

Johannes Horak

Personal Details



Date of birth 07.08.1984
Place of birth Steyr, Austria
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Education

12/2015 - current

PhD programme Atmospheric Sciences, Area of dissertation: Meteorology and Geophysics

Supervisors: Prof. Dr. Alexander Gohm and Univ. Prof. Dr. Mathias Rotach.

Simulation of the state of the atmosphere above complex topography with the Intermediate Complexity Atmospheric Research Model and assessing its performance.

03/2006 - 03/2013

Diploma programme: Physics, University of Vienna

Diploma thesis title: *Design and Characterisation of a LIAD Source in View Of Matter Wave Interferometry*

Supervisor: Univ. Prof. Dr. Markus Arndt.

The thesis characterizes a self-designed molecular beam source based on the soft laser desorption mechanism LIAD. It explores its usability for experiments in matter wave interferometry and investigates the driving mechanism of the process with numerical and experimental methods.

10/2004 - 02/2005

Diploma programme: Philosophy, University of Salzburg

10/2003 - 09/2004

Civil service, AKH Linz

09/1998 - 06/2003

School leaving exam at technical college for software engineering and business, HTBLA Leonding

Publications and Scientific Work

Lead Author

J. Horak, M. Hofer, F. Maussion, E. Gutmann, A. Gohm, and M. W. Rotach, “Assessing the added value of the Intermediate Complexity Atmospheric Research (ICAR) model for precipitation in complex topography,” *Hydrology and Earth System Sciences*, vol. 23, no. 6, pp. 2715–2734, 2019

J. Horak, A. Haberleitner, and G. Schauburger, “How to transport veterinary drugs in insulated boxes to avoid thermal damage by heating or freezing,” *BMC veterinary research*, vol. 13, no. 1, p. 140, 2017

J. Horak, I. Schmerold, K. Wimmer, and G. Schauburger, “Cabin air temperature of parked vehicles in summer conditions: life-threatening environment for children and pets calculated by a dynamic model,” *Theoretical and Applied Climatology*, pp. 1–12, 2016

J. Horak, D. Heunoske, M. Lueck, J. Osterholz, and M. Wickert, “Numerical modeling and characterization of the laser-matter interaction during high-power continuous wave laser perforation of thin metal plates,” *Journal of Laser Applications*, 2015

Co-Author

J. Osterholz, D. Heunoske, J. Horak, B. Lexow, M. Lueck, S. Schaeffer, and M. Wickert, “Experimental characterization of energy transfer from large-diameter kilowatt continuous-wave laser beams to metal samples,” *Journal of Laser Applications*, vol. 29, no. 1, p. 012011, 2017

U. Sezer, L. Wörner, J. Horak, L. Felix, J. Tüxen, C. Götz, A. Vaziri, M. Mayor, and M. Arndt, “Laser-induced acoustic desorption of natural and functionalized biochromophores,” *Analytical Chemistry*, vol. 87, no. 11, pp. 5614–5619, 2015

A. Haberleitner, G. Schauburger, J. Horak, and I. Schmerold, “Thermal drug storage conditions in veterinary vehicles - A one-year field study in Austria,” *Wiener Tierärztliche Monatsschrift*, vol. 101, no. 5-6, pp. 110–119, 2014

Talks and Posters

“Simplified physics-based precipitation downscaling for glacierized mountain regions”, *AGM 2019*, Innsbruck, Austria. Poster, (download)

“Weather pattern-based evaluation of the Intermediate Complexity Atmospheric Research Model (ICAR)”, *EGU 2018*, Vienna, Austria. Session: Downscaling, Methods and Applications, (download)

“Downscaling the Local Weather Above Glaciers in Complex Topography”, *EGU 2017*, Vienna, Austria. Session: Downscaling, Methods and Applications

“Numerical Modelling and Characterization of the Laser-Matter Interaction During High-Power CW Laser Perforation of Thin Metal Plates”, *ICALEO 2014*, San Diego, USA. Session: Modelling and Simulation

Research Stays / Courses

4/2016 - 05/2016	National Center for Atmospheric Research, Boulder, USA An introduction to the intermediate complexity atmospheric research model (ICAR).
06/2014	Thermography in R&D and automation (three days)
02/2014	Basics of FEM modelling (two days)

Science Communication

Author and owner of the science-blog timaios.org. Selected published articles:

- Nebensonnen und wie sie entstehen ([link](#))
- Wie funktioniert Wissenschaft? ([link](#))
- Wie funktioniert eine Infrarotkamera?([link](#))

Member of the “Eis and Klima Blog” of the Austrian newspaper derStandard.at. Author of the articles: “Die Vermessung der Gletscher” ([link](#)) and “Wetter und Klima: Vertrauen in Modelle finden” ([link](#)).

Languages

German (first language), English (C2) and Russian (A1)

Further Expertise

Thermography	Collection of data with a thermographic camera and its analysis with corresponding software.
Coding	Python (numpy, scipy, cartopy, matplotlib, xarray, pandas, ...), Fortran, Bash Script, C, C++, C#, Java, JavaScript, PHP, HTML, SQL (Oracle, MySQL, PostgreSQL), Access
Operating systems	Windows, Linux (server and desktop)
Software	Mathematica, MATLAB, Origin, Solidworks, MS Office, \LaTeX , LS-Dyna, LS-Prepost, COMSOL, Adobe Bridge, Lightroom and Photoshop, Steinberg Cubase, Open Source Blogsystems and CMS (Serendipity, Wordpress)
Photography	Owner and photographer of/on www.livepics.at .

Teaching Experience

- 10/2011 - 01/2012 Tutor for mathematics exercises
University of Natural Resources and Life Sciences, Vienna
- 03/2010 - 07/2010 Tutor for introductory physics lab exercises
University of Veterinary Medicine, Vienna
- 03/2009 - 07/2009 Tutor for introductory physics lab exercises
University of Veterinary Medicine, Vienna

Work Experience

- 12/2015 - current **Research assistant, *University of Innsbruck***
Downscaling of atmospheric variables with the Intermediate Complexity Atmospheric Research Model in complex topography with a focus on target quantities relevant for process-based distributed glacier mass-balance models.
- 09/2013 - 08/2015 **Research assistant, *Fraunhofer EMI, Freiburg (Germany)***
Group: Laser technology. Numerical and experimental studies of the interaction between high-power continuous-wave laser radiation and metal plates.
- 10/2010 - 06/2012 Creation of L^AT_EX versions of lecture notes and presentations for Prof. Dr. Helmuth Hüffel, *University of Vienna*
- 04/2008 - 06/2010 **Project staff member, *University of Veterinary Medicine, Vienna***
Department: Medical physics. Development of a balance equation based numerical model describing the temporal evolution of the cabin temperature of a vehicle. Input parameters are its geometry, optical/thermal properties and meteorological data during the time interval to be simulated for.
- 05/2007 - 06/2007 **Project staff member, *University of Vienna***
Group: Quantum nanophysics and molecular quantum optics. Setting up of Young's double slit experiment with single photons.
- 07/2005 - 07/2006 **Software engineer, *MIC Customs Solutions, Linz***
Adaption and development of Oracle Forms based customs software for corporations.
- 03/2005 - 06/2005 **Mobile patrol, *Securitas, Linz***