

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

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



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

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 |