

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

WORK EXPERIENCE

03/2018 – 05/2021	Research Scientist Karlsruhe Institute of Technology Steinbuch Centre for Computing (SCC) Computational Science and Mathematical Methods (CSMM)
03/2017 – 05/2020	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
04/2017 – 03/2018	Research Scientist RWTH Aachen Center for Computational Engineering Science (MathCCES) Simulation in Nuclear Technology Note: Continued at KIT
10/2015 – 04/2017	Student research and teaching assistant RWTH Aachen Research: 'Fully coupled MHD-simulations in OpenFOAM' Teaching: 'Partial differential equations'
10/2013 – 03/2014	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 | • OpenMC |
| • OpenFOAM | • Gmsh |
| • deal.II | • Paraview |

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EDUCATION

03/2018 – 10/2021	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
03/2017 – 05/2020	Mathematics PH.D. STUDENT · RWTH Aachen Center for Computational Engineering Science (MathCCES) Supervisor: Prof. Dr. Martin Frank Note: Continued at KIT
04/2015 – 03/2017	M.Sc. Computational Engineering Science STUDENT · RWTH Aachen Thesis: 'Uncertainty Quantification for Wind Farm Models' Supervisor: Prof. Dr. Martin Frank
10/2010 – 03/2015	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 6 successful Master theses
- Topics: Machine Learning (3), Data Science (2), 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