

*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 Schools.  
 1988 Ph.D. Uppsala University

**Professional record:****Present position**

07/2001 – present Professor in Boundary-Layer Meteorology, Stockholm University.

**Employment record:**

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 (part time 50%), Research Department, Swedish Meteorological and Hydrological Institute (SMHI), Norrköping  
 06/1996 – 02/1997 Visiting Faculty, California Institute of Technology, Engineering and Applied Science (Environmental Engineering), 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 Graduate Student, Department of Meteorology, Uppsala University  
 07/1979 – 06/1994 Officer, Swedish Air Force, Swedish Armed Forces Weather Service

**Other:**

08/2001 – 12/2009 Partial parental leave, net-total ~40 months.  
 03/1993 Associate Professor [*Docent*] in Meteorology, Uppsala University

**Longer invited visits:**

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

**Other shorter visits:**

University of Leeds, Leeds, UK; National Oceanic and Atmospheric Administration (NOAA), Boulder, Colorado; University of California at Irvine, California; National Center for Atmospheric Research (NCAR), Boulder, Colorado; Naval Postgraduate School, Monterey, California; Stanford University, Palo Alto, California; NOAA, Air Resources Lab, Turbulence and Diffusion Division, Oak Ridge, Tennessee; Desert Research Institute, University of Nevada at Reno, Nevada.

**Main research interests:**

- Arctic climate processes: Arctic boundary-layer meteorology, clouds and aerosols, atmospheric circulation changes.
- Atmospheric boundary layer and mesoscale dynamics: Boundary layer clouds, interplay between radiation, cloud microphysics and turbulence in and below clouds; Interaction with mesoscale dynamics; Stable boundary layers; Analysis of field experiment data and development of parameterizations.
- Coastal meteorology, the dynamics of mesoscale circulations: sea/land breeze circulation, coastal jets, supercritical flows and wind reversal events, interaction with the boundary layer dynamics; Interaction between mesoscale flow and complex coastal orography and coastline orientation.

**Scientific activity:**

- Arctic and Global Predictions, 2012 - present, funded by the *US Office of Naval Research*.
- SWERUS-C3 Arctic expedition, 2011 – present, funded by *Knut and Alice Wallenberg Foundation* & *US Office of Naval Research*.
- Unified Parameterizations for Seasonal Prediction, 2011 - present, funded by the *US Office of Naval Research*.
- European Union Cloud Intercomparison, Process Study & Evaluation Project (EUCLIPSE), 2010 – present, funded by the *European Union 7<sup>th</sup> Framework Program*.
- Advanced Simulation of Arctic Climate Change and Effects in the Nordic Countries (ADSIMNOR), 2010 - present. Strategic Research Initiative lead by SMHI, *FORMAS*.
- Utilization of Advanced Satellite and In situ Observations in Support of Arctic Climate Modeling, 2008-present. Joint project with SMHI Research Department & the Rossby Center, *Swedish Space Board*.
- Small-scale processes with large scale impacts, subprogram at the *Bert Bolin Climate Research Center* (formerly *Stockholm University Climate Research Environment, SUCLIM*), 2006 – present. “Linnaeus research program” funded by *FORMAS* and *Swedish National Research Council*.
- Arctic Summer Cloud-Ocean Study (ASCOS), 2005 – present. Co-Chief Scientist and responsible for the meteorological program on 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*.
- Arctic Regional Climate Model Intercomparison (ARCMIP), 2002 – present. Participating in Arctic regional modeling using the US Navy model COAMPS™. Funded by *SWECLIM* and the *Swedish National Research Council*.
- Developing Arctic Modeling and Observing Capabilities for Long-term Environmental Studies (DAMOCLES), 2005 – 2010. Participant and Task Leader for the developing understanding on Arctic clouds. Funded by the *European Union 6<sup>th</sup> Framework Program*.
- Developing Improved Models of the Stable Boundary Layer Incorporating the Residual Layer Region, 2007 – 2009. Joint research project with Prof. Balsley, Colorado University, USA. *US National Science Foundation*.
- Arctic Ocean Experiment 2001 (AOE-2001), 1999 – 2006. Responsible for the meteorological program on the icebreaker based field experiment to the Arctic, summer 2001. Funded by the *Nordic Council of Ministers*, *Swedish Polar Secretariat*, *Knut and Alice Wallenberg foundation* and the *Swedish Natural Research Council*.
- Marine Effects of Atmospheric Deposition (MEAD), 2000-2003. Participant and Co-responsible for meteorological modeling. Funded by the *European Union 5<sup>th</sup> Framework Program*.
- Swedish Regional Climate Modeling Programme (SWECLIM), 1998 - 2003. Subprogram manager with responsibility for model development. Funded by *MISTRA* and *SMHI*.
- Transport Processes in the Coastal Atmospheric Boundary Layer, 1998 - 2000. Funded by the *United States Department of the Navy - Office of Naval Research*.
- Coastal Air Pollution Meteorology And Nutrient Exchange (CAPMAN), 1997 – 2003. Part of EUROTRAC-2.
- NOPEX, sub-project 6: Turbulent fluxes in the atmospheric boundary layer (Airborne meteorological measurements), 1993 - 2000. Funded by the *Swedish Natural Research Council*, the *Nordic council of Ministers* and the *Swedish Air Force*.
- Coastal-Waves 1996, 1996 - 1999. A field work/modeling program on US West-coast meteorology. Funded by *United States Department of the Navy, Office of Naval Research*, the *Swedish Natural Research Council* and the *United States National Science Foundation*.
- Coastal Meteorology Accelerated Research Initiative, 1994 - 1998. Funded by the *United States Department of the Navy - Office of Naval Research*.
- A study of the effect of ocean-atmosphere coupling on the variability of the coastal sea and the marine atmospheric boundary layer, 1991- 1997. With Scripps Institution of Oceanography, La Jolla, and Desert Research Institute, Reno, in USA. Funded by the *Swedish Natural Research Council*.
- Swedish program for Airborne meteorological measurements, 1990-92. Funded by the *Swedish Natural Research Council*.
- Airborne measurements of mesoscale flow and spatial distribution of turbulence in Blekinge, 1989 – 1990. Funded by the *Swedish Natural Research Council*, the *Swedish Program for Wind Energy* and the *Swedish Air Force*.
- Development of a system for airborne meteorological measurements, 1985-89. Funded by *Knut and Alice Wallenberg Foundation*, the *Swedish Natural Research Council*, the *Swedish Program for Wind Energy* and the *Swedish Air Force*.
- Mere Interieure, 1984-85. A precipitation climate investigation in Tunisia and Algeria. Funded by *SWECO Inc*, a subsidiary to VBB Inc.

**Awards:**

- Senior Scientist, Swedish Research Council, 1998-2006
- CIRES Visiting Fellowship, 2005-2006
- CIRES Distinguished Lecture, November 2005
- American Meteorological Society, Journal of Applied Meteorology Editors Award, January 2006
- Swedish Government 30 Year Service Award

**Committees, board of experts etc.**

- *Swedish Association of Scientists* (Sveriges Naturvetareförbund), Vice Chair, member of the Executive Committee and the board, 1984 – 1997
- *Swedish Environmental Protection Agency, Air Quality Committee*, (*Naturvårdsverkets Forskningsnämnds Luftvårds-kommitte*), Chair, 1992 - 1996
- *Swedish Natural Research Council*, Member of reference Group for the International Review of Swedish Research in the Earth Sciences, 1994–1995
- *SWECLIM*, Subprogram Manager and member of Science Steering Group, 1998 – 2003
- *AOE-2001*, Subprogram Manager and member of the Science Steering Group, 1999 – 2006
- *Swedish National Committee on Geophysics and Geodesy*, Swedish Academy of Sciences, member, 1997 - 2005
- *American Meteorological Society (AMS) Coastal Environment Science and Technology Advisory Committee* (formerly Meteorology and Oceanography of the Coastal Zone), member, 2003 - 2010
- *International Study of Arctic Change (ISAC)*, International Arctic Science Committee (IASC) and Arctic Ocean Science Board (AOSB), member of the Interim Science Steering Group, 2004 – 2005
- *Swedish National Committee for WCRP and IGBP*, Swedish Academy of Sciences, Chair, 2004 - 2007
- *Arctic Summer Cloud Ocean Study (ASCOS)*, Co-Chief Scientist, 2004 – present
- *WCRP Assimilation and Observation Panel (WOAP)*, 2006 - 2011
- *European Centre for Medium range Weather Forecast, Science Advisory Committee*, member, 2006 – present
- *Bert Bolin Center for Climate Research* (formerly Stockholm University Climate Research Environment, SUCLIM), Core Theme Leader and member of Science Steering Group, 2006 – present
- *International Study of Arctic Change (ISAC)*, Science Steering group, 2006 – present, Chair 2006 – present.
- *Swedish Secretariat for Environmental Earth System Studies (SSEESS)*, Joint Swedish platform for ICSU/WCRP/IGBP activities, Royal Swedish Academy of Sciences, member of the Board, 2010 – present
- *International Meteorological Institute (IMI)*, Stockholm University, Director, 2010 – present
- *International Arctic Science Committee (IASC) Working Group on the Atmosphere*, vice-Chair, 2010 – present
- *Arctic in Rapid Transition (ART)*, member of the Science Advisory Committee, 2011 – present
- *Swedish National Committee for Global Environmental Change*, Swedish Academy of Sciences, 2012 - present
- *Department of Meteorology, Stockholm University*, Head of Department (Prefekt), 1 August 2012 – present; Deputy Head of Department, 1 January – 31 July 2012.
- *EARTHSYSTEMS graduate program*, Portugal, member of the Science Advisory Committee, 2013 – present

**Consultant:**

- *Swedish Meteorological and Hydrological Institute*: Liquid water content and visibility in stratus clouds and fog, an investigation for the location of a new major air port in Oslo, Norway, 1989 - 90
- *SAAB Military Aircraft Inc.* and *Swedish Defense Material Administration*: JAS aircraft development project, issues related to impact of atmospheric turbulence on the "fly-by-wire" aircraft control system, 1989 - 90
- *Bofors Missile Inc.* and *Swedish Defense Material Administration*: Measurements of liquid water in clouds, 1996
- *Vattenfall AB* and *Fylgia Attorneys at Law*: River fog at Hemavan airport, investigation for negotiations in the *Swedish Environmental Court*, 2002
- *Skellefteå municipality* and *Glimstedt Attorneys at Law*: Damages from extreme snow fall in Skellefteå 2010, investigation for court case against insurance company, 2012

**Other professional activities:**

- The *State of the Arctic* conference, member of the organizing committee, co-convenor of the 4th "International Day", March 2010 in Miami.
- Session co-convenor for American Geophysical Union Fall Meeting, San Francisco: Union Session on "International Study of Arctic Change" (2008), Global Change Session on "Understanding and Responding to

Pan-Arctic Environmental Change” (2009), and Global Change Session on “Science for a sustainable Arctic” (2010).

- Member of the jury at the “Young Scientists Exhibition”, Stockholm April 1995.
- External reviewer or panel reviews: Research Council of Norway (RCN), US National Science Foundation (NSF), UK National Environmental Research Council (NERC), National Science and Environmental Research Council Canada (NSERC), US Atmospheric Radiation Program (ARM), and several other occasional services.
- Reviewer for science journals: *Nature Geoscience*, *Journal of Atmospheric Sciences*, *Journal of Applied Meteorology and Climatology*, *Journal of Atmospheric and Oceanic Technology*, *Journal of Climate*, *Bulletin of the American Meteorological Society*, *Monthly Weather Review*, *Boundary-Layer Meteorology*, *Climate Dynamics*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *Tellus*, *Atmospheric Physics*, *Journal of Hydrology*, *Annales Geophysicae*, *Atmospheric Chemistry and Physics* and several other international journals
- Member of: Swedish Meteorological Society (SMS); American Meteorological Society (AMS); American Geophysical Union (AGU); European Geophysical Union (EGU); Swedish Geophysical Society (SGF); Royal Meteorological Society (RMetS).

#### **Pedagogic experience and training:**

- *Graduate teaching:*
  - Global Change, Part of (so-called *Atmospheric week*), Uppsala University (1998 and 2000)
  - Mesoscale Meteorology, Stockholm University (2000/2001)
  - Boundary-Layer Meteorology, Stockholm University (2002/2003, 2007 & 2011)
  - Arctic processes, Part of: Atmospheric processes, SWECLIM summer colloquium at Bornö, (2003)
  - Cloud Physics, Part of, *Boundary-Layer Clouds*, Stockholm University (2006)
  - Climate processes and modeling, Part of, *Arctic climate*, Stockholm University (2008)
  - Arctic Climate, Bert Bolin Center Research Summer School in Abisko, member of organizing committee, teaching part of *Atmospheric processes* (2009 & 2011)
- *Undergraduate teaching, course responsible & teaching:*
  - Introductory Fluid Dynamics, independent part of “Atmospheric Physics and Chemistry” at Uppsala University (1995 – 1997) and at Stockholm University (2000 – 2001)
  - Dynamic Meteorology and Weather Forecast Models at Uppsala University (1989 – 1996)
  - Atmospheric Motion Systems, replacing "Dynamic Meteorology and Weather Forecast Models", “Numerical Methods in Meteorology” and “Mesoscale Meteorology”, annually 1997 – 1998 at Uppsala University
  - Mesoscale Meteorology at Stockholm University (1999, annually 2002 – 2004, 2010)
  - Boundary-layer Meteorology at Stockholm University (annually 2005 – present)
- *Other undergraduate teaching:*
  - Numerical Methods in Meteorology, Uppsala University (partly, 1991 – 1996);
  - Meteorology and Climatology, Uppsala University (1994 – 1998, note: Earth Science students);
  - Geophysical Fluid Dynamics, Uppsala University, 1997 – 1998,
  - Introductory Meteorology for Environmental Engineering program, parts of, *Dynamic Meteorology*, at Uppsala University (1996 & 1997)
  - Atmospheric Chemistry, overview of Dynamic Meteorology for Chemistry majors at Stockholm University (2007 & 2008)
  - Overview of Meteorology for non-Science majors at Stockholm University (2007 & 2008)
  - Climate Change, Introduction to evening and summer courses at Stockholm University (twice annually, 2010-2012).
  - Climate system, Lectures on boundary layer meteorology in the climate system at Stockholm University (annually since 2010)
  - Climate Change, part of a course on Sustainable Engineering, Royal Technical University, Stockholm (annually since 2009)
  - Arctic Climate Processes, The Arctic boundary layer and clouds, SVALI intensive course, Uppsala University, 2012
- *Other academic teaching:*
  - Thermodynamics and Boundary Layer Meteorology, national skill-development program for operational forecasters in the civilian and military weather services, Swedish Meteorological and Hydrological Institute, SMHI (1992-94);

- *Pedagogic training:*
  - Pedagogisk utbildning - med kurs i forskningsinformation for forskare (*Pedagogic education for research scientists - including education in science information*), Uppsala University (1992);
  - First International Workshop on Computer Aided Learning in Meteorology, Hydrology and Oceanography, Boulder, Colorado, US, (July 1993);
  - Supervision of undergraduate thesis work, Uppsala University (1995);
  - Supervision of graduate students, Uppsala University (1996);
  - Supervision of graduate students, Stockholm University (2004, 2007)
- *Pedagogic leadership:*
  - *Weather-related issues, including flight safety*, responsible for all teaching and training for all permanent staff at Västgöta Air Force base (1980-88).
  - *Atmospheric Sciences and Oceanography*, Stockholm University, graduate program responsible, 2005 – 2010
  - *Undergraduate Students Counselor*, Stockholm University, 2009
- *Public lectures:*
  - *Climate change lectures*: various organizations and schools, about 5 times per year; in local, regional and national media (magazines, newspapers, radio and TV) about 2 – 5 times per year; panel debates etc. 2-4 times per year
  - *Arctic Change lectures*: various organizations and schools also about 2 – 5 times per year

### Supervision:

- Supervisor, undergraduate theses (BSc): Caroline Tollstadius, Stockholm University, 2009; Sara Brattström, Stockholm University, 2009; Samuel Cedving, Stockholm University, 2009; Karin Jonsson, Stockholm University, 2009; Caroline Lindberg, Stockholm University, 2009; Henrik Sjöman, Stockholm University, 2011.
- Supervisor, undergraduate theses (MSc): Lars Pålsson, Uppsala University, 1991; Patrick Samuelsson, Uppsala University, 1992; Linda Ström, Uppsala University, 1994; Ulf Andrae, Uppsala University, 1995; Stefan Söderberg, Uppsala University, 1999; Anna Rune, Uppsala University, 1999; Pontus von Shoenberg, Stockholm University, 2002; Malin Tindberg, Stockholm University, 2004; Jan Näs, Stockholm University, 2004; Pehr Meldert, Stockholm University, 2005; Linda Hildeberg, Stockholm University, 2006; Henrik Braathen, Stockholm University, 2008; Samuel Cedving, Stockholm University, 2011; Muhammad Kaleem, Stockholm University, 2011; Pjotr Kupiszewski, Stockholm University, 2011; Eva Hallin, Stockholm University, 2012.
- Ph.D. supervisor (completed): Patrick Samuelsson, 1993 – 1999 (graduated March 1999); Linda Ström, 1995 – 1999 (graduated October 1999); Zhiqiang Cui, 1995 – 1996 (one-year visiting student from PRC); Ragothaman Sundararajan, 1997 – 2001 (graduated October 2001); Stefan Söderberg, 1999 – 2004, (graduated March 2004); Admir Taragino, 2000 – 2002; Rune Grand Graverssen, 2003 – 2008, (graduated May 2008); Joseph Sedlar, 2006 – 2010, (graduated December 2010)
- Ph.D. supervisor (current): Raza Ranjha, 2009 – (2013); Abubakr Salih, 2009 – (2013); Ulrika Willén, 2009 – (2012); E. Harmacher-Barth, assistant advisor, 2009 – (2014); Cecilia Lundkvist, 2010 – (2015); Marie Kapsch, 2011 – (2016); Erik Johansson, SMHI, 2012 – (2017), Georgia Sotiropoulou, 2012 – (2017).
- Faculty Opponent on a PhD examination: Douglas Nilsson (Stockholm University), 1997; Idar Barstad (University of Bergen, Norway), 2002; Jan Willem de Berg (Utrecht University, Holland), 2008.
- Serving on PhD examination committees: Alberto Rondon, 1993; Elias Holm, 1994; Hong Lin, 1996; Nils Gustafsson, 1997; Erik Kjellström, 1998; Annica Ekman, 2001; Oskar Parmhed, 2004; Peter Tunved, 2004; Esben Almqvist, 2006.
- Post-doctoral supervision: Branko Grisogono, 1993 – 1996; Patrick Samuelsson, 1999 – 2000; Mark Žagar, 2000 – 2004; Stefan Söderberg, 2004 – 2006; Thorsten Mauritsen, 2007 – 2009; Florence Bocquet, 2007 – 2009; Per Axelsson, 2009 – 2010; Rune Grand Graverssen, 2010 – 2011, Julien Savre, 2011 – present; Erik Svensson, 2011 – present.

### Invited scientific presentations:

1. Why should modelers care about field campaigns? ECMWF and THORPEX joint workshop on "Polar Prediction", Reading, UK, 24 – 28 June 2013 (invited paper).
2. The cloudy atmospheric boundary layer over the Arctic Ocean, MOSAiC workshop, Boulder, USA, 25 - 28 July, 2012 (invited paper).
3. High latitude campaigns and model results (impact of ice and snow). ECMWF and GABLS joint workshop on "Diurnal cycles and the stable atmospheric boundary layer", Reading, UK, 7 – 10 November 2012 (invited paper).

4. Arctic climate processes and their model representation. WCRP and WGNE Workshop on “Physics of Weather and Climate Models”, March 20-23, 2012, Pasadena, California (keynote).
5. Arctic cloud and boundary layer processes in observations (and modelling), AIDA workshop, 27-28 September, 2011, Potsdam, Germany.
6. Can Arctic sea-ice melt be explained by atmospheric meridional transports? American Geophysical Union Fall Meeting, 13-17 December, 2010, San Francisco, California (invited paper).
7. Boundary-layer and aerosol/cloud interaction in central Arctic summer observed during ASCOS. American Geophysical Union Fall Meeting, 13-17 December, 2010, San Francisco, California (invited paper).
8. International Arctic science – a vision for the future, State of the Arctic conference, 16-19 March, 2010, Miami, Florida (keynote).
9. Arctic small-scale processes – Confronting models with reality, DAMOCLES International Symposium on the *Arctic Climate system, its present status, future evolution and potential impacts*, Brussels, November 2010 (keynote).
10. Is every 50 years enough: What – and how – did we learn from the International Polar Year. American Meteorological Society’s *10<sup>th</sup> Conference on Polar Meteorology and Oceanography*, May 2009, in Madison, Wyoming (keynote).
11. ASCOS – The Arctic Summer Cloud-Ocean Study. American Geophysical Union Fall Meeting, San Francisco, December 2008, (invited paper).
12. The Vertical Structure of the Arctic Atmosphere, and some words on one Swedish contributions to IPY. AMAP workshop on “*The use of Unmanned Aerial Vehicles (UAV) for Arctic Research*”, April 2008, Stockholm (invited paper).
13. What (little?) do we know about the Arctic atmosphere? *Global environmental change: The role of the Arctic*. ESF-VR-Formas conference, October 2007, Nynäshamn Sweden (keynote).
14. Small-scale Dynamic Processes. *Polar Dynamics Symposium*, celebrating the 60<sup>th</sup> Anniversary of the Department of Geoscience at the University of Bergen, August 2007, Bergen (keynote).
15. Why should we trust climate models in the Arctic? *Arctic Forum 2007*, Annual ARCUS meeting, May 2007, Washington DC (invited paper).
16. Climate change in the Arctic. March 2007, Kristanstad University College (invited lecture).
17. Climate simulations – Computational physics or hokus-pokus? KTH Computational Science and Engineering Centre, Royal Technical University, September 2005, Stockholm (invited lecture).
18. So what is so special about Arctic clouds? *CIRES Distinguished Lecture*, November 2005.
19. Are coastal atmospheric boundary layers modeled sufficiently well for small-scale coupling to the coastal ocean? *NURC Workshop on High Resolution Coupled Coastal Prediction Systems*, 28 November – 2 December, La Spezia, Italy (invited paper).
20. So what is so special about Arctic clouds? *ARM Science Team Meeting*, March 14-18 2005, Daytona Beach (keynote).
21. Coastal and Polar Atmospheric Regional Modeling – How good are our models? Joint Session of the 6<sup>th</sup> Conference on Coastal Atmospheric and Oceanic Prediction and Processes and 8<sup>th</sup> Conf on Polar Meteorology and Oceanography, AMS Annual Meeting, San Diego, 9 – 12 January 2005 (invited paper).
22. The summertime Arctic boundary layer from AOE2001, May 2003, NOAA/ETL, Boulder, USA (invited lecture).
23. The summertime Arctic boundary layer from AOE2001. May 2003, Naval Postgraduate School, Monterey, USA (invited lecture).
24. The fascinating Arctic 2: A COAMPS-simulation of the SHEBA-year, April 2003, Naval Research Laboratory, Monterey, USA (invited lecture).
25. The fascinating Arctic 1: The summertime Arctic boundary layer from AOE2001. April 2003, Naval Research Laboratory, Monterey, USA (invited lecture).
26. Mesoscale meteorology - is it important and can it be defined?, June 2002, NATO Advanced Science Workshop on “Air pollution on regional scale”, Kalithea, Greece (keynote).
27. Mesoscale coastal flows. February 2002, Department of Geophysics, University of Bergen (invited lecture).
28. The mesoscale effect on the boundary layer by a small lake, April 2000. NOAA/AL, Boulder, Colorado, USA (invited lecture).
29. The mesoscale effect on the boundary layer by a small lake, April 2000. Desert Research Institute, Reno, Nevada, USA (invited lecture).
30. High-resolution numerical simulations of coastal atmospheric boundary layer flow. The “50 years of Office of Naval Research contribution to international oceanography” special session, The Oceanographic Society meeting, Amsterdam, July 8-11 1996 (invited paper).

**Invited public (popular) presentations:**

1. Klimatförändringar i Arktis (in Swedish, Arctic Climate Change), Greenpeace Action for Arctic Day, Kulturhuset Stockholm, April 2013.
2. Klimatforskning om - och i - Arktis (in Swedish, Climate research about – and in – the Arctic), Salem public library “Science Cafee”, March 2013.
3. Arctic Clouds: Links to weather and climate, Senior Arctic Officials to the Arctic Council, 5 November, 2012.
4. Klimatet i Arktis – Vad händer och varför? (in Swedish, Arctic climate – what is happening and why?), Global Challenge “Arctic policy”, May, 2011.
5. The Climate Issue : Challenges for Industrial Society - a State of the Art lecture on Climate Science. Royal Technical University, Stockholm, May 2011.
6. Climate and weather – projections and forecasts: What can we say about the future?, Handelsbanken Agricultural Day, Svaneholms Castle, 7 April 2011, Skurup.
7. Vad händer med klimatet? (In Swedish, *What is happening with the climate?*), Uppsala Senior’s University, Uppsala University, 5 April 2011, Uppsala.
8. Klimatet på hal is (In Swedish, *Climate on this ice*), Swedish Environmental Protection Organization, Järfälla Chapter, February 2011, Järfälla.
9. The Climate Issue : Challenges for Industrial Society - a State of the Art lecture on Climate Science. Royal Technical University, Stockholm, May 2010.
10. Klimatet i Arktis; en forskares vardag (In Swedish, *Arctic climate change: a scientists perspective*), Stockholm Senior University, March 2010, Stockholm.
11. Klimatet – Jordens och debattens. En forskares tankar om IPCC. (In Swedish, *The Climate – of the Earth and in the debate*), Swedish Parliament, March 2010, Stockholm.
12. Mänskliga klimatförändringar – Varför skall det vara så svårt att veta helt säkert? (In Swedish, *On climate change – why is it so difficult to know for certain?*). Upplands-Bro Rotary , February 2010, Upplands Bro.
13. Vår påverkan på klimatet – Varför skall det vara så svårt att veta helt säkert? (In Swedish, *Our impact on climate – why is it so difficult to know for certain?*). Chalmers, March 2010, Gothenburg.
14. Mänskliga klimatförändringar – Varför skall det vara så svårt att veta helt säkert? (In Swedish, *On climate change – why is it so difficult to know for certain?*). Uppsala University, March 2010, Uppsala.
15. Mänskliga eller naturliga klimatförändringar – Varför skall det vara så svårt att veta helt säkert? (In Swedish, *Human or natural climate change – why is it so difficult to know for certain?*). Swedish Association of Academic Professional, November 2010, Stockholm.
16. Arktiska sommarmoln, ASCOS, (in Swedish, Arctic summer clouds, ASCOS), Swedish Meteorological Society, 19 September, 2009.
17. Klimatförändringar i Arktis och forskningsexpeditioner – hur hänger de ihop? (In Swedish, Arctic climate change and research expeditions – how are they linked?), Ishotellet Jukkasjärvi, February 2009.
18. Mänskliga klimatförändringar – Varför skall det vara så svårt att veta helt säkert? (In Swedish, *On climate change – why is it so difficult to know for certain?*). Svenska Handelsbankens “Stora klimatdag”, 19 October 2007, Stockholm.
19. Globala klimatförändringar – dagens kunskapsläge (*Global Climate Change – what do we know today?*), Swedish Nature Protection Organization (SNF) General Assembly, Luleå, June 2007.
20. Om klimatförändringar – varför ska det vara så svårt att veta säkert? (In Swedish, *On climate change – why is it so difficult to know for certain?*). Teknik och Naturvetenskap, open lecture series at Kristianstad University College, 2007.
21. Klimatförändringar i Arktis – vad vet vi och varför skall vi bry oss? (*Climate change in the Arctic – Why should we bother?*) Café Ledande Forskning, Augusti 2006, Stockholm University.
22. Extremer och medelvärden. Hur kan vi säga om - och hur - klimatet förändras (In Swedish, *Extremes and mean values. How can we tell if – and how – the climate changes*), November 2004, Center of environment and development studies, Uppsala University & Swedish Agricultural University.
23. Klimatförändringar som naturkatastrof (*Climate change as a natural disaster*), November 2004, Dept Physical Geography, Stockholm University.
24. Klimatförändringar i Arktis – results from ACIA (In Swedish, *Climate change in the Arctic – Results from ACIA*), October 2004, Swedish Polar Research Secretariat 20<sup>th</sup> Anniversary, Stockholm.
25. Extremer och medelvärden (och katastrofer). Hur kan vi säga om - och hur - klimatet förändras (In Swedish, *Extremes and mean values. How can we tell if – and how – the climate changes*), November 2004, Department of Physical Geography, Stockholm.
26. Klimatförändringar i Arktis – Varför skall vi bry oss? (*Climate change in the Arctic – Why should we bother?*), August 2004, Alfred Nobel Research School for senior high-school students, Karlskoga.
27. Klimatförändringar i Sverige (In Swedish, *Climate change in Sweden*), October 2003, Haninge Rotary.

28. Arctic Ocean 2001: Intryck från en forskningsresa till en mycket märklig – och vacker – plats (In Swedish, *Arctic Ocean 2001 – impressions from a research journey to a very special – and beautiful place*), October 2003, Swedish Meteorological Society, Uppsala.
29. Vad händer med Sveriges klimat (In Swedish, *What happens to the Swedish climate*), August 2003, Alfred Nobel Research School for senior high-school students, Karlskoga.
30. Klimatförändringar ur ett nordiskt perspektiv (In Swedish, *Climate change from a Nordic perspective*), November 2002, Klimat och Miljöforum, Kiruna.
31. Medelvärden eller extremer. Hur kan vi säga om - och hur - klimatet förändras (In Swedish, *Mean values or extremes. How can we tell if – and how – the climate changes*), November 2002, Forum Ångström, Uppsala.
32. Klimatmodeller som arbetsverktyg (In Swedish, *Climate models as a tool*), October 2002, Miljöforum, Norrköping.
33. Arctic Ocean Experiment 2001: Intryck från resa till en mycket märklig – och vacker – plats. October 2001, Äventyrarnas Förening, Stockholm.
34. Intryck från Arktis (In Swedish, *Impressions from the Arctic*). April 2001, Swedish Air Force Weather Service Annual Research and Development Meeting, Stockholm.
35. Resultat från Nopex (In Swedish, *Results from Nopex*). April 2001, Swedish Air Force Weather Service Annual Research and Development Meeting, Stockholm, Sweden.
36. Sweclim – Svensk klimatmodellering (In Swedish, *Sweclim – Swedish climate modeling*). April 2001, Swedish Air Force Weather Service Annual Research and Development Meeting, Stockholm, Sweden.
37. Klimatet i Norden (In Swedish, *The Nordic climate*): February 2001, Näringslivets Miljöchefer (Environmental Controllers in Sweden), Naturskyddsverket (Swedish EPA) and World Watch Institute, Stockholm.
38. Det växlande klimatet (In Swedish, *The varying climate*): October 2000, Swedish Nature Protection Organization (*Svenska Naturskyddsföreningen*) Annual Meeting, Stockholm.



## *Publications by Michael Tjernström*

### Ph.D. Thesis:

M. Tjernström (MT), 1988: Numerical modeling of stratiform boundary-layer clouds on the meso- $\gamma$ -scale. *Acta Universitatis Upsaliensis*, Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science, ISBN 91-554-2147-4, Uppsala, Sweden

Thesis advisors: Prof. Ulf Högström and Associate Prof. Leif Enger, Uppsala University, Sweden.

### Original papers in peer-reviewed journals:

1. MT, 1987: A study of flow over complex terrain using a three dimensional model. A preliminary model evaluation focusing on stratus and fog. *Annales Geophysicae*, **5B**, (5), 469-486.
2. MT, 1988: Numerical simulations of stratiform boundary layer clouds on the meso- $\gamma$ -scale. Part 1: The influence of terrain height differences. *Boundary-Layer Meteorology*, **44**, 33-72.
3. MT, 1988: Numerical simulations of stratiform boundary layer clouds on the meso- $\gamma$ -scale. Part 2: The influence of a step change in surface roughness and surface temperature. *Boundary-Layer Meteorology*, **44**, 207 - 230.
4. MT, L. Enger and A. Andren, 1988: A three-dimensional numerical model for studies of atmospheric flows on the meso- $\gamma$ -scale. *Journal of Theoretical and Applied Mechanics*, **7**, 167-194.
5. MT, 1989: Some tests with a surface energy balance scheme, including a bulk parameterization for vegetation, in a mesoscale model. *Boundary-Layer Meteorology*, **48**, 33 - 68.
6. Enger, L, and MT, 1991: Estimating the effect on the regional precipitation climate in a semi-arid region caused by an artificial lake using a mesoscale model. *Journal of Applied Meteorology*, **30**, 227-250.
7. MT, and C. A. Friehe, 1991: Analysis of a radome air-motion system on a twin-jet aircraft for boundary layer research. *Journal of Atmospheric and Oceanic Technology*, **8**, 19-40.
8. MT, 1991: Airborne observations of thermal mesoscale circulations in the coastal marine boundary layer. *Journal of Geophysical Research*, **96**, C11, 20499-20520.
9. MT, 1993: Simulated liquid water and visibility in stratiform boundary layer clouds over sloping terrain. *Journal of Applied Meteorology*, **32**, 656-665.
10. MT, 1993: Turbulence length scales in stably stratified free-shear flow analyzed from slant aircraft profiles. *Journal of Applied Meteorology*, **32**, 948-963.
11. MT and A.-S. Smedman, 1993: The vertical turbulence structure of the coastal marine atmospheric boundary layer. *Journal of Geophysical Research*, **98**, 4809-4826.
12. Smedman, A.-S., MT and U. Högström, 1993: Analysis of the turbulence structure of a marine low level jet. *Boundary-Layer Meteorology*, **66**, 105-126.
13. MT and D. Koračin, 1995: Modeling the impact of stratocumulus on boundary layer structure. *Journal of the Atmospheric Sciences*, **52**, 863-878.
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2. Enger, L. och MT, 1987: A higher order closure model for studies of the meso- $\gamma$ -scale. Mesoscale Dynamics and Weather Prediction Workshop, October 12-13, Getå, Sweden.
3. MT, 1988: A numerical study of mesoscale perturbations in stratiform boundary layer cloud fields. 10<sup>th</sup> International Cloud Physics Conference, August 15-20, 1988, Bad-Homburg, Germany.
4. MT, 1989: On the use of pressure fluctuations on the radome of a Sabreliner aircraft for airmotion sensing in boundary layer research - or - what to do when you can't afford your own research aircraft. International Workshop on the Airborne Measurements of Wind, Turbulence and Position, August 26-28, 1989, Oberpfaffenhofen, Germany.
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