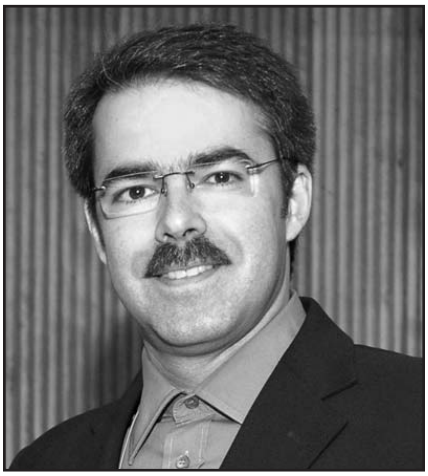
From *SIAM News*, Volume 39, Number 9, November 2006

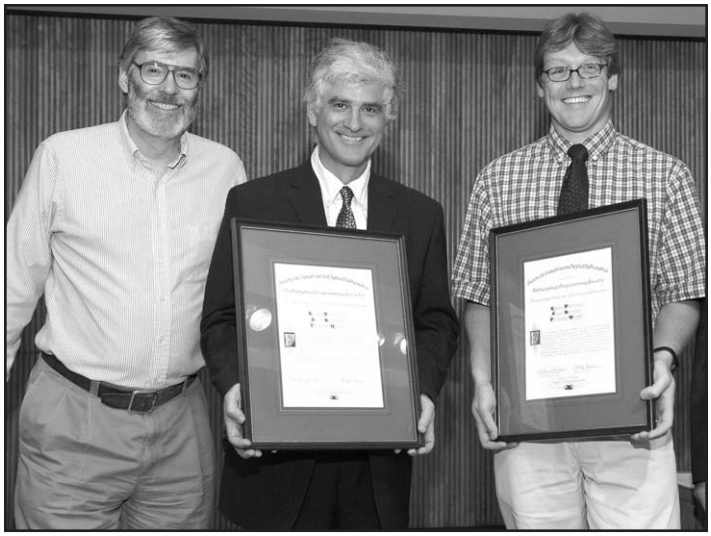
Boston, July 2006: SIAM Recognizes Outstanding Achievement in Control and Optimization



*Michael Hintermüller (left, University of Graz) and Jean-Michel Coron (Université Paris-Sud) accepted SIAM Outstanding Paper Prizes at the 2006 SIAM Annual Meeting. Hintermüller and his co-authors—Kazufumi Ito (North Carolina State University) and Karl Kunisch (University of Graz)—were honored for their paper "The Primal–Dual Active Set Strategy as a Semismooth Newton Method" (*SIAM Journal on Optimization, *Volume 13, Issue 3, 2003).*
*Coron and his co-author, Emmanuel Trélat (Université Paris-Sud), were recognized for their paper "Global Steady-State Controllability of One-Dimensional Semilinear Heat Equations" (*SIAM Journal on Control and Optimization, *Volume 43, Issue 2, 2004).*
Unable to attend the meeting were the recipients of the third prize awarded this year: Girish N. Nair and Robin J. Evans, both of the University of Melbourne, Australia. Nair and Evans's paper "Stabilizability of Stochastic Linear Systems with Finite Feedback Data Rates" appeared in SIAM Journal on Control and Optimization *(Volume 43, Issue 2, 2004).*

The SIAM Activity Group on Analysis of Partial Differential Equations, which held a conference in Boston in conjunction with the 2006 SIAM Annual Meeting, took advantage of the prize luncheon to award the first SIAG/APDE Prize, to François Golse (Université Paris VII-Denis Diderot) and Laure Saint-Raymond (Université Paris VI-Pierre et Marie Curie). Golse, shown here, accepted the prize, which recognizes an outstanding paper in PDEs, published in English in a peer-reviewed journal. Golse and Saint-Raymond's paper, "The Navier–Stokes Limit of the Boltzmann Equation for Bounded Collision Kernels," was published in Inventiones Mathematicae *(Volume 155, Number 1, 2004). In it, according to the prize committee, the authors made "the definitive connection between weak solutions of the Boltzmann equation and Leray solutions of the incompressible Navier–Stokes equation."*

Peter Kloeden (Johann Wolfgang Goethe Universität, Frankfurt am Main, Germany), received the 2006 W.T. and Idalia Reid Prize in Mathematics at the 2006 SIAM Annual Meeting. Cited "for his fundamental contributions to the theoretical and computational analysis of differential equations," Kloeden gave a prize lecture titled "Random Attractors and the Preservation of Synchronization in the Presence of Noise."



The Lagrange Prize for Continuous Optimization, established in 2002 as a joint prize of the Mathematical Programming Society and SIAM, was awarded in Boston to Roger Fletcher (University of Dundee), Sven Leyffer (Argonne National Laboratory), and Philippe Toint (University of Namur, Belgium). On hand to present the prize was selection committee chair Michael Todd (left), who is shown here with Toint (center) and Leyffer.

*The three researchers were honored for the following papers: "Nonlinear Programming Without a Penalty Function," by Roger Fletcher and Sven Leyffer (*Mathematical Programming*, 91 (2), 239–269, 2002) and "On the Global Convergence of a Filter–SQP Algorithm," by Roger Fletcher, Sven Leyffer, and Philippe L. Toint (*SIAM Journal on Optimization*, Volume 13, 44–59, 2002).*

"In the development of nonlinear programming over the last decade," according to the prize citation, "an outstanding new idea has been the introduction of the filter. This new approach to balancing feasibility and optimality has been quickly picked up by other researchers, spurring the analysis and development of a number of optimization algorithms in such diverse contexts as constrained and unconstrained nonlinear optimization, solving systems of nonlinear equations, and derivative-free optimization. The generality of the filter idea allows its use, for example, in trust region and line search methods, as well as in active set and interior point frameworks.

"Currently, some of the most effective nonlinear optimization codes are based on filter methods. The importance of the work cited here will continue to grow as more algorithms and codes are developed.

"The filter sequential quadratic programming (SQP) method is proposed in the first of the two cited papers. Many of the key ideas that form the bases of later non-SQP implementations and analyses are motivated and developed. The paper includes extensive numerical results, which attest to the potential of the algorithm.

"The second paper complements the first, using novel techniques to provide a satisfying proof of correctness for the filter approach in its original SQP context. The earlier algorithm is simplified, and, in so doing, the analysis plays its natural role with respect to algorithmic design."

The triennial prize, presented alternately at MPS and SIAM meetings, was awarded for the first time in 2003, to Adrian Lewis. The next award is scheduled for 2009, at the MPS Symposium.