

contact/web	e-mail: sylwester.arabas@uj.edu.pl phone: +48502254779 homepage: www.ii.uj.edu.pl/~arabas ORCID: orcid.org/0000-0003-2361-0082 Publons: publons.com/researcher/3026921/sylwester-arabas Google Scholar: scholar.google.com/citations?user=X1s5grkAAAAJ LinkedIn: linkedin.com/in/sylwester-arabas
highlights	<ul style="list-style-type: none">· numerical modelling and data analysis in atmospheric physics· cloud physics, aerosol-cloud-precipitation interactions, particle-based μ-physics· research software engineering focused on reproducibility & maintainability· free and open-source software maintenance, dissemination and advocacy· scientific data visualisation, vector graphics and typesetting· public presentations, teaching sciences, organisation of meetings· building teams, keeping things simple, done and documented· international experience in academic, gov, corporate and startup realms
employment	2018.10–...: Jagiellonian Univ. (Computer Sci.), Kraków, Poland leadership in open-source Python projects: atmos.ii.uj.edu.pl computational research on aerosol and clouds mentorship for graduate students (computer science, physics) lectureship (“Modelling of Atmospheric Clouds”) 2021.07–2022.06: Univ. Illinois (Atmos. Sci.), Urbana, Illinois postdoc at the group of Nicole Riemer 2017.10–2018.09: AETHON, Athens, Greece urban transport modelling (EU’s H2020 “Innovation Associate” programme) 2015.11–2017.09: Chatham Financial, Cracow, Poland financial models software development 2013.12–2015.10: University of Warsaw ([Geo]Physics), Poland leadership in open-source CFD-related projects: github.com/igfuw lectureship (C++ for first-year undergraduate students) 2005.10–2013.12: graduate studies (see below) 2002.10–2005.12: Mazovian Governor Office, Warsaw, Poland web/db developer 2000–2009: ITStudio.pl, Warsaw, Poland web/db developer
university education	2008–2013: Faculty of Physics, University of Warsaw – PhD in Physics thesis: Elements of modern cloud modelling (in English) supervisor: H. Pawłowska, degree obtained: 2013-12-16 referees: G. Feingold (NOAA), L. Łobocki (Warsaw Tech.) 2002–2008: Faculty of Physics, University of Warsaw – MSc, 350 ECTS thesis: Microphysical properties of shallow convective clouds (in Polish) supervisor: H. Pawłowska; referee: K. Haman; degree obtained: 2008-06-25
study visits	2022: (2 weeks) California Institute of Technology (Pasadena, California) 2015: (4 weeks) University of Hyogo (Kobe, Japan) 2012: (4 weeks) National Center for Atmospheric Research (Boulder, Colorado) 2010: (4 weeks) JAMSTEC/The Earth Simulator Center (Yokohama, Japan)
coding skills	Python, C++, C#, C, IDL/GDL, Fortran, SQL, UNIX tools, \LaTeX / \BibTeX ; multi-threaded, GPU and MPI parallelism; design patterns; test automation
editorship	Geoscientific Model Development (topical editor since 2020)
language skills	fluent: Polish, English ; basics: Russian, French

- workshops, schools, courses**
- 2021: 10-th International Cloud Modelling Workshop (virtual)
 - 2021: Advanced numerical methods for hyperbolic equations (U. Trento)
 - 2019: Water Isotopes and Climate (NCAR)
 - 2019: DYAMOND-ESiWACE Hackathon (Mainz)
 - 2018: Particle-based modeling of cloud microphysics (U. Hyogo)
 - 2018: Mathematics Applied in Transport and Traffic Systems (TUDelft)
 - 2018: Innovation Management (A.T. Kearney, Dusseldorf/Berlin/Munich)
 - 2017: Pedestrian Dynamics: Modelling, Validation and Calibr. (Brown Univ.)
 - 2017: Robust Mathematical Finance (ETH)
 - 2017: Quantitative Finance (U. Milano-Bicocca)
 - 2016: Numerical methods for Hamilton-Jacobi equations (RICAM, Linz)
 - 2014: IP, Licensing and Commercialisation (U. Oxford)
 - 2014: Global Cloud Resolving Modelling (RIKEN, Kobe)
 - 2014: Experim. Methodology in Comp. Sci. Research (U. St. Andrews)
 - 2012: 8-th International Cloud Modelling Workshop (U. Warsaw)
 - 2011: Atmospheric Water Vapour in the Climate System (Venice Int. Univ.)
 - 2008: Aerosols and Climate Change (U. L'Aquila)
 - 2008: Physics and chem. of air pollution and their effects (U. Helsinki)
 - 2007: Boundary-Layer Research with Airborne Instruments (EUFAR, Iasi)
 - 2007: Formation and growth of atmospheric aerosols (U. Helsinki)
- field campaigns**
- 2011: (3 weeks) CARRIBA helicopter measurements campaign (Barbados)
 - 2008: (3 weeks) EUCAARI aircraft measurements campaign (Rotterdam)
 - 2008: (2 weeks) SEASALT aircraft measurements campaign (Austrian Alps)
 - 2006: (3 weeks) AMMA aircraft measurements campaign (Burkina Faso)
- funding record**
- Poland's National Science Centre (ncn.gov.pl):
 - 2022-24: PI in a SONATA project (ca. \$250 000)
 - 2011-13: PI in a PRELUDIUM project (ca. \$15 000)
 - Foundation for Polish Science (fnp.org.pl):
 - 2018-21: PI in "Reintegration" grant (ca. \$200 000)
 - 2012-13: 2×START fellowship (incl. visit at NCAR, Boulder, CO)
 - European Facility for Airborne Research (eufar.net):
 - 2008: PI in SEASALT student project (seasalt.igf.fuw.edu.pl) (ca. \$25 000)
- seminars**
- Environ. & Climate Sci. Dept, Brookhaven National Lab, NY (2022)
 - Dept. Environ. Sci. & Engineering, Caltech (2022): youtu.be/OOJe-JFMDpU
 - Dept. Atmospheric Sciences, Univ. Illinois at Urbana-Champaign (2021)
 - Dept. Atmospheric and Oceanic Sciences, McGill University, Montreal (2019)
 - National Center for Atmospheric Research, Boulder, Colorado (2019,'14,'12,'10)
 - Los Alamos National Laboratory (2019)
 - Faculty of Sciences, University of Pécs, Hungary (2019)
 - Department of Atmospheric Sciences, Yonsei University, Seoul (2019)
 - Graduate School for Simulation Studies, University of Hyogo, Kobe (2019,'15)
 - Nanjing University of Information Science and Technology, China (2019)
 - Lab. de mécanique des fluides et d'acoustique, École Centrale de Lyon (2019)
 - Institute for Atmospheric Physics, Univ. Mainz (2019)
 - Physics Seminar, Michigan Tech, Houghton, Michigan (2018)
 - Dept. of Atmospheric Sciences, University of Wyoming, Laramie (2018,'15)
 - Complex Systems and Applications Group, Demokritos, Athens, Greece (2018)
 - Chemical Engineering Department, University of Patras, Greece (2018)
 - Faculty of Civil Engineering and Geosciences, TU Delft, The Netherlands (2015)
 - National Atmospheric and Oceanic Administration, Boulder, Colorado (2012)
 - Meteorological Research Institute, Tsukuba, Japan, (2010)
 - Japan Agency for Marine-Earth Science and Technology, Yokohama (2010)

conference presentations	<p>American Meteorological Society Annual Meeting / Cloud Physics Conference: '22 (Madison, poster), '22 (Houston, virtual talk), '18 (Vancouver, poster)</p> <p>International Conference on Clouds and Precipitation: '21 (virtual, 2 contribs), '12 (Cancún, talk), '08 (Cancún, talk)</p> <p>UCAR Software Engineering Assembly Conference (Boulder, Colorado): '21,'13 (talk)</p> <p>FOSDEM (Free & Open Source Software Devs Euro Meeting, Brussels): '21,'20,'19 &'18 (volunteer),'17,'16,'15,'14,'13 (convener),'12,'11 (talk),'10</p> <p>European Geosciences Union General Assemblies (Vienna): '20 (virtual, co-convener), '10 (poster), '09 (poster), '07 (poster)</p> <p>Numerical Analysis and Scientific Computation with Applications: '18 (Kalamata, talk)</p> <p>Transportation Research Arena (Vienna): '18 (poster)</p> <p>C++Now by Boost & Software Freedom Conservancy (Aspen, Colorado): '15 (talk)</p> <p>SIAM Conference on Mathematical and Computational Issues in Geosciences: '13 (Padua, talk), '11 (Long Beach, talk)</p> <p>American Geophysical Union Fall Meetings (San Francisco): '12 (poster), '10 (poster)</p> <p>Metström: Multiple Scales in Fluid Mechanics and Meteorology (Berlin): '11 (talk)</p>
teaching	<p>Faculty of Math. and CS, Jagiellonian University:</p> <ul style="list-style-type: none"> 2020: Modelling of Atmospheric Clouds (lecture + computer lab) 2020: Programmer's Workshop (UNIX/L^AT_EX/git/...) (remote lab) 2020: Programming 1 (C/C++) (remote lab) 2018: Abstract programming (computer lab) 2018: Design patterns (computer lab) <p>Faculty of Physics, U. Warsaw:</p> <ul style="list-style-type: none"> 2015: Programming in C++ (lecture) <p>U. Vigo in Ourense, Spain:</p> <ul style="list-style-type: none"> 2014: A short course on object-oriented numerics (ephyslab.uvigo.es/numeric) <p>Institute of Geophysics, U. Warsaw:</p> <ul style="list-style-type: none"> 2011, '14: Numerical modelling in atmospheric physics 2010: Physics of the atmospheric boundary layer 2009, '10: Atmospheric thermodynamics and cloud physics 2008, '09: Hands-on data processing in meteorology
organisation of meetings	<p>“Probabilistic Particle-Based Methods in Aerosol-Cloud Microphysics Modeling” (AMS Symposium on Aerosol-Cloud-Climate Interactions, Denver, 2023) https://annual.ametsoc.org/index.cfm/2023/program-events</p> <p>“Lagrangian cloud microphysics: progress and prospects” (EGU GA, 2020) http://meetingorganizer.copernicus.org/EGU2020/session/36655</p> <p>“Eulerian/Lagrangian methods for cloud microphysics” (Cracow, 2019) http://www.ii.uj.edu.pl/~arabas/workshop_2019/</p> <p>“Eulerian/Lagrangian methods for cloud microphysics” (Warsaw, 2015) http://goo.gl/1fj5H8</p> <p>“FOSS for scientists” (Brussels, 2013, day-long conference session) http://archive.fosdem.org/2013/schedule/track/foss_for_scientists/</p>
open-source software	<p>PyMPDATA & PySDM (2019–...): ~ 2500 Python commits, maintenance</p> <p>libmpdata++, libcloudph++ (2013–2015): ~1000 C++ commits</p> <p>GNU Data Language (2009–...): ~500 C++ commits, co-maintenance</p>

- mentorship** MSc in CS: Piotr Bartman (2020); MSc in Physics: Michael Olesik (2020)
- peer-reviewed papers**
- Bartman et al. 2022:
PyMPDATA v1: Numba-accelerated implementation of MPDATA ...
(J. Open Source Soft. doi: [10.21105/joss.03896](https://doi.org/10.21105/joss.03896))
- Bartman et al. 2022:
PySDM v1: particle-based cloud modelling package ...
(J. Open Source Soft. doi: [10.21105/joss.03219](https://doi.org/10.21105/joss.03219))
- Olesik et al. 2022:
On numerical broadening of particle-size spectra: ...
(Geosci. Model Dev. 15, doi: [10.5194/gmd-15-3879-2022](https://doi.org/10.5194/gmd-15-3879-2022))
- Bartman & Arabas 2021:
On the design of Monte-Carlo particle coagulation solver interface: ...
(LNCS 12743, doi: [10.1007/978-3-030-77964-1_2](https://doi.org/10.1007/978-3-030-77964-1_2))
- Arabas & Farhat 2020:
Derivative Pricing as a Transport Problem:
MPDATA solutions to Black-Scholes-type equations
(J. Comput. Appl. Math. 373, doi: [10.1016/j.cam.2019.05.023](https://doi.org/10.1016/j.cam.2019.05.023))
- Arabas & Shima 2017:
On the CCN (de)activation nonlinearities
(Nonlin. Proc. Geophys. 24, doi: [10.5194/npg-24-535-2017](https://doi.org/10.5194/npg-24-535-2017))
- Arabas, Jaruga, Pawlowska & Grabowski, 2015:
libcloudph++ 1.0: a single-moment bulk, double-moment bulk, and
particle-based warm-rain microphysics library in C++
(Geosci. Model Dev. 8, doi: [10.5194/gmd-8-1677-2015](https://doi.org/10.5194/gmd-8-1677-2015))
- Jaruga, Arabas, Jarecka, Pawlowska, Smolarkiewicz & Waruszewski, 2015:
libmpdata++ 1.0: a library of parallel MPDATA solvers
for systems of generalised transport equations
(Geosci. Model Dev. 8, doi: [10.5194/gmd-8-1005-2015](https://doi.org/10.5194/gmd-8-1005-2015))
- Arabas, Jarecka, Jaruga & Fijałkowski, 2014:
Formula Translation in Blitz++, NumPy and Modern Fortran: ...
(Sci. Prog. 22, doi: [10.3233/SPR-140379](https://doi.org/10.3233/SPR-140379))
- Arabas & Shima, 2013:
Large-Eddy Simulations of Trade Wind Cumuli
Using Particle-Based Microphysics with Monte Carlo Coalescence
(J. Atmos. Sci., doi: [10.1175/JAS-D-12-0295.1](https://doi.org/10.1175/JAS-D-12-0295.1))
- Kulmala, Asmi, Lappalainen et al., 2011:
General overview: European Integrated project on Aerosol Cloud Climate
and Air Quality interactions (EUCAARI)
(Atmos. Chem. Phys., doi: [10.5194/acp-11-13061-2011](https://doi.org/10.5194/acp-11-13061-2011))
- Arabas & Pawlowska, 2011:
Adaptive method of lines for multi-component aerosol
condensational growth and CCN activation
(Geosci. Model Dev., doi: [10.5194/gmd-4-15-2011](https://doi.org/10.5194/gmd-4-15-2011))
- Cairo, Pommereau, Law et al., 2010:
An introduction to the SCOUT-AMMA stratospheric aircraft, balloons
and sondes campaign in West Africa, August 2006: rationale and roadmap
(Atmos. Chem. Phys., doi: [10.5194/acp-10-2237-2010](https://doi.org/10.5194/acp-10-2237-2010))
- Arabas, Pawlowska & Grabowski, 2009:
Effective radius and droplet spectral width
from in-situ aircraft observations in trade-wind cumuli during RICO
(Geosci. Res. Lett., doi: [10.1029/2009GL038257](https://doi.org/10.1029/2009GL038257))