WIAS - Research Group 3 “Numerical Mathematics and Scientific Computing”

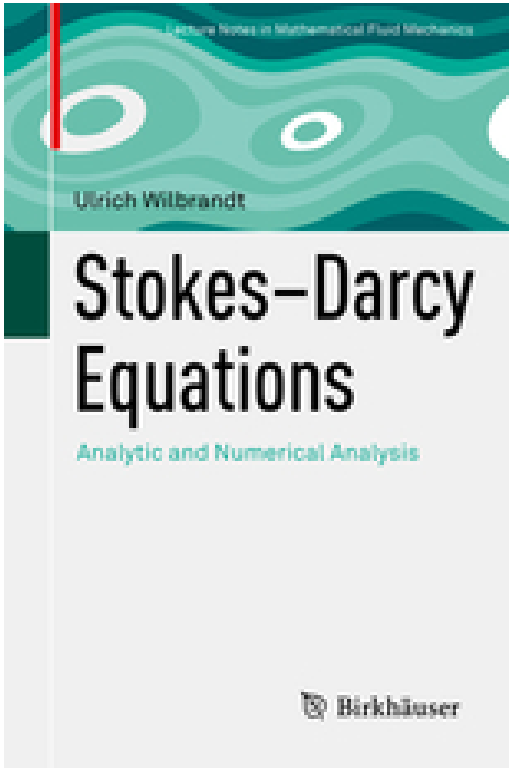
Volker John

Some Statistics 2018

- new members since last WIAS days
  - Zahra Lakdawala
  - Baptiste Moreau
- members left since last WIAS days
  - Mine Akbas (DAAD)
  - Felix Anker
  - Clemens Bartsch
  - Gabi Blättermann
  - Laura Dimovic (apprentice)
  - Gert Reinhardt

Some Statistics 2018 (cont.)

- publications
  - 1 monograph (U. Wilbrandt, early 2019)
  - 1 book chapter (A. Caiazzo)
  - 18 refereed papers (4 together with other RGs)
  - 3 proceedings (3 together with other RGs)
  - 2 papers among the top 10 highly cited articles published in 2017 and 2018 in IMA Journal of Numerical Analysis



Some Statistics 2018 (cont.)

- publications
  - 1 monograph (U. Wilbrandt, early 2019)
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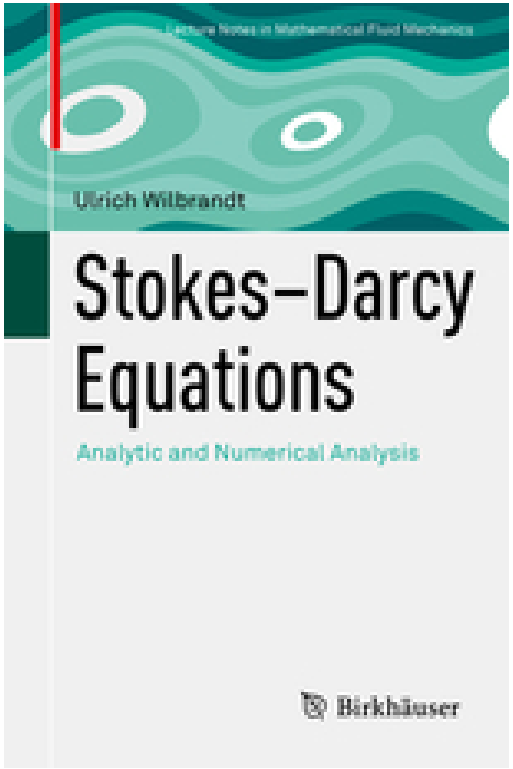
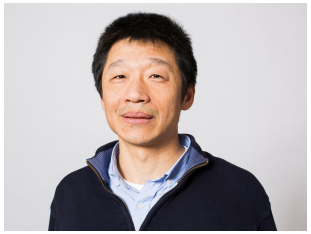
  - 18 refereed papers (4 together with other RGs)
  - 3 proceedings (3 together with other RGs)
  - 2 papers among the top 10 highly cited articles published in 2017 and 2018 in IMA Journal of Numerical Analysis
- Ph.D. theses
  - Ulrich Wilbrandt (Freie Universität Berlin), summa
  - Clemens Bartsch (Freie Universität Berlin), summa
- grants
  - DFG (Math+, DFG-GARC)
  - BMBF
  - industry (BOP), licenses (TETGEN)



Research Topics

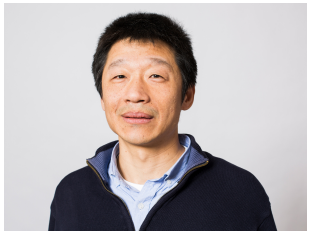

Hang Si


Alexander Linke


Christian Merdon

- tetrahedral mesh generation
  - algorithms for robust boundary conforming Delaunay mesh generation
  - TETGEN: 3d Delaunay mesh generation software

Research Topics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Alexander Linke


Christian Merdon

- tetrahedral mesh generation
  - algorithms for robust boundary conforming Delaunay mesh generation
  - TETGEN: 3d Delaunay mesh generation software

- pressure-robust discretizations for flow problems
  - aim: physically consistent discretizations of equations from fluid dynamics
  - development, numerical analysis, implementation of new methods

Research Topics (cont.)


Wolfgang Dreyer


Patricio Farrell


Jürgen Fuhrmann


Alexander Linke


Christian Merdon


Holger Stephan


Petr Vagner

- numerical methods for charge transport
  - semiconductors and electrolytes
  - collaboration with RG 1+2+7
  - DDFERMI: new flexible platform for simulations based on PDELIB
  - three running projects, two with RG 7

Research Topics (cont.)


Laura Blank


Alfonso Caiazzo

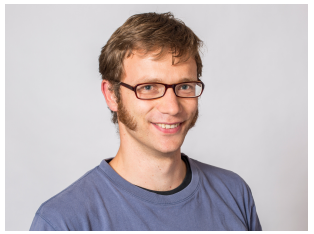

Patricio Farrell


Abhinav Jha


Volker John


Alexander Linke


Christian Merdon


Ulrich Wilbrandt

- numerical analysis
  - equations from fluid dynamics and semiconductor device simulations
  - finite element and finite volume discretizations

Research Topics (cont.)


Laura Blank


Alfonso Caiazzo


Baptiste Moreau


Volker John


Zahra Lakdawala

- applications from biomedicine
  - biological tissues
  - numerical methods for strongly heterogeneous media
  - reduced order modeling (ROM)

Research Topics (cont.)


Laura Blank


Alfonso Caiazzo


Baptiste Moreau


Volker John

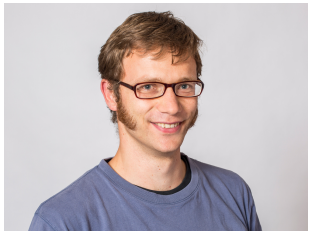

Zahra Lakdawala

- applications from biomedicine
  - biological tissues
  - numerical methods for strongly heterogeneous media
  - reduced order modeling (ROM)

- numerical methods for population balance systems
  - novel coupled stochastic-deterministic methods
  - application: particulate flows in chemical engineering
  - collaboration with RG 5

Research Topics (cont.)


Najib Alia

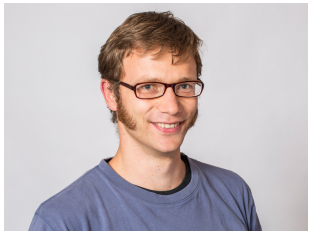

Ulrich Wilbrandt


Rainer Schlundt

- optimal control of ladle stirring
  - within European industrial doctoral project MIMESIS
- optimal control and design for partial differential equations, with RG 8

Research Topics (cont.)


Najib Alia


Ulrich Wilbrandt


Rainer Schlundt

- optimal control of ladle stirring
  - within European industrial doctoral project MIMESIS
- optimal control and design for partial differential equations, with RG 8
- discretizations for Maxwell equations using finite integration technique, efficient solvers

Apprenticeship Training

Marko Jahn

Holger Stephan

- mathematical-technical software developer
  - apprentice 2017 – 2020
  - supervised by G. Reinhardt until 10/2018
  - supervised by H. Stephan from 11/2018

Software Developed and Maintained with Participation of RG3


Laura Blank


Alfonso Caiazzo


Patricio Farrell


Jürgen Fuhrmann


Abhinav Jha


Volker John


Zahra Lakdawala


Alexander Linke


Christian Merdon


Baptiste Moreau


Timo Streckenbach


Ulrich Wilbrandt

- numerical simulations of PDEs: PARMOON, PDELIB (DDFERMI)