CURRICULUM-VITAE

Pierre RAMET

Born	13 October 1971 in Montreuil (France)
Citizenship	French
Current position	ASSOCIATE PROFESSOR at Bordeaux University
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Education

2000- : Associate professor in computer science at Bordeaux University. Research activities done within the **HiePACS** team (Project involving Bordeaux University, IPB and Inria).

1997-2000 : PhD. Thesis at Bordeaux University (defense 12 January 2000).

Titre :

Optimization of communication and data distribution in dense and sparse linear algebra

Reviewers :

— M. Patrick AMESTOY (ENSEEIHT, IRIT) ;
— M. Michel COSNARD (ENS Lyon, LIP) ;

Jury members :

— M. Patrick AMESTOY (ENSEEIHT, IRIT) ;
— M. Michel COSNARD (ENS Lyon, LIP) ;
— M. Frédéric DESPREZ (INRIA, LIP) ;
— M. Jack DONGARRA UTK, ICL ;
— M. Iain DUFF (Rutherford Appleton Lab (Oxford), CERFACS) ;
— M. Jean ROMAN (ENSEIRB, LaBRI), advisor ;

1996-1997 : Military service at CEA/CESTA.

1992-1995 : Ingeneer training in computer science at ENSEIRB.

My interests span high-performance computing, focusing on sparse linear algebra. I am the developer of `PaStiX`, a high-performance sparse direct solver. Beyond sparse linear algebra, I am interested in

— Parallel algorithms (graph partitioning, nested dissection)
— Numerical algorithms (H-matrices, low rank approximations)
— Hardware accelerators (GPU, KNL)

1 Teaching Activities

The following list indicates the number of hours spent in teaching activities on a yearly basis.

— Undergraduate level/Licence : System programming 24h, Databases 32h, Object programming 48h, Distributed programming 32h, Cryptography 24h at Bordeaux University.
— Post graduate level/Master : Load balancing and scheduling 16h, Numerical algorithms 32h at Bordeaux INP (ENSEIRB-MATMECA). I also give classes on Cryptography 24h, HoChiMinh City in Vietnam.

2 Administration Activities

— Since 2011, I am deputy head of the SATANAS (Supports and Algorithms for High Performance Numerical Applications) team.
— Between 2005 and 2009, I was an elected member of the selection commitee of the computer science department at Bordeaux University.
— I was also expert for GENCI (French supercomputing ressources).

3 Scientific Responsabilities

Since 2015, I am scientific advisor at CEA (French Alternative Energies and Atomic Energy Commission) in the field of high performance computing in numerical simulations.

4 PhD. Advising

PhD. Advising

Gregoire Pichon (50%) *Using low rank compression techniques in sparse direct solvers*, Bordeaux University, in progress, funded by Inria and DGA.

Salli Moustafa (50%) *Massively Parallel Cartesian Discrete Ordinates Method for Neutron Transport Simulation*, Bordeaux University, December 2015, funded by EDF.

Astrid Casadei (80%) *Optimizations of hybrid sparse linear solvers relying on Schur complement and domain decomposition approaches*, Bordeaux University, October 2015, funded by the french ministry for research.

Xavier Lacoste (80%) *Scheduling and memory optimizations for sparse direct solver on multi-core/multi-gpu cluster systems*, Bordeaux University, February 2015, funded by ANR ANEMOS.

Bruno Lathuiliere (80%) *Méthode de décomposition de domaine pour les équations du transport simplifié en neutronique*, Bordeaux University, January 2010, funded by EDF.

Mathieu Faverge (50%) *Ordonnancement hybride statique-dynamique en algèbre linéaire creuse pour de grands clusters de machines NUMA et multi-coeurs*, Bordeaux University, December 2009, funded by ANR NUMASIS.

5 Research topics

My interests span high-performance computing, focusing on sparse linear algebra. I mainly work on high performance parallel solver for very large sparse linear systems based on block direct method and block iterative method. I develop the `PaStiX` software which is based on an efficient scheduling and memory manager, in order to solve 3D problems with several million unknowns from simulation codes for electromagnetism with CEA/CESTA and fusion physics with CEA/EURATOM. I also work on domain decomposition method applied to neutron physics with EDF. More recently, I investigate hierarchical compression techniques to reduce the burden on large blocks appearing during the nested dissection process. In collaboration with E. Darve from Stanford University, We have developed a preliminary sparse direct solver using block low-rank kernels considering ordering strategies to enhance data locality and compressibility.

6 Software Development

I am the Co-PI of the `PaStiX`[1] software. `PaStiX` is a parallel sparse direct solver, based on a dynamic scheduler for modern hierarchical architectures. Some recent results demonstrate that using generic runtime systems provide a uniform and portable programming interface across heterogeneous environments, and are, therefore, a sustainable solution for hybrid environments. Furthermore, exploiting such a modular programming paradigm should facilitate the experiments of H-matrix arithmetics in this advance software package.

7 Reviews

— **Reviews for international journals** : SIAM Journal on Scientific Computing, ACM Transactions on Mathematical Software, Parallel Computing, Concurrency and Computation : Practice and Experience, Parallel and Distributed Computing Practices, Journal of Computational Physics, International Journal for Numerical Methods in Engineering, Computers and Fluids, International Journal for Numerical Methods in Fluids.
— **Reviews for international conferences** : IPDPS, Europar, Supercomputing, PMAA, ...

8 Dissemination

Between 2011 and 2016 I was a trainer during a training of the Prace european initiative entitled “Parallel Linear Algebra”.

1. https://gitlab.inria.fr/solverstack/pastix

9 Projects and contracts

— I was the deputy head of the following ANR project :

2011-2015. ANR MN11 ANEMOS [2] : Advanced Numeric for ELMs : Modeling and Optimized Schemes.

2006-2010. ANR CIS06 ASTER [3] : Adaptive MHD Simulation of Tokamak ELMs for ITER.

— I was also involved in some other ANR projects :

2013-2017. ANR MN13 SOLHAR [4] : Solvers for heterogeneous architectures on top of task-based runtime systems.

2008-2012. ANR COSINUS08 PETAL and COSINUS10 PETALH : Preconditioning scientific applications on pETascALe Heterogeneous machines.

2006-2010. ANR CIS06 SOLSTICE [5] : SOLvers et SimulaTIons in Extreme Computing.

2005-2009. ANR CIS05 NUMASIS [6] : High performance computing on NUMA architectures for seismology simulations.

— I was involved in the following industrial contracts :

2014-2016. Contract with `Algo'Tech` : this collaboration, backed up by financial support from Bpifrance, enabled the SME to make the technological leap necessary for the development of a software version adapted to HPC.

2014-2015. Industrial contracts with the CEA/CADARACHE : optimization of the linear algebra routines in the JOREK, a production controlled plasma fusion simulation code.

2006-2015. Industrial contracts with the EDF : in this collaboration, we work on a parallel 3D Cartesian SN solver specialized for nuclear core simulation code.

2000-. Industrial contracts with the CEA/CESTA : a long-term collaboration on performance analysis of our contributions to sparse direct solver for matrices coming from different applications developped at CEA/CESTA.

— I was involved in the following international collaborations :

2013-2017. Stanford University and Lawrence Berkeley National Laboratory within the associate team FAST-LA [7] : Fast and Scalable Hierarchical Algorithms for Computational Linear Algebra.

2011-2015. University of Tennessee within the associate team MORSE [8] : Matrices Over Runtime Systems Exascale.

2008-2009. University of Minnesota within the associate team PHYLEAS [9] : Study of parallel hybrid sparse linear solvers.

2007-2008. Japan Atomic Energy Agency.

2. http://math.unice.fr/~nkonga/Anemos.html
3. http://aster.gforge.inria.fr/
4. http://solhar.gforge.inria.fr/
5. http://solstice.gforge.inria.fr/
6. http://numasis.gforge.inria.fr/
7. https://www.inria.fr/en/associate-team/fastla
8. http://icl.cs.utk.edu/projectsdev/morse
9. http://www-sop.inria.fr/nachos/phyleas

10 Publications

International journals

[1] G. Pichon, M. Faverge, P. Ramet, and J. Roman. *Reordering strategy for blocking optimization in sparse linear solvers*. SIAM Journal on Matrix Analysis and Application, 38(1) :226-248, 2017.

[2] S. Moustafa, I. Dutka-Malen, L. Plagne, A. Poncot, and P. Ramet. *Shared Memory Parallelism for 3D Cartesian Discrete Ordinates Solver*. Annals of Nuclear Energy, 2014.

[3] O. Coulaud, L. Giraud, P. Ramet, and X. Vasseur. *Developments in Parallel, Distributed, Grid and Cloud Computing for Engineering*. Chapter Augmentation and Deflation in Krylov subspace methods, pages 249-275. Saxe-Coburg Publications, Kippen, Stirlingshire, United Kingdom, 2013.

[4] M. Barrault, B. Lathuilière, P. Ramet et J. Roman. *Efficient Parallel Resolution of The Simplified Transport Equations in Mixed-Dual Formulation*. Journal of Computational Physics, 230(5) :2004-2020, 2011.

[5] G. Huysmans, Pamela S., E. van der Plas et P. Ramet. *Non-Linear MHD simulations of Edge Localised Modes (ELMs)*. Journal on Plasma Physics and Controlled Fusion, 51(12) :124012, 2009.

[6] R. Abgrall, R. Huart et P. Ramet. *Numerical simulation of unsteady MHD flows and applications*. Magneto-HydroDynamics Journal, 45(2) :225-232, 2009.

[7] P. Hénon, P. Ramet et J. Roman. *On finding approximate supernodes for an efficient ILU(k) factorization*. Parallel Computing, 34 :345-362, 2008.

[8] P. Hénon, P. Ramet, et J. Roman. *PaStiX : A High-Performance Parallel Direct Solver for Sparse Symmetric Definite Systems*. Parallel Computing, 28(2) :301–321, 2002.

[9] E. Caron, S. Chaumette, S. Contassot-Vivier, F. Desprez, E. Fleury, C. Gomez, M. Goursat, E. Jeannot, D. Lazure, F. Lombard, J.M. Nicod, L. Philippe, M. Quinson, P. Ramet, J. Roman, F. Rubi, S. Steer, F. Suter et G. Utard. *Scilab to Scilab//, the OURAGAN Project*. Parallel Computing, 27(11) :1497–1519, 2001.

[10] D. Goudin, P. Hénon, F. Pellegrini, P. Ramet, J. Roman et J.-J. Pesqué. *Parallel Sparse Linear Algebra and Application to Structural Mechanics*. Numerical Algorithms volume 24, pages 371-391, 2000.

International conferences with proceedings (Springer LNCS, IEEE or SIAM)

[11] G. Pichon, E. Darve, M. Faverge, P. Ramet, and J. Roman. *Sparse Supernodal Solver Using Block Low-Rank Compression*. 18th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC'17), Orlando, USA, June 2017.

[12] S. Moustafa, M. Faverge, L. Plagne, P. Ramet. *3D Cartesian Transport Sweep for Massively Parallel Architectures with PARSEC*. 29th IEEE International Parallel & Distributed Processing Symposium (IPDPS'15), pages 581-590, Hyderabad, India, May 2015.

[13] A. Casadei, P. Ramet, and J. Roman. *An improved recursive graph bipartitioning algorithm for well balanced domain decomposition*. 21st IEEE International Conference on High Performance Computing, pages 1-10, Goa, India, décember 2014.

[14] X. Lacoste, M. Faverge, P. Ramet, S. Thibault, and G. Bosilca. *Taking advantage of hybrid systems for sparse direct solvers via task-based runtimes*. HCW'2014 workshop of IPDPS, pages 29-38, Phoenix, USA, May 2014.

[15] G. Huysmans, Pamela S., E. van der Plas et P. Ramet. *Non-Linear MHD simulations of Edge Localised Modes*. 36th EPS Plasma Physics Conference, Sofia, Bulgarie, June 2009.

[16] M. Barrault, B. Lathuilière, P. Ramet et J. Roman. *A domain decomposition method applied to the simplified transport equations*. IEEE 11th International Conference on Computational Science and Engineering, Sao Paulo, Brazil, pages 91-97, July 2008.

[17] Y. Caniou, J.-S. Gay et P. Ramet. *Tunable parallel experiments in a GridRPC framework : application to linear solvers*. VECPAR'08, LNCS 5336, pages 430-436, Toulouse, France, June 2008.

[18] N. Kushida, Y. Suzuki, N. Teshima, N. Nakajima, Y. Caniou, M. Dayde et P. Ramet. *Toward an International Sparse Linear Algebra Expert System by Interconnecting the ITBL Computational Grid with the Grid-TLSE Platform*. VECPAR'08, LNCS 5336, pages 424-429, Toulouse, France, June 2008.

[19] M. Faverge et P. Ramet. *Dynamic Scheduling for sparse direct Solver on NUMA architectures*. Proceedings of PARA'08, Trondheim, Norway, à paraître dans LNCS, May 2008.

[20] P. Hénon, P. Ramet et J. Roman. *Partitioning and Blocking Issues for a Parallel Incomplete Factorization*. PARA'06, Workshop on state-of-the-art in scientific computing, Umea, Suède, LNCS 4699, pages 929-937, June 2006.

[21] P. Hénon, P. Ramet et J. Roman. *On using an hybrid MPI-Thread programming for the implementation of a parallel sparse direct solver on a network of SMP nodes*. Sixth International Conference on Parallel Processing and Applied Mathematics, Workshop HPC Linear Algebra, Poznan, Pologne, LNCS 3911, pages 1050-1057, september 2005.

[22] P. Hénon, F. Pellegrini, P. Ramet, J. Roman, et Y. Saad. *Applying parallel direct solver skills to build robust and highly performant preconditioners*. PARA'04, Workshop on state-of-the-art in scientific computing, Copenhague, Danemark, LNCS 3732, pages 601-619, June 2004.

[23] O. Beaumont, P. Ramet et J. Roman. *Asymptotically optimal algorithm for Laplace task graphs on heterogeneous platforms*. Fifth International Conference on Parallel Processing and Applied Mathematics (PPAM), Czestochowa, Pologne, LNCS 3019, pages 880-887, September 2003.

[24] P. Hénon, P. Ramet et J. Roman. *Efficient algorithms for direct resolution of large sparse system on clusters of SMP nodes*. SIAM Conference LA'2003, Williamsburg, USA, July 2003.

[25] P. Hénon, P. Ramet et J. Roman. *PaStiX : A Parallel Direct Solver for Sparse SPD Matrices based on Efficient Static Scheduling and Memory Managment*. SIAM Conference PPSC'2001, Portsmouth, Virginie, USA, March 2001.

[26] P. Hénon, P. Ramet et J. Roman. *PaStiX : A Parallel Sparse Direct Solver Based on a Static Scheduling for Mixed 1D/2D Block Distributions*. IPDPS'2000, Cancun, Mexique, LNCS 1800, pages 519-525, May 2000.

[27] P. Hénon, P. Ramet et J. Roman. *A Mapping and Scheduling Algorithm for Parallel Sparse Fan-In Numerical Factorization*. EuroPar'99, Toulouse, France, LNCS 1685, pages 1059-1067, September 1999.

[28] F. Desprez, P. Ramet et J. Roman. *Optimal Grain Size Computation for Pipelined Algorithms*. EuroPar'96, Lyon, France, LNCS 1123, pages 165-172, September 1996.

International conferences or workshops

[29] G. Pichon, E. Darve, M. Faverge, P. Ramet, and J. Roman. *Sparse Supernodal Solver Using Hierarchical Compression over Runtime System*. SIAM Conference on Computation Science and Engineering, Atlanta, USA, February 2017.

[30] G. Pichon, M. Faverge, and P. Ramet. *Exploiting Modern Manycore Architecture in Sparse Direct Solver with Runtime Systems*. SIAM Conference on Computation Science and Engineering, Atlanta, USA, February 2017.

[31] G. Pichon, M. Faverge, P. Ramet, and J. Roman. *Impact of Blocking Strategies for Sparse Direct Solvers on Top of Generic Runtime*. SIAM Conference on Computation Science and Engineering, Atlanta, USA, February 2017.

[32] E. Darve, M. Faverge, G. Pichon, P. Ramet, and J. Roman. *Sparse Supernodal Solver Using Hierarchical Compression*. Workshop on Fast Direct Solvers, Purdue, USA, November 2016.

[33] P. Ramet *On the use of low rank approximations for sparse direct solvers*. SIAM Annual Meeting, Boston, USA, July 2016.

[34] M. Faverge, G. Pichon, P. Ramet, and J. Roman. *Impact of Blocking Strategies for Sparse Direct Solvers on Top of Generic Runtimes*. SIAM Conference on Parallel Processing for Scientific Computing, Paris, France, April 2016.

[35] E. Darve, M. Faverge, G. Pichon, P. Ramet, and J. Roman. *Exploiting H-Matrices in Sparse Direct Solvers*. SIAM Conference on Parallel Processing for Scientific Computing, Paris, France, April 2016.

[36] M. Faverge, G. Pichon, P. Ramet, and J. Roman. *Blocking strategy optimizations for sparse direct linear solver on heterogeneous architectures*. Sparse Days, Saint Girons, France, June 2015.

[37] M. Faverge, G. Pichon, P. Ramet, and J. Roman. *On the use of H-Matrix Arithmetic in PaStiX : a Preliminary Study*. Workshop on Fast Solvers, Toulouse, France, June 2015.

[38] X. Lacoste, M. Faverge, and P. Ramet. *A task-based sparse direct solver suited for large scale hierarchical/heterogeneous architectures*. SIAM Conference on Computation Science and Engineering, Salt Lake City, USA, February 2015.

[39] A. Casadei, P. Ramet, and J. Roman. *Towards a recursive graph bipartitioning algorithm for well balanced domain decomposition*. SIAM Conference on Computation Science and Engineering, Salt Lake City, USA, February 2015.

[40] P. Ramet. *On the design of parallel linear solvers for large scale problems*. International Congress on Industrial and Applied Mathematics, Pekin, China, August 2015.

[41] A. Casadei and P. Ramet. *Towards a recursive graph bipartitioning algorithm for well balanced domain decomposition*. International Congress on Industrial and Applied Mathematics, Pekin, China, August 2015.

[42] S. Moustafa, M. Faverge, L. Plagne, and P. Ramet. *Parallel 3D Sweep Kernel with PARSEC*. 16th IEEE International Conference on High Performance and Communications, workshop on HPC-CFD in Energy/Transport Domains, Paris, France, August 2014.

[43] A. Casadei, P. Ramet, and J. Roman. *Nested Dissection with Balanced Halo*. SIAM Workshop on Combinatorial Scientific Computing, Lyon, France, July 2014.

[44] E. Agullo, M. Faverge, L. Giraud, A. Guermouche, P. Ramet, and R. Roman. *Toward parallel scalable linear solvers suited for large scale hierarchical parallel platforms*. WCCM-ECCM-ECFD, Barcelona, Spain, July 2014.

[45] S. Moustafa, I. Dutka-Malen, L. Plagne, A. Poncot, and P. Ramet. *Shared Memory Parallelism for 3D Cartesian Discrete Ordinates Solver.*. Joint International Conference on Supercomputing in Nuclear Applications + Monte Carlo, Paris, France, October 2013.

[46] X. Lacoste, M. Faverge, and P. Ramet. *Sparse Linear Algebra over DAG Runtimes*. SIAM Conference on Computation Science and Engineering, Boston, USA, February 2013.

[47] A. Casadei, L. Giraud, P. Ramet, and J. Roman. *Towards Domain Decomposition with Balanced Halo*. Workshop Celebrating 40 Years of Nested Dissection, Waterloo, Canada, July 2013.

[48] P. Ramet. *From hybrid architectures to hybrid solvers*. Workshop Celebrating 40 Years of Nested Dissection, Waterloo, Canada, July 2013.

[49] X. Lacoste, P. Ramet, M. Faverge, I. Yamazaki, G. Bosilca. *Toward a supernodal sparse direct solver over DAG runtimes*. PMAA'2012, London, England, June 2012.

[50] A. Casadei et P. Ramet. *Memory Optimization to Build a Schur Complement*. SIAM Conference LA'2012, Valencia, Spain, June 2012.

[51] X. Lacoste et P. Ramet. *Sparse direct solver on top of large-scale multicore systems with GPU accelerators*. SIAM Conference LA'2012, Valencia, Spain, June 2012.

[52] M. Faverge et P. Ramet. *Fine Grain Scheduling for Sparse Solver on Manycore Architectures*. SIAM Conference PPSC'2012, Savannah, USA, February 2012.

[53] Y. Suzuki, N. Kushida, T. Tatekawa, N. Teshima, Y. Caniou, R. Guivarch, M. Dayde et P. Ramet. *Development of an International Matrix-Solver Prediction System on a French-Japanese International Grid Computing Environment*. Joint International Conference on Supercomputing in Nuclear Applications and Monte Carlo 2010, Tokyo, Japan, October 2010.

[54] M. Barrault, B. Lathuilière, P. Ramet et J. Roman. *A Non Overlapping Parallel Domain Decomposition Method Applied to The Simplified Transport Equations*. International Conference on Mathematics, Computational Methods and Reactor Physics, New-York, USA, May 2009.

[55] R. Abgrall, O. Coulaud, P. Hénon, R. Huart, G. Huysmans, G. Latu, B. Nkonga, S. Pamela et P. Ramet. *Numerical simulation of tokamak plasmas*. 7th PAMIR International Conference on Fundamental and Applied MHD, Presqu'île de Giens, France, September 2008.

[56] M. Faverge, X. Lacoste et P. Ramet. *A NUMA Aware Scheduler for a Parallel Sparse Direct Solver*. PMAA'2008, Neuchatel, Suisse, June 2008.

[57] M. Barrault, B. Lathuilière, P. Ramet et J. Roman. *A Domain Decomposition Method Applied to Large Eigenvalue Problems in Neutron Physics*. PMAA'2008, Neuchatel, Suisse, June 2008.

[58] M. Barrault, B. Lathuilière, P. Ramet et J. Roman. *A domain decomposition method for the resolution of an eigenvalue problem in neutron physics*. International Symposium on Iterative Methods in Scientific Computing (IMACS), Lille, France, March 2008.

[59] P. Hénon, P. Ramet et J. Roman. *On finding approximate supernodes for an efficient ILU(k) factorization*. PMAA'2006, Rennes, France, September 2006.

[60] B. Braconnier, B. Nkonga, M. Papin, P. Ramet, M. Riccuito, J. Roman et R. Abgrall. *Efficient solution technique for low Mach number compressible multiphase problems*. PMAA'2006, Rennes, France, September 2006.

[61] P. Hénon, F. Pellegrini, P. Ramet et J. Roman. *Blocking Issues for an Efficient Parallel Block ILU Preconditioner*. SIAM Conference On Preconditioning Techniques For Large Sparse Matrix Problems In Scientific And Industrial Applications, Atlanta, USA, May 2005.

[62] P. Hénon, P. Ramet et J. Roman. *A Blockwise Algorithm for Parallel Incomplete Cholesky Factorization*. PMAA'2004, Marseille, France, October 2004.

[63] P. Hénon, B. Nkonga, P. Ramet et J. Roman. *Using of the High Performance Sparse Solver PaStiX for the Complex Multiscale 3D Simulations performed by the FluidBox Fluid Mechanics Software*. PMAA'2004, Marseille, France, October 2004.

[64] P. Hénon, F. Pellegrini, P. Ramet, J. Roman et Y. Saad. *High Performance Complete and Incomplete Factorizations for Very Large Sparse Systems by using Scotch and PaStiX softwares*. SIAM Conference PPSC'2004, San Francisco, USA, February 2004.

[65] P. Hénon, F. Pellegrini, P. Ramet et J. Roman. *Towards High Performance Hybrid Direct-Iterative Solvers for Large Sparse Systems*. SIAM Conference On Preconditioning Techniques For Large Sparse Matrix Problems In Scientific And Industrial Applications, Napa, USA, October 2003.

[66] P. Hénon, P. Ramet et J. Roman. *Parallel factorization of very large sparse SPD systems on a network of SMP nodes*. PMAA'2002, Neuchâtel, Suisse, November 2002.

[67] P. Hénon, P. Ramet et J. Roman. *PaStiX : A High-Performance Parallel Direct Solver for Sparse Symmetric Definite Systems*. PMAA'2000, Neuchâtel, Suisse, August 2000.

[68] D. Goudin, P. Hénon, F. Pellegrini, P. Ramet, J. Roman et J.-J. Pesqué. *Description of the EMILIO Software Processing Chain and Application to Structural Mechanics*. PMAA'2000, Neuchâtel, Suisse, August 2000.

International invited talks

[69] P. Ramet. *From hybrid architectures to hybrid solvers*. Seminar at Stanford, July 2013.

[70] P. Ramet. *Hybrid methods, Hybrid architectures, Hybrid compressions for sparse direct solvers*. Seminar at Stanford, November 2013.

[71] P. Ramet. *Dynamic Scheduling for Sparse Direct Solver on NUMA and Multicore Architectures*. ComplexHPC meeting, Lisbon, Portugal, October 2009.

[72] P. Hénon, P. Ramet et J. Roman. *A supernode amalgamation algorithm for an efficient block incomplete factorization*. Workshop on parallel iterative solvers and domain decomposition techniques, Minneapolis, USA, July 2008.

[73] P. Hénon, P. Ramet et J. Roman. *A supernode amalgamation algorithm for an efficient block incomplete factorization*. Workshop PPAM'07, Gdansk, Pologne, September 2007.

[74] P. Ramet. *High performances methods for solving large sparse linear systems - Direct and Incomplete Factorization*. Workshops ReDIMsOPS, Japan Atomic Energy Agency, Tokyo, Japon, May 2007.

[75] O. Czarny, G. Huysmans, P. Hénon et P. Ramet. *Improvement of existing solvers for the simulation of MHD instabilities*. Numerical flow models for controlled fusion, Porquerolles, France, April 2007.

[76] P. Hénon, F. Pellegrini, P. Ramet et J. Roman. *An efficient hybrid MPI/Thread implementation on a network of SMP nodes for the parallel sparse direct solver PaStiX : ordering / scheduling / memory managment / out-of-core issues, and application to preconditioning*. Sparse Days and Grid Computing, Saint Girons, France, June 2003.

National conferences with proceedings

[77] P. Hénon, P. Ramet. *Optimisation de l'occupation mémoire pour un solveur parallèle creux direct hautes performances de type supernodal*. RenPar'2002, Hamamet, Tunisie, April 2002.

[78] P. Hénon, P. Ramet. *PaStiX : Un solveur parallèle direct pour des matrices creuses symétriques définies positives basé sur un ordonnancement statique performant et sur une gestion mémoire efficace*. RenPar'2001, Paris, France, April 2001.

[79] P. Ramet. *Calcul de la Suite Optimale de Taille de Paquets pour la Factorisation de Cholesky*. RenPar'9, Lausanne, Suisse, pages 111–114, May 1997.

[80] P. Ramet. *Calcul de la Taille Optimale des Paquets pour les Algorithmes Macro-Pipelines*. RenPar'8, Bordeaux, France, pages 21–24, June 1996.

National invited talks

[81] P. Ramet. *Solveurs Directs*. Maison de la Simulation : Formation en Algèbre Linéaire Creuse Parallèle, Montpellier, France, March 2015.

[82] P. Ramet. *PaStiX : Parallel Sparse Matrix Package*. JDEV2015 : Journées Développement Logiciel, Bordeaux, France, July 2015.

[83] P. Ramet. *On the design of parallel linear solvers for large scale problems*. Formation CNRS, Journée problème de Poisson, Paris, France, January 2015.

[84] P. Ramet. *Task-based linear solvers for modern architectures*. 7th ITER International School, High Performance Computing in Fusion Science, Aix-en-Provence, France, August 2014.

[85] P. Ramet. *Solveurs Directs*. Maison de la Simulation : Formation en Algèbre Linéaire Creuse Parallèle, Paris, France, March 2014.

[86] P. Ramet. *Hybrid methods, Hybrid architectures, Hybrid compressions for sparse direct solvers*. Journée Scientifique du MCIA, February 2014.

[87] P. Ramet. *Solveurs Directs*. Maison de la Simulation : Formation en Algèbre Linéaire Creuse Parallèle, Paris, France, March 2013.

[88] P. Ramet. *Méthodes directes et hybrides pour des solveurs creux adapatés aux machines multiCPUs/multiGPUs*. 3ième Ecole Thématique de Simulation Numérique, Frejus, France, July 2013.

[89] P. Ramet. *Sparse direct solver on top of large-scale multicore systems with GPU accelerators*. CEMRACS'2012, Méthodes numériques et algorithmes pour architectures pétaflopiques, Marseille, France, August 2012.

[90] P. Ramet. *Solveurs Directs*. Maison de la Simulation : Formation en Algèbre Linéaire Creuse Parallèle, Bordeaux, France, November 2011.

[91] P. Ramet. *Linear algebra and sparse direct methods*. Séminaires de l'école MFN 2011 sur les méthodes et algorithmes pour le calcul haute performance, Roscoff, France, June 2011.

[92] P. Ramet. *Ordonnancement dynamique dans le solveur PaStiX pour des machines NUMA et multicoeurs*. Formation CNRS, Solveurs de systèmes linéaires de grande taille : les avancées récentes, Lyon, France, November 2010.

[93] P. Ramet. *Formation Parallélisme*. CEMRACS'2010, Modèles Numériques pour la Fusion, Marseille, France, August 2010.

[94] P. Ramet. *Résolution de Systèmes Linéaires, Algorithmes et Parallélisme*. Formation CNRS, Informatique Scientifique pour le Calcul, Sète, France, October 2008.

[95] P. Ramet et J. Roman. *Méthodes directes hautes performances de résolution en algèbre linéaire creuse*. Ecole CEA-EDF-Inria sur le calcul scientifique intensif, Rocquencourt, France, November 2006.

Miscellaneous

[96] M. Alaya, M. Faverge, X. Lacoste, A. Péré-Laperne, J. Péré-Laperne, P. Ramet, and T. Terraz. *Simul'Elec and PASTIX interface specifications*. Algo'Tech, 2015.

[97] M. Faverge, X. Lacoste, P. Ramet, and T. Terraz. *Etude de la factorisation directe hétérogène et de la factorisation incomplète sur solveur PaStiX appliquées à des systèmes issus de problèmes du CEA/CESTA*. CEA/DAM/CESTA, 2015.

[98] M. Boulet, G. Meurant, D. Goudin, J.-J. Pesqué, M. Chanaud, L. Giraud, P. Hénon, P. Ramet et J. Roman. *Résolution des systèmes linéaires sur calculateurs pétaflopiques*. Revue CHOCS vol 41, revue scientifique et technique de la Direction des Applications Militaires, January 2012.

[99] G. Caramel et P. Ramet. *Optimisation des performances des outils de calcul de neutronique des coeurs*. E.D.F. / SINETICS, 2007.

[100] P. Hénon, P. Ramet et J. Roman. *Evaluation des performances de la version SMP du solveur PaStiX de la chaine logicielle EMILIO dans l'environnement du code ODYSSEE du CESTA*. CEA/DAM/CESTA, 2005.

[101] P. Hénon, F. Pellegrini, P. Ramet et J. Roman. *Etude sur l'applicabilité de méthodes itératives nouvelles aux problèmes du CESTA*. CEA/DAM/CESTA, 2004.

[102] P. Hénon, P. Ramet et J. Roman. *Amélioration et Extension du Solveur Direct Parallèle pour Grandes Matrices Creuses du CESTA*. CEA/DAM/CESTA, 2003.

[103] D. Lecas et P. Ramet. *Parallélisation du code MIRO*. CEA/DAM/CESTA, 2001.

[104] D. Goudin, P. Hénon, F. Pellegrini, P. Ramet et J. Roman. *Mise en oeuvre d'une Bibliothèque d'Outils pour la Résolution par Méthode Directe de Grands Systèmes Linéaires Creux Symétriques Définis Positifs sur Machine Parallèle*. CEA/DAM/CESTA, 2000.

PhD. Advising

[105] M. Faverge. *Ordonnancement hybride statique-dynamique en algèbre linéaire creuse pour de grands clusters de machines NUMA et multi-coeurs*. PhD thesis, LaBRI, Université Bordeaux, Talence, France, December 2009.

[106] B. Lathuilière. *Méthode de décomposition de domaine pour les équations du transport simplifié en neutronique*. PhD thesis, LaBRI, Université Bordeaux, Talence, France, January 2010.

[107] X. Lacoste. *Scheduling and memory optimizations for sparse direct solver on multi-core/multi-gpu cluster systems*. PhD thesis, LaBRI, Université Bordeaux, Talence, France, February 2015.

[108] A. Casadei. *Optimizations of hybrid sparse linear solvers relying on Schur complement and domain decomposition approaches*. PhD thesis, LaBRI, Université Bordeaux, Talence, France, October 2015.

[109] S. Moustafa. *Massively Parallel Cartesian Discrete Ordinates Method for Neutron Transport Simulation*. PhD thesis, LaBRI, Université Bordeaux, Talence, France, December 2015.

Softwares

[110] P. Ramet. PaStiX 5.*. A scientific library that provides a high performance parallel solver for very large sparse linear systems based on direct methods. Available at : http://pastix.gforge.inria.fr/. APP (IDDN.FR.001.230016.000.S.C.2008.000.31235).

[111] P. Ramet. PaStiX 6.0. Available at : https://gitlab.inria.fr/solverstack/pastix.