Curriculum Vitæ

LAURENT O. JAY

August 2009

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Higher Education

- University of Geneva, Switzerland, Mathematics, Ph.D. ("Doctorat ès Sciences Mention Mathématiques"), 1994. Advisor: Professor Ernst Hairer.
- University of Geneva, Switzerland, Computer Science, M.Sc. ("Diplôme d'Informaticien"), 1990.
- University of Geneva, Switzerland, Mathematics, M.Sc. ("Diplôme de Mathématicien"), 1990.
- University of Geneva, Switzerland, Computer Science, B.Sc. ("Licence ès Sciences Informatique"), 1989.

Academic Positions

Long Term Positions

- Professor with tenure since July 2009, Department of Mathematics, University of Iowa, Iowa City, USA. Associate Professor with tenure July 2003-June 2009. Assistant Professor, August 1998-June 2003. Affiliated faculty member of the interdisciplinary Program in Applied Mathematical and Computational Sciences, July 2002-present. Courses taught so far: Graduate courses: Numerical analysis I; Numerical analysis II; Nonlinear dynamics and chaos; Nonlinear dynamics with numerical methods; Optimization techniques; Ordinary differential equations I; Ordinary differential equations II; Topics in numerical analysis; Topics in applied mathematics. Undergraduate courses: Calculus I; Calculus II; Differential equations for engineers; Elementary numerical analysis; Engineering calculus I; Matrix algebra.

- Postdoctoral Associate, February 1997-January 1998, Minnesota Supercomputer Institute and Computer Science Department, University of Minnesota, Minneapolis, USA. In collaboration with Professor Yousef Saad (Computer Science and Engineering) and Professor Jim Chelikowski (Computational Materials Science).

- Postdoctoral Associate, October 1994-January 1997, Army High Performance Computing Research Center and Computer Science Department, University of Minnesota, Minneapolis, USA. Also Research Scholar, October 1995-September 1996, Minnesota Supercomputer Institute, Minneapolis, USA. In collaboration with Professor Linda R. Petzold (Computer Science and Engineering).

- Research and Teaching Assistant, October 1989-September 1994, Department of Mathematics, University of Geneva, Switzerland. Teaching assistant for the following courses: Analysis I; Distribution theory; General mathematics I; General mathematics II; Introduction to probability; Numerical analysis; Numerical analysis of partial differential equations; Numerical dynamical systems; Probability and statistics; Statistics for computer scientists; Statistics for non-mathematicians.

Short Term and Visiting Positions

- Visiting Professor, January-June 2005, Departments of Mathematics and Econometrics, University of Geneva, Switzerland.

- Visiting Professor, March 2004, Department of Applied Mathematics, University of Zaragoza, Spain.

- Visiting Professor, July 2003-June 2004, Departments of Mathematics and Econometrics, University of Geneva, Switzerland.

- Visiting Professor, February 2002, Department of Applied Mathematics, University of Zaragoza, Spain.

- Visiting Professor, June 2001, Centre for Mathematical Sciences, Numerical Analysis, Lund University, Sweden.

- Visiting Postdoctoral Fellow, February, May-August 1998, Institute for Mathematics and Its Applications, and Minnesota Supercomputer Institute, University of Minnesota, Minneapolis, USA.

- Visiting Postdoctoral Fellow, March-April 1998, Department of Mathematics, University of Geneva, Switzerland.

- Visiting Postdoctoral Fellow, November 1994, Department of Mathematics and Center for Global and Regional Environmental Research, University of Iowa, Iowa City, USA.

Academic awards and grants

- *Mathematical & Physical Sciences Funding Program (MPSFP) 2007-2008*, Office of the Vice President for Research, University of Iowa, Iowa City. Title of project: *Innovative curve search methods in numerical nonlinear optimization*, amount: US$ 30,000. Duration: July 2008-June 2009, Principal Investigator.

- *NSF grant, Award No CMMI-0654044*. Title of project: *Collaborative research: simulation of multibody dynamics: leveraging new numerical methods and multiprocessor capabilities*, amount: US$ 59,503. Duration: September 2007-August 2010, Principal Investigator, in collaboration with Prof. Dan Negrut, Department of Mechanical Engineering, University of Wisconsin-Madison.

- *Dean's Scholar Award*, March 2003, College of Liberal Arts and Sciences, University of Iowa, USA, amount: US$ 10,000. Award reserved for the first time to recognize and honor a stellar promotion record (this award is usually awarded to recognize mid-career faculty members, tenured associate professors between their third and fifth year at rank, who excel in both teaching and scholarship or creative work).

- *NSF-Faculty Early Career Development (CAREER) Program, Award No DMS-9983708*. Title of project: *Development, analysis, implementation, and application of innovative structure preserving integrators for constrained systems in mechanics*, amount: US$ 200,000. Duration: June 2000-May 2005, Principal Investigator.

- *NASA Award No 1210679, JPL subcontract No 1213833*: Research project with Jet Propulsion Laboratory (JPL) entitled *SPARK integration methods for formation flying simulation*, amount: US$ 15,000. Duration: November 1999-November 2000, Principal Investigator.

- *Old Gold Summer Fellowship*, College of Liberal Arts and Sciences, University of Iowa, USA, amount: US$ 4000. Duration: June 1999. Principal Investigator.

- *Travel awards* from the University of Iowa, USA (Summer 1999, Summer 2001, Spring 2002).

- *50th Vacheron & Constantin Prize*, April 1998, Faculty of Sciences, University of Geneva, Switzerland; competitive prize awarded to the best research project, amount: CHF 15,000.

- *Grant for scientific research*, 4 months, July 1997, Holderbank Foundation (Holderbank-Stiftung zur Forderung der wissenschaftlichen Fortbildung), Switzerland, amount: CHF 20,000, Principal Investigator.

- *Seventh Leslie Fox Prize Meeting*, second prize, June 1995, University of Dundee, Scotland; international award in numerical analysis for research scientists under thirty years old.

- *Grant in Mathematics for young researchers*, 12 months, April 1994, Swiss National Science Foundation, Switzerland, amount: CHF 36,000, Principal Investigator.

- *Vacheron & Constantin Award*, June 1994, Faculty of Sciences, University of Geneva, Switzerland; best Ph.D. thesis in mathematics.

- *Travel awards* from the University of Geneva, Switzerland, Marc Birkigt Funds, and the Swiss Mathematical Society, (June 1991, June 1992, January 1993, June 1993, July 1994).

Publications

Refereed

1. L.O. Jay: *Preconditioning of implicit Runge-Kutta methods.* Scalable Computing: Practice and Experience, accepted for publication, 2009.

2. D. Negrut, L.O. Jay, and N. Khude: *A discussion of low order numerical integration formulas for rigid and flexible multibody dynamics.* J. Comput. Nonlinear Dyn., Vol. 4, Issue 2, 021008, 2009.

3. L.O. Jay and D. Negrut: *A second order extension of the generalized-α method for constrained systems in mechanics.* In "Multibody Dynamics, Computational Methods and Applications", Carlo L. Bottasso ed., Computational Methods in Applied Sciences, E. Onate series ed., Springer, Vol. 12, special Vol. consisting of a selection of 12 papers from ECCOMAS Thematic Conference on Multibody Dynamics held in Milano, 2007, pp. 143-158, 2008.

4. L.O. Jay: *Specialized partitioned additive Runge-Kutta methods for systems of overdetermined DAEs with holonomic constraints.* SIAM J. Numer. Anal., Vol. 45, pp. 1814-1842, 2007.

5. L.O. Jay and D. Negrut: *Extensions of the HHT-α method to differential-algebraic equations in mechanics.* Electronic Transactions on Numerical Analysis (ETNA), Vol. 26, pp. 190-208, 2007.

6. L.O. Jay: *Beyond conventional Runge-Kutta methods in numerical integration of ODEs and DAEs by use of structures and local models.* J. Comput. Appl. Math., Vol. 204, pp. 56-76, 2007.

7. L.O. Jay: *Specialized Runge-Kutta methods for index* 2 *differential algebraic equations.* Math. Comp., Vol. 75, pp. 641-654, 2006.

8. L.O. Jay: *Preserving Poisson structure and orthogonality in numerical integration of differential equations.* Comput. Math. Appl., Vol. 48, pp. 237-255, 2004.

9. M. Calvo, L.O. Jay, J.I. Montijano, and L. Rández: *Approximate compositions of a near identity map by multi-revolution Runge-Kutta methods.* Numer. Math., Vol. 97, pp. 635-666, 2004.

10. S.S. Shome, E.J. Haug, and L.O. Jay: *Dual-rate integration using partitioned Runge-Kutta methods for mechanical systems with interacting subsystems.* Mech. Based Design Structures Mach., Vol. 32, pp. 253-282, 2004.

11. L.O. Jay: *Solution of index* 2 *implicit differential-algebraic equations by Lobatto Runge-Kutta methods.* BIT, Vol. 43, pp. 93-106, 2003.

12. L.O. Jay: *Iterative solution of nonlinear equations for SPARK methods applied to DAEs.* Numer. Algorithms, Vol. 31, pp. 171-191, 2002.

13. L.O. Jay: *A note on Q-order of convergence.* BIT, Vol. 41, pp. 422-429, 2001.

14. L.O. Jay: *Inexact simplified Newton iterations for implicit Runge-Kutta methods.* SIAM J. Numer. Anal., Vol. 38, pp. 1369-1388, 2000.

15. N. Biehn, S.L. Campbell, L.O. Jay, and T. Westbrook: *Some comments on DAE theory for IRK methods and trajectory optimization.* J. Comput. Appl. Math., Vol. 120, pp. 109-131, 2000.

16. P.E. Gill, L.O. Jay, M.W. Leonard, L.R. Petzold, and V. Sharma: *An SQP method for the optimal control of large-scale dynamical systems.* J. Comput. Appl. Math., Vol. 120, pp. 197-213, 2000.

17. L.O. Jay and T. Braconnier: *A parallelizable preconditioner for the iterative solution of implicit Runge-Kutta type methods.* J. Comput. Appl. Math., Vol. 111, pp. 63-76, 1999.

18. L.O. Jay, H. Kim, Y. Saad, and J. Chelikowski: *Electronic structure calculations for plane-wave codes without diagonalization.* Comput. Phys. Comm., Vol. 118, pp. 21-30, 1999.

19. L.O. Jay: *Structure preservation for constrained dynamics with super partitioned additive Runge-Kutta methods.* SIAM J. Sci. Comput., Vol. 20, pp. 416-446, 1998.

20. L.R. Petzold, L.O. Jay, and J. Yen: *Numerical solution of highly oscillatory ordinary differential equations.* Acta Numerica, A. Iserles ed., Cambridge Univ. Press, Cambridge, pp. 437-484, 1997.

21. L.O. Jay, A. Sandu, F.A. Potra, and G.R. Carmichael: *Improved QSSA methods for atmospheric chemistry equations.* SIAM J. Sci. Comput., Vol. 18, pp. 182-202, 1997.

22. L.R. Petzold, J.B. Rosen, P.E. Gill, L.O. Jay*, and K. Park: *Numerical optimal control of parabolic PDEs using DASOPT.* In "Large-scale optimization with applications", Part II: "Optimal design and control", IMA Vol. Math. Appl., L.T. Biegler, T.F. Coleman, A.R. Conn, and F.N. Santosa eds, Springer, New York, Vol. 93, pp. 271-300, 1997.

23. L.O. Jay: *Symplectic partitioned Runge-Kutta methods for constrained Hamiltonian systems.* SIAM J. Numer. Anal., Vol. 33, pp. 368-387, 1996.

24. L.O. Jay: *Convergence of Runge-Kutta methods for differential-algebraic systems of index 3.* Appl. Numer. Math., Vol. 17, pp. 97-118, 1995.

25. E. Hairer and L.O. Jay: *Implicit Runge-Kutta for higher index differential-algebraic systems.* Contributions in Numerical Mathematics, World Sci. Ser. Appl. Anal., Vol. 2, pp. 213-224, 1993.

26. L.O. Jay: *Collocation methods for differential-algebraic equations of index 3.* Numer. Math., Vol. 65, pp. 407-421, 1993.

27. L.O. Jay: *Convergence of a class of Runge-Kutta methods for differential-algebraic systems of index 2.* BIT, Vol. 33, pp. 137-150, 1993.

28. L.O. Jay: *Dense output for extrapolation based on the semi-implicit midpoint rule.* ZAMM, Vol. 73, pp. 325-329, 1993.

Submitted to Refereed Journals

29. L.O. Jay: *Lagrange-d'Alembert SPARK integrators for constrained systems in mechanics.* To be submitted, 2009.

30. L.O. Jay: *Lagrange-d'Alembert SPARK integrators for nonholonomic Lagrangian systems.* Submitted, 2009.

31. L.O. Jay: *Consistent extensions of the symplectic Euler method for a class of overdetermined DAEs.* Submitted, 2008.

Miscellaneous

32. L.O. Jay and D. Negrut: *Convergence of a second order extension of the generalized-α method for constrained systems in mechanics,* in progress.

33. L.O. Jay and D.G. Mohr: *Curve search in nonlinear unconstrained optimization,* in progress.

34. L.O. Jay: *Hybrid families of Runge-Kutta methods for ordinary differential equations,* in progress.

35. L.O. Jay and H. Oh: *Application of SPARK methods to systems of mixed index 2 and 3 DAEs in mechanics,* in progress.

36. L.O. Jay: *On modified Newton iterations for SPARK methods applied to constrained systems in mechanics,* Proceedings of the 7th International Conference of Numerical Analysis and Applied Mathematics (ICNAAM 2009), AIP Conference Proceedings, Th. E. Simos ed. Rethymno, Crete, Greece, pp. 1017-1020, 2009.

37. L.O. Jay: *Lagrange-d'Alembert SPARK integrators for nonholonomic Lagrangian systems,* Proceedings of the 2009 NSF CMMI Engineering Research and Innovation Conference, Honolulu, Hawaii, 2009.

38. D. Negrut, L.O. Jay, and N. Khude: *A discussion of low order numerical integration formulas for rigid and flexible multibody dynamics,* Proceedings of IDETC07, Proceedings of the 6th ASME International Conference on Multibody Systems, Nonlinear Dynamics and Control, Las Vegas, Nevada, 2007.

39. L.O. Jay and D. Negrut: *A second order extension of the generalized-α method for constrained systems in mechanics,* Proceedings of Multibody Dynamics 2007, ECCOMAS Thematic Conference, C. L. Bottasso, P. Masarati, and L. Trainelli eds., Dipartimento di Ingegneria Aerospaziale, Politecnico di Milano, Milano, Italy, 2007.

40. D. Negrut, L.O. Jay, N. Khude, and T. Heyn: *A discussion of low order numerical integration formulas for rigid and flexible multibody dynamics,* Proceedings of Multibody Dynamics 2007, ECCOMAS Thematic Conference, C. L. Bottasso, P. Masarati, and L. Trainelli eds., Dipartimento di Ingegneria Aerospaziale, Politecnico di Milano, Milano, Italy, 2007.

41. L.O. Jay: *Using additivity in numerical integration of DAEs.* Mathematisches ForschungsInstitut Oberwolfach Report, 14/2006, pp. 850-853, 2006.

42. L.O. Jay: *Use of structures and local models in numerical integration of ODEs and DAEs: Beyond traditional Runge-Kutta methods,* Proceedings of the International Conference on Computational and Mathematical Methods in Science and Engineering, CMMSE-2005, Alicante, Spain, pp. 578-607, 2005.

43. Z. Mi, J. Yang, K. Abdel-Malek, and L.O. Jay: *Planning for kinematically smooth manipulator trajectories.* DETC2002/MECH-34325, Proceedings of 2002 ASME Design Engineering Technical Conferences and Computer and Information in Engineering Conference, 5B, Montreal, Canada, American Society of Mechanical Engineers, New York, pp. 1065-1073, 2002.

44. L.O. Jay: *Lagrangian integration with symplectic methods.* AHPCRC Preprint 97-009, 1997.

45. L.O. Jay, A. Sandu, F.A. Potra, and G.R. Carmichael: *Efficient numerical integrator for atmospheric chemistry.* ICIAM 95, Third International Congress on Industrial and Applied Mathematics, Hamburg, Germany, July 1995. Special Issue of Z. Angew. Math. Mech., Issue 4: Applied Sciences, E. Kreuzer and O. Mahrenholtz eds., Akademie-Verlag, Berlin, pp. 450-453, 1996.

46. L.O. Jay and L.R. Petzold: *Highly oscillatory systems and periodic-stability.* AHPCRC Preprint 95-015, 1995.

47. L.O. Jay: *Runge-Kutta type methods for index three differential-algebraic equations with applications to Hamiltonian systems.* Ph.D. thesis, Department of Mathematics, University of Geneva, Switzerland, 1994.

48. L.O. Jay: *Construction of a continuous solution for an extrapolation method: theory and practice.* M.Sc. thesis, Departments of Mathematics and of Computer Science, University of Geneva, Switzerland, 1990.

Invited Lectures and Conference Presentations

International meetings

- *On modified Newton iterations for SPARK methods applied to constrained systems in mechanics.* September 18-22, 2009, ICNAAM 2009, 7th International

Conference of Numerical Analysis and Applied Mathematics, Rethymno, Crete, Greece. Organizer of a session entitled *DAEs and their Applications* with 7 speakers.

- *Numerical nonlinear optimization and ODEs: one-night stand or marriage of reason?* September 7-8, 2009, International workshop on the numerical solution of ordinary differential equations on the occasion of Prof. Manuel Calvo 65th birthday, Faculty of Sciences, University of Zaragoza, Spain.

- *Lagrange-d'Alembert integrators for constrained systems in mechanics.* June 17-20, 2009, Conference on Scientific Computing and Differential Equations, Geneva, Switzerland.

- *Lagrange-d'Alembert integrators for nonholonomic Lagrangian systems.* May 25-29, 2009, SciCADE 2009, International Conference on Scientific Computation And Differential Equations, Beijing, China.

- *Butcher trees and curve search in nonlinear optimization.* December 12-15, 2007, Joint Meeting of the AMS-NZMS 2007, Co-organizer of a Special Session on Geometric Numerical Integration, Victoria University of Wellington, New Zealand.

- *A second order extension of the generalized-α method for constrained systems in mechanics.* July 9-13, 2007, SciCADE 07, International Conference on Scientific Computation And Differential Equations, Co-organizer of two minisymposia, Saint-Malo, France.

- *A second order extension of the generalized-α method for constrained systems in mechanics.* June 25-28, 2007, ECCOMAS Thematic Conference on Multibody Dynamics, Politecnico di Milano, Italy.

- *Using additivity in numerical integration of DAEs.* March 19-25, 2006, Geometric Numerical Integration, Workshop, Mathematisches Forschungsinstitut Oberwolfach, Germany.

- *Runge-Kutta methods and DAEs.* June 27-30, 2005, Plenary lecture, CMMSE 2005, the 2005 Conference on Mathematical Methods in Science and Engineering, University of Alicante, Spain.

- *Modified Gauss methods for Hamiltonian and Lagrangian systems with holonomic constraints.* May 23-27, 2005, SciCADE 05, Scientific Computation And Differential Equations, Nagoya, Japan.

- *Gauss methods, DAEs, and orthogonal integration.* May 27-28, 2004, Dynamical Systems on Matrix Manifolds: Numerical Methods and Applications Workshop, Dipartimento di Matematica, Universita degli Studi di Bari, Italy.

- *Retaining superconvergence of IRK methods applied to DAEs of index 2 and 3.* June 30-July 4, 2003, International Conference on Scientific Computing and Differential Equations (SciCADE'03), Minisymposium on Applications in Mechanics, The Norwegian Institute of Science and Technology, Trondheim, Norway.

- *Runge-Kutta methods and differential-algebraic equations.* August 19-23, 2002, series of lectures given at a Summer School in Geometric Integration, Special Year in Geometric Integration (SYGI), supported by the Centre for Advanced Study and the Norwegian Academy of Science and Letters, Arendal, Norway.

- *Geometric integration in mechanics with differential-algebraic equations and Lobatto Runge-Kutta methods.* August 5-7, 2002, Foundations of Computational Mathematics, Geometric Integration and Computational Mechanics workshop, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, USA.

- *Approximation of near identity Poincaré maps by multi-revolution Runge-Kutta methods.* June 26-29, 2002, Conference on Scientific Computation, University of Geneva, Switzerland.

- *Preconditioning for implicit Runge-Kutta methods.* July 29-August 3, 2001, International Conference on Scientific Computation And Differential Equations (SciCADE'01), Vancouver, British Columbia, Canada.

- *Preconditioning and parallel implementation of implicit Runge-Kutta methods.* June 26-29, 2001, 2001 Biennial conference on numerical analysis, University of Dundee, Scotland.

- *Preconditioners for the iterative solution of implicit Runge-Kutta type methods applied to ODEs and DAEs.* January 8-12, 2001, Auckland Numerical Ordinary Differential Equations (ANODE 2001) Workshops, Department of Mathematics, University of Auckland, New Zealand.

- *Iterative solution of nonlinear equations for Lobatto IRK methods applied to DAEs.* September 21-24, 2000, First SIAM Conference on Computational Science & Engineering, Washington DC, USA.

- *Implementation issues for implicit integration methods.* August 16-20, 1999, Auckland Numerical Ordinary Differential Equations (ANODE99) Workshops, Department of Mathematics, University of Auckland, New Zealand.

- *Inexact simplified Newton iterations for implicit Runge-Kutta methods.* August 9-13, 1999, International Conference on Scientific Computation And Differential Equations (SCICADE99), Fraser Island, organized by the Department of Mathematics of the University of Queensland, Australia.

- *A parallelizable preconditioner for the iterative solution of implicit Runge-Kutta type methods.* February 25-27, 1998, 2nd Meeting on Numerical Methods for Differential Equations, Department of Mathematics, University of Coimbra, Portugal.

- *Symplectic partitioned Runge-Kutta methods for constrained Hamiltonian systems.* June 25, 1995, *Seventh Leslie Fox Prize Meeting*, University of Dundee, Scotland.

- *Stiffness and highly oscillatory systems.* June 19-22, 1995, ODE to NODE, Workshop, Geiranger, Norway.

- *Structure-preserving integrators and DAEs.* March 28-April 1, 1995, SciCADE-95, Minisymposium, Stanford University, California, USA.

- *Structure-preserving integrators for Hamiltonian and mechanical systems.* July 25-29, 1994 SIAM Annual Meeting, Minisymposium, San Diego, California, USA.

- *Symplectic partitioned Runge-Kutta methods for constrained Hamiltonian systems.* June 29-July 2, 1993, 15th Biennial conference on numerical analysis, University of Dundee, Scotland.

- *Convergence of Runge-Kutta methods for differential-algebraic systems of index 3.* January 4-8, 1993, SCADE93, University of Auckland, New Zealand.

National meetings

- *A new class of curve search methods in nonlinear optimization.* May 3, 2008, 2008 Midwest Numerical Analysis Conference, University of St. Thomas, Minneapolis, USA.

- *A second order extension of the generalized-α method for constrained systems in mechanics.* May 21-25, 2007, Numerical Methods for Nonlinear Elliptic Equations, NSF-CBMS Regional Research Conference, The University of Iowa, Iowa City, USA.

- *Modified Gauss methods for Hamiltonian and Lagrangian systems with holonomic constraints.* May 20-22, 2005, 2005 Midwest Numerical Analysis Conference, University of Iowa, Iowa City, USA.

- *Preconditioning for implicit Runge-Kutta methods.* May 12, 2001, Midwest Numerical Analysis Day, Computer Science Department, University of Illinois, Urbana-Champaign, USA.

- *Inexact approximate simplified Newton iterations for implicit Runge-Kutta methods.* April 24, 1999, Midwest Numerical Analysis Day, Department of Applied Mathematics, Illinois Institute of Technology, Chicago, USA.

- *Numerical optimal control of PDEs using DASOPT.* April 27, 1996, Midwest Numerical Analysis Day, University of Wisconsin, Milwaukee, USA.

- *Partitioned Runge-Kutta methods for Hamiltonian systems with constraints.* April 1, 1993, Swiss Day in Numerical Analysis, Fribourg, Switzerland.

Colloquia and Seminars

- *Lagrange-d'Alembert SPARK integrators for nonholonomic Lagrangian systems.* April 29, 2009, Seminar, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, USA.

- *Modified Gauss methods for high index differential-algebraic equations.* February 15, 2005, Special Seminar and Numerical Analysis Seminar, Department of Mathematics, North Carolina State University (NCSU), Raleigh, USA.

- *Modifications of Gauss methods for differential equations with constraints.* May 7, 2004, Numerical and Analysis Colloquium, Department of Mathematics, University of Fribourg, Switzerland.

- *Modifications of Gauss methods for differential equations with constraints.* April 27, 2004, Colloquium, Department of Mathematics, University of Fribourg, Switzerland.

- *Gauss methods and DAES: the return!* March, 2004, Department of Applied Mathematics Seminar, University of Zaragoza, Spain.

- *Modified Gauss methods for Hamiltonian systems with constraints.* January, 2004, Numerical Analysis Seminars (2), Department of Mathematics, University of Geneva, Switzerland.

- *Specialized Runge-Kutta methods for index 2 differential algebraic equations.* November, 2003, Numerical Analysis Seminar, Department of Mathematics, University of Geneva, Switzerland.

- *Approximation of Poincaré maps by multi-revolution methods.* March, 2002, Numerical Analysis Seminar, Department of Mathematics, University of Geneva, Switzerland.

- *Approximation of Poincaré maps by multi-revolution methods.* March, 2002, Department of Mathematics and Computer Science Seminar, Public University of Navarra, Pamplona, Spain.

- *Approximation of Poincaré maps by multi-revolution Runge-Kutta methods.* March, 2002, Department of Applied Mathematics and Computation Seminar, University of Valladolid, Spain.

- *Numerical integration of orthogonal and isospectral flows; Preconditioning and parallel implementation of SPARK methods for differential equations; Solution of mixed index* 2-3 *implicit differential-algebraic equations by Lobatto SPARK methods.* February, 2002, Department of Applied Mathematics Seminars (3), University of Zaragoza, Spain.

- *Preserving orthogonality in numerical integration of ODEs.* January, 2002, Numerical Analysis Seminar, Department of Mathematics, University of Geneva, Switzerland.

- *Preconditioning and parallel implementation of implicit Runge-Kutta methods for ODEs and DAEs.* July, 2001, Numerical Analysis Seminar, Department of Mathematics, University of Geneva, Switzerland.

- *Preconditioning and parallel implementation of implicit Runge-Kutta methods for ODEs and DAEs.* June, 2001, Numerical Analysis Seminars (3), Department of Mathematics, Lund University, Sweden.

- *Solution of nonlinear systems for implicit Runge-Kutta methods by inexact simplified Newton iterations.* July, 2000, Applied Mathematics Workshop, Department of Mathematics, University of Auckland, New Zealand.

- *Numerical optimization of PDEs using DASOPT.* January, 2000, Numerical Analysis Seminar, Department of Mathematics, University of Geneva, Switzerland.

- *Poisson integration with symplectic methods; A preconditioner for the iterative solution of implicit Runge-Kutta type methods.* March, 1998, 2 Numerical Analysis Seminars (2), Department of Mathematics, University of Geneva, Switzerland.

- *Iterative solution of implicit Runge-Kutta type methods and their application in constrained dynamics.* March 26, 1998, Colloquium, LMC-IMAG, University of Grenoble, France.

- *Iterative solution of implicit Runge-Kutta type methods and their application in constrained dynamics.* February 19, 1998, Colloquium, Department of Mathematics, Southern Methodist University, Dallas, Texas, USA.

- *Iterative solution of implicit Runge-Kutta type methods and their application in constrained dynamics.* February 16, 1998, Colloquium, Department of Mathematics, Florida Atlantic University, Boca Raton, USA.

- *Iterative solution of implicit Runge-Kutta type methods and their application in constrained dynamics.* February 13, 1998, Colloquium, Center for Applied Scientific Computing (CASC), Lawrence Livermore National Laboratory, California, USA.

- *Iterative solution of implicit Runge-Kutta type methods and their application in constrained dynamics.* February 5, 1998, Colloquium, Department of Mathematics, University of Iowa, Iowa City, USA.

- *On the numerical solution of stochastic differential equations.* October, 1997, Numerical Analysis Seminar, Department of Computer Science, University of Minnesota, Minneapolis, USA.

- *Numerical problems and algorithms in tomography.* February, 1997, Numerical Analysis Seminar, Department of Computer Science, University of Minnesota, Minneapolis, USA.

- *Structure-preserving integrators for Hamiltonian and mechanical systems.* January 10, 1996, Winter Seminar Series, Supercomputer Institute of the University of Minnesota, Minneapolis, USA.

- *Numerical integration and structure-preservation.* June 29, 1995, Colloquium, Department of Mathematics, University of Fribourg, Switzerland.

- *SPARK methods for mechanical systems.* June 28, 1995, Numerical Analysis Seminar, Department of Mathematics, University of Geneva, Switzerland.

Editorial Board

- Associate Editor of Mathematics and Computers in Simulation since June 2008.

Refereeing

- Referee for the National Science Foundation (NSF), USA.
- National Science Foundation (NSF) review panel (2002, 2008).
- Referee for professional journals including: Advances in Computational Mathematics; Applied Mathematics Letters; Applied Numerical Mathematics; BIT; Computer and Mathematics with Applications; Electronic Journal of Linear Algebra; Electronic Transactions on Numerical Analysis; IMA Journal on Numerical Analysis; International Journal for Numerical Methods in Fluids; International Journal of Mathematics and Mathematical Sciences; Journal of Computational and Applied Mathematics; Journal of the Franklin Institute; Journal of Guidance, Control, and Dynamics; Journal of the London Mathematical Society; Journal of Nonlinear Science; Journal of Physics A: Mathematical and General; Linear Algebra and its Applications; Mathematics and Computers in Simulation; Numerical Algorithms; Numerische Mathematik; Parallel Computing; SIAM Journal on Applied Dynamical Systems; SIAM Journal on Numerical Analysis; SIAM Journal on Scientific Computing; Tamkang Journal of Mathematics.
- Book manuscripts evaluation for CRC Press, John Wiley, Kluwer Academic Publishers, SIAM, and Springer.
- Review of a candidate for a position of *Chargé de Recherche de première classe*, INRIA (Institut National de Recherche en Informatique et en Automatique), France.

Ph.D. students

- Thesis director of Scott J. Small, Ph.D. student in the Program in Applied Mathematical and Computational Sciences, started in 2009.
- Thesis director of Beven Kair, Ph.D. student in Mathematics, started in 2009.
- Thesis director of Darin G. Mohr, Ph.D. student in the Program in Applied Mathematical and Computational Sciences, started in 2007.
- Thesis director of Hyounkyun Oh, Ph.D. student in the Program in Applied Mathematical and Computational Sciences, graduated in July 2005.
- Ph.D. dissertation committees: Erik Krohn, Computer Science, University of Iowa, PhD proposal, November 2007 and May 2009; Qinghong Zhang, Program in Applied Mathematical and Computational Sciences, University of Iowa, November 2002; Roger K. Polston, Mechanical Engineering, University of Iowa, May 2000 and May 2002; Horatiu C. German, Mechanical Engineering, University of Iowa, May 2001. Corina Sandu, Mechanical Engineering, University of

Iowa, November 2000. Siddhartha S. Shome, Mechanical Engineering, University of Iowa, September 2000. Mirela Iancu, Program in Applied Mathematical and Computational Sciences, University of Iowa, July and November 2000.

- External assessor for a MPhil Transfer Report, Department of Mathematics, Faculty of Science, University of Mauritius, Réduit, Republic of Mauritius, June 2006.

Memberships

- Society for Industrial and Applied Mathematics (SIAM).
- American Mathematical Society (AMS).
- American Association of University Professors (AAUP).
- Swiss Mathematical Society (SMS).

Miscellaneous

- Research Mentor of 3 undergraduate students for NSF VIGRE-Heartland Research Experience for Undergraduates (REU), University of Iowa, Iowa City, June 8-July 31, 2009.
- Languages: English (fluent), French (native), German (good knowledge).
- Dale Carnegie course, 1997.
- Third cycle course in numerical analysis, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, 1992-1993.
- Former player of the junior Swiss national soccer team.

References

Available upon request.