

# Fifth SIAM Workshop on Combinatorial Scientific Computing (CSC11)

May 19-21, 2011, Darmstadt, Germany

<http://www.siam.org/meetings/csc11/>

## Scientific Program

### Thursday, May 19, 2011

- **2pm:** Plenary Lecture (joint with SIAM OP11) [**room spectrum A**]  
Thomas F. Coleman (University of Waterloo) : *Efficient Automatic Differentiation for Nonlinear Systems and Continuous Optimization (by using graphs)*
- **3pm:** CSC 11 Opening [**room 2.04, titan(ium)**]
- **3.15pm-4.15pm:** 3 Contributed Lectures [**room 2.04, titan(ium)**]
  - Jean-Paul Watson, Ali Pinar, Richard Chen, Genetha Gray, John Siirola, and Patricia Hough: *Computational Challenges in Optimization for Electrical Grid Operations and Planning*
  - Caslav Ilic, Stephan Schmidt, Nicolas Gauger, and Volker Schulz: *Detailed Aerodynamic Shape Optimization Based on an Adjoint Method with Shape Derivatives*
  - Hans Mittelmann: *Computing Strong Bounds in Combinatorial Optimization*
- **4.15pm-4.45pm:** *coffee break* [**room 0.03, copernicum**]
- **4.45pm-5.45pm:** 3 Contributed Lectures [**room 2.04, titan(ium)**]
  - Suely Oliveira and David Stewart: *Clustering via optimization*
  - Assefaw Gebremedhin, Umit Catalyurek, John Feo, Mahantesh Halappanavar, and Alex Pothen: *Multithreaded Algorithms for Graph Coloring*
  - Ebadollah Varnik, Lukas Razik, and Uwe Naumann: *Fast Conservative Estimation of Hessian Sparsity*

- **5.45pm-8pm:** Poster Session (+ drinks) [**room 0.03, copernicum**]
  - Haim Avron and Sivan Toledo: *Randomized algorithms for estimating the trace of an implicit symmetric positive semi-definite matrix*
  - Bas Fagginger Auer and Rob Bisseling: *A Geometric Approach to Parallelising Sparse LU Decomposition*
  - Johannes Lotz and Uwe Naumann: *Reversing the Data Flow of Computer Programs*
  - Michael Weitzel, Sebastian Niedenführ, Katharina Nöh, and Wolfgang Wiechert: *High-Performance Simulation of Isotope Labeling Experiments for Metabolic Flux Estimation*
  - Ali Pinar: *The Inhibiting Bisection Problem*
  - Ali Pinar and Isabelle Stanton: *Sampling Graphs with a Prescribed Joint Degree Distribution Using Markov Chains*
  - Robert Luce: *On fill and flops in symmetric Gaussian elimination*
  - Satoru Iwata and Mizuyo Takamatsu: *On Kronecker Canonical Form of Mixed Matrix Pencils*
  - David Gleich, Reid Andersen, and Vahab Mirrokni: *Overlapping clusters for distributed computation*
  - Ilya Safro: *Multiscale approach for network compression-friendly ordering*
  - Martin Buecker, Simon Lessenich, and Michael Luelfesmann: *A collection of web-based educational models for interactively exploring algorithms in combinatorial scientific computing*
  - Tobias Steinle, Jadran Vrabec, and Andrea Walther: *Simulation of particle-filled hollow spheres*
  - Kamila Ghidetti, Lucia Catabriga, Maria Claudia Boeres, and Maria Cristina Rangel: *A study of the influence of sparse matrices reordering algorithms for  $ILU(p)$  preconditioner on the GMRES method*
  - Curtis Janssen, Helgi Adalsteinsson, Scott Cranford, Joseph Kenny, Ali Pinar, David Evensky, and Jackson Mayo: *A Simulator for Large-scale Parallel Computer Architectures*
  - Madan Sathe, Giorgos Kollias, Olaf Schenk, and Ananth Grama: *A Scalable Parallel Framework for Graph Similarity*
  - Benjamin Letschert and Andrea Walther: *Parallelization of ADOL-C for MPI-parallel function evaluations*
  - Ali Cevahir, Cevdet Aykanat, Ata Turk, and B. Barla Cambazoglu: *Site-Base Partitioning and Repartitioning Techniques for Parallel PageRank Computation*
  - Johannes Huber, Uwe Naumann, Olaf Schenk, Ebadollah Varnik, and Andreas Wächter: *Algorithmic Differentiation and Nonlinear Optimization for an Inverse Medium Problem*

## Friday, May 20, 2011

- **8.30am:** Plenary Lecture [**room 2.07, aurum**]  
Burkhard Monien (Paderborn University) : *Recent Trends in Graph Partitioning for Scientific Computing*
- **9.30am-10.10am:** 2 Contributed Lectures [**room 2.07, aurum**]
  - Steve Reinhardt, John Gilbert, Adam Lugowski, and Aydin Buluc: *Enabling Non-Graph-Expert Use of Very-large-scale Graph Analysis*
  - Nicholas Edmonds and Andrew Lumsdaine: *Scalable Parallel Solution Techniques for Data-Intensive Problems in Distributed Memory*
- **10.10am-10.40am:** *coffee break* [**room 0.03, copernicum**]
- **10.40am-noon:** 4 Contributed Lectures [**room 2.07, aurum**]
  - Erin Carson, Nicholas Knight, and James Demmel: *Hypergraph Partitioning for Computing Matrix Powers*
  - Andreas Stathopoulos, Costas Bekas, and Alessandro Curioni: *Toward architecture aware graph partitioning*
  - Iain S. Duff and Bora Ucar: *On Hypergraph Partitioning based Sparse Matrix Ordering*
  - Roxana Ionutiu, Joost Rommes, and Wil Schilders: *Graph partitioning with separation of terminals*
- **noon-2pm:** *lunch break* [**restaurant CALLA**]
- **2pm-3.20pm:** 4 Contributed Lectures [**room 2.07, aurum**]
  - Andreas Griewank and Felix Dalkowski: *On Piecewise Linearization by Algorithmic Differentiation*
  - Iain S. Duff and Kamer Kaya: *Preconditioners based on Strong Components*
  - Alex Druinsky and Sivan Toledo: *Computing Selected Eigenvalues of Banded Symmetric Matrices*
  - Haim Avron, Alex Druinsky, and Sivan Toledo: *Dispersive Lanczos*
- **3.20pm-3.50pm:** *coffee break* [**room 0.03, copernicum**]
- **3.50pm-5.10pm:** 4 Contributed Lectures [**room 2.07, aurum**]
  - Patrick Amestoy, Iain Duff, Jean-Yves L'Excellent, Francois-Henry Rouet, and Bora Ucar: *Parallel computation of entries of  $A^{-1}$*
  - Ioannis Koutis, Gary Miller, and Richard Peng: *Approaching optimality for solving SDD linear systems*
  - Aydin Buluc and John Gilbert: *Parallel Sparse Matrix Indexing and Assignment*

- Patrick R. Amestoy, Alfredo Buttari, Abdou Guermouche, Jean-Yves L’Excellent, and Bora Ucar: *The minimum degree ordering with dynamical constraints*

- **5.10pm-6.40pm:** Business meeting [room 2.07, aurum]

- **7.30pm:** Conference Dinner [Ratskeller]

## Saturday, May 21, 2011

- **8.30pm:** Plenary Lecture [room 2.07, aurum]

Trond Steihaug (Bergen University) : *Sparse Matrix Structures and Higher Derivatives*

- **9.30am-10.10am:** 2 Contributed Lectures [room 2.07, aurum]

- Jieqiu Chen, Paul Hovland, and Robert Luce: *Optimal Derivative Accumulation Using Mixed Integer Programming*

- Viktor Mosenkis, Elmar Peise, and Uwe Naumann: *Branch and Bound for Optimal Jacobian Accumulation*

- **10.10am-10.40am:** coffee break [room 0.03, copernicum]

- **10.40am-noon:** 4 Contributed Lectures [room 2.07, aurum]

- Albert-Jan Yzelman and Rob Bisseling: *Cache-oblivious sparse matrix-vector multiplication*

- Grey Ballard, James Demmel, Olga Holtz, and Oded Schwartz: *Graph Expansion and Communication Costs of Fast Matrix Multiplication*

- Siva Rajamanickam, Erik Boman, and Michael Heroux: *A Hybrid Parallel Solver Framework For General Sparse Linear Systems*

- Ichitaro Yamazaki, Xiaoye Li, Francois-Henry Rouet, and Bora Ucar: *Combinatorial Problems in a Parallel Hybrid Linear Solver*

- **noon:** End of CSC11 [room 2.07, aurum]

- **2pm-4pm:** Social Event: Guided Tour [Mathildenhöhe]