

# 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. in late October, I am looking forward to work on new and exiting topics.

## Personal


Jannick Wolters  
Aachen, Germany  
31 years old

## Interests


CFD simulations  
GPU Accelerators  
Machine Learning  
High Performance Computing  
Cloud Computing  
Data Science  
Teaching


## Portfolio


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 jawolters

## Contact

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## WORK EXPERIENCE

03/2018 – 04/2021	<b>Research Scientist</b> Karlsruhe Institute of Technology Steinbuch Centre for Computing (SCC) Computational Science and Mathematical Methods (CSMM)
03/2017 – 05/2020	<b>EFRE.NRW Project: ZEBRA</b> 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	<b>Research Scientist</b> RWTH Aachen Center for Computational Engineering Science (MathCCES) Simulation in Nuclear Technology
10/2015 – 04/2017	<b>Student research and teaching assistant</b> RWTH Aachen University Research: 'Fully coupled MHD-simulations in OpenFOAM' Teaching: 'Partial differential equations'
10/2013 – 03/2014	<b>Research Internship</b> ABB Switzerland Ltd. Research Center Baden Subject: 'Power Device Simulations in OpenFOAM'

## AREAS OF EXPERTISE

### MATHEMATICS

#### Topics

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

#### Numerical Analysis

- Finite Volume Method
- Finite Element Method
- Sparse Reconstruction
- Continuous Optimization
- Krylov Subspace Solver
- Monte-Carlo Simulation

### COMPUTER SCIENCE

#### Languages

C++	<div><div></div></div>
Python	<div><div></div></div>
Matlab	<div><div></div></div>
julia	<div><div></div></div>
Fortran	<div><div></div></div>
R	<div><div></div></div>

#### High Performance Computing

- MPI / OpenMP / OpenACC
- PETSc / Eigen

#### Machine Learning

- Tensorflow
- Keras

### SOFTWARE PACKAGES

- |            |            |
|------------|------------|
| • FEniCS   | • OpenMC   |
| • OpenFOAM | • Gmsh     |
| • deal.II  | • Paraview |

## EDUCATION

03/2018 – 10/2021	<b>Mathematics</b> 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	<b>Mathematics</b> PH.D. STUDENT · RWTH Aachen University Center for Computational Engineering Science (MathCCES) Supervisor: Prof. Dr. Martin Frank Note: Continued at KIT
04/2015 – 03/2017	<b>M.Sc. Computational Engineering Science</b> STUDENT · RWTH Aachen University Thesis: 'Uncertainty Quantification for Wind Farm Models' Supervisor: Prof. Dr. Martin Frank
10/2010 – 03/2015	<b>B.Sc. Computational Engineering Science</b> STUDENT · RWTH Aachen University Thesis: 'MHD Simulations in OpenFOAM' Supervisor: Prof. Dr. Manuel Torrilhon

## MANAGEMENT ABILITIES

### Projects

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

### Students

- Supervised 5 successful Master theses
- Topics: Machine Learning (3), Data Science (1), Inverse Problems (1)

### Social

- Active member of the SIAM Student Chapter Aachen (2017 - 2020)

## SOFT SKILLS (TOP 3)

- Determination & Persistence
- Teamwork
- Solution-Oriented Thinking

## OTHER VALUABLE SKILLS


- Fluent in German & English
- Expert level Linux user
- SCRUM / Agile Development
- Versioning systems GIT / SVN
- Teaching (University lectures & exercises)
- Docker / containerd
- LaTeX, Markdown & MS-Office

## PUBLICATIONS


2021	<b>Sparse signal reconstruction for prompt gamma neutron activation analysis</b> J. WOLTERS, K. KRYCKI, M. FRANK In progress
2021	<b>Uncertainty quantification of offshore wind farms using Monte Carlo and sparse grids</b> P. RICHTER, J. WOLTERS, M. FRANK In revision, Journal of Energy Sources, Part B: Economics, Planning, and Policy
2021	<b>Entropy-based methods for uncertainty quantification of hyperbolic conservation laws</b> M. FRANK, J. KUSCH, J. WOLTERS Springer International Publishing
2020	<b>Intrusive acceleration strategies for uncertainty quantification for hyperbolic systems of conservation laws</b> J. KUSCH, J. WOLTERS, M. FRANK Journal of Computational Physics


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