

ICIAM 2011

A Tribute to Jerry Marsden from the Mathematical Sciences Community

By Anthony M. Bloch and Melvin Leok

The applied mathematics community lost a beloved and influential colleague with the death of Jerry Marsden in September 2010. As co-chair of the Scientific Program Committee and a member of the Steering Committee for ICIAM 2011, Jerry exerted a strong influence on the structure and scientific content of the congress.

Indeed, in many ways Jerry was the heart of the ICIAM 2011 program. From the start he and scientific co-chair Ivar Ekeland promoted a “big picture” view of applied and industrial mathematics. They considered it important that ICIAM break into new areas, such as multimedia and statistics. They also felt strongly that the meeting should highlight the connection of mathematics to socioeconomic challenges, such as climate change, and to other disciplines, such as biology. In essence, they wanted to build a big tent that would include all mathematical scientists doing sophisticated application-oriented mathematics. To real-

ize their vision, early on they conceived the idea of thematic panels that would reach out to new communities. In this respect ICIAM 2011 was both a huge success and a model for future congresses.

Jerry advocated the inclusion of groups that might find it difficult to attend ICIAM. Accordingly, the organizers allocated special funds for young scientists in North America, as well as for a cross-section of scientists from developing nations. Jerry also insisted that, unlike other big meetings, ICIAM should not have exclusive social activities. The value of ICIAM, he believed, lies in part in the chances for students to meet the “big names” and for everyone to network. And so it was that the opening reception and the Marsden memorial reception were open to all delegates.

Well connected in the applied mathematics community, Jerry was a professor at the California Institute of Technology from 1995 on, and he had spent the preceding 27 years at the University of California

See **Jerry Marsden** on page 3

In his three years as co-chair of the Scientific Program Committee for ICIAM 2011, Jerry Marsden (1942–2010) was, in the words of co-chair Ivar Ekeland, “the heart and soul of this committee.” Photo by Margot Weinstein.



Behind the Scenes at ICIAM 2011

Beginning with the two articles on this page, *SIAM News* is devoting this and upcoming issues to coverage of ICIAM 2011. Making it possible to bring the vast and diverse five-day congress to life were the efforts of Irene Fonseca, Hans Kaper, and Fadiil Santosa. Adding to their already busy agendas as speakers/organizers, they enthusiastically, and as systematically as possible, took on the task of extracting from ICIAM 2011 a set of (mostly) short articles intended to give readers a taste of the work presented. Readers who attended ICIAM and navigated the option-laden program will understand the extent of the challenge they accepted.

On behalf of readers, we thank our three guest editors for their outstanding insight, energy, and flair. Thanks are due also to those they recruited to serve as their “eyes and ears,” as well as to the speakers and organizers who, having delivered outstanding talks and sessions, took their contributions a step further by capturing their essence in writing.

Jerry Marsden

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at Berkeley. He was also the founding director of the Fields Institute in Canada. He was the recipient of many honors, including fellowship in the Royal Societies of London and Canada; in 2005 he was SIAM’s John von Neumann lecturer. When Jerry’s death was announced, many scientists wrote to the organizers wanting to put together special activities in his memory. And so, in many ways, ICIAM 2011 became a tribute to Jerry from the entire mathematical sciences community.



On Wednesday evening, Jerry’s longtime friend and collaborator Alan Weinstein (UC Berkeley) gave a memorial lecture. Barbara Keyfitz, who was an undergraduate with Jerry at the University of Toronto, introduced Alan, whose lecture was titled “Introduction to Marsden and Symmetry” in homage to Jerry’s key work on symmetry in dynamics and his popular book *Mechanics and Symmetry* with Tudor Ratiu.

After discussing Jerry’s first paper (on projective geometry), written when he was an undergraduate at Toronto, Alan presented highlights of Jerry’s prolific output on geometric mechanics through the years. Symmetry emerged as playing a crucial role in much of geometric mechanics, and Jerry was a central figure in this development.

Following the lecture was a reception in memory of Jerry, hosted by Springer. Phil Holmes (Princeton University) and Katepalli Sreenivasan (NYU) spoke. Jerry and Phil were instrumental in the founding of the *Journal of Nonlinear Science*; Katepalli is the current editor.



Memorial activities in Vancouver included an evening lecture, “Introduction to Marsden and Symmetry,” by Alan Weinstein of UC Berkeley, and a two-part minisymposium, *Geometry, Mechanics, and Dynamics*. Participants in these activities were John Ball (University of Oxford; inset) and, from left, Marty Golubitsky (Ohio State University); Alan Weinstein; Tudor Ratiu (Ecole Polytechnique Fédérale de Lausanne), who organized the session; Philip Holmes (Princeton University), Mark Gotay (University of British Columbia, Pacific Institute for the Mathematical Sciences), Darryl Holm (Imperial College London), Anthony Bloch (University of Michigan), and Paul Newton (University of Southern California).

Three sets of minisymposia had been organized in honor of Jerry’s work, with the range of topics reflecting the astounding breadth of his interests in geometry and its most far-reaching applications. Many of the speakers also described the profound influence of Jerry’s generosity, insights, and mentoring on their professional careers. Participants in two of the sessions—Applications of Numerical Geometric Methods in Dynamics and Control and Geometry, Mechanics, and Dynamics—are shown in the accompanying photos.

During Jerry’s years at Caltech, his work focused on a systematic and rigorous application of geometric and dynamical systems techniques to computational and real-world science and engineering problems, which spanned the gamut from microfluidics to interplanetary transport and control of mechanical systems. A final two-part minisymposium, organized

by Kamran Mohseni of the University of Florida at Gainesville, was devoted to the “Caltech Period.” Speakers in the morning session were George Haller (McGill University), Alison Marsden (UC San Diego), Shane Ross (Virginia Tech), and Rouslan Krechetnikov (UC Santa Barbara). Igor Mezic (UC Santa Barbara), Melvin Leok, Matthew West (University of Illinois, Urbana-Champaign), and Mohseni discussed their research in the afternoon session.

Acknowledgments

The authors thank Achi Dosangh, Wendy McKay, Arvind Gupta, and Jo-Anne Rockwood for help with this article.

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Among the minisymposia commemorating Jerry Marsden was Applications of Numerical Geometric Methods in Dynamics and Control, with speakers, from left, Sujit Nair (United Technologies Research Center), Stevan Dubljevic (University of Alberta), Sina Ober-Blöbaum (University of Paderborn), and Marin Kobilarov of Caltech. Dubljevic and Kobilarov organized the session.