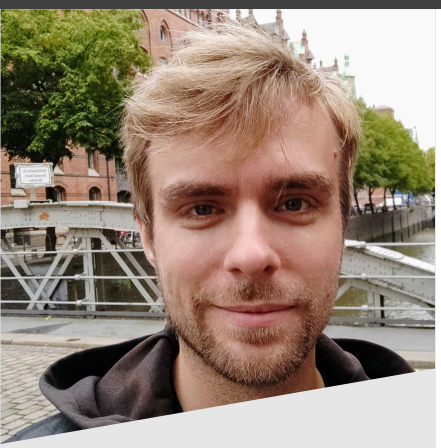
Jannick **Wolters**

Applied Mathematician



About me

I am currently living in the beautiful city of Aachen, working on my Ph.D. at Karlsruhe Institute of Technology.
During my studies i developed a passion for solving complex real world problems from the realm of transport equations on modern HPC architectures.
Being a quick learner and reliable team player, i have successfully been working on a wide range of problems with fellow Ph.D. students as well as industry partners.
As I am now close to finishing my Ph.D., i am looking forward to work on new and exiting topics.

Personal

Jannick Wolters
Aachen, Germany
31 years old

Interests

GPU/FPGA Accelerators
Transport simulations
Machine Learning
High Performance Computing
Data Science
Teaching

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Work Experience

2018 – 2021 — **Research Scientist**
Karlsruhe Institute of Technology
Steinbuch Centre for Computing (SCC)
Computational Science and Mathematical Methods (CSMM)

2017 – 2020 — **EFRE.NRW Project: ZEBRA**
Karlsruhe Institute of Technology & AiNT GmbH
R&D Project to develop an innovative measurement system for non-destructive elemental analysis of raw materials and contaminated sites based on PGNAA.
Role: Method development and FEM transport solver implementation

2017 – 2018 — **Research Scientist**
RWTH Aachen
Center for Computational Engineering Science (MathCCES)
Simulation in Nuclear Technology
Note: Continued at KIT

2015 – 2017 — **Student research and teaching assistant**
RWTH Aachen
Research: 'Fully coupled MHD-simulations in OpenFOAM
Teaching: 'Partial differential equations'

2013 – 2014 — **Research Internship**
ABB Switzerland Ltd. Research Center Baden
Subject: 'Power Device Simulations in OpenFOAM'
Supervisor: Dr. Vincent Dousset

Areas of Expertise

Mathematics

Topics

- Transport equations
  - Boltzmann
  - Navier-Stokes
  - Magnetohydrodynamics
- Uncertainty Quantification
- Inverse Problems
- (Bayesian) Statistics
- Data Science

Numerics

- Finite Volume Method
- Finite Element Method
- Sparse Reconstruction
- Optimization
- Krylov Solver
- High-dimensional Integration

Computer Science

Languages

C++
Python
Matlab
julia

High Performance Computing

- MPI / OpenMP / OpenACC
- PETSc / Eigen

Machine Learning

- Tensorflow
- Keras

Software Packages

- FEniCS
- OpenFOAM
- deal.ii
- OpenMC
- Gmsh
- Paraview

Education

2018 – 2021	**Mathematics** Ph.D. student · Karlsruhe Institute of Technology Steinbuch Centre for Computing (SCC) Computational Science and Mathematical Methods (CSMM) Thesis: 'Uncertainty Quantification for the Evaluation of PGNAA Spectra' Supervisor: Prof. Dr. Martin Frank
2017 – 2018	**Mathematics** Ph.D. student · RWTH Aachen Center for Computational Engineering Science (MathCCES) Supervisor: Prof. Dr. Martin Frank Note: Continued at KIT
2015 – 2017	**M.Sc. Computational Engineering Science** Student · RWTH Aachen Thesis 'Uncertainty Quantification for Wind Farm Models' Supervisor: Prof. Dr. Martin Frank
2010 – 2015	**B.Sc. Computational Engineering Science** Student · RWTH Aachen Thesis 'MHD Simulations in OpenFOAM' Supervisor: Prof. Dr. Manuel Torrilhon

Management abilities

Projects

- EU / state NRW funded project in very close collaboration with external company for three years
- Research group projects with multiple Ph.D. students

Students

- Supervised 8 successful thesis (2 Bachelor 6 Master)
- Topics: Machine Learning (4), Data Science (3), Inverse Problems (1)

Soft skills (top 3)

- Determination
- Teamwork
- Persistence

Other valuable skills

- Deep Linux knowledge
- SCRUM / Agile Development
- Versioning systems GIT / SVN
- Teaching (University lectures / exercises)
- Docker / Vagrant

Publications

2021	**Sparse signal reconstruction for prompt gamma neutron activation analysis** J. Wolters, K. Krycki, M. Frank Submitted to
2021	**Uncertainty Quantification of Offshore Wind Farms Using Monte Carlo and Sparse Grids** P. Richter, J. Wolters, M. Frank Journal of Energy Sources, Part B: Economics, Planning, and Policy
2021	**Entropy–Based Methods for Uncertainty Quantification of Hyperbolic Conservation Laws** M. Frank, J.Kusch, J. Wolters Springer International Publishing
2020	**Uncertainty Quantification of Offshore Wind Farms Using Monte Carlo and Sparse Grids.** J.Kusch, J. Wolters, M. Frank Journal of Computational Physics

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