

Curriculum Vitae for Michael Tjernström

Full name: Michael Kjell Henry Tjernström
Address: Department of Meteorology,
Stockholm University,
106 91 Stockholm
Born: 17 August 1955
Place of Birth: Solna, Sweden
Citizenship: Swedish
Marital Status: Married, to Gunilla Svensson
Children: Martin (1979), and Linnea (1984), Johanna (2000)
Education: 1979 B.Sc. Stockholm University
1979 Air-Force Officer Swedish Air Force Officer Training School.
1988 Ph.D. Uppsala University



Professional record:

Employment:

07/2001 – present Professor in Boundary-Layer Meteorology, Stockholm University.
10/2005 – 08/2006 CIRES Visiting Fellow, University of Colorado at Boulder, USA
12/1998 – 11/2005 Senior Scientist, Swedish Research Council, at Stockholm University
05/2000 – 06/2001 Professor in Meteorology, Uppsala University
05/1997 – 11/1997 Research Fellow (50%), Swedish Meteorological and Hydrological Institute, Norrköping
06/1996 – 02/1997 Visiting Faculty, California Institute of Technology, Pasadena, USA
07/1994 – 04/2000 Senior Lecturer in Meteorology, Uppsala University
01/1991 – 06/1994 Assistant Professor in Meteorology, Uppsala University
04/1988 – 12/1990 Post-doctoral Fellow, Department of Meteorology, Uppsala University
09/1983 – 03/1988 PhD-student, Department of Meteorology, Uppsala University
07/1979 – 06/1994 Officer, Air Force Weather Service, Swedish Armed Forces

Other:

08/2001 – 12/2009 Partial parental leave, net-total ~20 months.
03/1993 Associate Professor [*Docent*] in Meteorology, Uppsala University

Extended invited visits:

08/2016 – 07/2017: Visiting Scientist, National Center for Atmospheric Research, Boulder Colorado
06 – 07 & 10 – 12/2009: Visiting scientist, NOAA Earth System Research Lab, Boulder, Colorado
07–08/2007 & 07/2008: Visiting Professor, CIRES, University of Colorado at Boulder
01–04/2000 & 01–05/2003 Visiting Scientist, Naval Research Laboratory, Marine Meteorology Division, United States Department of the Navy, Monterey, California
01 - 02/1996 & 1998, Visiting Scientist, California Institute of Technology
01 – 03/1999
06 – 07/1993 Visiting Scientist, Scripps Institution of Oceanography, University of California, San Diego, California
11/1991 & 02 – 03/1992: Visiting Scientist Desert Research Institute, Atmospheric Sciences Division, University of Nevada, Reno, Nevada, Reno, Nevada

Main research interests:

- *Arctic climate processes*: Arctic boundary-layer meteorology, clouds and aerosols, atmospheric circulation its changes especially warm-and-moist airmass intrusions and cold-air outbreaks.
- *Atmospheric boundary-layer and mesoscale dynamics*: Boundary layer clouds, dynamics and interaction; Stable boundary layers; Field experiments and parameterizations; Interaction with mesoscale dynamic.

Scientific activity (selected):

- Atmospheric rivers and the onset of Arctic melt (ARTofMELT), 2021 – present, PI, spring-time expedition on the Swedish research icebreaker *Oden* in 2023, funded by *Swedish Polar Research Secretariat* and *Knut and Alice Wallenberg Foundation*.
- Arctic Climate Across Scales (ACAS), 2016 – present, PI, funded by *Knut and Alice Wallenberg Foundation*
- Physics of Arctic warm-air intrusions, 2016 – present, PI, funded by the *Swedish Research Council*
- Integrated Arctic Observation System (INTAROS), 2016 – present, co-PI, Theme Leader for the *Atmosphere* and WP2 Task Leader, *European Opinion Horizon2020* program.
- Advanced Prediction in Polar regions and beyond: modelling, observing system design and Linkages associated with arctic Climate change (APPLICATE), 2016 – present, co-PI, funded by the *European Opinion Horizon2020* program
- Arctic Clouds in Summer Experiment (ACSE) & SWERUS-C3, 2011 - present, PI for ACSE and Co-PI in SWERUS (Boundary-layer meteorology program), Arctic expedition funded by *Knut and Alice Wallenberg Foundation*, *US Office of Naval Research*, *Faculty of Science Stockholm University* & *Swedish Research Council*
- Arctic Summer Cloud-Ocean Study (ASCOS), 2005 – 2013. Co-Chief Scientist and leader of the meteorological program for an icebreaker-based field experiment to the Arctic summer 2008, during the International Polar Year, funded by the *Swedish National Research Council* and the *Knut & Alice Wallenberg Foundation*
- Developing Arctic Modeling and Observing Capabilities for Long-term Environmental Studies (DAMOCLES), 2005 – 2010. Participant and Task Leader. Funded by the *European Union 6th Framework Program*

Committees, board of experts etc. (selected).

- Research icebreaker Oden as a National Infrastructure, member of the Steering Group, 2022 - present.
- (AC)³ (Arctic Amplification: Climate Relevant Atmospheric, Surface Processes and Feedback Mechanisms), Germany, member of Scientific Advisory Board, 2019 – present
- IASC, Swedish representative in the *Atmospheric Working Group*, 2011 – 2018, and the *Bylaws Action Group*, modifying, organizing and modernizing the IASC Bylaws and governing documents, member, 2018 – 2019
- *Nansen Environmental and Remote Sensing Centre (NERSC)*, Bergen Norway, Scientific Council, member since 2014, Chair 2017 – present
- *PhD Program director, Atmospheric Sciences and Oceanography*, Dept. of Meteorology, Stockholm University, 2017 – present.
- *INTAROS*, H2020 program, Scientific Steering group & Theme Leader Atmosphere, 2016 - present
- *Department of Meteorology, Stockholm University*, Head of Department (Prefekt), 1 August 2012 – 31 July 2015 and Deputy Head of Department, 1 January – 31 July, 2012.
- *Bolin Center for Climate Research* (formerly Stockholm University Climate Research Environment, SUCLIM, and Bert Bolin Center for Climate Research). Member of the Board 2012 – 2015; Core Theme Leader and member of Science Steering Group, 2006 – 2012.

Supervision, teaching and outreach:

- 30 years teaching experiences at all academic levels, in total > 20 different courses
- Undergraduate thesis supervision: About 30 since 1990
- Ph.D. theses supervision: 18 completed, two ongoing
- Faculty Opponent on PhD examinations: Four, at Stockholm University, University of Bergen (Norway), Utrecht University (Holland), and University of Helsinki (Finland)
- PhD examination committees: Eight @ Stockholm University, two @ Gothenburg University and one @ KTH
- Frequent popular-science presenter; often appearing in local and national media (papers, radio and TV).

Original papers in peer-reviewed journals (selected from a total of > 140; Google Scholar: > 7800 citations & h-index 49):

1. Mauritsen, T., J. Sedlar, M. Tjernström (MT), and coauthors, 2011: An Arctic CCN-limited cloud-aerosol regime, *Atmospheric Chemistry and Physics*, **11**, 165–173, doi:10.5194/acp-11-165-2011.
2. Sedlar, J., MT, and 8 coauthors, 2011: A transitioning Arctic surface energy budget: the impacts of solar zenith angle, surface albedo and cloud radiative forcing. *Climate Dynamics*, **37**, 1643–1660, doi:10.1007/s00382-010-0937-5.
3. Kapsch, M-L, R.G. Graversen and MT, 2013: Springtime atmospheric transport controls Arctic summer sea ice. *Nature Climate Change*, **3**, 744–748, doi: 10.1038/NCLIMATE1884.
4. MT and 43 co-authors, 2014: The Arctic Summer Cloud Ocean Study (ASCOS): Overview and experimental design, *Atmospheric Chemistry and Physics*, **14**, 2823–2869, doi:10.5194/acp-14-2823-2014
5. Vihma, T., R. Pirazzini, I. A. Renfrew, J. Sedlar, MT, and 11 coauthors, 2014: Advances in understanding and parameterization of small-scale physical processes in the marine Arctic: A review. *Atmospheric Chemistry and Physics*, **14**, 9403–9450, doi:10.5194/acp-14-9403-2014
6. MT, and 11 coauthors, 2015: Warm-air advection, air mass transformation and fog causes rapid ice melt, *Geophysical Research Letters*, **42**, 5594–5602, doi:10.1002/2015GL064373.
7. Sotiropoulou, G., MT and 10 coauthors, 2016: Atmospheric conditions during the Arctic Clouds in Summer Experiment (ACSE): Contrasting open-water and sea-ice surfaces during melt and freeze-up seasons. *Journal of Climate*, **29**, 8721-8744, doi: 10.1175/JCLI-D-16-0211.1.
8. Sedlar, J., and MT, 2017: Clouds, warm air and a climate cooling signal over the summer Arctic. *Geophysical Research Letters*, **44**, 1095–1103, doi:10.1002/2016GL071959.
9. Brooks I. M., MT, and 8 coauthors, 2017: The turbulent structure of the Arctic summer boundary layer during ASCOS. *Journal of Geophysical Research*, **122**, <https://doi.org/10.1002/2017JD027234>.
10. MT, and coauthors, 2019: Arctic summer air-mass transformation, surface inversions and the surface energy budget, *Journal of Climate*, **32**, 769-789, <https://doi.org/10.1175/JCLI-D-18-0216.1>
11. MT, 2019: The Arctic boundary layer. In *100 years of progress: Boundary-layer meteorology*, [Eds. Margaret A. LeMone and Wayne Angevine], *Meteorological Monographs*, American Meteorological Society, Early Release, <https://doi.org/10.1175/AMSMONOGRAPHS-D-18-0013.1>.
12. Naakka, T., T. Nygård, MT, T. Vihma, R. Pirazzini and I. M. Brooks, 2019: The impact of radiosounding observations on numerical weather prediction analyses in the Arctic, *Geophysical Research Letters*, **46**, <https://doi.org/10.1029/2019GL083332>.
13. Sedlar, J., MT, and coauthors, 2019: Confronting Arctic troposphere and surface energy budget representations in regional climate models with observations. *Journal of Geophysical Research*, **125**, <http://dx.doi.org/10.1029/2019JD031783>.
14. MT, G. Svensson, L. Magnusson, I. M. Brooks, J. Prytherch, J. Vüllers and G. Young, 2020: Central Arctic Weather Forecasting: Confronting the ECMWF IFS with observations from the Arctic Ocean 2018 expedition. *Quarterly Journal of the Royal Meteorological Society*, **147**, 1278-1299, <https://doi.org/10.1002/qj.3971>.
15. Nygård, T., MT, T. Naakka, 2021: Wintertime vertical profiles of temperature and humidity in the Arctic atmosphere linked to large scale circulation, *Weather and Climate Dynamics*, **2**, <https://doi.org/10.5194/wcd-2-1263-2021>.
16. You, C., MT, A. Devasthale, and D. Steinfeld, 2022: The role of atmospheric blockings in regulating Arctic warming, *Geophysical Research Letters*, **49**, e2022GL097899. <https://doi.org/10.1029/2022GL097899>.