

Saturday, September 9

8:45 – 9:25 **Invited lecture V: Jari Toivanen**  
*A Parallel Partial Solution Variant of Cyclic Reduction and Applications*

9:25 – 10:40 **Domain Decomposition**  
*Minisymposium* proposed by Damien Tromeur-Dervout

- *A new cement to glue nonconforming grids with Robin interface conditions in the finite element case*  
**Caroline Japhet**, Yvon Maday, Frédéric Nataf
- *Aitken-Schwarz DDM to solve Darcy flow in heterogeneous underground mediums*  
Jocelyne Erhel, Andrea Frullone, **Damien Tromeur-Dervout**, Jean-Raynal de Dreuzy
- *Domain Decomposition methods for Stiff ODEs/DAEs*  
**David Guibert**, Damien Tromeur-Dervout

10:40 – 11:10 **Coffee break**

11:10 – 12:00 **Applications II**

- *ab initio Electronic Structure Calculations on the BG/L Supercomputer*  
**Constantine Bekas**, Alessandro Curioni, Wanda Andreoni
- *Multilevel domain decomposition for electronic structure calculations*  
**Maxime Barrault**, Guy Bencteux, Eric Cancès, William Hager, Claude Le Bris

12:00 **End of the Conference**

12:10 **Lunch**

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# PMAA 2006

## PROGRAM



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September 7 – 9, 2006

9:00 – 9:40 **Invited lecture I: Erik Boman**  
*Combinatorial Algorithms for Parallel Sparse Matrix Distributions*

- 9:40 – 10:30 **Preconditioners I**
- *On finding approximate supernodes for an efficient ILU(k) factorization*  
**Pascal Hénon**, Pierre Ramet, Jean Roman
  - *Numerical experiments with additive Schwarz preconditioner for non-overlapping domain decomposition in 3D*  
Luc Giraud, **Azzam Haidar**, Shane Mulligan

10:30 – 11:00 **Coffee break**

- 11:00 – 12:30 **Direct Methods for Dense and Sparse Matrices**
- *Modeling the LU Factorization for SMP Clusters*  
Jack Dongarra, **Emmanuel Jeannot**, Julien Langou
  - *A Preliminary Analysis of the Out-of-Core Solution Phase of a parallel Multifrontal Approach*  
Patrick Amestoy, Iain Duff, Abdou Guermouche, **Tzvetomila Slavova**
  - *Efficiently solving large sparse linear systems on a distributed and heterogeneous grid by using the multisplitting-direct method*  
Sylvain Contassot-Vivier, **Raphaël Couturier**, Christophe Denis, Fabienne Jézéquel
  - *Schur complements and direct solvers applied on a simple domain: trend and behavior of a monolevel strategy*  
**Jean-Paul Boufflet**, Emmanuel Lefrançois, Michel Vayssade

12:40 – 14:15 **Lunch**

14:15 – 14:55 **Invited lecture II: Gérard Meurant**  
*Algebraic Multilevel Preconditioners on Massively Parallel Computers*

- 14:55 – 16:10 **Preconditioners II**
- *A new implementation of the CMRH method for solving dense linear systems*  
Mohammed Heyouni, **Hassan Sadok**
  - *A Parallel Implementation with a Comparative Study of GMRES(m) Preconditioned by Multiplicative Schwarz Method*  
**Emmanuel Kamgnia**, Guy Antoine Atenkeng Kahou, Bernard Philippe
  - *Convergence of iterative solvers for the method coupling Finite elements and integral representation*  
Faker Ben Belgacem, **Nabil Gmati**, Faten Jelassi, Bernard Philippe

16:10 – 16:30 **Coffee break**

16:30 – 18:10 **Parallel sessions**

**I. Grid and eigenvalue computations**  
*Minisymposium proposed by Serge Petiton*

- *Solving symmetric eigenproblems on grid and global computing environment*  
**Laurent Choy**, Serge Petiton, Mitsuhisa Sato
- *Dynamic load balancing of the power method on a Grid*  
**Clovis Dongmo Jiogo**, Pierre Manneback
- *Efficient Parallel Implementation of Classical Gram-Schmidt Orthogonalization Using Matrix Multiplication*  
Takuya Yokozawa, **Daisuke Takahashi**, Taisuke Boku, Mitsuhisa Sato
- *Resolution of Large Scale Hermitian Eigenproblem using YML Workflow Framework*  
**Nahid Emad**, Tetsuya Sakurai

**II. Graph Partitioning**

- *A Partitioning Algorithm for Block-Diagonal Matrices with Overlap*  
**Guy Antoine Atenkeng Kahou**, Laura Grigori, Masha Sosonkina
- *PT-Scotch: A tool for efficient parallel graph ordering*  
**Cédric Chevalier**, Francois Pellegrini
- *Using hypergraph partitioning for iterative linear system solution techniques*  
**Masha Sosonkina**, Yousef Saad, Bora Uçar
- *Parallel algorithms for downdating the least squares estimator of the regression mode*  
**Petko Ivanov Yanev**, Erricos John Kontoghiorghes

18:10 **End of the sessions**

18:30 **Reception at the Town Hall of Rennes**

8:00 – 8:40 **Invited lecture III: Erik Elmroth**  
*Using recursion to improve performance of dense linear algebra software*

- 8:40 – 9:55 **Parallel algorithms I**
- *Parallel synchronous and asynchronous iterative algorithms for Procrustes-type problems*  
Giorgos Kollias, **Efstratios Gallopoulos**, Daniel Szyld
  - *Parallel Quasi-Monte Carlo Algorithms for Matrix Computations*  
**Aneta Karaivanova**
  - *Algorithm RaPTI for solving evolution problems in a time-parallel way*  
**Nabil Nassif**, Noha Makhoul Karam, Yeran Soukiassian.

9:55 – 10:25 **Coffee break**

10:25 – 12:05 **Parallel sessions**

**I. Parallel Matrix Algorithms in Computational Science**  
*Minisymposium proposed by Ahmed Sameh*

- *Solving large scale eigenvalue problems in electronic structure calculations*  
**Yousef Saad**

- *Computational Nanoelectronics*  
**Eric Polizzi**

- *Molecular Dynamics Simulations of Reactive Systems*  
Sagar Pandit, Metin Aktugla, **Ananth Grama**
- *A Parallel System Solver for the Navier-Stokes Equations*  
**Ahmed Sameh**, Murat Manguoglu, Faisal Saied

**II. Second Session**  
*SVD based methods*

- *Balanced Truncation Model Reduction of Large and Sparse Descriptor Linear Systems*  
**José Manuel Badía**, Peter Benner, Rafael Mayo, Enrique S. Quintana-Ortí, Gregorio Quintana Ortí, Alfredo Remón
- *New Class of Block Matrix Orderings for the Parallel Two-Sided Jacobi SVD Algorithm*  
**Gabriel Okša**, Ondrej Sýkora, Marian Vajteršic

*Parallel Environments*

- *The Standards and Data Structures of Dense Linear Algebra Software*  
Fred Gustavson, **Jerzy Waśniewski**
- *An unified linear equation solvers interface for industrial softwares*  
**Bernard Sécher**, Michel Belliard

12:05 – 13:45 **Lunch**

13:45 – 14:25 **Invited lecture IV : Peter Arbenz**  
*Multilevel mu-Finite Element Analysis for Human Bone Structures*

- 14:25 – 15:40 **Parallel Algorithms II**
- *Combining Building Blocks for Parallel Multilevel Matrix Multiplication*  
Sascha Hunold, **Thomas Rauber**, Gudula Rünger
  - *Matrix Multiplication on Three Heterogeneous Processors*  
**Brett Becker**, Alexey Lastovetsky
  - *Parallel processing of matrix operations on the Pulsyr configurable architecture*  
**Andriy Lutsyk**, Bohdan Rusyn, Oleksiy Lutsyk

15:40 – 16:00 **Coffee break**

16:00 – 16:50 **Applications I**

- *Efficient technique for solving low Mach number compressible multiphase problems*  
Benjamin Braconnier, Boniface Nkonga, Mikael Papin, **Pierre Ramet**, Mario Ricchiuto, Jean Roman, Rémi Abgrall
- *Parallel Multistage Stochastic Programming Model Used in Portfolio Management*  
**Maria Lucka**, Igor Melicherck, Ladislav Halada.

16:50 **End of the sessions**

17:00 **Departure for the Mont Saint Michel excursion and conference dinner**