

Personal Details Name: Tinja Olenius
Telephone: +46 76 495 7787
E-mail: tinja.olenius@smhi.se, tinja.olenius@alumni.helsinki.fi
Mailing address: SMHI / Swedish Meteorological and Hydrological Institute, Research Department, Meteorology Research Unit, SE-60176 Norrköping, Sweden

Current Position Air quality researcher, Swedish Meteorological and Hydrological Institute (SMHI)

Research **Research interests**

- Air quality modeling
- Atmospheric particle formation and its effects
- Aerosol physics
- Nanoparticle dynamics and thermodynamics

Tools

- Molecular cluster and aerosol dynamics simulations
 - Box and trajectory model applications
 - Large-scale transport model implementations
-

Education 2015 Doctor of Philosophy, University of Helsinki
Thesis: *Cluster population simulations as a tool to probe particle formation mechanisms*
2011 Master of Science, University of Helsinki
2010 Bachelor of Science, University of Helsinki

- Major: Physics
- Minors: Theoretical physics, astronomy

Employment **Swedish Meteorological and Hydrological Institute (SMHI), Research Department**

2019- Researcher, Meteorology Research Unit – Environment and Climate

Stockholm University, Department of Environmental Science and Analytical Chemistry (ACES) & Bolin Centre for Climate Research

2017-2019 Research scientist, Atmospheric Science Unit

2015-2017 Post doctoral fellow, Atmospheric Science Unit

University of Helsinki, Department of Physics, Division of Atmospheric Sciences

2011-2015 PhD researcher, Computational Aerosol Physics Group
2011 Research assistant, Computational Aerosol Physics Group

Funded Research Projects

2025-2028 *UNIC: Understanding Non-CO2 Impact for deCarbonized aviation*, Horizon Europe, 65 k€ (of 4.5 M€), participant
2020-2022 *New-generation tools for robust quantification of atmospheric nanoparticle sources*, Swedish Research Council Formas, 3 MSEK (ca. 287 k€), PI
2020-2022 *Explicit framework from molecular clusters to nanoparticles for resolving atmospheric aerosol formation dynamics*, Swedish Research Council (Vetenskapsrådet), 2.7 MSEK (ca. 259 k€), PI
2018 *Robust modeling tools for exhaust gas cleaning through gas-to-particle conversion*, the ÅForsk Foundation, 488 kSEK (ca. 47 k€), PI
2012- Smaller travel grants of a total of ca. 3 k€

Open-Source Software

J-GAIN: Aerosol particle formation rate look-up table generator and interpolator

- An efficient tool to compute, store and retrieve particle formation rates for user-defined input on arbitrary particle-forming gases and environmental conditions
- Can be used to readily apply quantum-chemistry-based particle formation rate predictions in large-scale models
- Available at <https://github.com/tolenius/J-GAIN/>

ClusterIn: Molecular cluster dynamics plugin for aerosol models

- A model add-on to couple the representations of small molecular cluster and larger aerosol particle populations for explicit simulation of particle formation dynamics
- Can be used for an explicit description of gas-cluster-aerosol dynamics in computationally light-weight applications, i.e. box and trajectory models
- Available at <https://github.com/tolenius/ClusterIn/>

GR-CLUE: Tool for interpreting observed nanoparticle growth rates

- A simple tool to assess the validity of nanoparticle growth rate deduced from size distribution data, required for appropriate implementation of the rates in aerosol models
- Available at <https://github.com/tolenius/GR-CLUE/>

ACDC: Atmospheric Cluster Dynamics Code

- An automatized tool to generate and solve molecular cluster kinetics equations with input on cluster properties
- Can be used as a standalone model for e.g. cluster concentrations and formation rates, or combined with other atmospheric chemistry modeling
- Available at <https://github.com/tolenius/ACDC/>

Publications **Peer-reviewed papers in international journals**

- Total 44 research papers; 11 first-author, 8 second-author, and 2 last-author papers
- *h*-index 23, total >3200 citations (Google Scholar, Aug 2024)

Book chapters

- 2 book chapters (in: *Introduction to Aerosol Modelling*, Wiley, 2022; *Physical Chemistry of Gas-Liquid Interfaces*, Elsevier, 2018)

For full publication list, see the Publications document and e.g. Google Scholar:
<https://scholar.google.com/citations?user=hjh0SJwAAAAJ&hl=en&oi=ao>

Presentations **Conference presentations and seminars**

- ~30 presentations in international conferences and workshops (at e.g. European Aerosol Conference (EAC), International Aerosol Conference (IAC), American Association for Aerosol Research (AAAR) Annual Conference, International Conference on Nucleation and Atmospheric Aerosols (ICNAA), Faraday Discussion, Nordic Society for Aerosol Research (NOSA) Aerosol Symposium)
- Several seminars (at e.g. Stockholm University, KTH Royal Institute of Technology, University of Oulu)

2019 Invited talk at European Meteorological Society (EMS) annual meeting

2017 Invited talk at International Aerosol Modeling Algorithms (IAMA) conference

Other Activities **Reviewer for journals**

- ACS Omega (2021)
- Aerosol Research (2024)
- Atmospheric Chemistry and Physics (2016-2018, 2020-2022, 2024)
- Chemistry of Materials (2020, 2021)
- Chemosphere (2019)
- Environmental Science: Atmospheres (2022)
- Environmental Science & Technology (2013, 2018, 2019, 2023)
- Geoscientific Model Development (2021)
- Industrial & Engineering Chemistry Research (2019)
- Journal of Aerosol Science (2014)
- Journal of Geophysical Research: Atmospheres (2018, 2022, 2024)
- Journal of Physical Chemistry A (2014, 2017, 2019, 2020)
- Nature Communications (2018)
- Physical Chemistry Chemical Physics (2015)
- Science Advances (2023)

Contribution to conference organization

- Technical Program Committee member for International Aerosol Modeling Algorithms (IAMA) conference (2021, 2023)

Teaching

Teaching and developing undergraduate and PhD-level courses

- 2017-2019 Modeling tools for environmental scientific studies (Modelleringsverktyg för miljövetenskapliga undersökningar), Stockholm University, Department of Environmental Science and Analytical Chemistry, 7.5 ECTS, undergraduate course, 49 hours
- 2014 Formation and growth of atmospheric aerosols, University of Helsinki, Department of Physics, 5 ECTS, PhD course, 25 hours
- 2011-2013 Thermal physics (Termofysiikka), University of Helsinki, Department of Physics, 8 ECTS, undergraduate course, 100 hours

Supervision

Advisor for

- 2 post doctoral researchers (Dr. Carlton Xavier 2022-, Dr. Jenni Kontkanen 2017)
- 3 bachelor theses (Paula Hietala 2016, Roope Halonen 2015, Matti Ala-Lahti 2014)