

Projects

- 2004 – Multi-asset options in computational finance. Supervision of C. Leentvaar, financed by STW; partners ABN-AMRO, RABO bank and AOT.
- 2003 – Study of bone ingrowth in shoulder prosthesis. Supervision of P. Broomans, financed by Platform CSE; partner Prof. A. van Keulen, mechanical engineering.
- 2002 – Fast solvers for the Helmholtz equation in heterogeneous media. Supervision of Y. Erlangga, financed by Senter (Min. Econ. Affairs); partners Shell and Philips.
- 2002 – Research in poroelasticity in cooperation with Dr. F.J. Gaspar, Univ. of Zaragoza, Spain and Dr. R. Wienands Univ. of Cologne, Germany.
- 2000 – Research in computational finance with partial differential equations.
- 1997 – 2000 Preparation of a book on multigrid with Prof. U. Trottenberg and Dr. A. Schüller.
- 1997 – 1999 Cooperation with Dr. D. Hoffmann (GMD.SCAI-ALG): Fast pde solvers for biomolecular applications.
- March–June 1996 Research stay at Courant-Institute of Math. Sciences, New York University (NYU). Theme: “Multiple Semicoarsening for 3D PDEs”.
- 1994 – 1999 Cooperation with T. Washio (NEC): Development of parallel Krylov subspace methods for linear and nonlinear systems of equations with multigrid preconditioning.
- 1993 – 1996 Researcher in the German national project POPINDA, parallelization of production codes (Flower, NS-Flex) for simulation of aerodynamic applications in fluid mechanics, development of parallel multigrid methods for computational fluid dynamics applications.

Teaching

Delft University

- Winter 2003 “Calculus” for 1st year math students
“Numerical mathematics” for 2nd year computer science students
“Scientific Computing and Simulation”, for 4th year math. Master students.
- Summer 2003 “Linear algebra” for 1st year architectural students
- Winter 2002 “Calculus” for 1st year computer science students
“Scientific Computing and Simulation”, for 4th year math. Master students.

Universität zu Köln

- Summer 2001 “Wissenschaftliches Rechnen” (scientific computing).
- Summer 2000 “Numerische Mathematik III” (numerical math. III) with Dr. A. Klawonn
seminar “Wissenschaftliches Rechnen”.
- Winter 1999/2000 “Numerische Mathematik II”
seminar “Numerik für die Navier-Stokes-Gleichungen”
- Summer 1999 “Numerische Mathematik I”
- 1997-1998: Assistent to Prof. Trottenberg in Numerik II und III, Universität zu Köln.
- April 1995: Lecturer in the GMD multigrid course in Bad Honnef.
- 1992/ 1993: Supervision of practical exercises, TU Delft, Netherlands.

Supervision Master's and Ph.D. Theses

Master Thesis

TU Delft, 1992	A. Klaren:	Discretizations of incompressible Navier-Stokes equations.
Uni. Köln/GMD, 1996	R. Wienands:	Multi-Stage-Jacobi Glätter in Mehrgitterverfahren zur Lösung der inkompressiblen Navier-Stokes-Gleichungen.
Uni. Köln/GMD, 1999	T. Füllenbach:	Mehrgitterverfahren für die zwei- und dreidimensionale Poissongleichung mit periodischen Randbedingungen und eine Anwendung in der Molekulardynamik.
Uni. Köln/GMD, 2001	J. Frisch:	Mehrgitterverfahren für die Berechnung von Optionspreisen.
TU Delft, 2003	C. Leentvaar:	Solving option pricing problems with a few grid points.

Ph.D Thesis

Uni. Köln/GMD 2001

R. Wienands: Fourier Analyse für kombinierte Lösungsverfahren.

Present Ph.D students

TU Delft, 2002

Y.E. Erlangga, Numerical methods for high wave number Helmholtz problems in heterogeneous media.

TU Delft, 2002

A. Almendral, Option pricing and jump diffusion processes.

TU Delft, 2003

P. Broomans, 3D numerical simulation of bone ingrowth for glenoid components design of shoulder prostheses.

TU Delft, 2004

C. Leentvaar, High dimensional option pricing partial differential equations.

Editorial Board

- 2002: Member editorial board SIAM's Journal for Scientific Computing.

Other Duties

- Member organizing committee ECCOMAS conference on fluid mechanics, Egmont Sea, the Netherlands 2006.
- Member organizing committee 8th European Multigrid Conference (EMG08), Den Haag, the Netherlands 2005.
- Member organizing committee IMACS 2005 conference, Toronto, Canada 2005.
- Organisation "Study group Mathematics with the Industry" in Delft, 15-19/4/2004.
- Member organizing committee Computational Finance Workshop Bad Herrenalb, Germany May 2003.
- Member organizing committee of bi-annual Copper Mountain conference on Multigrid methods, starting 2002.
- 2000: Chairman of the "Institutsausschuss" of GMD's institute SCAI, which is an advisory board for the institute leader.
- 1990-1993, chairman of the Ph.D., students associated with the J.M. Burgerscenter for fluid dynamics research school in the Netherlands.

Nominations

- Projekt POPINDA was "Best scientific project in GMD, Germany 1997".
- "Honourable mention" SIAM student paper competition 1992.
- Prize in student paper competition 5. Copper Mountain Conference 1991.