

# Tobias Sauter

---

## Contact Information

name Tobias Sauter  
marital status married  
date of birth 08.05.1977  
place of birth Ellwangen  
nationality german  
academic title Dr. rer. nat. M. Sc.  
address Riedgasse 38, 6020 Innsbruck, Austria  
mobile +43 660 4416537  
email sauter.tobias@gmail.com  
homepage www.tobiassauter.info

## Education

- 2006–2011 **Dr. rer. nat.**, *RWTH Aachen University, Department of Geography and Climatology, Aachen, summa cum laude.*
- 2002–2006 **Magister Scientiarum**, *Geography, Meteorology and Geology, Albert-Ludwigs-University, Freiburg.*
- 2004–2005 **Semesters abroad**, *Geography and Geology, ERASMUS exchange programme, Universidad de Granada, Spain.*
- 2000–2002 Studies in Computer science and Mathematics, Albert-Ludwigs-University, Freiburg.

## Dissertation

- title *Application, optimization and uncertainty estimation of global nonlinear nonparametric prediction algorithms - Case studies in Physical Geography*
- supervisors Prof. Dr. Christoph Schneider, Prof. Dr. Jucundus Jacobeit, PD. Dr. Wolfgang Römer

## Awards and Honors

- 2012 **“VGDH Dissertation Price”**, *Award for best Ph.D. thesis in Physical Geography in 2011 received from the Verband der Geographen an Deutschen Hochschulen (VGDH).*
- 2012 **“Borchersplakette”**, *Award from the RWTH Aachen University for excellent Ph.D. thesis.*

---

## Work Experience

- since 2013 **Postdoctoral Research Fellow**, *Institute of Meteorology an Geophysics*, University of Innsbruck.  
Project management, research, teaching, supervision of bachelor, master and Ph.D. thesis.
- 2011–2013 **Postdoctoral Research Fellow**, *RWTH Aachen University*, Aachen.  
Project management, research, teaching, supervision of bachelor, master and Ph.D. thesis.
- 2006–2011 **Ph.D. Student**, *RWTH Aachen University*, Aachen.  
Project management, research, teaching, support of bachelor and master thesis.
- 2005–2006 **Research Assistant**, *Albert-Ludwigs University*, Freiburg.  
Climatological and glaciological field work and statistical modelling.
- 2003–2006 **Geological Field Assistant**, *Ingenieurbüro Geotechnik*, Freiburg.  
Field measurements and analysis of soil samples.
- 1999–2000 **Software Engineer**, *ID-TV Company*, Berlin.  
Development and optimization of 3D avatar motions.
- 1998–1999 **Software Engineer**, *ID Company*, Aalen.  
Development of web applications and databases.
- 1997–1998 **Social Service**, *Arbeiterwohlfahrt*, Aalen.  
Integrative care of disabled persons.

---

## Grants

- 2014 **Research Grant (under review)**, *Tiroler Wissenschaftsfond*, Small scale thermal and topographic effects on upslope winds feeding a convective cloud at Nordkette.
- 2014 **Research Grant (under review)**, *Nachwuchsförderung Universität Innsbruck*, Small scale atmospheric flow in an Arctic environment.
- 2014 **Research Grant (under review)**, *Deutsche Forschungsgemeinschaft*, The impact of dynamic and thermodynamic flow conditions on the spatio-temporal distribution of precipitation in southern Patagonia.
- 2013 **TiP Summer School**, *Grant for the Sino-German Summer School on Glaciology in the European Alps in 2013*.
- 2012 **VALUE COST Action**, *European network on Validating and Integrating Downscaling Methods for Climate Change Research, funded by the intergovernmental framework for European Cooperation in Science and Technology*.
- 2010 **Boost-Fund Project**, *RWTH Aachen University*, Virtual Air Traffic System Simulation (VATSS).

---

## International Network/Collaboration

Chinese Academy of Science, CHINA (S. Kang); Universidad de Chile, CHILE (R. Garreaud); Technical University Berlin, GER (D. Scherer); Technical University Dresden, GER (M. Buchroithner); Rheinische-Friedrich-Wilhelms University Bonn, GER (V. Venema); GEOMAR Kiel, GER (D. Maraun); University Trier, GER (R. Kilian); RWTH Aachen, GER (C. Schneider); University of Innsbruck, AUS (M. Rotach, G. Kaser); Alaska Climate Research Center, USA (M. Stuefer); International Centre for Theoretical Physics (ICTP), I (E. Coppola); University of Birmingham, UK (M. Widmann).

---

## Projects

**KongsGlaz**, *Response of Kongsvegen glacier (Svalbard) to climate changes*, Austrian Research Fond (FWF), Era-Net.

**DynRG-TIP**, *Dynamic Response of glaciers on the Tibetan Plateau to climate change*, German Research Foundation (DFG) Priority Programme 1372: "Tibetan Plateau: Formation-Climate-Ecosystem".

**Gis Klischee**, *Adaptation of winter sports tourism to climate change and weather variability in German Low Mountain Ranges*, Federal Ministry of Education and Research (BMBF) project "klimazwei".

**Gran Campo Nevado**, *Climate variability and the dynamic response of the Gran Campo Nevado Ice Cap, southern Patagonia*, Funded by the German Research Foundation (DFG).

**IPY Kinnvika and Svalglac ERS-Project**, *Dynamic response of surface energy and mass balance of Vest- and Austfonna on climate change, Svalbard*, Funded by the German Research Foundation (DFG).

**TR32**, *Transregional collaborative research center 32: Scale consistent two-way coupling of land-surface and atmospheric models*, Funded by the German Research Foundation (DFG).

**WET**, *Variability and trends of hydrological components in benchmark watersheds on the Tibetan Plateau*, Federal Ministry of Education and Research (BMBF) project: "Tibet and Central Asia: Monsoon dynamic and ecosystems".

**VATSS**, *Virtual Air Traffic Simulation System: Auralisation and optimization of flight paths in the vicinity of airports*, Boost Fund Project of the RWTH University.

---

## Teaching Experience

Lectures	Atmospheric boundary layer Climatology Glaciology Glacier Dynamics Global Change
Advanced seminar	Natural resources and global change in Central and South Asia

- Courses Introduction to Atmospheric Physics  
Introduction to climate modelling  
Data analysis in Geoscience and Geography with Matlab  
Introduction to Geography
- Field courses Meteorological field internship, Norway  
Excursion to Southern Germany and Tyrol  
Excursion to Nepal

## Expeditions

- 2011, 2010 **DynRG-TiP Project**, *Dynamic response of glaciers on the Tibetan plateau to climate change*, Tibetan plateau.
- 2009 **IPY Kinnvika Project**, *Dynamic Response of Surface Energy and Mass Balance of Vest- and Austfonna (Nordaustlandet, Svalbard) on Climate Change*, Nordaustlandet, Spitzbergen.
- 2002, 2003, 2008 **Gran Campo Nevado Project**, *Climate Glacier Project*, Patagonia, Chile.

## Professional Activities

- since 2013 **COST Action “VALUE”**, *Short-term scientific mission (STSM) manager*, Organization and funding of inter-laboratory exchange visits for young researcher in the early stage of their career.
- since 2011 **COST Action “VALUE”**, *Member of the “VALUE” Cost Action management committee*, Validating and Integrating Downscaling Methods for Climate Change Research.
- since 2009 **Convener at the Annual General Assembly of the European Geoscience Union**, *Geophysical downscaling session within the Climate Division*.
- since 2008 **Reviewer**, *Reviewer of research articles in a number of magazines, e.g. Int.J.Clim., J.Clim., J.Appl.Met.Clim., Hydrol. Processes, Quat. Int., Int.J.Glac., J.Mount.Sc..*

## Professional Affiliations

- since 2013 American Geosciences Union membership.
- since 2005 European Geosciences Union membership.
- since 2005 Member of the Arbeitskreis Klima (Working Group Climatology, Germany).

## Research Interests

- methods statistical and dynamical downscaling, sensitivity and uncertainty estimation, stochastic weather generator, LES/RANS modelling, turbulence closure schemes
- processes orographic precipitation, atmospheric boundary layer, two-phase flow, turbulence, land-atmosphere interactions

---

## Further Education

- 2014 **ECMWF Training Course**, *Parametrization and diabatic processes (2 weeks)*, Reading, United Kingdom.
- 2011 **Parallel Programming**, *Intensive course on MPI, OpenMP and HPC programming (1 week)*, Forschungszentrum Jülich, Germany (lead by Dr. Rolf Rabenseifner).
- 2010 **Introduction to Computational fluid dynamics**, *Navier-Stokes equation, finite differences, finite volumes, finite elements, turbulence modelling, parallelization (1 week)*, RWTH Aachen University, Germany.
- 2008 **Inverse modelling in Earth and Environmental Sciences**, *Local search inverse modelling algorithms, parameter uncertainty estimation, global search algorithms, parameter estimation, multi-objective optimisation, coupling of inverse and forward simulation models (1 week)*, University of Leuven, Belgium.

---

## Languages

- German **first language**
- English **full professional proficiency**
- Spanish **full professional proficiency**
- French **elementary proficiency**

---

## Computer Skills

- Numerical Models WRF, OpenFOAM
- HPC MPI, OpenMP, PetSC
- Programming languages C++, Fortran, Unix shell scripts, Python, Matlab, R Gnu
- Applications NCL, CDO, ArcGIS, LaTeX, common databases

---

## Selected Publications

**Sauter T.** and C. Schneider (2013): Klimawandel und Folgen für die Vergletscherung im südlichen Südamerika. *Geographische Rundschau*, 12, 38–43.

**Sauter T.**, M. Möller, R. Finkelnburg, M. Grabiec, D. Scherer and C. Schneider (2013): Modelling snowdrift for the Vestfonna Ice Cap, north-eastern Svalbard. *The Cryosphere*, 7, 1287–1301, doi:10.5194/tc-7-1287-2013.

Reinartz S., **T. Sauter** and C. Schneider (2013): Impact of precipitation downscaling schemes on mass balance modeling of the Gran Campo Nevado Ice Cap, Patagonia. *Journal of Glaciology*, 59 (218), 11067-1116.

Schneider L., **T. Sauter** and C. Schneider (2013): Estimating the spatial distribution of orographic precipitation on the Jostedals Ice Cap, Norway. *Geografiska Annalea*, (under revision).

**Sauter T.** and V. Venema (2011): Natural three-dimensional predictor domains for statistical downscaling. *Journal of Climate*, 24, 6132–6145, doi:10.1175/2011JCLI4155.1.

Brands, S., Taboada, J.J., Cofiño, A.S., **Sauter, T.**, Schneider, C. (2011): Statistical downscaling of daily temperatures in the northwestern Iberian Peninsula from global climate models: validation and future scenarios. - *Climate Research*, 48, 163–176, doi:10.3354/cr00906.

Franz, K., R. Hoernschemeyer, M. Große Boeckmann, R. Schmitt, J. Pollmanns, J. Feldhusen, K. Bueker, J. Reichmuth, K. Petzoldt, **T. Sauter**, C. Schneider, A. Ewert, M. Fromhold-Eisebith (2011): A methodical approach to assess the aircraft life cycle. - 2nd International Air Transport and Operations Symposium (ATOS 2011), Delft.

Maraun, D., F. Wetterhall, A.M. Ireson, R.E. Chandler, E.J. Kendon, M. Widmann, S. Brienen, H.W. Rust, **T. Sauter**, M. Themeßl, V.K.C. Venema, K.P. Chun, C.M. Goodess, R.G. Jones, C. Onof, M. Vrac and I. Thiele-Eich (2010): Precipitation downscaling under climate change. Recent developments to bridge the gap between dynamical models and the end user. *Reviews of Geophysics*, 48, RG3003, doi:10.1029/2009RG000314.

**Sauter, T.**, B. Weitzenkamp and C. Schneider (2010): Spatio-temporal prediction of snow cover in the Black Forest mountain range using remote sensing and a recurrent neural network. *International Journal of Climatology*, doi: 10.1002/joc.2043.

Brands, S., J. Taboada, A.S. Cofiño, C. Schneider, **T. Sauter** (2010): Statistical downscaling of daily temperatures in northwestern Spain from an ensemble of AR4-GCMs. - EGU General Assembly 2010 Wien.

Huintjes, E., H. Li, **T. Sauter**, Z. Li and C. Schneider (2010): Degree-day modelling of the surface mass balance of Urumqi Glacier No. 1, Tian Shan, China. *The Cryosphere Discuss.*, 4, 207-232.

Buttstädt, M., **T. Sauter**, C. Schneider (2010): Changes of extreme events in an urban area due to anthropogenic climate change. - 1st World Congress on Cities and Adaptation to Climate Change, 28.05.2010-30.05.2010 Bonn.

**Sauter, T.**, V. Venema, D. Maraun, E. Coppolo (2010): Geophysical Downscaling Methods. - EGU General Assembly 2010 Wien.

**Sauter, T.** and V. Venema (2009): Multi-site simulation of daily rain sums using a new surrogate-based weather generator and self organising maps for weather classification. - Free Workshop on precipitation downscaling and modelling 2009, Norwich, UK.

**Sauter, T.**, C. Schneider, R. Kilian and M. Moritz (2009): Simulation and Analysis of Runoff from a partly glaciated meso-scale Catchment area in Patagonia using an Artificial Neural Network. *Hydrological Processes*, 23, 1019-1030.

Käsmacher, O., **T. Sauter** and C. Schneider (2008): Comparison of the results of linear and nonlinear objective weather type classification methods applied to the region of the northern North Atlantic. - 8th European Meteorological Society (EMS) Annual Meeting and 7th European Conference on Applications of Meteorology (ECAM) 2008, Amsterdam.

Mönnig, C., O. Käsmacher, B. Weitzenkamp, **T. Sauter** and C. Schneider (2008): GIS-based Interpolation and Downscaling of Climate Data using Topographic Data and Remote Sensing. - EGU General Assembly 2008, Wien.

**Sauter, T.**, K. Petzoldt, H.-W. Pätz, K. Thomas, M. Vrac, A. Volz-Thomas, A., Wahner and C. Schneider (2008): Application of Self-organizing maps to define weather types for the analysis of trace gas distribution over the eastern United States . - 8th European Meteorological Society (EMS) Annual Meeting and 7th European Conference on Applications of Meteorology (ECAM), Amsterdam.

Schirmer, M., **T. Sauter**, C. Schneider, C. Fierz, J. Schweizer and M. Lehning (2008): Statistical Assessment of regional Avalanche Danger using SNOWPACK parameters. - EGU General Assembly 2008, Wien.

Petzoldt, K., P. Nedelec, **T. Sauter**, C. Schneider, H. Smit, H. Thomas, V. Thouret, A. Volz-Thomas and A. Wahner (2007): Regular vertical profiles of ozone and precursors from MOZAIC for regional air quality. - 7th European Meteorological Society (EMS) Annual Meeting and 8th European Conference on Applications of Meteorology (ECAM), 01.-05.10.2007 San Lorenzo de El Escorial.

### Books

**Sauter, T.** (2012): Non-parametric modelling in Geoscience. *Süddeutscher Verlag für Hochschulschriften*, Saarbrücken.

Roth, R., A. Krämer, C. Schneider, B. Weitzenkamp, **T. Sauter**, C. Simmer and H. Wilker (2009): GIS-KliSchee - Anpassung des Wintersporttourismus in den deutschen Mittelgebirgen an Klimawandel und Witterungsvariabilität. In: Mahammadzadeh, M., H. Biebeler and H. Bardt (Hrsg.): Klimaschutz und Anpassung an die Klimafolgen, Kap. 32, S. 263 - 270 Köln.

Schneider, C., **T. Sauter** and B. Weitzenkamp (2009): Klimawandel und Wintersport in Mittelgebirgen. *Nationalatlas aktuell* 11 (26.11.2009), Leibniz-Institut für Länderkunde (IfL) Leipzig.