



contact

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highlights

- background: experimental data analysis and numerical modelling in geophysics
- international experience in gov, academic, corporate and startup realms
- physics of the Earth's atmosphere, aerosol-cloud-precipitation interactions
- 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

employment

2018.10 – ...: **Institute of Computer Science and Computational Mathematics, Jagiellonian University, Cracow, Poland**
computational research on aerosol and clouds
supervision of graduate students (physics, computer science)

2017.10 – 2018.09: **AETHON Engineering Consultants, 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: **Institute of Geophysics, Faculty of Physics, University of Warsaw, Warsaw, Poland**
postdoc researcher in the physics of aerosol-cloud interactions,
lead programmer for open-source CFD-related projects
lecturer (C++ for first-year undergraduate students)

2002.10 – 2005.12: **Mazovian Governor Office, Warsaw, Poland**
public officer, 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: Hanna Pawłowska, degree obtained on 2013-12-16
referees: Graham Feingold (NOAA, USA), Lech Łobocki (Warsaw Tech.)

2002 – 2008: **Faculty of Physics, University of Warsaw** – MSc, 350 ECTS
thesis: Microphysical properties of shallow convective clouds (in Polish)
supervisor: Hanna Pawłowska; degree obtained on 2008-06-25
referee: Krzysztof Haman

study visits

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

C++, Python, C#, IDL/GDL, Fortran, SQL, UNIX tools, L^AT_EX/B_IB_TE_X;
multi-threaded, GPU and MPI parallelism; design patterns; test automation

language skills

fluent: **Polish, English**
conversational: Russian, French
basics: Japanese, Spanish

- workshops, schools, courses**
- 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)
 - 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)
 - 2006: Multi-spectral environmental satellites (IMiGW/U. Wisconsin, Cracow)
- 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**
- Foundation for Polish Science (fnp.org.pl):
 - 2018: Reintegration grant (PI, ca. \$200 000)
 - 2014: Mentorship programme (mentor: prof. Harm Jonker, TU Delft)
 - 2012-13: 2×START fellowship (incl. visit at NCAR, Boulder, CO)
 - 2011: Conference award (SIAM GS11, Long Beach, California)
 - Poland's National Science Centre (ncn.gov.pl):
 - 2013-15: co-author/participant in a HARMONIA project (ca. \$250 000)
 - 2011-13: PI in a PRELUDIUM project (ca. \$15 000)
 - European Facility for Airborne Research (eufar.net):
 - 2008: PI in SEASALT student project (seasalt.igf.fuw.edu.pl) (ca. \$25 000)
- extramural non-alma mater seminars**
- Dept. of Atmospheric and Oceanic Sciences, McGill University, Montreal (2019)
 - National Center for Atmospheric Research, Boulder, Colorado (2010,'12,'14,'19)
 - 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 (2015,'19)
 - 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 (2015,'18)
 - 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>AMS Cloud Physics Conference: 2018 (Vancouver, poster)</p> <p>Numerical Analysis and Scientific Computation with Applications: 2018 (Kalamata, talk)</p> <p>Transportation Research Arena (Vienna): 2018 (poster)</p> <p>C++Now by Boost & Software Freedom Conservancy (Aspen, Colorado): 2015 (talk: youtube.com/watch?v=bnbZQexvh00)</p> <p>UCAR Software Engineering Assembly Conference (Boulder, Colorado): 2013 (talk)</p> <p>Metström: Multiple Scales in Fluid Mechanics and Meteorology (Berlin): 2011 (talk)</p> <p>SIAM Conference on Mathematical and Computational Issues in Geosciences: 2011 (Long Beach, talk), '13 (Padua, talk)</p> <p>American Geophysical Union Fall Meetings (San Francisco): 2010 (poster), '12 (poster)</p> <p>FOSDEM (Free & Open Source Software Devs Euro Meeting, Brussels): 2010, '11 (talk), '12, '13 (convener), '14, '15, '16, '17, '18 & '19 (volunteer), '20</p> <p>International Conference on Clouds and Precipitation: 2008 (Cancún, talk), '12 (Leipzig, talk)</p> <p>European Geosciences Union General Assemblies (Vienna): 2007 (poster), '09 (poster), '10 (poster)</p>
paper reviews	<p>Geoscientific Model Development (2014, 2016, 3×2019, 2020)</p> <p>Journal of the Atmospheric Sciences (2019, 2020)</p> <p>Atmospheric Chemistry and Physics (2014, 2018, 2019)</p> <p>Advances in Atmospheric Sciences (2019)</p> <p>Proc. Eastern Asia Society for Transportation Studies (2017)</p> <p>J. Advances in Modelling Earth Systems (2015)</p>
teaching	<p>Dept. Math. and CS, Jagiellonian University: 2020: Modelling of Atmospheric Clouds (lecture + computer lab) 2018: Abstract programming (computer lab) 2018: Design patterns (computer lab)</p> <p>Faculty of Physics, U. Warsaw: 2015: Programming in C++ (lecture)</p> <p>U. Vigo in Ourense, Spain: 2014: A short course on object-oriented numerics (ephyslab.uvigo.es/numeric)</p> <p>Institute of Geophysics, U. Warsaw: 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</p>
organisation of meetings	<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>

papers

- 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)
- Arabas & Shima 2017:
On the CCN (de)activation nonlinearities
(Nonlin. Proc. Geophys. 24, doi: 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)
- 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)
- Arabas, Jarecka, Jaruga & Fijalkowski, 2014:
Formula Translation in Blitz++, NumPy and Modern Fortran:
A Case Study of the Language Choice Tradeoffs
(Sci. Prog. 22, doi: 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)
- Kulmala, Asmi, Lappalainen et al., 2011:
General overview: European Integrated project on Aerosol Cloud Climate
and Air Quality interactions (EUCAARI) –
integrating aerosol research from nano to global scales
(Atmos. Chem. Phys., doi: 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)
- 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)
- 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)

bibliographic records

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Google Scholar: <https://scholar.google.pl/citations?user=X1s5grkAAAAJ>
ResearchGate: https://www.researchgate.net/profile/Sylwester_Arabas

open-source software

MPyDATA & PySDM (2019–...): > 350 Python commits, maintenance
libmpdata++, libcloudph++ (2013–2015): ~1000 C++ commits
GNU Data Language (2009–...): ~500 C++ commits, co-maintenance