoral Fellow, Earth & Planetary Sciences, Johns Hopkins University. Development of tracer inversion method for estimating ocean kinematics, especially lateral diffusivity, from satellite observations.
- 8/2016 – 12/2016 Scientist, Geophysical Institute, University of Bergen
- 8/2012 – 8/2016 PhD research focusing on model simulations and data analysis of ocean circulation changes under freshwater forcing. University of Bergen  
Supervisors: C. Li, L. H. Smedsrud, B. Risebrobakken.
- 5/2009 – 8/2012 Research assistant, Finnish Meteorological Institute (FMI). Analysis of model and observational data. Participation in the Argo program in the Baltic Sea. Supervisors: Dr. T. Stipa, Prof. B. Rudels and Dr. J. Haapala.
- 7– 8/2008 & 5 – 6/2007 Summer intern, Finnish Institute of Marine Research. Analysis of model results for project report. Supervisor: Dr. T. Stipa.

### Research & Teaching Experience

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- 2020 Lecturer in a CHESSE graduate research school 'Modelling Workshop'.
- 2017 – 2018 Participation in the Johns Hopkins [Teaching Academy](#)
- 7/2015, 7/2021 Lecturer in *A Changing Arctic* -course as part of the International Summer School (ISS) at University of Oslo, Norway
- 1–6/2014 Graduate Student Trainee with Professor Bruno Tremblay, Department of Atmospheric and Oceanic Sciences, McGill University, Canada

2013–2015	Teaching assistant in following courses <i>numerical modelling, data-analysis in meteorology and oceanography, dynamical meteorology, and seminar in atmospheric sciences</i> , University of Bergen, Norway
1–5/2012	Teaching assistant, <i>introduction to oceanography</i> , University of Helsinki, Finland
summers 2010/11	Research cruises in the North Atlantic and Nordic Seas on board F/S Meteor (M82-1) and F/S Poseidon (P418/2). Tasks included CTD work including post-processing of the CTD and ADCP data. Chief scientists: Prof. D. Quadfasel (M82-1) and Dr. K. Latarius (P418/2), both University of Hamburg, Germany.

## Funding

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2021	Work Package leader in NFR funded MakingWaves project (4,48 MNOK for NORCE) and project participant in MuSIC (2,21 MNOK for NORCE).
2020	Work Package leader in NFR funded TopArctic (1,27 MNOK for NORCE) and DOTpaleo (5,76 MNOK for NORCE) projects.

## Supervision

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2015–2016	Co-supervisor, MSc thesis, Musa Ssemujju: Monsoon in North East Bangladesh.
2014	Co-supervisor, MSc thesis, Emilie Otilde Lotsberg: A view on possible regime shifts in the North Atlantic subpolar gyre in the mid 1920s and 1990s.

## Publications

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Gjermundsen, A., **Nummelin, A.**, Olivié, D., Bentsen, M., Seland, Ø & Schulz M. (2021). Shutdown of Southern Ocean convection controls long-term greenhouse gas-induced warming. *Nat. Geosci.* . <https://doi.org/10.1038/s41561-021-00825-x>. (<https://rdcu.be/cyxtx> read-only)

**Nummelin, A.**, Busecke, J. J. M., Haine, T. W. N., & Abernathey, R. P. (2021). Diagnosing the Scale and Space Dependent Horizontal Eddy Diffusivity at the Global Surface Ocean, *Journal of Physical Oceanography*, <https://doi.org/10.1175/JPO-D-19-0256.1>.

Seland, Ø., Bentsen, M., Olivié, D., Toniazzo, T., Gjermundsen, A., Graff, L. S., Debernard, J. B., Gupta, A. K., He, Y.-C., Kirkevåg, A., Schwinger, J., Tjiputra, J., Aas, K. S., Bethke, I., Fan, Y., Griesfeller, J., Grini, A., Guo, C., Ilicak, M., Karset, I. H. H., Landgren, O., Liakka, J., Moseid, K. O., **Nummelin, A.**, Spensberger, C., Tang, H., Zhang, Z., Heinze, C., Iversen, T., and Schulz, M. (2020): Overview of the Norwegian Earth System Model (NorESM2) and key climate response of CMIP6 DECK, historical, and scenario simulations, *Geosci. Model Dev.*, 13, 6165–6200, <https://doi.org/10.5194/gmd-13-6165-2020>.

Tsujino, H., Urakawa, L. S., Griffies, S. M., Danabasoglu, G., Adcroft, A. J., Amaral, A. E., Arsouze, T., Bentsen, M., Bernardello, R., Böning, C. W., Bozec, A., Chassignet, E. P., Danilov, S., Dussin, R., Exarchou, E., Fogli, P. G., Fox-Kemper, B., Guo, C., Ilicak, M., Iovino, D., Kim, W. M., Koldunov, N., Lapin, V., Li, Y., Lin, P., Lindsay, K., Liu, H., Long, M. C., Komuro, Y., Marsland, S. J., Masina, S., **Nummelin, A.**, Rieck, J. K., Ruprich-Robert, Y., Scheinert, M., Sicardi, V., Sidorenko, D., Suzuki, T., Tatebe, H., Wang, Q., Yeager, S. G., and Yu, Z. (2020). Evaluation of global ocean–sea-ice model simulations based on the experimental protocols of the Ocean Model Intercomparison Project phase 2 (OMIP-2), *Geosci. Model Dev.*, 13, 3643–3708, <https://doi.org/10.5194/gmd-13-3643-2020>.

Fransner F., Counillon F. Bethke I., Tjiputra J., Samuelsen A., **Nummelin A.**, and Olsen A. (2020). Ocean Biogeochemical Predictions-Initialization and Limits of Predictability. *Frontiers in Marine Science*, 7, doi: 10.3389/fmars.2020.00386, <https://www.frontiersin.org/article/10.3389/fmars.2020.00386>.

Lambert, E., **Nummelin, A.**, Pemberton, P., & Ilicak, M. (2019). Tracing the imprint of river runoff variability on Arctic water mass transformation. *Journal of Geophysical Research: Oceans*, 124.

<https://doi.org/10.1029/2017JC013704>

**Nummelin, A.**, S. Jeffress, and T. Haine (2018): Statistical Inversion of Surface Ocean Kinematics from Sea Surface Temperature Observations. *J. Atmos. Oceanic Technol.*, 35, 1913–1933, doi: [10.1175/JTECH-D-18-0057.1](https://doi.org/10.1175/JTECH-D-18-0057.1)

Jensen M., **A. Nummelin**, S. Nielsen, H. Sadatzki, E. Sessford, B. Risebrobakken and A. Born. A (2018). A spatio-temporal reconstruction of sea-surface temperatures in the North Atlantic during Dansgaard-Oeschger events 5-8, 14, 901-922, doi: 10.5194/cp-14-901-2018

Schemm, S., **A. Nummelin**, N.G. Kvamstø, and Ø. Breivik (2017), The Ocean Version of the Lagrangian Analysis Tool LAGRANTO. *J. Atmos. Oceanic Technol.*, 34, 1723-1741, doi: 10.1175/JTECH-D-16-0198.1

**Nummelin, A.**, C. Li, and P. J. Hezel (2017), Connecting ocean heat transport changes from the midlatitudes to the Arctic Ocean, *Geophys. Res. Lett.*, 44, doi:10.1002/2016GL071333.

**Nummelin A.**, M. Ilicak, C. Li, and L. H. Smedsrud (2016), Consequences of future increased Arctic runoff on Arctic Ocean stratification, circulation, and sea ice cover, *J. Geophys. Res. Oceans*, 120, doi:10.1002/2015JC011156

**Nummelin A.**, C. Li, and L. H. Smedsrud (2015), Response of Arctic Ocean stratification to changing river runoff in a column model, *J. Geophys. Res. Oceans*, 120, 2655–2675, doi:10.1002/2014JC010571

Rudels B., M. Korhonen, G. Budéus, A. Beszczynska-Möller, U. Schauer, **A. Nummelin**, D. Quadfasel, and H. Valdimarsson, (2012) The East Greenland Current and its impacts on the Nordic Seas: observed trends in the past decade *ICES J. Mar. Sci.* 69(5):841-851. doi:10.1093/icesjms/fss079

Roiha P., A. Westerlund, **A. Nummelin**, and T. Stipa (2010) Ensemble forecasting of harmful algal blooms in the Baltic Sea, *J. Mar Systems*, Vol. 83, Issues 3–4. doi:10.1016/j.jmarsys.2010.02.015

## Outreach

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2018	Fluid dynamics demonstrations, Johns Hopkins Annual Physics Fair
2013 & 2015	Presentations in Forskningsdagene UNG, youth science night, Bergen
2013–	Contributing author, <a href="http://www.scisnack.com/">http://www.scisnack.com/</a> science blog

## Scientific Tools

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Analysis	Currently Python – also experience with tools such as Matlab, R, and Ferret.
Numerical models	Number of hydrodynamic models from Norwegian Earth System Model to GOTM 1-D turbulence model.
Instrumentations	Shipboard equipment (CTD, ADCP), active remote control of Argo floats

## Language

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<b>Finnish</b>	<i>Native</i>	<b>English</b>	<i>Excellent</i>		
<b>Norwegian</b>	<i>Fluent</i>	<b>Swedish</b>	<i>Fluent</i>	<b>French</b>	<i>Basics</i>

## Service

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2019	Co-organizer: Workshop on Machine Learning in the Earth's Climate System
2018	Expert reviewer, IPCC Special Report on Oceans & Cryosphere in a Changing Climate
2015–	Reviewer for <i>Journal of Physical Oceanography</i> , <i>Journal of Geophysical Research: Oceans</i> , <i>Geophysical Research Letters</i> , and <i>Climate Dynamics</i>
2016,2019	Organizing committee member, annual meeting of the Bjerknes Centre for Climate Research
10/2012–9/2015	Organizing committee member, Geophysical Institute Colloquium

6/2013–1/2014

Head of the organizing committee, ResClim modelling workshop

## **References**

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Professor Thomas Haine, postdoc supervisor, +1 410 516 7048, thomas.haine@jhu.edu

Professor Camille Li, PhD supervisor, +47 55 58 37 05, camille.li@uib.no