

SYMPOSIUM ON DYNAMICAL SYSTEMS AND RELATED FIELDS

- FROM WATERLOO TO THE WORLD AND BACK -

CONFERENCE ON THE OCCASION OF PROFESSOR N. SRI NAMACHCHIVAYA'S 60TH BIRTHDAY

ORGANIZERS:

LUDWIG ARNOLD (UNIVERSITY OF BREMEN, GERMANY)

ANIL KUMAR BAJAJ (PURDUE UNIVERSITY, USA)

NARESH MALHOTRA (KPMG LLP, NEW YORK, USA)

PAUL K. NEWTON (UNIVERSITY OF SOUTHERN CALIFORNIA, USA)

SANJIV TALWAR (FINANCIAL RISK GROUP, USA)

MAUREEN FRASER (LOCAL ARRANGEMENTS, UNIVERSITY OF WATERLOO, CANADA)

BETH SANDORE NAMACHCHIVAYA (LOCAL ARRANGEMENTS, UNIVERSITY OF WATERLOO, CANADA)

This symposium seeks to identify the key drivers, challenges, and opportunities in the field of deterministic, random and data-driven dynamical systems. Invited speakers will present ways by which the mathematical tools and techniques from stochastic and nonlinear dynamical systems can inform and improve biological, environmental, information and mechanical sciences.

Opening reception and registration:

Mike & Ophelia Lazaridis Quantum-Nano Centre on the University of Waterloo campus

200 University Avenue West, Waterloo, ON N2L 3G1, Canada Time and Date: 18:30 – 20:30, May 15, 2018

Please see website for **registration**: <http://www.fields.utoronto.ca/activities/17-18/dynamical-systems>

The symposium will be held at the Mike & Ophelia Lazaridis Quantum-Nano Centre (Room QNC 0101) on the University of Waterloo campus (please turn over the page for the map).

Conference Dates: May 15 – 18, 2018

Please see website for conference travel, accommodation and logistics: <https://publish.illinois.edu/sri60symposium/>

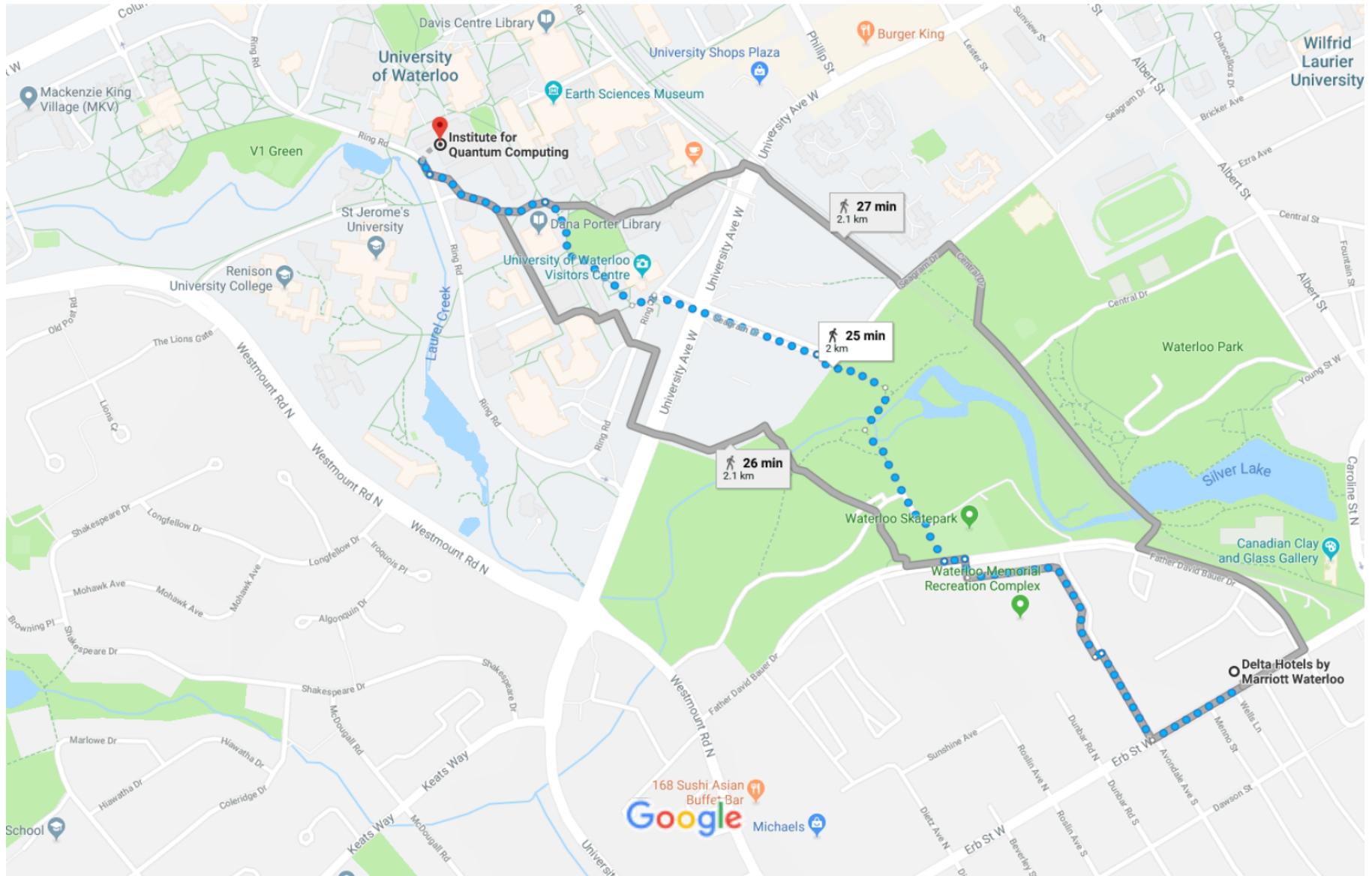
THE SYMPOSIUM IS SUPPORTED IN PART BY:

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Delta Hotels by Marriott Waterloo to Institute for Quantum Computing

Walk 2.0 km, 25 min



DAY 1: WEDNESDAY MAY 16, 08:30 – 18:00

Room QNC 0101, The Institute for Quantum Computing, University of Waterloo, Waterloo, ON

08:30 – 09:00	Registration and Coffee
09:00 – 09:30	Opening Session: Chair Ludwig Arnold (University of Bremen, Germany) Opening Remarks: Chair Applied Mathematics, Siv Sivalogathan (University of Waterloo, Canada) Welcome to Waterloo: Dean of Mathematics, Stephen M. Watt (University of Waterloo, Canada) Personal Remarks: S. T. Ariaratnam (University of Waterloo, Canada); Anil Kumar Bajaj (Purdue University, USA); Harry H. Hilton (University of Illinois, Urbana, USA); Naresh Malhotra (KPMG LLP, New York, USA)
09:30 – 11:00	Session 1 – Stochastics and Dynamics: Chair S. T. Ariaratnam (University of Waterloo, Canada) Lecture 01: 09:30 – 10:00 Ludwig Arnold (University of Bremen, Germany): <i>From Urbana to Bremen and Beyond – Sri’s Encounter with Random Dynamical Systems</i> Lecture 02: 10:00 – 10:30 Peter Baxendale (University of Southern California, USA): <i>Small time asymptotics for an additive functional of a fast diffusion process: moderate, large and very large deviations</i> Lecture 03: 10:30 – 11:00 Peter Imkeller (Humboldt-University, Berlin, Germany): <i>Weierstrass curves and rough dynamical systems</i>
Coffee Break 11:00 – 11:30	
11:30 – 13:00	Session 2 – Weak Convergence and Homogenization: Chair Wolfgang Kliemann (Iowa State University, USA) Lecture 04: 11:30 – 12:00 Mark Freidlin (University of Maryland, College Park, USA): <i>Reaction-diffusion in composite structures</i> Lecture 05: 12:00 – 12:30 Manfred Denker (Penn State University, State College, USA): <i>Weak convergence in multi-parameter semi-martingales</i> Lecture 06: 12:30 – 13:00 Ilya Pavlyukevich (Friedrich-Schiller University, Jena, Germany): <i>On the heterogeneous diffusion process</i>
Lunch Break 13:00 – 14:30 (on your own – campus dining options)	
14:30 – 16:00	Session 3 – Dynamics of Networks: Chair Steven W. Shaw (Florida Institute of Technology, USA) Lecture 07: 14:30 – 15:00 Eyad H. Abed (University of Maryland, College Park, USA): <i>Dynamics of social networks with interconnected communities</i> Lecture 08: 15:00 – 15:30 Sue Ann Campbell (University of Waterloo, Canada): <i>Time delays and pattern formation in neural networks</i> Lecture 09: 15:30 – 16:00 Zoi Rapti (University of Illinois, Urbana, USA): <i>Occupancy patterns in a small pond network: revisiting the Levins model</i>
Coffee Break 16:00 – 16:30	
16:30 – 18:00	Session 4 – New Frontiers and Applications: Chair Sanjiv Talwar (Financial Risk Group, USA) Expository lecture: 16:30 – 17:15 Naresh Malhotra (KPMG LLP, New York, USA): <i>Blockchain applications in financial markets – The New Big Bang?</i> Expository lecture: 17:15 – 18:00 Siv Sivalogathan (University of Waterloo, Canada): <i>Mathematics and medicine: Quo Vadis?</i>

DAY 2: THURSDAY MAY 17, 09:00 – 22:00

Room QNC 0101, The Institute for Quantum Computing, University of Waterloo, Waterloo, ON

09:00 – 10:30	Session 5 – Data Assimilation: Chair Ravi R. Mazumdar (University of Waterloo, Canada) Lecture 01: 09:00 – 09:30 C. K. R. T. Jones (University of North Carolina, Chapel Hill, USA): <i>Can you make mistakes about errors?</i> Lecture 02: 09:30 – 10:00 Nicolas Perkowski (Humboldt-University, Berlin, Germany): <i>BSDE methods for dimension reduction in nonlinear filtering</i> Lecture 03: 10:00 – 10:30 Ryne Beeson & Hoong Chieh Yeong (University of Illinois, Urbana, USA): <i>Reduced order nonlinear filters for multi-scale systems with correlated sensor noise</i>
Coffee Break 10:30 – 11:00	
11:00 – 12:30	Session 6 – Dynamics and Stability of Engineering Systems: Chair Alfons Ams (Freiberg University of Technology, Germany) Lecture 04: 11:00 – 11:30 Walter Wedig (Karlsruhe Institute of Technology, Germany): <i>Limit cycles and Lyapunov exponents in vehicle and rotor dynamics</i> Lecture 05: 11:30 – 12:00 Mikhail Dimentberg (Worcester Polytechnic Institute, USA): <i>Short-term instability and intermittency in stochastic systems</i> Lecture 06: 12:00 – 12:30 Soon-Jo Chung (California Institute of Technology, USA): <i>Nonlinear stochastic incremental stability for aerospace robotics applications</i>
Lunch Break 12:30 – 14:00 (on your own – campus dining options)	
14:00 – 15:30	Session 7 – Control Systems: Chair Robert McDonald (Boeing, Springfield, VA, USA) Lecture 07: 14:00 – 14:30 Fritz Colonius (University of Augsburg, Germany): <i>Some mathematical problems in control under communication constraints</i> Lecture 08: 14:30 – 15:00 Petros G. Voulgaris (University of Illinois, Urbana, USA): <i>An input-output approach to mean field problems in control</i> Lecture 09: 15:00 – 15:30 Bruce A. Conway (University of Illinois, Urbana, USA): <i>New heuristic and evolutionary methods available for the optimal control of dynamic systems</i>
Coffee Break 15:30 – 16:00	
16:00 – 17:45	Session 8 – “The Old Illini Lunch Gang”: Chair Mahmoud Mamlouk (BMO Harris Bank, Chicago, USA) Lecture 10: 16:00 – 16:30 Harry H. Hilton (University of Illinois, Urbana, USA): <i>From deterministic da Vinci-Euler-Bernoulli elastic beams to non-homogeneous viscoelastic Timoshenko ones with random</i> Lecture 11: 16:30 – 17:00 Larry A. Bergman (University of Illinois, Urbana, USA): <i>Protection of large scale structures from stand-off blast loads</i> Lecture 12: 17:00 – 17:45 N. Sri Namachchivaya (University of Waterloo, Canada): <i>Joy of being a dynamist: An opportunity to work with brilliant colleagues</i>
Conference Group Photo 18:00 – 18:15	
19:00 – 22:00	Conference Banquet at The University Club: Masters of Ceremony – Bruce A. Conway (University of Illinois, Urbana, USA) and Sanjiv Talwar (Financial Risk Group, USA) Personal Remarks by friends and colleagues: Nishith Goel (Cistel Technology Inc.), Birgit Walter (Bremen), Marc-André Pick (Hamburg), Naresh Malhotra (New York), etc.

DAY 3: FRIDAY MAY 18, 09:00 – 13:00

Room QNC 0101, The Institute for Quantum Computing, University of Waterloo, Waterloo, ON

09:00 – 10:30	Session 9 – Stochastic Stability and Random Attractors: Chair Henry Van Roessel (University of Alberta, Canada) Lecture 01: 09:00 – 09:30 Volker Wihstutz (University of North Carolina, Charlotte, USA): <i>Noise induced mixing of modes versus resonance in randomly perturbed linear systems</i> Lecture 02: 09:30 – 10:00 Hans Crauel (Goethe University Frankfurt, Germany): <i>Minimal random attractors</i> Lecture 03: 10:00 – 10:30 Leo Dostal & Marc-André Pick (Hamburg University of Technology, Germany): <i>Random dynamics of floating wave energy converters</i>
Coffee Break 10:30 – 11:00	
11:00 – 12:30	Session 10 – Dynamics of Engineered and Natural Systems: Chair Eihab Abdel-Rahman (University of Waterloo, Canada) Lecture 04: 11:00 – 11:30 Steven W. Shaw (Florida Institute of Technology, USA): <i>Nonlinear resonances in micro-mechanical-systems: new frontiers for applications</i> Lecture 05: 11:30 – 12:00 William F. Langford (University of Guelph, Canada): <i>Bifurcations in an energy balance climate model</i> Lecture 06: 12:00 – 12:30 Wei Chau Xie (University of Waterloo, Canada): <i>Seismic risk analysis of nuclear power plants</i>
12:30 – 13:00	Closing Session Closing Remarks: Ludwig Arnold (University of Bremen, Germany), Paul K. Newton (University of Southern California, USA) and N. Sri Namachchivaya (University of Waterloo, Canada)

Conference Group Photo: Thursday May 17, 18:00 – 18:15

Please gather at the entrance of Room QNC 0101 for the conference group photo.

Conference Accommodation

A room block is being held at a conference rate of \$164 CAD (plus HST) until Thursday, April 19 2018 at the

Delta Hotels Waterloo:

110 Erb St W, Waterloo, ON N2L 0C6

Phone: (519) 514-0404

When booking rooms for conference, attendees should request the conference rate of \$164 CAD (plus HST) for the “Dynamical Systems and Related Areas”. If you have questions regarding online reservation at the Delta Hotels Waterloo, please contact Meagan MacNeil, at meagan.macneil@deltahotels.com or by calling 519.514.0416.