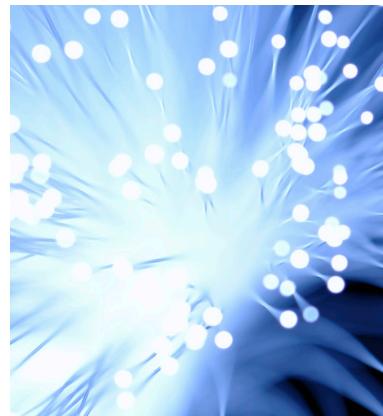


The INTERNATIONAL CONFERENCE on
APPLIED MATHEMATICS,
MODELING and COMPUTATIONAL SCIENCE



AMMCS2013

Interdisciplinary AMMCS Conference Series

AUGUST 26–30
WATERLOO, ONTARIO, CANADA

Mathematics and Computation in the Physical Sciences

Partial Differential and Integral Equations in Mathematical Physics

Applications of Dynamical Systems and Discrete Mathematics

Computational Physics and Chemistry

Computational Algebra, Combinatorics and Number Theory

Mathematical Models in Social Sciences

Computational Mechanics and Engineering

Financial Mathematics and Computational Finance

Statistical Modeling in Environmental Sciences

Computational Methods for Hyperbolic Problems

Applied Problems and Methods in Research and Education

CONFERENCE PROGRAM

Program Chair

Monica Gabriela Cojocaru

Contents

1 Acknowledgements	1
2 Conference Events	2
3 Information for Visitors	3
4 Welcoming Remarks	4
5 Plenary Speakers	5
6 Semi-Plenary Speakers	16
7 Special Symposia and Organizers	24
8 Conference Schedule	27
8.1 Monday, August 26, 2013	27
8.2 Tuesday, August 27, 2013	29
8.3 Wednesday, August 28, 2013	31
8.4 Thursday, August 29, 2013	33
8.5 Friday, August 30, 2013	35
9 Detailed Conference Schedule	37
9.1 Monday, August 26 – 10:30 - 12:30	37
9.2 Monday, August 26 – 15:30 - 17:30	39
9.3 Tuesday August 27–10:30 - 12:30	41
9.4 Tuesday, August 27 – 15:30 - 17:30	44
9.5 Wednesday, August 28 – 10:30 - 12:30	46
9.6 Wednesday, August 28 – 16:30 - 18:30	48
9.7 Poster Session – Thursday, August 29 – 10:00 - 10:30 & 15:00 - 15:30	50
9.8 Thursday, August 29 – 10:30 - 12:30	51
9.9 Thursday, August 29 – 15:30 - 18:00	54
9.10 Friday, August 30 – 10:30 - 12:50	57
9.11 Friday, August 30 – 15:30 - 18:00	59
10 Maps	62
10.1 Bricker Academic Building - Floors 1 and 2 Map	62
10.2 Bricker Academic Building - Floor 3 Map	63
10.3 Wilfrid Laurier University Campus	64
10.4 Directions to the Conference Banquet	65
11 Index of Participants	66

Registration:

The AMMCS-2013 registration desk is located in the 1st floor of the Bricker Academic building. It will be staffed at the following times:

Sunday, August 25	15:00 - 18:00 and 19:00 - 21:00 (Science Courtyard)
Monday, August 26	7:30 - 11:30 and 13:30 - 16:00
Tuesday August 27	8:30 - 10:30 and 13:30 - 15:30
Wednesday, August 28	8:30 - 10:30
Thursday, August 29	8:30 - 10:30 and 13:30 - 15:30
Friday, August 30	8:30 - 10:30

1 Acknowledgements

Organizing Committee

Monica G. Cojocaru	(Conference Program Chair, Guelph)
Manuele Santoprete	(Student Prize Committee Chair, Wilfrid Laurier University)
Hasan Shodiev	(Local Organizing Committee Chair, Wilfrid Laurier University)
Robert Jerrard	(Global Organizing Committee, UofT)
Herb Kunze	(Global Organizing Committee, U of Guelph)
Roman Makarov	(Conference Treasurer)
Brian West	(Conference Program Chair - until April 2013)
Ilias Kotsireas	(General Co-chair - until August 2013)
Roderick Melnik	(General Co-chair, SIAM Representative)

Technical Support Committee

Cameron Davidson-Pilon	(Web Coordinator)
Dalibor D. Dvorski	(Electronic Publishing Coordinator)
Jeanette Haas	(Administrative Support)
Sanjay Prabhakar	(Computer Support)
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Huaxiong Huang (York University)	Tamas Terlaky (Lehigh University)
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Peter Kuchment (Texas A & M University)	Olof Runborg (KTH Royal Institute of Technology)
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Student Volunteers Team

Richard Douglas	Mary Huang	Safia Athar	Anisha Mahant
Ayesha Banerjee	Andrei Malinovski	Jasmine Clement	Rania Masood
Sherry Cheng,	Sylvia Nguyen	Rakesh Dhote	Nynke Prins
Nguyen Hoang	Monika Roerig	Harold Hodgins	Limeng Shi
Amina Khan	Stephen Tully	Nida Khan	Chi Zhang
Cressanne Lang	Jingyu Ma	Damaris McKinley	Erin Meger
Saqif Abdullah			

2 Conference Events

Welcoming Reception

Sunday, August 25 - 19:00 - 21:00 Science Courtyard

Join your fellow AMMCS-2013 attendees for an informal get-together with food and drinks.

The welcoming reception is included as part of your registration fees; a conference registration table will be set up at the event.

(See Section 10 for directions)

Conference Banquet

Thursday, August 29 - 19:00 - 22:00 St. George Hall, 665 King St. N, Waterloo - www.stgeorgehall.com

After-dinner speech by **Peter Carr**, *Morgan Stanley, New York, USA*.

Those of you who have already purchased banquet tickets will receive them upon check-in. For others, \$50 tickets will be sold at the registration desk until 15:30 on Tuesday, August 27.

For those requiring transportation, a bus will be provided.

(See Section 10 for directions)

Student Prize Competition and Young Researcher Awards

Friday, August 30, 18:00 - 18:15 BA101

At the conclusion of the conference, the winners of the AMMCS-2013 Student Prize Competition will be announced. Three separate competitions will be held for undergraduate and graduate students:

1.Best AMMCS-2013 Poster. To be eligible, the student must be a co-author of the work presented and a designer of the poster. This competition may include a short discussion with a judging panel, related to the content of the poster. The poster presentations are scheduled for Thursday, August 29.

2. Best AMMCS-2013 Student Paper in a Special Session. To be eligible, the student must be a co-author of the work and present it during one of the Special Sessions or Minisymposia.

3. Best AMMCS-2013 Student Paper in a Contributed Session. To be eligible, the student must be a co-author of the work and present it during one of the Contributed Sessions.

The AMMCS-2013 Kolmogorov-Wiener Prize for Young Researchers will also be awarded. The competition for this award is open to young researchers in the category of recent PhD graduates and postdoctoral fellows under the age of 35.

3 Information for Visitors

Wireless Networking

AMMCS-2013 is pleased to provide free wireless internet service on the Wilfrid Laurier University campus. For connection information and to obtain a password, please go to the registration desk.

Computer Terminals

Rooms BA206 and BA207 contain computers that are available for use by AMMCS-2013 attendees. In particular, you may use these rooms to check your email or edit your presentations (on PowerPoint). For login information, please go to the registration desk.

Parking

AMMCS-2013 attendees may purchase parking passes for \$7 per day. These can be purchased (using cash only) from 8:00 to 16:00 at the parking kiosk, which is located at the main entrance to the campus, off of University Ave. They can also be purchased at the AMMCS-2013 registration desk on Monday and Tuesday. Finally, there are two Pay and Display lots. These also cost \$7 per day, payable by cash or credit card. Parking permits allow you to park in the white permit lots only. Parking is free on weekends and after 16:30 on weekdays.

Public Transit

Wilfrid Laurier University is serviced by routes 7, 8, 12, 29, 200, and 201 on University Ave. West and King St. North. Route maps are available at the registration desk or at www.grt.ca. For a taxi, call 519-888-7777.

AMMCS-2013 thanks the following sponsors and cooperating organizations for their generous support:



4 Welcoming Remarks

Welcome to AMMCS-2013

On behalf of the Organizing, Scientific and Technical Committees of the International Conference on Applied Mathematics, Mathematical Modeling and Computational Science, we would like to welcome you to the conference held from August 26 through 30, 2013 on the Waterloo Campus of the Wilfrid Laurier University, Canada.

The previous conference in this Interdisciplinary AMMCS Conference Series took place two years ago in the year of the 100th anniversary of Wilfrid Laurier University. The AMMCS-2011 was a satellite meeting of the International Congress on Industrial and Applied Mathematics held on Canadian soil for the first time.

This year the AMMCS conference has an even more exciting scientific program featuring over 50 special and contributed sessions in several parallel tracks, 11 one-hour talks given by distinguished scientists and mathematicians, as well as 8 semi-plenary speakers. Each day of the conference, the scientific program starts with a plenary session that features one of the conference plenary speakers. The scientific program of the conference provides a unique opportunity for in-depth technical discussions and exchange of ideas in applied mathematics, computational science and mathematical modeling with their applications in natural and social sciences, engineering and technology, industry and finance.

We are proud that the conference is again held this year on the campus of Wilfrid Laurier University. It is the oldest university in the Cambridge-Kitchener-Waterloo-Guelph area, a beautiful part of Southwestern Ontario located in a comfortable driving distance from some of North America's major tourist destinations, including the Niagara Escarpment, a UNESCO World Biosphere Reserve, Toronto and Niagara Falls.

On behalf of the Organizing, Scientific and Technical Committees, we would like to thank all people involved in this event. In particular we would like to express our sincere thanks to special session organizers, to all the authors who submitted valuable results forming the basis of conference, and to our sponsors. Thanks to all for your hard work to ensure a dynamic, enjoyable and professionally fulfilling conference. We also hope that you will enjoy this beautiful part of the world and will take home with you an intellectually inspiring and socially satisfying experience.

Roderick Melnik, Ilias Kotsireas

Conference Co-Chairs,



5 Plenary Speakers

Plenary Speaker Wednesday, Aug 28, 15:15–16:15 Room BA 201

Peter Carr Managing Director Morgan Stanley

Models, Mathematics, and Markets - Is the Intersection an Empy Set?

Dr. Peter Carr is a Managing Director at Morgan Stanley with over 15 years of experience in the financial industry. He is currently the Global Head of Market Modeling, overseeing several quantitative teams spread over three continents. He also presently serves as the Executive Director of the Math Finance program at NYU's Courant Institute, the Treasurer of the Bachelier Finance Society, and a trustee for the Museum of Mathematics in New York. Prior to joining the financial industry, Dr. Carr was a finance professor for 8 years at Cornell University, after obtaining his PhD from UCLA in 1989. He has over 75 publications in academic and industry-oriented journals and serves as an associate editor for 8 journals related to mathematical finance. He was selected as Quant of the Year by Risk Magazine in 2003 and Financial Engineer of the Year by IAFE/Sungard in 2010. For the last two years, Dr. Carr has served on the CFTC's Technology Advisory Committee and was listed in Institutional Investor's Tech 50, an annual listing of the 50 most influential people in financial technology.



Abstract

Did Albert Einstein ever write that compound interest is the most powerful force in the universe? I have my doubts, but the financial crisis of 2007-8 has left little doubt that mathematical models matter for markets. In this high-level talk, I will provide a historical overview of how mathematics has been used to model markets.

Plenary Speaker

Tuesday, Aug 27, 9:00–10:00 Room BA 201

Emily A. Carter *Princeton University*

How Quantum Mechanics Can Help Solve the World's Energy Problems

Professor Carter is the Founding Director of the Andlinger Center for Energy and the Environment at Princeton University and the Gerhard R. Andlinger Professor in Energy and the Environment, as well as Professor of Mechanical and Aerospace Engineering and Applied and Computational Mathematics. Her current research is focused entirely on enabling discovery and design of molecules and materials for sustainable energy, including converting sunlight to electricity and fuels, providing clean electricity from solid oxide fuel cells, clean and efficient combustion of biofuels, optimizing lightweight metal alloys for fuel-efficient vehicles, and characterizing hydrogen isotope incorporation into plasma facing components of fusion reactors.

Professor Carter received her B.S. in Chemistry from UC Berkeley in 1982 (graduating Phi Beta Kappa) and her Ph.D. in Chemistry from Caltech in 1987. After a year as a postdoctoral researcher at the University of Colorado, Boulder, she spent the next 16 years on the faculty of UCLA as a Professor of Chemistry and later of Materials Science and Engineering. She moved to Princeton University in 2004. She holds courtesy appointments in Chemistry, Chemical Engineering, and three interdisciplinary institutes (PICSciE, PRISM, and PEI). The author of over 260 publications, she has delivered more than 400 invited lectures all over the world and serves on numerous international advisory boards spanning a wide range of disciplines. Her scholarly work has been recognized by a number of national and international awards and honors from a variety of entities, including the American Chemical Society (ACS), the American Vacuum Society, the American Physical Society, the American Association for the Advancement of Science, and the International Academy of Quantum Molecular Science. She received the 2007 ACS Award for Computers in Chemical and Pharmaceutical Research, was elected in 2008 to both the American Academy of Arts and Sciences and the National Academy of Sciences, in 2009 was elected to the International Academy of Quantum Molecular Science, in 2011 was awarded the August Wilhelm von Hoffmann Lecture of the German Chemical Society, and in 2012 received a Doctor Honoris Causa from the Ecole Polytechnique Federale de Lausanne.

Abstract

If we are to survive as a species on this planet, we must make major science and engineering breakthroughs in the way we harvest, store, transmit, and use energy. An overview of my own research efforts in this direction will be given, including: optimizing materials to improve efficiency of turbine engines used for power generation and aircraft propulsion, characterizing combustion of biofuels and tritium incorporation in fusion reactor walls, optimizing mechanical properties of lightweight metal alloys for fuel-efficient vehicles, optimizing ion and electron transport in solid oxide fuel cell cathodes, and designing novel materials from abundant elements for photovoltaics and photoelectrodes to convert sunlight into electricity and fuels.

Fast and accurate quantum mechanics methods enabling the treatment of large biofuel molecules and mesoscale defects in metals that control mechanical properties will be briefly discussed. Then examples of key metrics we calculate to help design efficient new materials for photovoltaics, photocatalysts, and solid oxide fuel cells will be presented. These metrics point toward which dopants or alloys are likely to provide the most efficient energy conversion materials.



Plenary Speaker

Monday, Aug 26, 9:00–10:00 **Room BA 201**

Ronald R. Coifman *Yale University*

Information Integration/Organization and Numerical Harmonic Analysis.

Ronald R. Coifman is Phillips professor of mathematics at Yale University. He received his Ph.D. from the University of Geneva in 1965. Prior to coming to Yale in 1980, he was a professor at Washington University in St Louis. Prof. Coifman's recent publications have been in the areas of nonlinear Harmonic Analysis , Fourier Analysis, wavelet theory, numerical analysis and scattering theory. Professor Coifman is currently leading a research program to develop new mathematical tools for efficient transcription and organization of data, with applications to feature extraction, learning classification and denoising. He was chairman of the Yale mathematics department 1986-89. He is a member of the National Academy of Sciences, American Academy of Arts and Sciences, and the Connecticut Academy of Sciences and Engineering. He received the DARPA Sustained Excellence Award in 1996, and the 1996 Connecticut Science Medal. The 1999 Pioneer award from the International Society for Industrial and applied Mathematics , the National Science Medal 1999, And the Wavelet Pioneer award 2009.



Abstract

We provide an overview of recent developments in methodologies for empirical organization of data. We present a geometric/analytic mathematical framework for learning, which revolves around building a network or a graph whose nodes are observations. In our framework, connections between observations are constantly reconfigured in order to achieve learning for specific tasks. In particular we will provide a synthesis of a range of ideas from mathematics and machine learning, which address the transition from a local similarity model to a global configuration. This is analogous to Newtonian Calculus, which from a local linear model of variability, calculates a global solution to a differential, or partial differential equation. We apply these fundamentals to jointly organize the rows and columns of a matrix, viewed either as the matrix of a linear operator, or as a Database. Here the rows are viewed as functions on the columns and the columns as functions of the rows, a dual geometry is built to optimize prediction and processing. We relate these methods to ideas from classical Harmonic Analysis and indicate tools to measure success of information extraction. In particular we introduce methodologies that resemble "signal processing" on data matrices, enabling functional regression, prediction, denoising, compression fast numerics, and so on. We illustrate these ideas to organize and map out in an automatic and purely data driven fashion on music databases of audio segments, text documents, psychological questionnaires, medical profiles, physical sensor data, financial data.

Plenary Speaker

Friday, Aug 30, 14:00–15:00 **Room BA 201**

Martin Golubitsky *Ohio State University*

Patterns of Synchrony

Martin Golubitsky is Distinguished Professor of Natural and Mathematics Sciences at the Ohio State University, where he serves as Director of the Mathematical Biosciences Institute. He works in the fields of nonlinear dynamics and bifurcation theory studying the role of symmetry in the formation of patterns in physical systems and the role of network architecture in the dynamics of coupled systems. He has co-authored four graduate texts, one undergraduate text, and two nontechnical trade books.

Dr. Golubitsky is a Fellow of the American Academy of Arts and Sciences, AAAS, and SIAM. He is also the 2001 corecipient of the Ferran Sunyer i Balaguer Prize for The Symmetry Perspective and the recipient of the 2009 Moser Lecture Prize of the SIAM Dynamical Systems Activity Group. He has been elected to the Councils SIAM, AAAS, and AMS. Dr. Golubitsky was the founding Editor-in-Chief of the SIAM Journal on Applied Dynamical Systems and has served as President of SIAM.

*Abstract*

This talk will survey recent results on rigid phase-shift synchrony in periodic solutions of coupled systems of differential equations. The mathematical questions were motivated by previous work on quadrupedal gaits and will be interpreted in terms of a generalized model for binocular rivalry.

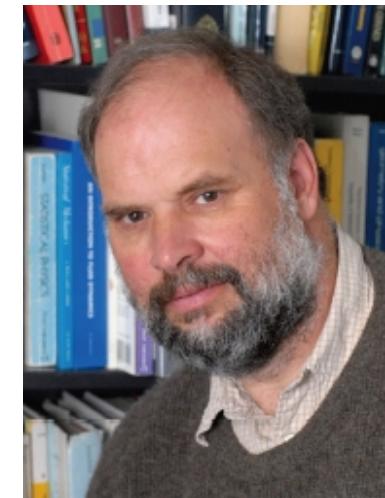
Plenary Speaker

Wednesday, Aug 28, 14:00–15:00 **Room BA 201**

Vaughan Jones *Vanderbilt University*

Computer involvement in the classification of small index subfactors

Sir Vaughan F. R. Jones (KNZM FRS FRSNZ) is a New Zealand mathematician, known for his work on von Neumann algebras and Knot Theory. He was awarded a Fields Medal in 1990 at the ICM in Kyoto. Jones is currently a distinguished professor of mathematics at Vanderbilt University. He previously served as a professor at the University of California, Berkeley and a Distinguished Alumni Professor at the University of Auckland.

*Abstract*

A subfactor of index k is a generalisation of a permutation group on a set of size k . Except that the number k is no longer required to be an integer- it is a real number. While the listing of all transitive permutation groups on a set of size 5 would be covered in a first class in group theory, the subfactor result has only recently been completed thanks to Morrison, Peters, Snyder and many other authors. And their computers. The classification begins with the enumeration of all possible "Principal graphs", which in index less than or equal to 4 are the usual singly laced Coxeter graphs. Ten more subfactors exist with index between 4 and 5, some of which are only accessible via computer computations. I will present these results and the local blend of computer calculation and theory, and the extent to which the computer calculations may or may not be necessary.

Plenary Speaker

Thursday, Aug 29, 9:00–10:00 **Room BA 201**

Lila Kari *Western University*

Nanocomputations by DNA Self-Assembly

Lila Kari is Professor in the Department of Computer Science at The University of Western Ontario. She received her M.Sc. in 1987 from the University of Bucharest, Romania, and her Ph.D. in 1991 for her thesis "On Insertions and Deletions in Formal Languages", for which she received the Nevanlinna Prize for the best mathematics thesis in Finland. Author of more than 170 peer reviewed articles, Professor Kari is regarded as one of the world's experts in the area of biomolecular computation, that is using biological, chemical and other natural systems to perform computations. She has served as Steering Committee Chair for the DNA Computing conference series, as Steering Committee member for the Unconventional Computation conference series, as well as on the Scientific Advisory Committee of the International Society for Nano-Scale Science and Engineering.

Lila Kari serves on the editorial boards of the journals Theoretical Computer Science, Natural Computing and Universal Computer Science, and as section editor for molecular computing for the Natural Computing Handbook (Springer). She has additionally served as a member of the Board of Directors of the FIELDS Institute for Research in Mathematical Sciences, the UK EPSRC peer review college, on the NSERC grant selection committee on computing and information systems and the NSERC Herzberg-Brockhouse-Polanyi Prize joint selection committee. At the University of Western Ontario she has received numerous awards, including the Florence Bucke Science Prize and the Faculty of Science Award for Excellence in Undergraduate Teaching. From 2002 to 2011 she was Canada Research Chair in Biocomputing, and her current research focusses on theoretical aspects of bioinformation and biocomputation, including models of cellular computation, nanocomputation by DNA self-assembly and Watson-Crick complementarity in formal languages.



Abstract

Self-assembly, the process by which objects autonomously come together to form complex structures, is ubiquitous in the physical world: Atoms bind to each other to form molecules, molecules may form crystals or macromolecules, cells interact to form biological organisms. Recent experimental research in DNA self-assembly demonstrated its potential for the parallel creation of a large number of nanostructures, including some encoding computations. This suggests exciting applications of self-assembly to circuit fabrication, nanorobotics, DNA computation, smart-drug design, and amorphous computing.

A systematic study of self-assembly as a computational process has been initiated by Adleman and Winfree. The individual components are therein modelled as square tiles on the infinite two-dimensional plane. Each side of a tile is covered by a specific "glue", and two adjacent tiles will bind to each other if they have matching glues on their abutting edges. Tiles that stick to each other may form various two-dimensional structures such as squares, rectangles, counters, or may cover the entire plane. In this talk I will describe the potential of the self-assembly of "DNA tiles" for nanocomputations. In addition, I will explore generalizations of the original model that add the possibility of having negative, "repelling", glues, as well as compare the computational power of deterministic versus non-deterministic self-assembly.

Plenary Speaker

Tuesday, Aug 27, 14:00–15:00 **Room BA 201**

Dimitrios Giannakis / Andrew Majda

The Courant Institute, New York University

Data-driven methods for dynamical systems: Quantifying predictability and extracting spatiotemporal patterns

Dr. Dimitrios Giannakis is a faculty member at the Courant Institute of Mathematical Sciences, NYU. He is also affiliated with Courant's Center for Atmosphere Ocean Science (CAOS). He received BA and MSci degrees from the University of Cambridge, and a PhD degree from the University of Chicago. Prior to joining Courant and CAOS as faculty he was a postdoctoral researcher there. Giannakis' research work is at the interface between applied mathematics and climate atmosphere ocean science. His primary research interests are in geometrical data analysis algorithms and statistical modeling of complex systems. He has applied these tools in topics including idealized dynamical systems, ocean and sea ice variability on seasonal to interannual timescales, and organized atmospheric convection.



Abstract

Large-scale datasets generated by dynamical systems arise in many applications in science and engineering. Two research topics of current interest in this area involve using data collected through observational networks or output by numerical models to quantify the uncertainty in long-range forecasting, and improve understanding of the operating dynamics. In this talk we discuss applied mathematics techniques to address these topics blending ideas from machine learning, delay-coordinate embeddings of dynamical systems, and information theory. We illustrate these techniques with applications to climate atmosphere ocean science.

This is a joint talk with Prof. Andrew Majda, Courant Institute, New York University

Andrew J. Majda is the Morse Professor of Arts and Sciences at the Courant Institute of New York University. Majda's primary research interests are modern applied mathematics in the broadest possible sense merging asymptotic methods, numerical methods, physical reasoning, and rigorous mathematical analysis.

Majda is a member of the National Academy of Sciences and has received numerous honors and awards including the National Academy of Science Prize in Applied Mathematics, the John von Neumann Prize of the Society of Industrial and Applied Mathematics, and the Gibbs Prize of the American Mathematical Society. He is also a member of the American Academy of Arts and Science. He has been awarded the Medal of the College de France, twice, and is a Fellow of the Japan Society for the Promotion of Science. He has received an honorary doctorate from his undergraduate alma mater, Purdue University.

In the past several years at the Courant Institute, Majda has created the Center for Atmosphere Ocean Science with a multi-disciplinary faculty to promote cross-disciplinary research with modern applied mathematics in climate modeling and prediction. Majda's current research interests include multi-scale multi-cloud modeling for the tropics, reduced stochastic and statistical modeling for climate, and novel mathematical strategies for prediction and data assimilation in complex multi-scale systems.



Plenary Speaker

Wednesday, Aug 28, 9:00–10:00 **Room BA 201**

George C. Papanicolaou *Stanford University*

Systemic Risk

George C. Papanicolaou is currently the Robert Grimmett Professor in Mathematics at Stanford University. Besides his former focus on the analysis of waves and diffusion in inhomogeneous or random media, his recent research interests also include financial mathematics, especially the use of asymptotics for stochastic equations in analyzing complex models of financial markets and in data analysis. In 1987, the University of Athens conferred an Honorary Doctor of Science on Papanicolaou. In 2000, he became a Fellow of the American Academy of Arts and Sciences and he was elected to the U.S. National Academy of Sciences. Papanicolaou was invited plenary speaker at multiple international congresses, among others at the SIAM 50th anniversary meeting in 2002 and at the International Congress of Industrial and Applied Mathematics in 2003. In 2006, he received the SIAM von Neumann Prize in recognition of his wide-ranging work on analytic and stochastic methods and their application to the modeling of phenomena in the physical, geophysical, and financial sciences. In 2010 he received the Willard Benter Prize in Applied Mathematics. In 2011 he was the Gibbs lecturer of the American Mathematical Society. The University of Paris Diderot conferred on him the degree Doctor Honoris Causa in 2011.



Abstract

The quantification and management of risk in financial markets is at the center of modern financial mathematics. But until recently, risk assessment models did not consider seriously the effects of inter-connectedness of financial agents and the way risk diversification impacts the stability of markets. I will give an introduction to these problems and discuss the implications of some mathematical models for dealing with them.

Plenary Speaker

Thursday, Aug 29, 14:00–15:00 **Room BA 201**

Panos M. Pardalos *University of Florida*

Optimization and Modeling in Energy Systems

Panos M. Pardalos serves as Distinguished Professor of Industrial and Systems Engineering at the University of Florida. He is also an affiliated faculty member of the Computer and Information Science Department, the Hellenic Studies Center, and the Biomedical Engineering Program. He is also the Director of the Center for Applied Optimization. Dr. Pardalos is a world leading expert in global and combinatorial optimization. His recent research interests include network design problems, optimization in telecommunications, e-commerce, data mining, biomedical applications, and massive computing.

*Abstract*

For decades, power systems have been playing an important role in humanity. Industrialization has made energy consumption an inevitable part of daily life. Due to our dependence on fuel sources and our large demand for energy, power systems have become interdependent networks rather than remaining independent energy producers. This talk will focus on the problems arising in energy systems as well as recent advances in optimization and modeling to address these problems. Among the topics to be discussed are emission constrained hydrothermal scheduling, electricity and gas networks expansion, as well as reliability analysis of power grid.

Plenary SpeakerMonday, Aug 26, 14:00–15:00 **Room BA 201****Israel Michael Sigal** *University of Toronto***Superconductivity and automorphic functions**

Israel Michael Sigal is the Norman Stuart Robertson Chair in Applied Mathematics and University Professor at the University of Toronto. He works in several areas of mathematical physics. Among his results are the proof (jointly with Avy Soffer) of asymptotic completeness of the quantum many-body scattering for short-range potentials and the development of a mathematical framework (jointly with Volker Bach and Jurg Frohlich) of the theory of emission and absorption of quantum radiation by non-relativistic quantum systems such as atoms and molecules, as well as several important results on the nonlinear Schrodinger, Ginzburg-Landau, mean-curvature and wave equations. Professor Sigal was an invited speaker at several International Congresses of Mathematical Physics and at an International Congress of Mathematicians.

*Abstract*

Macroscopic theory of superconductivity is based on the celebrated Ginzburg - Landau equations. First developed to explain and predict properties of superconductors, these equations had a profound influence on physics well beyond their original designation area. These are a pair of coupled nonlinear equations for a complex function (called order parameter or Higgs field) and a vector field (magnetic potential or gauge field). They are the simplest representatives of a large family of equations appearing in physics and mathematics. (The latest variant of these equations is the Seiberg - Witten equations.) Besides of importance in physics, they contain beautiful mathematics (some of the mathematics was discovered independently by A. Turing in his explanation of patterns of animal coats). In this talk I will review recent results involving key solutions of these equations - the magnetic vortices and vortex lattices, their existence, stability and dynamics, and how they relate to the modified theta functions appearing in number theory. Some automorphic functions play a key role in this theory.

Plenary Speaker

Friday, Aug 30, 9:00–10:00 Room BA 201

Godfried T. Toussaint *NYUAD/M.I.T./McGill*

Phylogenetic Analysis of the Musical Rhythms of the World

Godfried T. Toussaint is a Research Professor of Computer Science at New York University Abu Dhabi in Abu Dhabi, United Arab Emirates. He is also an affiliate researcher in the Computer Science and Artificial Intelligence Laboratory at the Massachusetts Institute of Technology in Cambridge, MA, USA. For many years he taught and did research in the School of Computer Science at McGill University in Montreal, in the areas of information theory, pattern recognition, textile-pattern analysis and design, computational geometry, machine learning, music information retrieval, and computational music theory. In 2005 he became a researcher in the Centre for Interdisciplinary Research in Music Media and Technology, in the Schulich School of Music at McGill University, in Montreal, Canada.

Dr. Toussaint is a founder and co-founder of several annual international conferences and workshops, including the ACM Symposium on Computational Geometry, and the Canadian Conference on Computational Geometry. He is an editor of several journals, including Computational Geometry: Theory and Applications, the International Journal of Computational Geometry and Applications, ISRN Geometry, and the Journal of Mathematics and the Arts. He is the recipient of several distinguished awards including a Killam Fellowship from the Canada Council for the Arts, and a Radcliffe Fellowship from Harvard University, where he spent one year at the Radcliffe Institute for Advanced Study, and one year in the Music Department. His research on the phylogenetic analysis of musical rhythms has been reported in several media, and was the focus of two Canadian television programs. He is the author of more than 390 publications.

Latest Book: *The Geometry of Musical Rhythm*, Chapman-Hall/CRC Press, January, 2013.



Abstract

The application of computational-mathematical tools to the analysis of symbolically notated musical rhythms of the world informs musicological issues such as whether one group of rhythms is more complex than another, whether one family of rhythms possesses an underlying metrical hierarchy, or how an evolutionary phylogeny of musical rhythms may be constructed. Recent results on these problems will be illustrated with examples. To submit rhythms to a phylogenetic analysis, a measure of similarity between rhythms is usually employed.

Two fundamental approaches to measuring the similarity between rhythms are compared: a feature-based technique and a transformation method. In the former procedure, statistical and/or structural features are computed from a suitable representation of the rhythms, thus representing them as points in a feature space. Two rhythms are considered to be similar if the distance between their corresponding points in this feature space is small. In the latter strategy a rhythm is represented as a binary sequence of symbols denoting onsets (sounds) and rests (silences), and a distance measure called the edit-distance is used. The edit distance between two rhythms is the minimum number of mutations required to transform one rhythm to the other. Here the mutations consist of insertions, deletions, and substitutions of onsets and rests. A phylogenetic analysis using the BioNJ algorithm from the SplitsTree-4 software package, incorporating the edit distance, applied to several collections of the musical rhythms practiced in several cultures around the globe, yields new insights into the paradigmatic roles played by the most salient rhythms.

6 Semi-Plenary Speakers

Wednesday, Aug 28, 16:50–17:50 Room BA 202

Julien Arino *University of Manitoba*

The spatio-temporal spread of drug-resistant tuberculosis

Julien Arino received his PhD in 2001 from Université Joseph Fourier in Grenoble, France in affiliation with INRIA Sophia Antipolis and the Villefranche-sur-mer Oceanological Observatory. He held postdoctoral fellowships at the University of Victoria (Jan 2001-Dec 2002) and McMaster University (Jan 2003-Jun 2005).

Since 2005, he has been a faculty member at the University of Manitoba. He is currently a member of the Bio.Diaspora Project, which is based at St Michael's Hospital (Toronto), and the Centre for Disease Modelling, which is hosted at York University.



Abstract

Tuberculosis is, after HIV/AIDS, the second largest cause of infectious disease induced death. It is estimated that in 2011, it killed 1.4 million people worldwide. Tuberculosis is also a disease of poverty, as contributing factors to its spread include poor and overcrowded living conditions, poor health conditions, etc. As a consequence, over 95% of new infections and deaths by tuberculosis occur in developing countries.

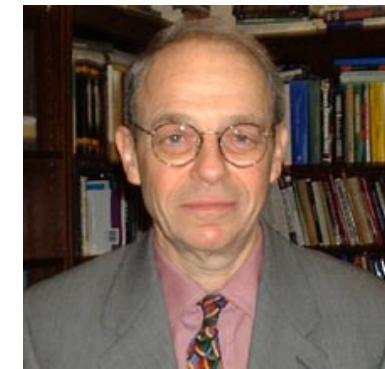
We formulate a model for tuberculosis in a single population that includes three strains: a drug-sensitive strain, MDR-TB and XDR-TB. We study the model mathematically and show, in particular, that the bifurcation structure of the whole model is governed by the behaviour of the XDR-TB strain. We then extend the model to a metapopulation setting, in which each country is a vertex in a multi-digraph, endowed with a system for the single population case. Weighted arcs between the vertices represent the rate of travel of individuals between the countries. We study the resulting large-scale system. Finally, we proceed to numerical experiments with realistic travel and population data.

This is a joint work with K. Khan (University of Manitoba) and I. Soliman (St Michael's Hospital, Toronto).

Semi-Plenary SpeakerMonday, Aug 26, 15:30–16:30 **Room BA 110****Steven Brams** *New York University***Fair Division**

Steven J. Brams is Professor of Politics at New York University and the author, co-author, or co-editor of 18 books and more than 250 articles. His books include *Theory of Moves* (Cambridge, 1994) and, co-authored with Alan D. Taylor, *Fair Division: From Cake-Cutting to Dispute Resolution* (Cambridge, 1996) and *The Win-Win Solution: Guaranteeing Fair Shares to Everybody* (Norton, 1999). His newest books are *Mathematics and Democracy: Designing Better Voting and Fair-Division Procedures* (Princeton, 2008) and *Game Theory and the Humanities: Bridging Two Worlds* (MIT, 2011). He holds two patents for fair-division algorithms and is chairman of the advisory board of Fair Outcomes, Inc.

Brams has applied game theory and social-choice theory to voting and elections, bargaining and fairness, international relations, and the Bible, theology, and literature. He is a former president of the Peace Science Society (1990-91) and of the Public Choice Society (2004-2006). He is a Fellow of the American Association for the Advancement of Science (1986), a Guggenheim Fellow (1986-87), and was a Visiting Scholar at the Russell Sage Foundation (1998-99).

*Abstract*

Over the past 20 years, there has been burgeoning interest in the subject of fair division — how one divides a single divisible good (e.g., a cake), or multiple indivisible goods (e.g., the marital property in a divorce), to satisfy such properties as efficiency, envy-freeness, and equitability. Some of the major possibility and impossibility results – relating to both the existence of such a division and algorithms for producing it – will be reviewed. How these results apply to dividing land, allocating items in a family estate to heirs, determining which rooms housemates get and how much of the rent each pays for its room, and matching applicants to colleges will be among the applications discussed.

Semi-Plenary Speaker

Monday, Aug 26, 15:50–16:50 **Room BA 101**

Bernd Hofmann *Technical University of Chemnitz*

On an Inverse and Ill-Posed Problem of Autoconvolution Type in Ultrashort Laser Pulse Characterization

Dr. Bernd Hofmann is professor for Analysis and Inverse Problems at the Chemnitz University of Technology, Germany, in the Department of Mathematics since 1993, where he served as Dean of the Faculty from 2006 to 2009. He established an interdisciplinary research group on inverse problems with applications in natural sciences, engineering and finance, organizing the annual ‘Chemnitz Symposium on Inverse Problems’, sometimes on tour (in Linz 2009, Canberra 2012, and Shanghai 2013).

Dr. Hofmann’s research focus is on regularization theory and practice as well as on studies concerning the nature of ill-posedness and appropriate tools for the treatment of ill-posedness phenomena. He works as a member of the Editorial Board of the journals ‘Inverse Problems’ and ‘Journal of Inverse and Ill-Posed Problems’.



Abstract

In the early 1990s motivated by applications from spectroscopy and stochastics contributions to the mathematical analysis of deautoconvolution problems as a class of inverse problems in spaces of continuous or quadratically integrable real functions were made. Such deautoconvolution problems were mostly aimed at finding non-negative functions with compact support from observations of its autoconvolution. Since the autoconvolution operator is nonlinear and smoothing, the deautoconvolution problem is ill-posed in the sense that the solutions need not be uniquely determined and mainly small perturbations in the data may lead to arbitrarily large errors in the solution. To overcome the negative consequences of ill-posedness some kind of regularization is required. Recently, the research group ‘Solid State Light Sources’ of the Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy, Berlin, hit on the autoconvolution problem in the context of a new approach in ultrashort laser pulse characterization called Self-Diffraction SPIDER. For phase reconstruction as an auxiliary problem the solution of an autoconvolution equation is needed, but now for complex functions to be determined from complex observations. Moreover, a device-related kernel function must be added. The ill-posedness phenomenon arises in the complex case, too, but a thorough analysis of the complex case in deautoconvolution was missing in the literature. The talk presents analytical and numerical results on the character of ill-posedness of the equation occurring as a part of the SD SPIDER approach. Moreover, an iterative regularization approach is suggested for the problem when only noisy data of are given.

Semi-Plenary Speaker

Tuesday, Aug 27, 15:50–16:50 **Room BA 202**

Eili Klein *John Hopkins University*

Ecological and Epidemiological Drivers of Viral Evolution

Dr. Eili Klein is an assistant professor at John Hopkins University in the Centre for Advanced modeling in the Social, Behavioural and Health Sciences; Dr. Klein also holds a fellow position at the Center for Disease Dynamics, Economics and Policy, in Washington, D.C. He received his PhD in ecology and evolutionary biology from Princeton University and has held research associate positions at the Center for Disease Dynamics, Economics and Policy and Resources for the Future.

Dr. Klein's interdisciplinary research involves ecology, epidemiology, economics, and human behaviour. His scientific interests include: factors that drive antimicrobial drug resistance; economic epidemiology; how human behaviour influences ecology/epidemiological dynamics; and how human behaviour influences evolution of an infectious disease.



Abstract

While it has long-been recognized that disease transmission is impacted by human behavior, the consequences of human behavior on the ecology of directly transmitted pathogens has been understudied. Using a biophysical model of virus stability, we examine how much of virus evolution is driven by epidemiological factors, such as contact rates and protective behavior, and how much is driven by biological characteristics of the virus, such as its growth rate. We use agent-based models, which scale from local to planetary to elucidate the driving factors for both endemic and epidemic directly transmitted viruses.

Semi-Plenary Speaker**Monday, Aug 26, 10:30 – 11:30 Room BA 111****Mel Levy Duke University****Variational Principles in Wave-Functional and Density- Functional Formulations of Quantum Mechanics**

Born 1941, in Brooklyn, New York.

Professor Emeritus, Tulane University and North Carolina A&T State University. Visiting Professor, Duke University (2007-). Professor, North Carolina Agricultural and Technical State University, 2002-2007. Professor, Tulane University, 1976-2002 (presently, Professor Emeritus). Visiting Professor or Visiting Scientist: Oak Ridge National Laboratory; Quantum Theory Project, University of Florida; Instituto Venezolano de Investigaciones Cientificas (I.V.I.C.), Caracas, Venezuela; Institute for Theoretical Physics, University of California at Santa Barbara; Institute of Theoretical Physics, Kossuth Lajos University, Debrecen, Hungary; Department of Physics and Theory Center Cornell University; Lecturer, Department of Chemistry, the University of North Carolina at Chapel Hill, 7/74-7/76.

International Academy of Quantum Molecular Science; International Academy of Mathematical Chemistry; Fellow of The American Physical Society; Editorial Board, Advances in Quantum Chemistry; Advisory Editorial Board, Theoretical Chemistry Accounts; Advisory Editorial Board, Progress in Theoretical Chemistry; Guest Editor: The International Journal of Quantum Chemistry; Tulane Liberal Arts and Sciences, Faculty Research Award, 1998.

***Abstract***

Variational theorems are important for obtaining approximate solutions to the Schrödinger equation. With this in mind, fundamental variational principles will first be discussed within the wave-functional formulation of quantum mechanics. Then the corresponding variational principles for ground states in density and density-matrix functional theories will be reviewed briefly for the non-degenerate and degenerate situations. Based on these variational principles, properties of the exact functionals will be presented that are difficult to satisfy with approximate functionals. Special emphasis will be given to degeneracies, coordinate scaling, and potentials (functional derivatives). Then, a new time-independent density-functional theory for excited states will be presented for Coulomb systems. The lecture will conclude with a description of certain relevant unsolved mathematical problems, such as one involving an ionization energy convexity property.

Semi-Plenary Speaker

Thursday, Aug 29, 15:50–16:50 **Room BA 101**

Silvina Matysiak *University of Maryland*

Role of dipolar interactions in protein folding

Dr. Silvina Matysiak is an assistant professor in the Fischell Department of Bioengineering at the University of Maryland College Park. She received her B.S. in Chemical Engineering from the Instituto Tecnológico de Buenos Aires in 2001 and her PhD in Chemistry from Rice University in 2007. Before joining Maryland, she was a postdoctoral fellow at the University of Texas at Austin.

Matysiak's primary area of interest is the characterization of protein dynamics and function at the molecular level. Her work includes using computer simulations to study the mechanism of protein folding and misfolding associated with neurodegenerative diseases, development of multiscale simulation approaches to bridge different time- and length-scales and how solvent organization affects cooperative transitions in biomolecular systems.



Abstract

The role of dipole interactions in protein folding A generic coarse-grained (CG) protein model will be presented to characterize the driving forces behind protein folding. The change in orientation of the atoms in the coarse-grained unit is captured by the addition of Drude oscillators inside each polar coarse-grained bead. The addition of dummy sites inside the polar beads introduces structural polarization into the coarse-grained model.

Realistic alpha/beta content is achieved *de novo* without any biases in the force-field toward a particular secondary structure. The dipoles created by the Drude oscillators interact with each other and drive the protein models to fold into unique structures depending on the amino acid patterning and presence of capping residues. In this talk, we will show the role of dipole-dipole and dipole-charge interactions in shaping the secondary and tertiary structure of proteins. In particular, we will focus on the folding of beta-hairpins and single helices and in helix bundles and multiple beta-sheet strands. In the folded ensemble, dipoles along a helix are found aligned parallel and stabilized by the presence of charged capping residues. On the other hand, beta-sheets exhibit antiparallel neighboring dipoles.

Semi-Plenary SpeakerTuesday, Aug 27, 15:50–16:50 **Room BA 208****Nicolae Tarfulea** *Purdue University Calumet***Boundary Conditions for Constrained Hyperbolic Systems: Mathematical and Numerical Analysis**

Dr Nicolae Tarfulea is Associate Professor in the Department of Mathematics, Computer Science & Statistics, Purdue University Calumet. He received his PhD from the University of Minnesota and his M.S. in Mathematics from the Penn State University in 2004 and 2001, respectively. His main research Interests are in Partial Differential Equations; Numerical Analysis; General Relativity. More precisely: boundary conditions for hyperbolic formulations of Einstein's equations, nonlinear elliptic equations, reaction diffusion systems, compressed sensing, and finite element methods. He has published 23 papers on these subjects in some of the most prestigious journals of mathematics, and gave over 20 invited talks in the last five years, and been a part of six research grants.

*Abstract*

Many applications in sciences and technology lead to first order symmetric hyperbolic (FOSH) systems of differential equations supplemented by constraint equations. The Cauchy problem for many such FOSH systems is constraint-preserving, i.e., the solution satisfies certain spatial differential constraints whenever the initial data does (e.g., Maxwell's equations or Einstein's field equations in various FOSH formulations). Frequently, artificial space cut offs are performed for such evolution systems, usually out of the necessity for finite computational domains. However, it may easily happen that boundary conditions at the artificial boundary for such a system lead to an initial boundary value problem which, while well-posed, does not preserve the constraints. Therefore, boundary conditions have to be posed in such a way that the numerical solution of the cut off system approximates as best as possible the solution of the original problem on infinite space, and this includes the preservation of constraints. It has become increasingly clear that in order for constraints to be preserved during evolution, the boundary conditions have to be chosen in an appropriate way. Here we consider the problem of finding constraint-preserving boundary conditions for constrained FOSH systems in the well-posed class of maximal nonnegative boundary conditions. Based on a characterization of maximal nonnegative boundary conditions, we discuss a systematic technique for finding such boundary conditions that preserve the constraints, pending that the constraints satisfy a FOSH system themselves. We exemplify this technique by presenting a few relevant applications (e.g., for FOSH formulations of Einstein's equations and for systems of wave equations in FOSH formulation subject to divergence constraints).

Semi-Plenary Speaker

Wednesday, Aug 28, 16:50–17:50 **Room BA 101**

Peter Tieleman *University of Calgary*

Martini coarse-grained and atomistic simulations of lipids

Peter Tieleman studied physical chemistry at the University of Groningen in the Netherlands, where he obtained his PhD under the supervision of Herman Berendsen, one of the pioneers of biomolecular simulation. After a year as a European Molecular Biology Organization fellow at the University of Oxford in Mark Sansom's research group, Tieleman joined the University of Calgary. Since 2005, he has been a Professor in the Department of Biological Sciences. His research interests are in biomolecular simulation and computational biology, with an emphasis on biochemical and biophysical problems involving cell membranes. Among his distinctions are an Alfred P. Sloan Foundation Fellowship, the Royal Society of Canada's Rutherford Memorial Medal in Chemistry, and a Natural Sciences and Engineering Research Council of Canada (NSERC) Steacie Memorial Fellowship.



Abstract

Computer simulations have been widely used to study properties of lipid aggregates. Over the past twenty years simulations have progressed from small models of lipid bilayers composed of one type of lipid at length scales of 5–8 nanometer and time scales of nanoseconds to very complex models at length scales of tens of nanometers and time scales of microseconds. The development of realistic coarse-grained models such as the MARTINI model has brought simulations of lipids to mesoscale scales where particle-based simulation and continuum models overlap and simulations can be compared to measurable mechanical parameters of lipid aggregates. MARTINI is parameterized primarily based on experimental data, but for many systems of biological importance there is limited experimental data that can be used in parameterization and validation. I will discuss recent progress in linking atomistic simulations, experimental results, and parameters from continuum models to MARTINI simulations, illustrated with examples on lipid mixtures, membrane tethers, and lipid-protein systems.

Special Invited Speaker

Thursday, Aug 29, 15:50–16:50 **Room BA 208**

Catherine Mavriplis *University of Ottawa*

Fifteen years of funded programs to advance women in science and engineering: progress and persistent challenges

Catherine Mavriplis, PhD, PE is an Associate Professor of Mechanical Engineering at the University of Ottawa and the NSERC Chair for Women in Science and Engineering (Ontario region). Dr. Mavriplis has been a professor of Mechanical and Aerospace Engineering since 1991, primarily at the George Washington University in the United States. She has also worked at the US National Science Foundation (NSF) in Mathematics and the University of Oklahoma in Meteorology. Her specialization is in Computational Fluid Dynamics and through application of her numerical modeling skills she has been involved in a number of interdisciplinary projects.

She maintains a strong collaboration with several U.S. researchers and the Royal Institute of Technology in Sweden. She currently serves on the Board of Directors of the Computational Fluid Dynamics Society of Canada. Dr. Mavriplis has worked under NSF funding to advance women since 1996, notably through the FORWARD to Professorship workshops under the NSF ADVANCE program, reaching up to 1,300 science and engineering doctoral women by 2013.



Abstract

I will discuss my work in advancing women in science and engineering through US National Science Foundation funding since 1997 and, more recently, since 2011, Canadas Natural Sciences and Engineering Research Council Chair for Women in Science and Engineering program. The FORWARD to Professorship program, in particular, has been a successful vehicle to empowering doctoral women who consider academic careers. Results of a survey of all 1300 FORWARD participants since 2003 will be presented, giving a picture of how this group of talented and motivated women are advancing and how the climate is changing. My work in Canada has also included women in industry, in particular with the Chair sponsor, Pratt & Whitney Canada, an aircraft engine manufacturer based in Montreal. I will discuss activities designed for mid-career professional women in industry as well as some initiatives for boosting numbers of women in computing.

7 Special Symposia and Organizers

SS-AAIP	Applied Analysis and Inverse Problems	Herb Kunze (<i>Math and Stats, Guelph</i>) Kimberly Levere (<i>School of Engineering, Guelph</i>)
SS-ADS	Canada-China Session on Applied Dynamic Systems	Yuming Chen (<i>Wilfrid Laurier University</i>) Fengqin Zhang (<i>Yuncheng University</i>) Xingfu Zou (<i>Western University</i>)
SS-ANMPDE	Advanced Numerical Methods for PDEs and Applications	Christina C. Christara (<i>University of Toronto</i>) Peter A. Forsyth (<i>University of Waterloo</i>) Dong Liang (<i>York University</i>)
SS-CDPB	Complex Dynamics of Population Behaviour	Stephen Tully (<i>Guelph</i>) Scott Greenhalgh (<i>Yale</i>) Chad Wells (<i>Yale</i>) Chris Pagnutti (<i>Guelph</i>)
SS-CF	Numerical Methods for Computationally Intensive Problems in Mathematical Finance	Duy-Minh Dang (<i>University of Waterloo</i>) Ken Jackson (<i>University of Toronto</i>)
SS-CFDRA	Computational Fluid Dynamics for Real Applications	Lakhdar Remaki (<i>BCAM, Spain</i>) Stéphane Moreau (<i>Sherbrooke</i>) Abdelkader Baggag (<i>Laval</i>)
SS-CMAIS	Control Methods for Advanced Industrial Systems	Behzad Samadi (<i>Maplesoft</i>) Jürgen Gerhard (<i>Maplesoft</i>)
SS-CMS	Computational Materials Science	Haipeng Wang (<i>NPU and University of Toronto</i>) Ziad Saghir (<i>Ryerson University</i>)
SS-CPH	Computational Photonics	Marek Wartak (<i>Wilfrid Laurier University</i>) Harry E. Ruda (<i>University of Toronto</i>)
SS-CSB	Computations in Systems Biology	Hin Hark Gan (<i>NYU</i>) Gaurav Arya (<i>UCSD</i>)
SS-DBCNDE	Dynamics and Bifurcations in Coupled Networks of Differential Equations: Theory and Applications	Luciano Buono (<i>UOIT</i>)
SS-DFT	Density Functional Theory	Ian Hamilton (<i>Wilfrid Laurier University</i>) Paul Ayers (<i>McMaster</i>) Viktor Staroverov (<i>Western</i>)
SS-DG	Decisions and Games	D. Marc Kilgour (<i>Wilfrid Laurier University</i>) Marcus Pivato (<i>Trent University</i>)
SS-EGT	Evolutionary Game Theory	Joe Apaloo (<i>St. Francis Xavier</i>) Ross Cressman (<i>Wilfrid Laurier University</i>)
SS-GLS	Geocomputational Landscapes and Spaces	Steven A. Roberts (<i>Wilfrid Laurier University</i>) Colin Robertson (<i>Wilfrid Laurier University</i>)

Special Symposia and Organizers

SS-HOMCFD	Higher-Order Methods in Computational Fluid Dynamics	Lilia Krivodonova (<i>University of Waterloo</i>) Hans De Sterck (<i>University of Waterloo</i>)
SS-HPTC	Recent Progress in Hyperbolic Problems: Theory and Computation	Jae-Hun Jung (<i>SUNY University at Buffalo</i>) Lilia Krivodonova (<i>University of Waterloo</i>) Allen Tesdall (<i>CUNY College of Staten Island</i>)
SS-IM	Industrial Mathematics	Sean Bohun (<i>UOIT</i>)
SS-LSNE	Lie Symmetry and Other Approaches in Theory and Applications of Nonlinear Equations	C.M. Khalique (<i>North-West University, RSA</i>) M. Abudiab (<i>Texas A&M University, USA</i>)
SS-MACBE	Modeling Approaches and Challenges in the Built Environment	Ryan Danks (<i>RWDI</i>) Michael Carl (<i>RWDI</i>)
SS-MCMBBM	Modeling and Computational Methods for Mathematical Biology and Medicine	Suzanne Shontz (<i>Mississippi State</i>) Corina Drapaca (<i>Penn State</i>) Siv Sivaloganathan (<i>Wilfrid Laurier University</i>)
SS-ME	Mathematical Epidemiology	Connell McCluskey (<i>Wilfrid Laurier University</i>)
SS-MFMCR	Theory and Applications in Finance	Joe Campolieti (<i>Wilfrid Laurier University</i>) Adam Metzler (<i>Wilfrid Laurier University</i>)
SS-MHP	Mathematics of Human Placenta: a Window into Fetal Origins of Adult Disease	C.M. Salafia (<i>Placental Analytics, LLC</i>) O. Shlakhter (<i>Alberta Health Services</i>) C.M. Salafia (<i>M. Yampolsky (Mathematics Department, University of Toronto)</i>)
SS-MIPD	Mathematical Immunology and Pathogen Dynamics	Jane Heffernan (<i>CDM, Math & Stats, York U</i>) Cameron Browne (<i>University of Ottawa</i>) Stanca Ciupe (<i>Virginia Tech University</i>) Jonathan Forde (<i>Hobart and William Smith Colleges</i>)
SS-MMNN	Mathematical Models for Nanoscience and Nanotechnology	Z.L. Miskovic (<i>University of Waterloo</i>) A.H. Majedi (<i>University of Waterloo</i>)
SS-MSEPSW	Multitaper Spectrum Estimation, Prolate Spheroidal Wave Functions, Quadratic-Inverse, and Related Problems	Wesley Burr (<i>Queen's University</i>) Charlotte Haley (<i>Queen's University</i>) David J. Thomson (<i>Queen's University</i>)
SS-NCTAP	New Computational Techniques for Applied Problems in Science and Engineering	Ludwig Kohaupt (<i>Beuth University of Technology Berlin</i>) Yan Wu (<i>Georgia Southern University</i>)

Special Symposia and Organizers

SS-NMDAEA	Numerical Methods for Differential-Algebraic Equations and Applications	Andreas Griewank (<i>Humboldt University, Germany</i>) Ned Nedialkov (<i>Cardiff University, UK</i>) John Pryce (<i>Cardiff University, UK</i>)
SS-QCTA	Quantum Control: Theory and Application	Lian-Ao Wu (<i>IKERBASQUE, Basque Foundation of Science and University of the Basque Country, Spain</i>)
SS-RPSETS	Recent Progress in Spintronics: Experiment and Dynamical Systems	Jingrun Chen (<i>UC Santa Barbara</i>) Xu Yang (<i>UC Santa Barbara</i>)
SS-RTDEDS	Recent Trends in Differential Equations and Dynamical Systems	Xinzhi Liu (<i>University of Waterloo</i>) Mohamad Alwan (<i>University of Waterloo</i>) Hongtao Zhang (<i>University of Waterloo</i>)
SS-RWFDNO	Continuous-time Random Walks, Fractional Diffusion and Non-local Operators: Applications to Physics, Finance, and Engineering	Mark M. Meerschaert (<i>Michigan State University, USA</i>) Enrico Scalas (<i>University of Eastern Piedmont, Italy and BCAM - Basque Center for Applied Mathematics, Basque Country, Spain</i>)
SS-SAEEM	Statistical Aspects of Environmental and Ecological Modeling	Vyacheslav Lyubchich (<i>University of Waterloo</i>) Yulia R. Gel (<i>University of Waterloo</i>)
SS-SCT	Social Choice Theory	D. Marc Kilgour (<i>Wilfrid Laurier University</i>) Marcus Pivato (<i>Trent University</i>)
SS-SDAG	Statistical Data Analysis and Geometry	Shoja Chenouri (<i>University of Waterloo</i>) Paul Marriott (<i>University of Waterloo</i>)
SS-SGT	Structured Graph Theory	Chinh Hoang (<i>Wilfrid Laurier University</i>) Kathie Cameron (<i>Wilfrid Laurier University</i>)
SS-SNDTA	Symmetry in Nonlinear Dynamics: Theory and Applications	Manuele Santoprete (<i>Wilfrid Laurier University</i>) Ray McLenaghan (<i>University of Waterloo</i>)
SS-SSMMBP	Simulations in Soft Matter and Molecular Bio-Physics	Cristiano L. Dias (<i>New Jersey Institute of Technology</i>)
SS-VPPO	Variational Problems of Physical Origin	Robert Jerrard (<i>University of Toronto</i>) Andrew Lorent (<i>University of Cincinnati</i>)
SS-WSM	Women in Science and Mathematics	Shohini Ghose (<i>Wilfrid Laurier University</i>) Hind Al-Abadleh (<i>Wilfrid Laurier University</i>)

8 Conference Schedule

8.1 Monday, August 26, 2013

	Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
08:30-09:00			AMMCS Conference Opening BA201 <i>Max Blouw Wilfrid Laurier University President and Vice-Chancellor, Chair of the Council of Ontario Universities</i> <i>Angela Vieth Councillor, City of Waterloo</i>		
09:00-10:00			Plenary Talk BA 201 - Chair: R. Melnik Information Integration/Organization and Numerical Harmonic Analysis. Ronald Coifman Yale University - Abstract and Biography - p 7		
10:00-10:30			Coffee Break: BA Hallways		
10:30-12:30	SS-AAIP - 1 Applied Analysis & Inverse Problems	SS-HPTC - 1 Recent progress in hyperbolic problems: Theory and Computation	SS-DG&SCT - 1 Decision Games and Social Choice Theory	SS-DFT - 1 Density Functional Theory	SS-SDAG Statistical Data Analysis and Geometry
12:30-14:00			Lunch		
14:00-15:00			Plenary Talk BA 201 - Chair: R. Melnik Dynamics of Magnetic Vortices and Decoherence Israel Michael Sigal The University of Toronto - Abstract and Biography - p 14		
15:00-15:30			Coffee Break BA Hallways		
15:30-17:50	SS-AAIP - 2 Applied Analysis & Inverse Problems	SS-HPTC - 2 Recent progress in hyperbolic problems: Theory and Computation	SS-DG&SCT - 2 Decision Games and Social Choice Theory	SS-DFT - 2 Density Functional Theory	SS-RWFDNO Continuous-time random walks, fractional diffusion and non-local operators: Applications

Monday, August 26, 2013

	Room BA202	Room BA208	Room BA209	Room BA210	Room BA211
08:30-09:00			AMMCS Conference Opening		
		Max Blouw <i>Wilfrid Laurier University President and Vice-Chancellor, Chair of the Council of Ontario Universities</i>			
		Angela Vieth <i>Councillor, City of Waterloo</i>			
09:00-10:00			Plenary Talk BA 201 - Chair: R. Melnik		
		Information Integration/Organization and Numerical Harmonic Analysis.			
		Ronald Coifman Yale University - Abstract and Biography - p 7			
10:00-10:30			Coffee Break: BA Hallways		
10:30-12:30	CS-MODELING-1 1 Partial Differential and Integral Equations in Mathematical Modeling	SS-MHP-1 Mathematics of human placenta: a window into fetal origins of adult disease	SS-MCMBBM-1 Modeling and Computational Methods for Mathematical Biology and Medicine	SS-MACBE-1 Modeling approaches and challenges in the built environment	CS-DSDE-1 Applications of Dynamical Systems and Differential Equations
12:30-14:00			Lunch		
14:00-15:00			Plenary Talk BA 201 - Chair: R. Melnik		
		Dynamics of Magnetic Vortices and Decoherence			
		Israel Michael Sigal The University of Toronto - Abstract and Biography - p 14			
15:00-15:30			Coffee Break BA Hallways		
15:30-17:50	SS-CSB Computations in Systems Biology	SS-MHP-2 Mathematics of human placenta: a window into fetal origins of adult disease	SS-MCMBBM-2 Modeling and Computational Methods for Mathematical Biology and Medicine	SS-MACBE-2 Modeling approaches and challenges in the built environment	CS-DSDE-2 Applications of Dynamical Systems and Differential Equations

8.2 Tuesday, August 27, 2013

	Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
09:00-10:00			Plenary Talk BA 201 - Chair: M. Levy How Quantum Mechanics Can Help Solve the World's Energy Problems Emily Carter Princeton University - Abstract and Biography - p 6		
10:00-10:30			Coffee Break: BA Hallways		
10:30-12:30	SS-AAIP-3 Applied Analysis & Inverse Problems	SS-HPTC-3 Recent progress in hyperbolic problems: Theory and Computation	SS-DG&SCT-3 Decision Games and Social Choice Theory	CS-CACO-1 Computational Algebra, Combinatorics and Optimization	SS-MSEPSW-1 Multitaper Spectrum Estimation, Prolate Spheroidal Wave Functions, Quadratic-Inverse, and Related Problems
12:30-14:00			Lunch		
14:00-15:00			Plenary Talk BA 201 - Chair: B. Hofmann Data-driven methods for dynamical systems: Quantifying predictability and extracting spatiotemporal patterns Dimitrios Giannakis / Andrew Majda, Courant Institute, New York University - Abstract and Biography - p 11		
15:00-15:30			Coffee Break BA Hallways		
15:30-17:30	SS-AAIP-4 Applied Analysis & Inverse Problems	SS-HPTC-4 Recent progress in hyperbolic problems: Theory and Computation		SS-DFT-3 Density Functional Theory	SS-MSEPSW-2 Multitaper Spectrum Estimation, Prolate Spheroidal Wave Functions, Quadratic-Inverse, and Related Problems

Tuesday, August 27, 2013

	Room BA202	Room BA208	Room BA209	Room BA210	Room BA211	Room BA305
09:00-10:00				Plenary Talk BA 201 - Chair: M. Levy How Quantum Mechanics Can Help Solve the World's Energy Problems Emily Carter Princeton University - Abstract and Biography - p 6		
10:00-10:30				Coffee Break: BA Hallways		
10:30-12:30	SS-CDPB-1 Complex Dynamics of Population Behaviour	SS-NCTAP-1 New Computational Techniques for Applied Problems in Science and Engineering	SS-CPH Computational Photonics	CS-FINANCE-1 Financial Mathematics and Computation	CS-DSDE-3 Applications of Dynamical Systems and Differential Equations	CS-MODELING-2 Partial Differential and Integral Equations in Mathematical Modeling
12:30-14:00				Lunch		
14:00-15:00				Plenary Talk BA 201 - Chair: B. Hofmann Data-driven methods for dynamical systems: Quantifying predictability and extracting spatiotemporal patterns Dimitrios Giannakis / Andrew Majda, Courant Institute, New York University - Abstract and Biography - p 11		
15:00-15:30				Coffee Break BA Hallways		
15:30-17:30	SS-CDPB-2 Complex Dynamics of Population Behaviour	SS-NCTAP-2 New Computational Techniques for Applied Problems in Science and Engineering		CS-FINANCE-2 Financial Mathematics and Computation	CS-BSM-1 Mathematics and Computation in Biological Sciences and Medicine	CS-MODELING-3 Partial Differential and Integral Equations in Mathematical Modeling

8.3 Wednesday, August 28, 2013

	Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
09:00-10:00			Plenary Talk BA 201 - Chair: R. Melnik Systemic Risk George Papanicolaou Stanford University - Abstract and Biography - p 12		
10:00-10:30			Coffee Break: BA Hallways		
10:30-12:30	SS-SSMBP-1 Simulations in soft matter and molecular Bio-Physics	SS-HPTC-5 Recent progress in hyperbolic problems: Theory and Computation	SS-MFMCR-1 Mathematical Finance - Modeling, Computation and Risk Management	SS-LSNE-1 Lie symmetry and other approaches in theory and applications of nonlinear equations	SS-GLS Geocomputational landscapes and spaces
12:30-13:00	Conference Photo Shoot <i>Meet in front of BA</i>				
13:00-14:00	Lunch				
14:00-15:00	Plenary Talk BA 201 - Chair: M. Golubitsky Computer involvement in the classification of small index subfactors Vaughan Jones Vanderbilt University - Abstract and Biography - p 9				
15:00-15:15	Coffee Break BA Hallways				
15:15-16:15	Plenary Talk BA 201 - Chair: J. Campolieti Models, Mathematics, and Markets - Is the Intersection an Empty Set? Peter Carr Morgan Stanley - Abstract and Biography - p 5				
16:15-16:30	Coffee Break BA Hallways				
16:30-18:30	SS-SSMBP-2 Simulations in soft matter and molecular Bio-Physics	SS-HPTC-6 Recent progress in hyperbolic problems: Theory and Computation	SS-MFMCR-2 Mathematical Finance - Modeling, Computation and Risk Management		SS-EGT Evolutionary Game Theory

Wednesday, August 28, 2013

	Room BA202	Room BA208	Room BA209	Room BA210	Room BA211
09:00-10:00	Plenary Talk BA 201 - Chair: R. Melnik Systemic Risk George Papanicolau Stanford University - Abstract and Biography - p 12				
10:00-10:30	Coffee Break: BA Hallways				
10:30-12:30	SS-CDPB-3 Complex Dynamics of Population Behaviour	SS-NCTAP-3 New Computational Techniques for Applied Problems in Science and Engineering	SS-RTDEDS-1 Recent trends in differential equations and dynamical systems	CS-FINANCE-3 Financial Mathematics and Computation	CS-BSM-2 Mathematics and Computation in Biological Sciences and Medicine
12:30-13:00	Conference Photo Shoot <i>Meet in front of BA</i>				
13:00-14:00	Lunch				
14:00-15:00	Plenary Talk BA 201 - Chair: M. Golubitsky Computer involvement in the classification of small index subfactors Vaughan Jones Vanderbilt University - Abstract and Biography - p 9				
15:00-15:15	Coffee Break BA Hallways				
15:15-16:15	Plenary Talk BA 201 - Chair: J. Campolieti Models, Mathematics, and Markets - Is the Intersection an Empty Set? Peter Carr Morgan Stanley - Abstract and Biography - p 5				
16:15-16:30	Coffee Break BA Hallways				
16:30-18:30	SS-ME1 Mathematical Epidemiology	SS-NCTAP-4 New Computational Techniques for Applied Problems in Science and Engineering	SS-RTDEDS-2 Recent trends in differential equations and dynamical systems		CS-BSM3 Mathematics and Computation in Biological Sciences and Medicine

8.4 Thursday, August 29, 2013

	Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
09:00-10:00			Plenary Talk BA 201 - Chair: P. Tieleman Nanocomputations by DNA Self-Assembly Lila Kari Western University - Abstract and Biography - p 10		
10:00-10:30			Coffee Break & Poster Session*: BA 110 & 111		
10:30-12:30	SS-SSMBP-3 Simulations in soft matter and molecular Bio-Physics	SS-SNDTA-1 Symmetry in Nonlinear Dynamics: Theory and Applications	SS-MFMCR-3 Mathematical Finance - Modeling, Computation and Risk Management	SS-SGT Structured Graph Theory	SS-CMS-1 Computational Materials Science
12:30-14:00			Lunch		
14:00-15:00			Plenary Talk BA 201 - Chair: M. Cojocaru Optimization and Modeling in Energy Systems Panos Pardalos University of Florida - Abstract and Biography - p 13		
15:00-15:30			Coffee Break & Poster Session*: BA 110 & 111		
15:30-18:00	SS-SSMBP-4 Simulations in soft matter and molecular Bio-Physics	SS-SNDTA-2 Symmetry in Nonlinear Dynamics: Theory and Applications	CS-MechE1 Computational Mechanics and Engineering	SS-LSNE-3 Lie symmetry and other approaches in theory and applications of nonlinear equations	SS-CMS-2 Computational Materials Science
19:00-22:00			Conference Banquet. details: section 2, map: section 10		

* Posters will be on display in rooms BA 110 and BA 111 for the duration of the conference. Authors will be available for discussion during the Thursday Poster Sessions.

Thursday, August 29, 2013

	Room BA202	Room BA208	Room BA209	Room BA210	Room BA211	Room BA305
09:00-10:00			Plenary Talk BA 201 - Chair: P. Tieleman Nanocomputations by DNA Self-Assembly Lila Kari Western University - Abstract and Biography - p 10			
10:00-10:30				Coffee Break & Poster Session*: BA 110 & 111		
10:30-12:30	SS-ME-2 Mathematical Epidemiology	SS-WSM-1 Women in Science and Mathematics	SS-HOMCFD1 High-Order Methods in Computational Fluid Dynamics	SS-ANMPDE1 Advanced Numerical Methods for PDEs and Applications	SS-ADS-1 Canada-China Session on Applied Dynamic Systems	CS-AMPRE-1 Applied Problems and Methods in Research & Education
12:30-14:00				Lunch		
14:00-15:00			Plenary Talk BA 201 - Chair: M. Cojocaru Optimization and Modeling in Energy Systems Panos Pardalos University of Florida - Abstract and Biography - p 13			
15:00-15:30				Coffee Break & Poster Session*: BA 110 & 111		
15:30-18:00	SS-ME3 Mathematical Epidemiology	SS-WSM2 Women in Science and Mathematics	SS-HOMCFD2 High-Order Methods in Computational Fluid Dynamics	SS-ANMPDE2 Advanced Numerical Methods for PDEs and Applications	SS-ADS-2 Canada-China Session on Applied Dynamic Systems	CS-AMPRE-2 Applied Problems and Methods in Research & Education
19:00-22:00			Conference Banquet. details: section 2, map: section 10			

* Posters will be on display in rooms BA 110 and BA 111 for the duration of the conference. Authors will be available for discussion during the Thursday Poster Sessions.

8.5 Friday, August 30, 2013

	Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
09:00-10:00			Plenary Talk BA 201 - Chair: M. Cojocaru Phylogenetic Analysis of the Musical Rhythms of the World Godfried Toussaint NYUAD/M.I.T/McGill - Abstract and Biography - p 15		
10:00-10:30			Coffee Break: BA Hallways		
10:30-12:50	SS-SSMBP-5 Simulations in soft matter and molecular Bio-Physics	SS-CFDRA-1 Computational Fluid Dynamics for Real Applications	CS-MECHE2 Computational Mechanics and Engineering	SS-MIPD-1 Mathematical Immunology and Pathogen Dynamics	SS-IM Industrial Mathematics
12:30-14:00			Lunch		
14:00-15:00			Plenary Talk BA 201 - Chair: M. Cojocaru Patterns of Synchrony Marty Golubitsky Ohio State University - Abstract and Biography - p 8		
15:00-15:30			Coffee Break: BA Hallways		
15:30-17:50	SS-SSMBP-6 Simulations in soft matter and molecular Bio-Physics	SS-CFDRA2 Computational Fluid Dynamics for Real Applications		SS-MIPD2 Mathematical Immunology and Pathogen Dynamics	SS-SAEEM Statistical Aspects of Environmental and Ecological Modeling
18:00-18:15			Presentation of Student and Young Researcher Awards BA101		

Friday, August 30, 2013

	Room BA202	Room BA208	Room BA209	Room BA210	Room BA211	Room BA305
09:00-10:00			Plenary Talk BA 201 - Chair: M. Cojocaru Phylogenetic Analysis of the Musical Rhythms of the World Godfried Toussaint NYUAD/M.I.T/McGill - Abstract and Biography - p 15			
10:00-10:30			Coffee Break: BA Hallways			
10:30-12:50	CS-CPC-1 Computational Physics and Chemistry	SS-MMNN Mathematical Models for Nanoscience and Nanotechnology	SS-QCTA-1 Quantum Control: Theory and Application -1	SS-DBCNDE 1 Dynamics and bifurcations in coupled networks of differential equations: theory and applications	SS-NMDAEA Numerical methods for differential-algebraic equations and applications	
12:30-14:00			Lunch			
14:00-15:00			Plenary Talk BA 201 - Chair: M. Cojocaru Patterns of Synchrony Marty Golubitsky Ohio State University - Abstract and Biography - p 8			
15:00-15:30			Coffee Break BA Hallways			
15:30-17:50	CS-CPC-2 Computational Physics and Chemistry	SS-RPSETS-1 Recent progress in spintronics: Experiment, theory and simulation	SS-QCTA-2 Quantum Control: Theory and Application -2	SS-DBCNDE 2 Dynamics and bifurcations in coupled networks of differential equations: theory and applications	SS-CMAIS Control Methods for Advanced Industrial Systems	SS-VPPO Variational Problems of Physical Origin
18:00-18:15			Presentation of Student and Young Researcher Awards BA101			

9 Detailed Conference Schedule

9.1 Monday, August 26 – 10:30 - 12:30

Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
SS-AAIP-1 Applied Analysis and Inverse Problems - 1 Session Chairs: Herb Kunze University of Guelph	SS-HPTC-1 Recent progress in hyperbolic problems: Theory and Computation - 1 Session Chairs: Tesdall, Allen CUNY College of Staten Island	SS-DG-1&SCT-1 Decisions and Games - 1, Social Choice Theory - 1 Session Chairs: Marcus Pivato, Trent University	SS-DFT-1 Density Functional Theory - 1 Session Chairs: Ian Hamilton, Paul Ayers , Viktor Staroverov Wilfrid Laurier University, McMaster University, Western	SS-SDAG Statistical Data Analysis and Geometry - 1 Session Chairs: Chenouri, Shoja University of Waterloo
10:30-10:50 #348 Fourier Transforms of Measure-valued images, self-similarity and inverse problem E.R.Vrscay University of Waterloo	10:30-10:50 #265 Estimation and propagation of volcanic source parameter uncertainty and the Eyjafjallajökull plume Patra, Abani University at Buffalo	10:30-10:50 #341 When Does Approval Voting Make the Right Choices? Kilgour, Marc Wilfrid Laurier University	10:30-11:30 #278 Variational principles in wave-functional formulations of quantum mechanics Levy, Mel (Semi-plenary, p 20) Duke University	10:30-10:50 #365 Spanifold: Spanning Tree Flattening Onto Lower Dimension Small, Christopher University of Waterloo
10:50-11:10 #409 Denoising of hyperspectral images D.Otero University of Waterloo	10:50-11:10 #563 Exponential time integration methods for wave-dominated problems Min, Misun Argonne National Laboratory	10:50-11:10 #41 Implementation of Majority Voting Rules Sean Horan Université du Québec à Montréal	11:30-11:50 #278 A new DFT approach to polarizable force-fields Verstraelen, Toon Ghent University	10:50-11:10 #369 Computational Aspects of Inference in Local Mixture Models Maroufy, Vahed University of Waterloo
11:10-11:30 #406 Numerical solution of 3D vector tomography problem with usage of singular value decomposition A.Polyakova Sobolev Institute of Mathematics SB RAS, Novosibirsk, Russia	11:10-11:30 #333 Smoothness Increasing Accuracy Conserving (SIAC) filtering for discontinuous Galerkin approximations to nonlinear hyperbolic conservation laws Ryan, Jennifer University of East Anglia	11:10-11:30 #620 Geometric Analysis of Three-Claimant Dynamic Bankruptcy Rules Jones, Michael, A. Mathematical Reviews, American Mathematical Socie	11:50-12:10 #141 Accurate Bond Dissociation Curves at Mean-Field Computational Cost: Describing Strongly Correlated Systems with Nonorthogonal Gemini Limacher, Peter McMaster University	11:10-11:30 #376 The Application of the Convex Geometry in the Generalized Method of Moments for Mixture Models Huang, Zhiyue University of Waterloo
11:30-11:50 #438 B-Spline slice-by-slice solution of 3D vector tomography problem I.Svetov IM SB RAS, Novosibirsk, Russia	11:30-11:50 #582 Shock detection of discontinuous Galerkin methods using multiwavelets Vuik, Thea Delft University of Technology	11:30-11:50 #192 Comparing Mutually Naïve and Strategic Sequential Selection Hopkins, Brian Saint Peter's University	12:10-12:30 #297 Kohn-Sham model for heavy atoms Melgaard, Michael University of Sussex	11:30-11:50#443 Computing least squares condition numbers on hybrid multicore/GPU systems Baboulin, Marc Inria and Université Paris-Sud, France
11:50-12:10 #438 A novel image registration-reconstruction framework for real-time monitoring of paraspinal tumors in radiation therapy D. Brunet Princess Margaret Hospital, University Health Network	11:50-12:10 #466 Linear Stability Analysis of the Discontinuous Galerkin Method on Uniform and Nonuniform Grids Qin, Ruibin University of Waterloo	11:50-12:10 #68 The variable choice set logit model applied to the 2004 Canadian election Gallego, Maria Wilfrid Laurier University		11:50-12:10 #456 Robustness in dimensionality reduction Liang, Jiaxi University of Waterloo
12:10-12:30 #174 Regularization Approach for Abel Transform Based Image Reconstruction by a Single Radiograph Wei, Su Hua Institute of Applied Physics and Computational Mathematics	12:10-12:30 #658 Relaxing the CFL Number of the Discontinuous Galerkin Method Krivodonova, Lilia University of Waterloo	12:10-12:30 #425 Convergence rates for the distance-based inconsistencies in pairwise comparison is examined by Monte Carlo study Koczkodaj, Waldemar W Laurentian University		12:10-12:30 #490 Quantifying the Asymptotic Coverage Probabilities of Bootstrap Confidence Regions Wang, Chunlin University of Waterloo

Room BA202	Room BA208	Room BA209	Room BA210	Room BA211
CS-MODELING-1 Partial Differential and Integral Equations in Mathematical Modeling - 1 Session Chairs: Socolowsky, Jürgen Brandenburg University of Applied Sciences	SS-MHP-1 Mathematics of human placenta: a window into fetal origins of adult disease - 1 Session Chairs: Salafia, C.M., Shlakhter, O., Yampolsky, M. Institute for Basic Research/Placental Analytics, Alberta Health Services, University of Toronto	SS-MCMMBM-1 Modeling and Computational Methods for Mathematical Biology and Medicine - 1 Session Chairs: Shontz, Suzanne, Drapaca, Corina, Sivaloganathan, Siv Mississippi State, The Penn State University, Wilfrid Laurier University	SS-MACBE-1 Modeling approaches and challenges in the built environment - 1 Session Chairs: Danks, Ryan, Carl, Michael RWDI, RWDI	CS-DSDE-1 Applications of Dynamical Systems and Differential Equations - 1 Session Chairs: Selmane, Schehrazad USTHB
10:30-10:50 #105 On a Two-Fluid Slot Coating Flow with Evaporation	10:30-10:50 #254 Why placental shape matters: a research trajectory	10:30-10:50 #45 A Study of Brain Biomechanics using Hamilton's Principle	10:30-10:50 #624 Large Scale Modelling of Human Thermal Numerical Weather and Climate Prediction for Building Science Phillips, Duncan Rowan, Williams, Davies, and Irwin Inc.	10:30-10:50 #35 Analytical Integration of the Osculating Lagrange Planetary Equations in the Elliptic Orbital Motion Hautesserres, Denis Centre National d'Etudes Spatiales
Socolowsky, Jürgen Brandenburg University of Applied Sciences	Salafia, Carolyn Placental Analytics	Drapaca, Corina The Pennsylvania State University	10:50-11:10 #371 Modeling and Pharmacokinetic Aspects for the Interaction between Beta Amyloid peptide and Choline Acetyltransferase and Acetylcholine Neurocycle and their relation to Alzheimers and Parkinsons Diseases Mustafa, Ibrahim Ryerson University	10:50-11:10 #86 Stability Analysis of a Human-Phlebotomus Papatasi-Rodent Epidemic Model
10:50-11:10 #100 Global Existence and Blow-up of Solutions for a Class of Nonlinear Nonlocal Wave Equations	10:50-11:10 #257 Translating Measures of Placental Shape into Predictors of Infant and Childhood Health	11:10-11:30 #300 Coupled Heat Transport and Darcian Water Flow in Freezing Soils	11:10-11:30 #591 Predicting nonlinearity of tumor spheroid growth in HGF media: a data-driven multi-species continuum model Konstorum, Anna University of California Irvine	11:10-11:30 #129 Energy Use Analysis at the Master Plan Level
Krupicka, Lukas Czech Technical University Prague	Shlakhter, O. Alberta Health Services	11:30-11:50 #240 Symmetry classification of a generalized variable-coefficient Gardner equation Bruzon, Maria S University of Cadiz	11:30-11:50 #137 Optimal transport and placental function	11:30-11:50 #581 Equivalence of the MTS Method and CMR Method for Delay Differential Equations Yu, Pei University of Western Ontario
11:30-11:50 #240 Symmetry classification of a generalized variable-coefficient Gardner equation Bruzon, Maria S University of Cadiz	Xia, Qinglan UC Davis	11:30-11:50 #137 Optimal transport and placental function	11:30-11:50 #536 Effect of fluid friction in fluid flow simulation in solid tumors	11:30-11:50 #145 Retention of Eventual Stability of Invariant Sets of Impulsive Differential Systems Sood, Anju Rayat Bahra College of Engineering and Nano technology for Women, Hoshiarpur
11:50 - 12:10 #299 High Concentration Vesicle Suspensions	11:50 - 12:10 # 105 Modeling and analyzing the placental vasculature	11:50 - 12:10 #315 Calcium dynamics in dendritic spines: A link to structural plasticity Dur-e-Ahmad, Muhammad Lahore University of Management Sciences	11:50 - 12:10 #585 Numerical Computational Methods and Applications in Building Ventilation Li, Eric Rowan, Williams, Davies, and Irwin Inc.	11:50 - 12:10 #147 Scattering states of a particle, with position dependent mass, in a double heterojunction Sinha, Anjana Jadavpur University
Quaife, Bryan University of Texas	Yampolsky, Michael University of Toronto	12:10 - 12:30 #482 Discussion	12:10 - 12:30 #482 A Machine Learning Tool for Automated Image Segmentation Shontz, Suzanne Mississippi State University	12:10 - 12:30 #154 A new multi-stage spectral relaxation method for solving chaotic initial value systems Dlamini, Phumlani University of Johannesburg, South Africa

9.2 Monday, August 26 – 15:30 - 17:30

Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
SS-AAIP-2 Applied Analysis and Inverse Problems - 2	SS-HPTC-2 Recent progress in hyperbolic problems: Theory and Computation - 2	SS-DG-2& SCT-2 Decisions and Games - 2, Social Choice Theory - 2	SS-DFT-2 Density Functional Theory - 2	SS-RWFDNO Continuous-time random walks, fractional diffusion and non-local operators: Applications
Session Chairs: Herb Kunze University of Guelph	Session Chairs: Allen Tesdall CUNY College of Staten Island	Session Chairs: D. Marc Kilgour Wilfrid Laurier University	Session Chairs: Ian Hamilton, Paul Ayers, Viktor Staroverov Wilfrid Laurier University, McMaster University, Western Ontario	Session Chairs: Meerschaert, M., Scalas, E. Michigan State University, University of Eastern Piedmont
15:30 - 15:50 #552 On the application of Adjoint methods in subsurface flow simulations L.Bush University of Wyoming	15:30-15:50 #566 A Generalized Sign-Changing Liouville Equation Saxton, Ralph University of New Orleans	15:30-16:30 #319 Fair Division Brams, Steven (Semi-plenary, p 17) New York University	15:30-15:50 #281 Constrained 1DM Algorithm with Fractional Occupations Chan, Matthew McMaster University	15:30-15:50 #79 Correlation structure of fractional Pearson diffusions Sikorskii, Alla Michigan State University
15:50 - 16:50 #17 On an inverse and ill-posed of autoconvolution type in ultra-short laser. Hofmann, Bernd (Semi-plenary, p 18) Chemnitz University of Technology, Department of Mathematics	15:50 - 16:10 #543 Special Solutions in Smectic Electroconvection Pugh, Mary University of Toronto	16:30 - 16:50#117 Ranking Multidimensional Alternatives and Uncertain Prospects Pivato, Marcus Trent University	15:50 - 16:10 #290 Energy Decomposition Analysis with Occupation Constraints Gonzlez Espinoza, Cristina Elizabeth McMaster University	15:50 - 16:10 #114 CTRWModel for Fractional Wave Equations Meerschaert, Mark M Michigan State University
16:50 - 17:10 #302 Changes in habitat of fish population:an inverse problem K.Levere University of Guelph	16:10 - 16:30 #514 Effects of Nonstrict Hyperbolicity on Singularity Formation Saxton, Katarzyna Loyola University, New Orleans	16:50 -17:10#246 Degree of Difficulty: A fundamental Problem in Contest Design Gerchak, Yigal Tel-Aviv University	16:10 - 16:30 #608 Variational Hirshfeld Ensemble Heidar Zadeh, Farnaz McMaster University	16:10 - 16:30 #136 Continuous-time Random Walk from a Continuous Double Auction Scalas, Enrico DISIT, Universita del Piemonte Orientale, Italy 16:30 - 16:50 #222 Analysis for Nonlinear Equations Involving Space Fractional Diffusion Schwab, Russell Michigan State University
	16:30 - 16:50 #96 Fast Sweeping Methods for Steady State Problems for Hyperbolic Conservation Laws Chou, Ching-Shan Ohio State University	17:10-17:30 #243 Bargaining with Uncertain Commitment: On the Limits of Disagreement Dutta, Rohan McGill University	16:30 - 16:50 #607 Conceptual Density-Functional Theory Formulation of a General-Purpose Reactivity Indicator: Beyond the Classic Reactivity Paradigms Anderson, James Peking University 16:50-17:10 # 156 Kohn-Sham effective potentials from density and correlated wavefunctions	16:50 - 17:10#248 Numerically efficient stochastic solution of the space-time fractional diffusion equation through Monte Carlo simulation of continuous-time random walks Germano, Guido Philipps-Universität Marburg 17:10 - 17:30 #349 Applications of Random Renormalization Group Operators O'Malley, Daniel Purdue University
	16:50-17:10#411 Isentropic Flow with Large Data Jenssen, Kris Penn State University		Cuevas-Saavedra, Rogelio Western Ontario 17:10 - 17:30 #115 Toward approximating the exchange-correlation potential by explicit modeling of the exchange-correlation charge distribution Kohut, Sviataslav Western Ontario	

Room BA202 SS-CSB Computations in Systems Biology	Room BA208 SS-MHP-2 Mathematics of human placenta: a window into fetal origins of adult disease - 2	Room BA209 SS-MCMBM-2 Modeling and Computational Methods for Mathematical Biology and Medicine - 2	Room BA210 SS-MACBE-2 Modeling approaches and challenges in the built environment - 2	Room BA211 CS-DSDE-2 Applications of Dynamical Systems and Differential Equations - 2
Session Chairs: Hin Hark Gan, Gaurav Arya NYU,UCSD	Session Chairs: C.M. Salafia, O. Shlakhter, M. Yampolsky Placental Analytics, Alberta Health Services, University of Toronto	Session Chairs: Suzanne Shontz, Drapaca, Corina, Sivaloganathan, Siv Mississippi State, Penn State,Wilfrid Laurier University	Session Chairs: Danks, Ryan, Carl , Michael RWDI,RWDI	Session Chairs: Ncube, Israel Memorial University of Newfoundland
15:30 - 15:50 #564 Genome organisation influences cell type-specific transcriptional programs	15:30 - 15:50 # 256 Human Placenta The Interface for Two Vascular Systems	15:30 - 15:50 #310 Cluster Newton Method for Sampling Multiple Solutions of an Underdetermined Inverse Problem: Parameter Identification for Pharmacokinetics	15:30 - 15:50 #05 Analytical study of wave run-up generated by bottom motion on a non-uniformly sloping beach	15:30 - 15:50 #16 Extension of Leighton's criteria to nonlinear dynamic equations of neutral type
Mitchell, Jennifer University of Toronto	Miller, Richard University of Rochester	De Sterck, Hans University of Waterloo	Bandyopadhyay, Arghya Khalisani College, Chandannagar, India	Tripathy, Arun Kumar Sambalpur University
15:50 - 16:10 #262 3-D Higher-Order Folded Chromosome Conformations From 2-D Interaction Frequency Maps	15:50 - 16:10 # 249 Efficient methods for detecting low-rank substructure	15:50 - 16:10 #176 The mechanism underlying the therapeutic effects of Vitamin C against cancer, at pharmacological concentrations	15:50 - 16:10 #52 A Cantor Set Model of Earthquake Dynamics in Aftershock Sequences	15:50 - 16:10 #380 Nutrient transport through heterogeneous soil medium
Arya, Gaurav University of California,San Diego	Rangan, Aadyta NYU	Molavian, Hamid University of Waterloo	Kamal, Kamal Indian Institute of Technology Roorkee	Kumar, Atul University of Lucknow, India
16:10 - 16:30 #303 Evidence of Evolutionary Couplings in Chlamydomonas Metabolic Network	16:10 - 16:30 #199 Metabolic Scaling Law for Mouse Fetal and Placental Weight	16:10 - 16:30 #151 The Effects of Body Fluid on Cheyne-Stokes Respiration	16:10 - 16:30 #101 Applicability of a Diffusion Model for Cosmic Ray Transport during Large Forbush Decrease Events	16:10 - 16:30 #382 Stability in a distributed delay differential equation
Salehi-Ashtiani, Kourosh NYU Abu Dhabi	Gasperowicz, Małgorzata University of Calgary	Willms, Allan University of Guelph	Kalugin, German Natural Resources Canada	Ncube, Israel Memorial University of Newfoundland
16:30-16:50 #460 Translational Systems Biology: understanding the limits of animal models as predictors of human biology	16:30-16:50 # 107 Modeling Oxygen Transport in the Inter-Villous Space of the Human Placenta	16:30-16:50 #143 Modeling Cell-Sheets Wound Closure	16:30-16:50 #121 Minimum Stack Height for Micro Aerosols Air Pollution	16:30-16:50 #396 Control of the Landau-Lifshitz Equation
Rhrissorakrai, Kahn IBM	Grebennikov, Denis Laboratory of Condensed Matter Physics, CNRS - Ecole Polytechnique	Habbal, Abderrahmane University Nice Sophia Antipolis and INRIA	Malek, Alaeddin Tarbiat Modares University	Chow, Amenda University of Waterloo
16:50-17:10 #503 Accelerated molecular dynamics simulations and community network analysis reveal allosteric signaling pathways in a lectin-binding chaperone Calreticulin	16:50-17:10 #449 Human Placenta The Interface for Two Vascular Systems	16:50-17:10 #472 Weakly compressible tube flow with radially dependent viscosity and Navier slip at the wall	16:50-17:10 #313 An Input-Output Analysis Approach in Waste of Electrical and Electronic Equipments	16:50-17:10 #402 Feedback Stabilization of Impulsive Underactuated Mechanical Systems by Using Lyapunov Constraints
Arora, Kaurnesh University of Michigan	Salafia, Carolyn Placental Analytics	Regmi, Laxmi Ryerson University	Ulukan, Ziya Galatasaray University	Chaalaal, Mohammed Houari Boumediene University of Sciences and Technology
17:10-17:30 #370 Investigating Oscillatory Phenomena in the Continuous Bioreactor for Production of Bioethanol Using Zymomonas Mobilis	17:10-17:30 Discussion	17:10-17:30 #481 Myelosuppression and cytokine interaction in a mathematical model of the human hematopoietic system	17:10-17:30 #586 Activity Recognition for Remote and Self-monitoring using Android Smartphones	17:10-17:30 #586 Activity Recognition for Remote and Self-monitoring using Android Smartphones
Mustafa, Ibrahim Ryerson University		Bélair, Jacques Université de Montréal		Kamal, Ankit University of Waterloo
17:30 - 17:50 # 362 Mechanics of microRNA-mediated translational regulation				
Gan, Hin Hark NYU				

9.3 Tuesday August 27–10:30 - 12:30

Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
SS-AAIP-3 Applied Analysis and Inverse Problems-1	SS-HPTC-3 Recent progress in hyperbolic problems: Theory and Computation-1	SS-DG&SCT-3 Decisions and Games & Social Choice Theory-1	CS-CACO-1 Computational Algebra, Combinatorics and Optimization	SS-MSEPSW-1 Multitaper Spectrum Estimation, Prolate Spheroidal Wave Functions, Quadratic-Inverse, and Related Problems
Session Chairs: Kimberly Levere University of Guelph	Session Chairs: Lilia Krivodonova University of Waterloo	Session Chairs: Marcus Pivato Trent University	Session Chairs: Aghayan Reza Kingston University, London	Session Chairs: W. Burr, C. Haley, D.J. Thomson Queen's University
10:30-10:50 #49 Designing a search grid for parameter estimation using sensitivity analysis. Van der Wee�n, Pieter Ghent University	10:30-10:50 #81 High Order Limiters for Hyperbolic Equations Berzins, Martin University of Utah	10:30-10:50 #317 Condorcet VS Borda, round n + 1 Zwicker, William S. Union College	10:30-10:50 #88 Highly Accurate Solution of Ordinary Differential Equation with Singularity Arising in Fluid Dynamics Pratibha, Pratibha Indian Institute of Technology Roorkee	10:30-10:50 # 493 Signal and Spectral Estimation on a Sphere Plattner, A. Princeton University
10:50-11:10 #468 Parameter state range for ODE models using monotonic linear multistep discretizations Skelton Andrew University of Guelph	10:50-11:10 #432 A Fourth-Order Solution-Adaptive CENO Scheme for Three-Dimensional Multi-Block Cubed-Sphere Grids Ivan, Lucian University of Waterloo	10:50-11:10 #194 Analogy in decision making Amarante, Massimiliano Universit� de Montr�al	10:50-11:10 #171 New Approach for solving the Linear Assignment Problem Gningue, Youssou Laurentian University, Sudbury, Canada	10:50-11:10 #417 Estimating evoked brain connectivity with discrete prolate spheroidal stimulation Lepage, Kyle Boston University
11:10-11:30 #488 The inverse problem of Fractal Potential Flows Vass, J�szef University of Waterloo	11:10-11:30 #109 The design of a class of positivity preserving high order Lagrangian schemes for multi-material compressible flow Cheng, Juan Institute of Applied Physics and Computational Mathematics	11:10-11:30 #193 Enumeration and Connections for Extensive-Form Games Hopkins, Brian Saint Peter's University	11:10-11:30 #209 Nondeterministic relational fuzzy operators Tchier, Fairouz King Saud University	11:10-11:30 #414 Discrete Prolate Spheroidal Sequences as Filters in Generalized Additive Models Burr, Wesley Queen's University
11:30-11:50 #568 The Monge-Kantorovich metric in application Mendivil, Franklin Acadia University	11:30-11:50#528 A numerical investigation into high-order multiderivative integrators for hyperbolic conservation laws Seal, David Michigan State University	11:30-11:50 #577 Fast Equilibrium Computation for Infinitely Repeated Games Andersen, Garrett Duke University	11:30-11:50 #292 Bias, Noise, and Indeterminacy Correction in Numerically Invariant Signatures Aghayan, Reza Kingston University London	11:30-11:50 #470 Spectral Coherence Evidence for Oceanic Control of Interannual Carbon Cycle Feedbacks Park, Jeffery Yale University
11:50-12:10 #359 Inverse problems for delay differential equations using the Collage Theorem Yodzis, Michael University of Guelph	11:50-12:10 #655 Glancing weak Mach reflection Tesdall, Allen CUNY College of Staten Island	11:50-12:10 #215 Selfish driving behaviour and its effects on highway traffic Nguyen, Sylvia University of Guelph	11:50-12:10 #418 Design and Application of Fault-Tolerant Circulant Digraph Networks Farrag, A. Dalhousie University	11:50-12:10 #500 Localized Band-Limited Representation and Robust Interpolative Image Manipulation Xiao, H. UC Davis
12:10-12:30#571 Gravitational wave parameter estimation with compressed likelihood evaluations Field, Scott University of Maryland	#284 Hyperbolic Descriptions of Viscous Heat-Conducting Gaseous Flows and Their Solution Groth, Clinton University of Toronto	12:10-12:30 #123 On the existence of Berge equilibrium with pseudocontinuous payoffs Deghdak, Messaoud W Universit� Mentouri, Constantine, Algeria	12:10-12:30 #351 Solving the simple Transportation Problem by using the Modified Vogel Approximation method Gningue, Youssou Laurentian University, Sudbury, Canada	12:10-12:30 #572 Paleoclimate time scale estimation using multitaper spectral methods Hinnov, Linda Johns Hopkins University

Tuesday, August 27 – 10:30 - 12:30

Room BA202	Room BA208	Room BA209	Room BA210
SS-CDPB-1 Complex Dynamics of Population Behaviour - 1 Session Chairs: Stephen Tully, Scott Greenhalgh, Chad Wells, Chris Pagnutti Guelph,Yale, Yale, Guelph	SS-NCTAP-1 New Computational Techniques for Applied Problems in Science and Engineering - 1 Session Chairs: Ludwig Kohaupt, Yan Wu	SS-CPH Computational Photonics Session Chairs: Marek Wartak, Harry E. Ruda	CS-FINANCE-1 Financial Mathematics and Computation - 1 Session Chairs: Pirvu , Traian
10:30-10:50 #473 Modelling Awareness and Adoption: Aggregate Behaviour versus Agent-Based Interactions with Network Effects Erin Wild University of Guelph	10:30-10:50 # 474 Solving a Large Scale Thermal Radiation Problem Using an Interoperable Executive Library Framework on Petascale Supercomputers Wong, Kwai University of Tennessee	10:30-10:50 #10 Mathematical and Computational Modeling of Noise Characteristics of Channel Amplifiers Shymanska, Alla Auckland University	10:30-10:50 #63 Utility Indifference Pricing: A Time Consistent Approach Pirvu, Traian McMaster University
10:50-11:10 #301 Coevolution of risk perception, sexual behaviour, and HIV transmission in an agent-based model Stephen Tully University of Guelph	10:50-11:10 # 36 On the vibration-suppression property and monotonicity behavior of a special weighted norm for dynamical systems $\dot{x} = Ax, x(t_0) = x_0$ Kohaupt, Ludwig Beuth University of Technology Berlin	10:50-11:10 #205 On the numerical solution of chromatographic separation models Tuomela, Jukka University of Eastern Finland	10:50-11:10 #113 A Monte Carlo Measure to Improve Fairness in Equity Analyst Evaluation Yaros, John Rutgers University
11:10-11:30 #94 Agent-Based Modeling of Emotional Communications in Online Social Networks: The Role of Offline Processes in Online Bursting Events Bosiljka Tadic Jozef Stefan Institute	11:10-11:30 #228 Structure-Preserving Simulation of Mechanical Systems Ball, Kenneth North Carolina State University	11:10-11:30 #283 Predicting Optimal Finite Field Strengths Leading to Most Precise Calculations of Nonlinear Optical Properties Mohammed, Ahmed McMaster University	11:10-11:30 #172 Investigating the Market Price of Volatility Risk for Options in a Regime-Switching Market Mielkie, Melissa University of Western Ontario
11:30-11:50 #596 Equation-based and Agent-based models of adoption behaviour in multi-dimensional characteristics space Monica Cojocaru University of Guelph	11:30-11:50#559 Solution of Wiener-Hopf and Fredholm integral equations by fast Hilbert and Fourier transforms Germano, Guido Philipps-Universität Marburg	11:30-11:50 #451 Near and Far Fields in High Quality Resonances of a Periodic Grating Byelobrov, Volodymyr IRE NASU	11:30-11:50 #218 Pricing exotic options under the time-changed Brownian motion model by variance reduction and quasi-Monte Carlo methods Tan, Qiuizi Wilfrid Laurier University
11:50-12:10 #515 Outcome inelasticity and outcome variability in behavior-incidence models: an example from an SEIR infection on a dynamic network Bryce Morsky University of Guelph	11:50-12:10 #578 Interactive computational search strategy of periodic solutions in an essentially nonlinear dynamics Kaushik, Aditya Panjab University, Chandigarh	11:50-12:10 #551 Iterative analytic approximation to nonlinear convection dominated systems Guclu, Yaman Michigan State University	11:50-12:10 #220 Pricing and Hedging Index Options with a Dominant Constituent Stock Cheyne, Helen University of Western Ontario
12:10-12:30#324 Chaos in an unforced Malaria Model Miranda Teboh-Ewungkem Lafayette College	12:10-12:30# ... TBA	12:10-12:30#269 Robust Second-order least-squares estimation for regression with autocorrelated error: application of FMW and Generalized M-Estimates based methods Bradley, Jonathan Wilfrid Laurier University	12:10-12:30 #269 Rosadi, Dedi Gadjah Mada University

Tuesday, August 27 – 10:30 - 12:30

Room BA211

CS-DSDE-3

Applications of Dynamical Systems and Differential Equations - 3

Session Chair:

Selmane, Schehrzad
USTHB

10:30-10:50 #480

Spectral approach in a 2D variational formulation for swirling flows in ducts with variable radius

Dragomirescu Ioana
Politehnica University Timisoara
10:50-11:10 #496

Dynamics of a modified Leslie-Gower predator-prey model with Crowley-Martin functional responses and stochastic perturbations

Ali, Namaat
MIA, University La Rochelle

11:10-11:30 #638

Chaotic flow in single phase natural circulation loops

Ardaneh, Kazem
University of Tsukuba, Japan

11:30-11:50 #610

Hybrid Fixed Point Theorem For Abstract Measure Delay Integro-Differential Equations

Bellalle Sidheshwar
Dayanand Science College, Latur
11:50-12:10 #615

Triple positive solutions of m point p-Laplacian boundary value problem involving the derivative on time scales

Dogan, Abdulkadir
Abdullah Gul University

12:10-12:30 #663

Replicator dynamics vs. agent-based models of Axelrod's norms game

Monica Gabriela Cojocaru
University of Guelph

Room BA305

CS-MODELING-2

Partial Differential and Integral Equations in Mathematical Modeling - 2

Session Chair:

Pirvu, Traian
McMaster University

10:30-10:50 #355

On Optimal Vortex Structures for Palinstrophy Generation

Ayala, Diego
McMaster University

10:50-11:10 #358

Numerical simulation of potential Maxwell's equations in harmonic regime

Ortegón, Francisco G.
University of Cadiz

11:10-11:30 #394

Kinetic and Material Property Effects on Fingering Instability in Reverse Smoldering Combustion

Ijioma, Ekeoma Rowland
Meiji Institute of Advanced Mathematical Sciences

11:30-11:50 #439

A free boundary approach to solve the equilibrium equations of a membrane

Viglialoro, Giuseppe
University of Cadiz

11:50-12:10 #453

Bounds on dispersion tensor in periodic media

Smaranda, Loredana
University of Pitesti

12:10-12:30 #539

A Mathematical Cellular Potts Model for Growth and Migration of Endothelial Cells

Soltani, Madjid
University of Waterloo

9.4 Tuesday, August 27 – 15:30 - 17:30

Room BA101	Room BA102	Room BA111	Room BA112
SS-AAIP-4 Applied Analysis and Inverse Problems - 4	SS-HPTC-4 Recent progress in hyperbolic problems: Theory and Computation - 4	SS-DFT-3 Density Functional Theory - 3	SS-MSEPSW-2 Multitaper Spectrum Estimation, Prolate Spheroidal Wave Functions, Quadratic-Inverse, and Related Problems - 2
Session Chairs: Kimberly Levere University of Guelph	Session Chairs: Lilia Krivodonova University of Waterloo	Session Chairs: Ian Hamilton, Paul Ayers , Viktor Staroverov Wilfrid Laurier University, McMaster University, Western Ontario	Session Chairs: W. Burr, C. Haley, D.J. Thomson Queen's University
15:30-15:50 #182 Iterative Techniques for Nonlinear Periodic Boundary Value Problems via Initial value problem Dezern, David Winston-Salem State University	15:30-15:50 #69 Compressible Navier-Stokes equations with temperature dependent dissipation Pan, Ronghua Georgia Institute of Technology	15:30-15:50 #170 Free energies of adsorption and activation energies for organo-arsenicals at the liquid/solid interface a computational study. Adamescu, Adrian University of Waterloo	15:30-15:50#611 Multitaper Smoothed Minimum Statistics Noise Power Estimation Castellanos, R. Florida Atlantic University
15:50-16:10 #452 The Scientific Way to Simulate Pattern Formation in Reaction-Diffusion Equations Cleary, Erin University of Guelph	15:50-16:10 #106 Conservation Laws with no Classical Riemann Solutions: Existence of Singular Shocks Tsikkou, Charis Department of Mathematics, West Virginia University	15:50-16:10 #102 A density functional theory of hydrogen transfer for short-chain alkane thiols on small cationic, anionic, and neutral gold clusters Smith, Silvija Wilfrid Laurier University	15:50-16:10 #545 Multitaper Spectrum Estimation and Quadratic-Inverse Theory: from Conception to Present Thomson, David Queen's University
16:10-16:30 #155 Regularizing a Volterra integral equation of the first kind Subbey, Sam Institute for Marine Research, Norway	16:10-16:30 #423 Normal forms and a Burgers-Hilbert equation Hunter, John University of California at Davis	16:10-16:30# 188 Computational Chemistry Studies On Atmospherically-Relevant Organic Complexes With Iron Jones, Glynis Wilfrid Laurier University	16:10-16:30 #230 Analysis of Multitaper Covariance and Autoregressive Spectral Estimates Erdol, Nurgun Florida Atlantic University
16:30-16:50 #360 On set-valued nonlinear Fredholm integral equations Kunze, Herb University of Guelph 16:50-17:10	16:30-16:50#280 Two-dimensional Riemann problems for conservation laws and shock reflection Jegdic, Katarina University of Houston - Downtown 16:50-17:10 #640 Recent Progress Towards Periodic Solutions of the Euler Equations Young, Robin University of Massachusetts, Amherst	16:30-16:50 #229 Accurate ab initio spin densities Boguslawski, Katharina ETH Zurich 16:50-17:10 #233 Towards reliable modeling of excited states of actinides from (relativistic) time-dependent density functional theory Tecmer, Pawel McMaster University	16:30-16:50 #422 Jackknifing Multitaper Auto-correlation Estimate Haley, Charlotte Queen's University 16:50-17:10

Tuesday, August 27 – 15:30 - 17:30

Room BA202	Room BA208	Room BA210	Room BA211	Room BA305
SS-CDPB-2 Complex Dynamics of Population Behaviour - 2 Session Chairs: Stephen Tully, Scott Greenhalgh, Chad Wells, Chris Pagnutti Guelph,Yale, Yale, Guelph	SS-NCTAP-2 New Computational Techniques for Applied Problems in Science and Engineering - 2 Session Chairs: Ludwig Kohaupt, Yan Wu Beuth University of Technology Berlin,Georgia Southern University	CS-FINANCE-2 Financial Mathematics and Computation - 2 Session Chairs: Pirvu, Traian McMaster University	CS-BSM-1 Mathematics and Computation in Biological Sciences and Medicine - 1 Session Chairs: Nikolaev, Alexei The Graduate Center, CUNY	CS-MODELING-3 Partial Differential and Integral Equations in Mathematical Modeling - 3 Session Chairs: Socolowsky, J. Brandenburg University of Applied Sciences
15:30-15:50 #311 Adaptation and parasite virulence in an increasingly connected world	15:30-15:50 #150 Discretization of Fractional Order Differentiator Over Paley-Wiener Space	15:30-15:50 #384 Valuation of the Peterborough Prison Bond	15:30-15:50#19 Effect of boundary absorption on dispersion of solute in a pulsatile Casson fluid flow	15:30-15:50# 609 Mixed problems for the Telegraph Equation in the Case of a System Consisting of N Segments with different Densities and Elasticities but Equal Impedances
Wild, Geoff University of Western Ontario	Wu, Yan Georgia Southern University	Hasan, Majid Western University,	Thomas-Sebastian, Binil University of West Indies	Smirnov,Ilyas Lomonosov Moscow State University
15:50-16:50 #600 Ecological and Epidemiological Drivers of Viral Evolution	15:50-16:50 #631 Boundary Conditions for Constrained Hyperbolic Systems: Mathematical and Numerical Analysis	15:50-16:10 #371 Basket Option Pricing with Levy Processes using Mellin Transforms	15:50-16:10 #270 A Note on Malthus parameter-Dependent Conservation Law in Population Dynamics	15:50-16:10 #541 Symbolic-Numerical Methods for some Special Functions Involved in Groundwater Hydrodynamics
Klein, Eili (Semi-plenary, p 19) Johns Hopkins University	Tarfulea, Nicolae (Semi-plenary, p 22) Purdue University Calumet	Manuge, Derek University of Guelph	Obabiyi, Olawale Sunday University of Ibadan	Bagayogo A.Bass University of Saint-Boniface
16:50-17:10 #234 The evolution of competitive helping within biological markets	16:50-17:10 #159 Matrices of Green's Type for Sets of Laplace Equations Posed on Joint Surfaces of Revolution Weakened with Apertures	16:10-16:30 #413 Simulation of Greeks of multiset options under exponential subordinated Brownian motion models by Malliavin calculus and quasi-Monte Carlo methods	16:10-16:30 #126 Nonlinear Robust Control and Regulation problems for Biomedical Dynamical Systems	16:10-16:30 # 477 Convergence of the Lagrange-Galerkin method for the equations modelling of fish-like swimming
Barclay, Pat University of Guelph 17:10 -17:30#179 Outlook on a global forest transition	Borodin, Volodymyr Middle Tennessee State University	Tan, Qiuzi Wilfrid Laurier University 16:30-16:50 #567 Fast pricing of discretely monitored exotic options using the Spitzer identity and Wiener-Hopf factorization	Belmiloudi, Aziz IRMAR-INSA of Rennes 16:30-16:50 #186 Optimal Control of Bioheat Equation using Semigroups	Smaranda, Loredana University of Pitesti 16:30-16:50 #21 Modelling, Simulation and Optimization of Gas Flow in an Exhaust Pipe
Pagnutti, Chris University of Guelph		Germano, Guido Philipps-Universitat Marburg 16:50-17:10 #639 CVaR Robust Mean-CVaR Portfolio Optimization	Malek, Alaeddin Tarbiat Modares University 16:50-17:10#237 A Model of Clusters in Binary and Ternary Strings Applied to Protein Secondary Structure Prediction	Rybicki, Martin University of Hamburg
		Salahi, Maziar University of Guilan 17:10-17:30 #169 Climate Change and Heavy Rainfall-related Water Damage Insurance Claims and Losses in Ontario, Canada	Nikolaev, Alexey The Graduate Center, CUNY	
		Cheng, Chad Shouquan Environment Canada		

9.5 Wednesday, August 28 – 10:30 - 12:30

Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
SS-SSMBP-1 Simulations in soft matter and molecular Bio-Physics - 1 Session Chairs: Trang Do University of Waterloo	SS-HPTC-5 Recent progress in hyperbolic problems: Theory and Computation - 5 Session Chairs: Jae-Hun Jung SUNY at Buffalo	SS-MFMCR-1 Mathematical Finance Modelling, Computation and Risk Management - 1 Session Chairs: Joe Campolieti, Adam Metzler Wilfrid Laurier University	SS-LSNE-1 Lie symmetry and other approaches in theory and applications of nonlinear equations - 1 Session Chairs: C.M.Khalique, M.Abdulaiib NorthWest University,RSA, Texas A&M University	SS-GLS Geocomputational landscapes and spaces Session Chairs: Steven A.Roberts, Colin Robertson Wilfrid Laurier University
10:30-10:50 #323 Using hybrid molecular dynamics-lattice Boltzmann simulations to study polymers and porous particles in confined environments Denniston,Colin University of Western Ontario	10:30-10:50 #334 We establish local well-posedness in Sobolev spaces, and almost global solutions for small localized data for an infinite bottom water wave equation in 2D. Ifrim, Mihaela McMaster University	10:30-10:50 #266 Interconnected Balance Sheets, Market Liquidity, and the Amplification Effect in a Financial System Chen, Nan The Chinese University of Hong Kong	10:30-10:50 #60 Exact Solutions of a (3+1)-dimensional B-type Kadomtsev-Petviashvili Equation Abudiab,Mufid Texas A&M University-Corpus Christi	10:50-11:10#499 Evolutionary Multi-objective Optimization Design for Peri-urban Greenlands Systems: metric implementations Roberts, Steven Wilfrid Laurier University
10:50-11:10 #429 Coarse-Grained Atomistic Modeling of Colloid Crystallization and Glass Formation with Phase Field Crystal Methods Berry,Joel McMaster University	10:50-11:10 #367 Absorbing boundary conditions for quantum relativistic mechanics Lorin, Emmanuel Carleton University	10:50-11:10 #538 Illiquidity and Insolvency: a Double Cascade Model of Financial Crises Hurd, Tom McMaster University	10:50-11:10 #457 Symmetry analysis and exact solutions of semilinear Schrodinger equations Anco, Stephen Brock University	10:50-11:10#407 Reducing Objectives in Many-Objective Optimization Problems for Landscape Design Cruz Cortes, Nareli Instituto Politecnico Nacional (CIC-IPN)
11:10-11:30 #489 Colloidal Particles Interacting in a Cholesteric Liquid Crystal Mackay, Frances University of Western Ontario	11:10-11:30 #475 An Efficient Implicit Boundary Integral Solver for the Vlasov-Maxwell System Causley, Matthew Michigan State University	11:10-11:30 #120 Trends and trades Hadjiliadis, Olympia Brooklyn College	11:10-11:30 #196 Symmetry reductions and exact solutions of a generalized Fisher equation Gandarias,Maria Luz University of Cadiz	11:10-11:30#547 Map Comparisons and Model Checking: A Comparative Analysis Robertson,Colin Wilfrid Laurier University
11:30-11:50 #321 Phase Field Crystal Modelling of Magneto-Elastic Effects in Isotropic Ferromagnetic Solids Faghghi, Niloufar McGill University	11:30-11:50 #183 Nonlinear wave interaction for the ultra-relativistic Euler equations Abdelrahman, Mahmoud Otto-von-Guericke, Magdeburg, Germany	11:30-11:50 #616 Stochastic correlation in financial markets Seco, Luis University of Toronto	11:30-11:50 #272 The effects of the singular lines in nonlinear wave equations Zhang,Lijun Zhejiang Sci-Tech University	11:30-11:50#574 LSP-GIS Method for Urban Land Suitability Decision-Making Dragicevic, Suzana Simon Fraser University
11:50-12:10 #327 Colloidal disks in nematic liquid crystals under the action of magnetic fields Antipova, Alena University of Western Ontario	11:50-12:10 #588 On the solution of dispersive evolution equations with discontinuous data Biondini, Gino State University of New York at Buffalo	11:50-12:10 #175 Explosive behavior in a lognormal interest rate model Pirjol, Dan JPM	11:50-12:10 #291 Power geometry for a reversible system of ordinary differential equations Soleev, Akhmadjon Samarkand State University, Uzbekistan	11:50-12:10#581 Comparing Interpolation Techniques for Predicting Rainfall in Tropical Climates Plouffe, Cameron Wilfrid Laurier University
12:10-12:30 #522 Pattern non-pattern transition for a nonlocal population dynamics Oliveira, Fernando University of Brasilia		12:10-12:30 #524 Hedging Bond Returns with Equity Costanzino, Nick Scotiabank	12:10- 12:30 #308 Application of Homotopy Perturbation Method with an Auxiliary Term for Nonlinear Dropping Equations Arisen In Packaging System Wang, Jun Jiangnan University,China	12:10-12:30#424 Approximations to Intractable Spatial Econometric Models and Their Solutions Through Global Optimization Wachowiak-Smolikova, Renata Nipissing University

Room BA202	Room BA208	Room BA209	Room BA210	Room BA211
SS-CDPB-3 Complex Dynamics of Population Behaviour Session Chairs: Stephen Tully, Scott Greenhalgh, Chad Wells, Chris Pagnutti Guelph, Yale, Yale, Guelph	SS-NCTAP-3 New Computational Techniques for Applied Problems in Science and Engineering Session Chairs: Ludwig Kohaupt, Yan Wu Beuth University of Technology Berlin, Georgia Southern University	SS-RTDEDS-1 Recent trends in differential equations and dynamical systems Session Chairs: Xinzhi Liu, Mohamad Alwan, Hongtao Zhang University of Waterloo	CS-FINANCE-3 Financial Mathematics and Computation Session Chairs: Pirvu, Traian McMaster University	CS-BSM-2 Mathematics and Computation in Biological Sciences and Medicine Session Chairs: Blahut, Kenneth Ryerson University
10:30-10:50 #80 Incentives' Effect in Influenza Vaccination Policy C. Yamin, Dan Yale University	10:30-10:50 #529 Nonconforming Generalized Finite Element Method for Linear Parabolic Interface Problems Tarfulea, Nicolae Purdue University Calumet	10:30-10:50 #16 Orthogonal separation of variables in spaces of constant curvature R. Smirnov Dalhousie University	10:30-10:50 #195 Parametric Estimation of Stationary Stochastic Process under indirect Observability Ren,Peng University of Huston	10:30-10:50#372 Modeling and Simulation for the Effect of Beta Aggregates on Acetylcholine Neurocycle through Choline Leakage Hypothesis Awad, Asmaa University of Waterloo
10:50-11:10 #127 Policy resistance undermines superspreadер vaccination strategies for influenza Wells,Chad Yale University	10:50-11:10 #304 Integration of Inventory Decisions and Supplier Selection to Optimum Design of Cellular Manufacturing Systems: A Stochastic Solution Space Ghezavati, Vahidreza I.A.U. South Tehran Branch	10:50-11:10 #84 Power geometry for a reversible system of ordinary differential equations Soleev, Akhmadjon Samarkand State University	10:50-11:10 #276 American option pricing under time-changed Brownian motion models Tse, Long Yiu Wilfrid Laurier University	10:50-11:10 #273 Modeling Blood Flow in a Brain Tumor Treated Concurrently with Radiotherapy and Chemotherapy Roy, Ranadhir University of Texas-Pan American
11:10-11:30 #350 A new multi-strain dynamic influenza model Thommes, Edward University of Guelph & GSK Canada	11:10-11:30 #542 Simulation of a Tumor Growth Model Based on an Adaptive Markov Chain Monte Carlo (AMCMC) Method Wang, Qing Shepherd University,USA	11:10-11:30 #103 Higher order functional boundary value problems via the lower and upper solutions method - applications Fialho, Joao College of the Bahamas	11:10-11:30 #502 Optimal Annuitization Timing With Stochastic Interest Rates Wang, Jinlian York University	
11:30-11:50 #268 The effects of vaccination preferences and perceived risk on the spread of influenza Greenhalgh, Scott Yale University	11:30-11:50 #157 Exploring Stochasticity and Imprecise Knowledge Based on Linear Inequality Constraints Subbey, Sam Institute for Marine Research, Norway	11:30-11:50 #152 A class of reaction-diffusion systems with mixed initial conditions Rosu, Daniela "G. Asachi" Technical University, Iasi, Romania	11:30-11:50 #643 Weather Derivatives and Applications in Canadian Data Cui, Kaijie University of Calgary	11:30-11:50 #465 Backward Bifurcation in a CTMC based model for the Transmission Dynamics of Dengue Fever Khan, Adnan Lahore University of Management Sciences
11:50-12:10 #516 Modelling homophilic imitation with replicator equations Morsky, Bryce University of Guelph	11:50-12:10 #44 Numerical Algorithm to Solve Two-Point Non-Linear Singularly Perturbed Boundary Value Problems Using Initial Value Technique Tiwari, Surabhi Motilal Nehru National Institute of Technology, Allahabad	11:50-12:10 #153 Viability for a time-dependent domain with respect to a reaction-diffusion system with delay Burlica, Monica-Dana "G. Asachi" Technical University, Iasi, Romania		11:50-12:10 #510 A spatial computer model for the spread of hepatitis C virus infection in vitro Blahut, Kenneth Ryerson University
12:10-12:30	12:10-12:30 # 421 Random but visually nice shapes are used for Monte Carlo study of the area estimation Improvement by pairwise comparisons Grant, Duncan Laurentian University	12:10-12:30 #239 An Explicit Recursive Formula for Computing the Normal Form and Center Manifold of n-dimensional Differential Systems Associated with Semisimple Cases Tian, Yun Western University		12:10-12:30 #530 Non-Linearity and Heterogeneity in Modeling of Population Dynamics Karev, Georgiy NCBI, NIH

9.6 Wednesday, August 28 – 16:30 - 18:30

Room BA101	Room BA102	Room BA110	Room BA112
SS-SSMBP-2 Simulations in Soft Matter and Molecular Bio-Physics - 2	SS-HPTC-6 Recent progress in hyperbolic problems: Theory and Computation - 6	SS-MFMCR-2 Mathematical Finance Modelling, Computation and Risk Management - 2	SS-EGT Evolutionary Game Theory
Session Chairs: Niloufar Faghihi McGill University	Session Chairs: Jae-Hun Jung SUNY University at Buffalo	Session Chairs: Campolieti, J., Metzler, A. Wilfrid Laurier University	Session Chairs: Joe Apaloo,Ross Cressman St.Francis Xavier, Wilfrid Laurier University
16:30-16:50 #275 Flow of spherical micellar solutions in confined channels Habibi, Mona Western University 16:50-17:30 #330 Martini coarse-grained and atomistic simulations of lipids Tieleman, Peter (Semi-plenary, p 23) University of Calgary 17:30-18:00 #314 The role of PEGylation in drug delivery: what can molecular dynamics simulation tell us Bunker, Alex University of Helsinki 18:00-18:30 #504 Frontiers in Membrane Biophysics Rheinstadter, Maikel McMaster University	16:30-16:50 #99 Challenging simulations of Black Hole Binaries Lousto, Carlos Rochester Institute of Technology 16:50-17:10 #434 Fast recovery of far-field time-domain signals from near-field data Field, Scott University of Maryland 17:10-17:30 #501 Sparse spectral methods for helically symmetric gravitational binaries Lau, Stephen University of New Mexico 17:30-17:50#415 Gravitational and electromagnetic phenomena in strongly gravitating systems Palenzuela, Carlos Perimeter Institute for Theoretical Physics 17:50- 18:10# 128 The Dynamics of a Scalar Field in Anti-de Sitter Liebling, Steven Long Island University	16:30-16:50 #51 Delayed Heston Model: Improvement of Vol Surface and Hedging of Vol Swaps Swishchuk, Anatoliy University of Calgary 16:50-17:10 #531 A Bias-Reduction Technique for Monte Carlo Pricing of Multiple-Exercise Options Reesor, Mark Western University 17:10-17:30 #405 A convolution method for numerical solution of backward stochastic differential equations Hyndman, Cody Concordia University 17:30-17:50 #584 Efficient Monte Carlo Simulation For Integral Functionals of Brownian Motion Kolkiewicz, Adam University of Waterloo 17:50- 18:10# 562 Hitting Times of Integrated Diffusions McLeish, Don University of Waterloo 18:10-18:30 #110 Multiple barriers and assets in Financial Mathematics Escobar, Marcos Ryerson University	16:30-16:50#148 Game-theoretic methods for functional response and optimal foraging behavior Cressman, Ross Wilfrid Laurier University 16:50-17:10 #185 Interspecific strategic effects of mobility in predator-prey systems Xu,Fei Wilfrid Laurier University 17:10-17:30 # 242 Infinite Niche Packing Apaloo, Joe St. Francis Xavier University 17:30-17:50 #336 Plants and games:adaptive strategies for nutrient foraging and competition McNickle, Gordon Wilfrid Laurier University 17:50-18:10 #534 Dynamics of pattern networks in rock-paper-scissors type models Menezes,Josinaldo Federal University of Rio Grande do Norte, Brazil 18:10-18:30 #634 Habitat Selection for the Ideal Free Distribution in Linear and Nonlinear(Allee Effect)Fitness Tran,Tan Speaker

Room BA202	Room BA208	Room BA209	Room BA211
SS-ME-1 Mathematical Epidemiology - 1	SS-NCTAP-4 New Computational Techniques for Applied Problems in Science and Engineering - 4	SS-RTDEDS-2 Recent trends in differential equations and dynamical systems - 2	CS-BSM-3 Mathematics and Computation in Biological Sciences and Medicine - 3
Session Chairs: Connell McCluskey Wilfrid Laurier University	Session Chairs: Ludwig Kohaupt, Yan Wu Beuth University of Technology Berlin, Georgia Southern University	Session Chairs: Xinzhi Liu, Mohamad Alwan, Hongtao Zhang University of Waterloo	Session Chairs: H.S. Jhajj Punjabi University, Patiala
16:30-16:50	16:30-16:50 #627 A Numerical Method for Multiple Time Scale Problems Kadioglu, Samet Yildiz Technical University	16:30-16:50 #305 Classification of Solutions of Second Order Nonlinear Neutral Delay Dynamic Equations Panigrahi, Saroj University of Hyderabad	16:30-16:50 #641 Dynamic models for rodent pest control: A case study of plateau pika Zhang, F. Yuncheng University
16:50-17:50 #613 The spatio-temporal spread of drug-resistant tuberculosis	16:50-17:10 #62 A Bee Foraging Heuristic to Find a Route for Manet-Wcp Arino, Julien (Semi-plenary, p 16) University of Manitoba 17:50-18:10 #626 The Spread of Infectious Disease with Imported Infections Sigdel, Ram Wilfrid Laurier University	16:50-17:10 #393 Input-to-State Stability of Large-Scale Stochastic Impulsive Systems with Time Delay and Application Alwan, Mohamad University of Waterloo	16:50-17:10 #546 Modeling Oxygen Dynamics of the Retina-Using Discrete Exterior Calculus Rusjan, Edmond SUNYIT, NY 17:10-17:30 #560 Role of predators in dynamics of niche construction Berezovskaya, Faina Howard University
18:10-18:30#392 A multi-strain analysis of Neisseria meningitidis on the impact of immunization in Canada Poore, Keith University of Guelph	17:10-17:30 #97 Interactive computational search strategy of periodic solutions in an essentially nonlinear dynamics Lev Petrov Plekhanov Russian University of Economics	17:30-17:50 #483 Chaos Entanglement: Leading Unstable Linear Systems to Chaos Zhang, Hongtao University of Waterloo	17:30-17:50 #637 Modelling 1, 5 and 10 μm Particle Deposition In Human Lung By CFD Goncalves, Jose Federal University of Sao Carlos 17:50-18:10 #282 Discrete Solitons for the Discrete Nonlinear Schrödinger Equations Zhou, Z. Guangzhou University 18:10-18:30 #306 Generalized Bessel Functions and Sturm Liouville Equations Balsim, Igor Kingsborough Community College of CUNY
		17:50-18:10 #508 Recent results on stability of open-loop and closed-loop switched systems Stechlinski, Peter University of Waterloo	
		18:10-18:30 #569 Discrete Dynamics of Differential Delay Equations Ivanov, Anatoli Pennsylvania State University	

9.7 Poster Session – Thursday, August 29 – 10:00 - 10:30 & 15:00 - 15:30

Room BA110

CS-POST-1

Chair: M. Santoprete

10:00 - 10:30 & 15:00 - 15:30 # 18

Kazemlou Sheikhi, Ahmad
Ministry of Education of Talesh City, Iran

Comparing the Results of Transforming Differential Method and Adomian Method in Solving Third Order Nonlinear Delay Differential Equation

10:00 - 10:30 & 15:00 - 15:30 # 408

De Sanctis, Bianca
University of Calgary
A Phenomenological Model for the Mechanism of Influenza-A Virus Budding and Scission

10:00 - 10:30 & 15:00 - 15:30 # 146

Xin, Xin
University of Guelph
Random Jitter Methods for Type 2 Ties in Survival Analysis

10:00 - 10:30 & 15:00 - 15:30 # 340

Bovard, Luke
University of Waterloo
Short-wave vortex instability in stratified flow

10:00 - 10:30 am & 3:00 – 15:30 pm # 506

Duncan, Grant
Laurentian University.
A Mathematical Model For Treatment Selection

10:00 - 10:30 & 15:00 - 15:30 # 583

Prabhakar, Sanjay
Wilfrid Laurier University
Parallel numerical methods for time dependent Schrodinger equations in the analysis of quantum heterostructures

10:00 - 10:30 & 15:00 - 15:30 # 522

Kloosterman, Matt
University of Waterloo
A Closed NPZ Model with Delayed Nutrient Recycling

10:00 - 10:30 & 15:00 - 15:30 # 594

Wang, J. Y
Laurentian University
Application of Advanced Diagonalization Methods to Quantum Spin Systems

Room BA111

CS-POST-2

Chair: M. Santoprete

10:00 - 10:30 & 15:00 - 15:30 # 61

Leal da Silva, Priscila
Universidade Federal do ABC, Brazil

On the group analysis of a modified Novikov equation

10:00 - 10:30 & 15:00 - 15:30 # 138

Newlands, Nathaniel
Agriculture and Agri-Food Canada
Downscaling of regional climate scenarios within agricultural areas across Canada with a multi-variate, multi-site statistical model

10:00 - 10:30 & 15:00 - 15:30 # 163

Johnson, Sam
National Institute of Technology Karnataka, India
Multiplication Operators with Closed Range in Operator Algebras

10:00 - 10:30 & 15:00 - 15:30 # 471

Rocha, Paulo
Universidade de Brasilia
Invariant Solutions of the 2+1 dimensional Gross-Neveu Equations

10:00 - 10:30 am & 3:00 – 15:30 pm # 575

Jiwari, Ram
Thapar University, India
A Differential Quadrature Algorithm for Numerical Treatment of Two-Dimensional Hyperbolic Equation

10:00 - 10:30 & 15:00 - 15:30 # 619

Billel, Negal
University Badji Mokhtar Annaba, Algeria
Convergence of the Regularized Sinc Collocation Method Applied to First kind Fredholm Integral Equation

10:00 - 10:30 & 15:00 - 15:30 # 375

Khor, Susan
Independent Post-Doc
Domain interactions from Protein interactions with Formal Concept Analysis

10:00 - 10:30 & 15:00 - 15:30 # 329

Liu, Bin
University of Waterloo
Simulation Studies of cationic/PC lipids monolayers at air/water interface

9.8 Thursday, August 29 – 10:30 - 12:30

Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
SS-SSMMBP-3 Simulations in soft matter and molecular Bio-Physics - 3 Session Chairs: Frances Mackay Western University	SS-SNDTA-1 Symmetry in Nonlinear Dynamics: Theory and Applications - 1 Session Chairs: Manuele Santoprete, Ray McLennaghan Wilfrid Laurier University, University of Waterloo	SS-MFMCR-3 Mathematical Finance - Modeling, Computation and Risk Management - 3 Session Chairs: Joe Campolieti, Adam Metzler Wilfrid Laurier University	SS-SGT Structured Graph Theory Session Chairs: Chinh Hoang, Kathie Cameron Wilfrid Laurier University	SS-CMS-1 Computational Materials Science - 1 Session Chairs: Haipeng Wang, Ziad Saghir NPU and University of Toronto, Ryerson University
10:30-10:50 #419 Multiple Replica Repulsion Technique for Efficient Conformational Sampling of Biological Systems Malevanets, Anatoly The Hospital for Sick Children, Toronto	10:30-10:50 #66 Relative Equilibria and Rotopulsators of the Curved N-Body Problem Diacu, Florin University of Victoria	10:30-10:50 #206 Long-dated foreign exchange interest rate derivatives: modeling, computational challenges, and parallel computation via a PDE approach Dang, Duy-Minh University of Waterloo	10:30-10:50 #258 Total Coloring of Graphs Embedded in Surfaces of Nonnegative Euler Characteristic Wang, Huijuan Shandong University	10:30-10:50 #139 Homogeneous crystallization of Si136 clathrate from liquid: Molecular dynamics simulations Lu, Yongjun Beijing Institute of Technology
10:50-11:10 #374 Exploring the Polyelectrostatic Model of Sic1-Cdc4 Interaction using Coarse-Grained Explicit-Chain Simulations Song, Jianhui University of Toronto	10:50-11:10 #202 Orbits in the Symmetric Four-body Problem Sweatman, Winston Massey University	10:50-11:10 #250 An unconditionally monotone numerical scheme for the two factor uncertain volatility model Ma,Kai University of Waterloo	10:50-11:10 #646 On magic labeling of type (1, 1, 1) for the subdivision of prisms Hussain, Muhammad COMSATS Institute of IT	10:50-11:10 #589 Task Based Parallelization of Molecular-Dynamics Simulations with Short-Range Forces Meyer, Ralf Laurentian University
11:10-11:30 #556 Velocity and energy distributions in microcanonical ensembles of hard spheres Germano, Guido Philipps-Universität Marburg	11:10-11:30 #444 Saari's homographic conjecture for the planar equal-mass three-body problem under the Newton potential and a strong force potential Fujiwara, Toshiaki Kitasato University	11:10-11:30 #236 Computation of the Loss Distribution Based on the Structural Model for Credit Portfolios Han, Meng RBC Capital Markets, Toronto	11:10-11:30 #245 On Hendrys conjecture on cycle extension Sritharan, R. The University of Dayton	11:10-11:30 #135 Molecular Dynamics Simulation of Density for Under-cooled Liquid Zirconium Wang, Haipeng Northwestern Polytechnical University; University of Toronto
11:30-11:50 #507 Ordered Mononucleotide Arrays in Multilamellar Lipid Matrices: Implications for the Origin of Life Toppozini, Laura McMaster University	11:30-11:50 #221 Symplectic Semiclassical Wave Packet Dynamics Ohsawa, Tomoki University of Michigan-Dearborn	11:30-11:50 #652 Hedging Costs for Variable Annuities under Regime Switching Azimzadeh, Parsiad University of Waterloo	11:30-11:50 #339 Constructions of k-critical P5-free graphs Sawada, Joe University of Guelph	11:30-11:50 #253 Investigation on Temperature Uniformity in Thermo-Diffusion Cells Farahbakhsh, Bahram Ryerson University
11:50-12:10 #511 Nano-scale Dimer Motor in a Chemical Gradient Colberg, Peter University of Toronto	11:50-12:10 #158 A new approach to the integrability of the Suslov problem Fernandez, Oscar Wellesley College	11:50-12:10 #537 Completing colored graphs to meet a target property Eschen, Elaine West Virginia University	11:50-12:10 #401 Nucleation Heterogeneity in Shape Memory Alloys: Studies with 3D Coupled Thermo-Mechanical Phase-Field Models Dhote, Rakesh University of Toronto; Wilfrid Laurier University	
12:10-12:30 #642 Escape from adaptive conflicts in the evolution of protein folds: bi-stability, mutational robustness, and gene duplication Sikosek, Tobias University of Toronto	12:10-12:30 #247 An obstruction class for isotropic fibrations Butler, Leo Central Michigan University	12:10- 12:30 #601 Coloring graphs without induced paths of fixed lengths Hoang, Chinh Wilfrid Laurier University	12:10-12:30 #98 Drilling Force and Temperature of Metallic Material with Hollow Drill Wang, Wendong Northwestern Polytechnical University; University of Toronto	

Thursday, August 29 – 10:30 - 12:30

Room BA202	Room BA208	Room BA209	Room BA210
SS-ME-2 Mathematical Epidemiology - 2 Session Chairs: Zhisheng Shuai University of Central Florida	SS-WSM-1 Women in Science and Mathematics - 1 Session Chairs: Shohini Ghose, Hind Al-Abadleh Wilfrid Laurier University	SS-HOMCFD-1 High-Order Methods in Computational Fluid Dynamics - 1 Session Chairs: Lilia Krivodonova, Hans De Sterck University of Waterloo	SS-ANMPDE-1 Advanced Numerical Methods for PDEs and Applications - 1 Session Chairs: Peter A. Forsyth, Dong Liang University of Waterloo, York University
10:30-10:50 #142 Mass Media Effects on an Influenza Epidemic Collinson, Shannon York University	10:30-10:50 #210 The Power of Diversity: Women's Leadership in STEM Giordan, Judith Chemical Angels Network	10:30-10:50 #285 Parallel High-Order CENO Finite-Volume Method for Large-Eddy Simulation of Turbulent Premixed Flames Tobaldini Neto, Luiz University of Toronto Institute for Aerospace Studies	10:30-10:50 #30 Optimal Trade Execution: Mean Variance or Mean Quadratic Variation? Forsyth, Peter University of Waterloo
10:50-11:10 #168 Sustained and transient oscillations induced by delayed antiviral immune response in an immunosuppressive infection model Wang, Lin University of New Brunswick	10:50-11:10 #395 Fast, recursive and numerically stable algorithms for discrete sine transformations having orthogonal factors M. Perera, Sirani Daytona State College	10:50-11:10 #337 High-Order Central ENO Finite-Volume Scheme for Ideal MHD Susanto, Andree University of Waterloo	10:50-11:10 #198 B-Spline Collocation Software for PDEs with Efficient Interpolation-Based Spatial Error Estimation Muir, Paul Saint Mary's University
11:10-11:30 #325 The impact of the Anopheles mosquito lifestyle, feeding and reproductive habits in the transmission dynamics of Malaria-implications for control Teboh-Ewungkem, Miranda Lafayette College	11:10-11:30 #521 Chemical Property Prediction based on Spectral Signature of Properties on Molecular Surfaces Heidar Zadeh, Farnaz McMaster University	11:10-11:30 #430 Assessment and Comparison of Discretization Techniques for the Diffusion Operator in High-Order Finite-Volume Methods Ivan, Lucian University of Waterloo	11:10-11:30 #212 (Towards) a multicore adaptive space time method for PDEs Haynes, Ronald Memorial University of Newfoundland
11:30-11:50 #573 A Century of Transitions in New York City's Measles Dynamics Hempel, Karsten McMaster University	11:30-11:50 #548 Fibre bundle framework for quantum fault tolerance Zhang, Lucy Liuxuan University of Toronto, Perimeter Institute	11:30-11:50 #373 An Adaptive High Order Discontinuous Galerkin Solver for Direct Numerical Simulation Mavriplis, Catherine University of Ottawa	11:30-11:50 #95 New Progress on Energy-Conserved S-FDTD Methods for Maxwell's Equations Liang, Dong York University
11:50-12:10 #540 Population-level effects of suppressing fever Earn, David McMaster University	11:50-12:10 #614 Topos Formulation of Quantum Theory Flori, Cecilia Perimeter Institute for Theoretical Physics	11:50-12:10 #428 Examining nonlinear wave propagation in the trumpet Resch, Janelle University of Waterloo	11:50-12:10 #64 ML-α-Deconvolution model in a bounded domain with a vertical regularization Ali, Hani Paris-Descartes University
12:10-12:30 #200 The Effects of Mass Gatherings on the Spatial Spread of an Epidemic Xu, Fei Wilfrid Laurier University	12:10-12:30 #625 Surface-enhanced quantum control: A SEQC way of controlling light and matter Rangan, Chitra University of Windsor	12:10-12:30 #225 Accelerated High-Order Solver for the Cahn-Hilliard Equation on General Domains Abukhdeir, Nasser Mohieddin University of Waterloo	12:10-12:30 #550 Application of Generalized Multiscale Finite Element Method in Multiphase Flow Models Ginting, Victor University of Wyoming

Thursday, August 29 – 10:30 - 12:30

Room BA211	Room BA305
SS-ADS-1 Canada-China Session on Applied Dynamic Systems - 1 Session Chairs: Yuming Chen, Fengqin Zhang, Xingfu Zou Wilfrid Laurier University, Yuncheng University, Western University	CS-AMPRE-1 Session Chairs: Ellina Grigorieva Texas Woman's University
10:30-10:50 #455 A positivity preserving semi-implicit numerical method for a highly nonlinear diffusion-taxis-reaction model Eberl, H. University of Guelph	10:30-10:50 # 164 Troesch's problem: Numerical simulation based on Haar wavelet collocation method Pundit, Sapna Motilal Nehru National Institute of Technology
10:50-11:10 #307 Dirichlet problem of delayed reaction-diffusion equations involving semi-infinite intervals Yi, Taishan Central South University	10:50-11:10 #40 Mathematical Modeling of Glassy-winged Sharpshooter Population Dynamics Yoon, Jeong-Mi University of Houston-Downtown
11:10-11:30 #149 Advances in Impulsive Differential Equations Dai, Binxiang Central South University	11:10-11:30 #74 Analytical methods in differential equations and optimal control: An Educational Approach Grigorieva, Ellina Texas Woman's University
11:30-11:50 #112 Controllability of second order impulsive functional differential systems with infinite delay in Banach spaces Li, Meili Donghua University	11:30-11:50 #125 Comparison between Adomian Method and Last Square Method For Solving HIV/AIDS non-linear system Rahmani, Fouad Lazhar Universite Constantine
11:50-12:10 #599 The Impact of a Single-strain Flu Vaccine on the Dynamics of a Two-strain influenza Rahman, Ashrafur University of Western Ontario	11:50-12:10 #144 Infinite families of (non)-Hermitian Hamiltonians associated with exceptional X_m Jacobi polynomials Roy, Barnana Indian Statistical Institute
12:10- 12:30 # 75 Codimension-1 sliding bifurcations of Filippov pest growth model with threshold policy Tang, Sanyi Shaanxi Normal University	

9.9 Thursday, August 29 – 15:30 - 18:00

Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
SS-SSMBP-4 Simulations in soft matter and molecular Bio-Physics - 4 Session Chairs: Chitra Narayanan New Jersey Institute of Technology	SS-SNDTA-2 Symmetry in Nonlinear Dynamics: Theory and Applications - 2 Session Chairs: Manuele Santoprete, Ray McLennan Wilfrid Laurier University, University of Waterloo	CS-MECHE-1 Computational Mechanics and Engineering - 1 Session Chairs: Ali Almansoori The Petroleum Institute	SS-LSNE-3 Lie symmetry and other approaches in theory and applications of nonlinear equations - 3 Session Chairs: C.M. Khalique, M. Abudiaab North-West University RSA, Texas A&M University	SS-CMS-2 Computational Materials Science - 2 Session Chairs: Haipeng Wang, Ziad Saghir NPU and University of Toronto, Ryerson University
15:30-15:50 #377 Investigating Peptide/RNA Binding Using Enhanced-Sampling Simulation Techniques Do, Trang University of Waterloo 15:50-16:30 #464 Role of dipolar interactions in protein folding Matysiak, Silvina (Semi-plenary, p 21) University of Maryland	15:30-15:50 #219 A Feasible Short-Step Primal-Dual Interior Point Algorithm for Solving Convex Quadratic Problems Smirnov, Roman Dalhousie University 15:50-16:10 #251 Orthogonal separation of the Hamilton-Jacobi equation on Spaces of Constant curvature Rajaratnam, Krishan University of Waterloo	15:30-15:50 #604 A newly designed hot extrusion die modeling and its comparison with conventional dies Yeprem, Aygul H. Yildiz Technical University 15:50-16:10 #38 Computational Analysis of Slender Body with Varying Elliptical Cross Section at Various AOAs Shams, Taimur National University of Sciences & Technology, NUST 16:10-16:30 #39 Reductions and solutions of ZK equation, Gardner KP and Extension KP equations using conservation laws Naeem, Imran Lahore University of Management Sciences	15:30-15:50 #54 Lie group classification for a generalized coupled Lane-Emden system of dimension one Khalique, Chaudry Masood North-West University 15:50-16:10 #461 A Computational Study of Forced Oscillations of a Korteweg-de Vries Type Equation Usman, Muhammad University of Dayton	15:30-15:50 #166 Twinning in Strained Ferroelastics: Microstructure and Statistics Ding, Xiangdong Xi'an Jiaotong University 15:50-16:10 #259 Phase separation and dendritic growth of bulk undercooled ternary Co-Cu-Pb alloy Yan, Na Northwestern Polytechnical University 16:10-16:30 #335 Analysis of twinned crystals via eigensymmetries of crystallographic orbits Marzouki, Mohamed Amine Radboud University Nijmegen
16:30-17:00 #519 Unraveling the role of solvent-macromolecule interactions in determining the conformations of macromolecules in bulk, droplet and vacuum environments Consta, Stylianis (Stella) University of Waterloo	16:10-16:30 #133 Stochastic modeling of the Oil Sands operations under environmental constraints Arsie, Alessandro University of Toledo	16:30-16:50 #298 Supply Chain Flexibility Metrics Evaluation Erol Genevois, Mujde Galatasaray University	16:30-16:50#58 In this work the (G'/G)-expansion method is used to determine exact solutions of coupled Kortweg de Vries and coupled Boussinesq equations Mothibi, Dimplo Millicent Panjab University	16:30-16:50 #244 Hysteresis Algorithm For Alleviating Organic LED Degradation Yang, Ning Northwestern Polytechnical University 16:50-17:10 #213 Dendritic Growth Velocity Calculation and Microstructural Evolution of Ni-Cu-Si Alloy Wang, Haipeng Northwestern Polytechnical University
17:00-17:30 #318 Various approaches for accelerating sampling of protein conformation : from amyloids to loop motion Coté, Sébastien Université de Montréal	16:30-16:50 #381 Integrable Viscous Conservation Laws Submission Arsie, Alessandro University of Toledo	16:50-17:10 #208 Effect of Particle Gradient on the Creep of an Isotropic Rotating Disc Rattan, Minto Brock University	16:50-17:10 #59 In this talk we look for exact solutions of the Klein-Gordon-Zakharov equations, which describes the interaction between Langmuir waves and ion sound waves Mhlanga, Isaiah Elvis Noth West University	17:10-17:30 #92 Non-equilibrium solidification in undercooled faceted-faceted Ni-56.2 Si at % eutectic alloy Lu, Yiping Dalian University of Technology
Pomès, Régis Hospital for Sick Children, Toronto	Wolf, Thomas Northwestern Polytechnical University	17:10-17:30 # 390 Design, Facbriication and Testing of a Hybrid Magnetostrictive-Poezolectric Energy Harvesting Unit Ibrahim, Mohammed University of Waterloo		

Thursday, August 29 – 15:30 - 18:00

Room BA202	Room BA208	Room BA209	Room BA210
SS-ME-3 Mathematical Epidemiology - 2 Session Chairs: Lin Wang University of New Brunswick	SS-WSM-2 Women in Science and Mathematics - 1 Session Chairs: Shohini Ghose, Hind Al-Abadleh Wilfrid Laurier University	SS-HOMCFD-2 High-Order Methods in Computational Fluid Dynamics - 1 Session Chairs: Lilia Krivodonova, Hans De Sterck University of Waterloo	SS-ANMPDE-2 Advanced Numerical Methods for PDEs and Applications - 1 Session Chairs: Peter A. Forsyth, Dong Liang University of Waterloo, York University
15:30-15:50 #140 Pair approximation models of foot and mouth disease. Impacts of IP/CP culling, ring and prophylactic vaccination, vaccine waning, loss of disease-induced immunity and disease re-introduction Ringa, Notice University of Guelph	15:30-15:50 #629 ZeroHopf bifurcation in the hyperchaotic Lorenz system Cid-Montiel, Lorena Wilfrid Laurier University	15:30-15:50 #366 High-Order Summation-by-Parts Discretization of the Navier-Stokes and Euler Equations Del Rey Fernández, David C. University of Toronto Institute for Aerospace Studies	15:30-15:50 #368 Domain Decomposition Techniques for Electromagnetic Scattering from Thin Wires Haslam, Michael York University
15:50-16:10 #484 Target Reproduction Number and Its Applications to Infectious Disease Control Shuai, Zhishengi University of Central Florida	15:50-16:50 #645 Fifteen Years of Funded Programs to Advance Women in Science and Engineering: Progress and Persistent Challenges Mavriplis, Catherine 24 University of Ottawa	15:50-16:10 #309 High-Order Finite Volume Element Methods for Elliptic PDEs with Singularities, and Applications to Capillarity De Sterck, Hans University of Waterloo	15:50-16:10 #207 An numerical impulse control PDE approach for continuous time optimal portfolio allocation under jump-diffusions Dang, Duy-Minh University of Waterloo
16:10-16:30 #487 Modelling pre-emptive vaccination to prepare for bioterrorist attacks Molina, Chai McMaster University	16:50-17:10 #648 Computational Thinking and Simulations in Teaching Science and Mathematics Shodiev, Hasan Wilfrid Laurier University	16:10-16:30 #463 Analysis of Heterogeneous Multiscale Methods for Long Time Multiscale Wave Propagation Problems Runborg, Olof KTH Royal Institute of Technology	16:10-16:30 #130 Efficient Splitting Characteristic Method for Aerosol Transports in Environment Fu, Kai York University
16:30-16:50 #27 Optimal Infectious Disease Control Grigorieva, Ellina Texas Woman's University	17:10 - 18:00 Women in Science - Panel Discussion A. Hind, S. Ghose Wilfrid Laurier University	16:30-16:50 #180 Simulation of the Mixing in An Imploding Shell Wang, Lili The Institute of Applied Physics and Computational Mathematics, p. R. China	16:30-16:50 #271 A Truncated FCI Approach Motivated from the Mathematics of Complexity for Solving the Electronic and Nuclear Schrödinger Equation Anderson, James Peking University
16:50-17:10 #87 Seasonal dynamics in an SIR epidemic system Sari, Nadir University of La Rochelle	16:50-17:10 #82 Study on Turbulent Mixing Induced by Richtmyer-Meshkov Instability Using the Second-Order Moment Model Yang, Min	16:50-17:10 #203 On the game p-Laplacian on graphs for processing and clustering of high dimensionnal data Elmoataz, Abderahim University of Caen Basse Normandy	16:50-17:10 #203 On the game p-Laplacian on graphs for processing and clustering of high dimensionnal data Elmoataz, Abderahim University of Caen Basse Normandy
17:10-17:30 #91 A mathematical model for the spread of ectoparasite-borne diseases Dénes, Attila University of Szeged		17:10-17:30 #641 Multicomponent polymer flooding in two dimensional oil reservoir simulation Kenettinkara, Sudarshan Kumar TIFR Centre for Applicable Mathematics	17:10-17:30 #641 Multicomponent polymer flooding in two dimensional oil reservoir simulation Kenettinkara, Sudarshan Kumar TIFR Centre for Applicable Mathematics

Thursday, August 29 – 15:30 - 17:30

Room BA211

SS-ADS-2

Canada-China Session on Applied Dynamic Systems - 1
Session Chairs:
Yuming Chen, Fengqin Zhang,
Xingfu Zou
Wilfrid Laurier University,
Yuncheng University, Western
University

15:30-16:50 #177

Agent-Based Modelling for Disease Dynamics in-silico Populations

Moghadas, Seyed M.

York University

15:50-16:10 #85

Modeling effects of environmental contamination and volunteers on hospital infections in China

Xiao, Yanni

Xi'an Jiaotong University

16:10-16:30 #261

Global stability of some epidemic models with age structure

Yang, Junyuan

Yuncheng University

16:30-16:50 #78

Using Lyapunov Functions to Construct Lyapunov Functionals

McCluskey, Connell

Wilfrid Laurier University

16:50-17:10 #181

Epidemic dynamics on semi-directed complex networks

Jin, Zhen

North University of China

17:10-17:30 #288

Mathematical Model of Anaerobic Digestion in a Chemostat: Effects of Syntrophy and Inhibition

Wolkowicz, Gail

McMaster University

Room BA305

CS-AMPRE-2

Applied Problems and Methods in Research & Education - 2
Session Chairs:
Ellina Grigorieva

Texas Woman's University

15:30-16:50 #459

Optimal designs for heteroscedastic accelerated life testing models with multiple factors

Krzeminski, Mark
Brock University

15:50-16:10 #189

Electrical contact resistance of micro-switch systems

Haj Mohammad Jafar, Reza

University of Toronto

16:10-16:30 #279

New Exceptional Orthogonal Polynomials and Non-linear algebras associated to the Quantum system

Dutta, Debjit
Indian Statistical Institute

16:30-16:50 #442

A New Approach of Particle Swarm Optimization based on Inverse Survival Function

Singh, Sharandeep
Punjabi University

9.10 Friday, August 30 – 10:30 - 12:50

Room BA101	Room BA102	Room BA110	Room BA111	Room BA112
SS-SSMBP-5 Simulations in soft matter and molecular Bio-Physics - 5 Session Chairs: Cristiano L. Dias New Jersey Institute of Technology	SS-CFDRA-1 Computational Fluid Dynamics for Real Applications - 1 Session Chairs: Lakhdar Remaki, Stéphane Moreau, Abdelkader Baggag BCAM, Sherbrooke, Laval	CS-MECHE-2 Computational Mechanics and Engineering - 2 Session Chairs: Salehian, Armaghan	SS-MIPD-1 Mathematical Immunology and Pathogen Dynamics - 1 Session Chairs: Jonathan Forde	SS-IM Industrial Mathematics Session Chairs: Sean Bohun
10:30-10:50 #518 Stability and Cooperativity of Protein Folding in Crowded and Confined Environments Linhananta, Apichart Lakehead University	10:30-10:50 #4 Modeling of Bubble Motion in a Sound Field Khattar, Dinesh Kirori Mal College, Delhi University	10:30-10:50 #211 Effect of Anisotropy on the Steady State Creep in a Rotating Cylinder Chamoli, Neeraj D.A.V. College, Chandigarh, India	10:30-10:50 #555 Linking immunology and epidemiology: dynamics of human rhinovirus in an immune-structured host population Laverty, Sean University of Central Oklahoma	10:30-10:50 #386 Quality assessment of medical images using the structural similarity index Kowalik-Urbaniak, Ilona University of Waterloo
10:50-11:10 #478 Interactions of extended peptide conformations and beta-sheet formation Dias, Cristiano New Jersey Institute of Technology	10:50-11:10 #7 On axisymmetrical boundary problem of unsteady motion of micropolar fluid in the half-space El-Sirafy, Ibrahim Alexandria University	10:50-11:10 # 446 Strip-saturation-induction model mode-III solution for piezo-electro-magnetic strip Verma, Pooja Raj Indian Institute of Technology Roorkee	10:50-11:10 #67 Dynamics of In-host Malaria Model Gumel, Abba University of Manitoba	10:50-11:10 #204 Some recent mathematics-in-industry study group projects from Australia and New Zealand Sweatman, Winston Massey University
11:10-11:30 #513 Calculating Free Energy of the Aggregation of the Peptide (HHC-36) In Bulk Vafaei, Shaghayegh University of Guelph	11:10-11:30 #12 The construction of an Integral formula for computing Cylindrical and Non-cylindrical Flow in the Region Bounded by Two Coaxial Cylinders of Varying Radii Pavlika, Vasos University of London	11:10-11:30 #445 Strip-saturation-yield model for a piezoelectric plate: A study on influence of change in poling direction Jangid, Kamlesh Indian Institute of Technology, Roorkee	11:10-11:30 #111 Hiv Escape from Ctl Response during Acute Infection: Modeling and Inference Leviyang, Sivan Georgetown University	11:10-11:30 #509 Modelling and Simulation of Atmospheric Pollutant Dispersion Stockie, John Simon Fraser University
11:30-11:50 #495 The implication of stochastic resonance effects on neurological disease quantifications Das, Tushar University of Waterloo	11:30-11:50 #224 Design considerations for thermal management of electronics enclosures Cocks, Rachele Regal Beloit Corporation	11:30-11:50 #653 Design and Testing of a Hybrid Energy Harvesting Device Using a Spiral Piezoelectric Unit and a Central Magnet Salehian, Armaghan University of Waterloo	11:30-11:50 #65 Understanding antibody-host dynamics following EIAV infection Ciupu, Stanca Virginia Tech	11:30-11:50 #525 Optimal Flu Vaccination in a Multiple Group Model Kloosterman, Matt University of Waterloo
11:50-12:10 #356 A Numerical Study on Tissue Topology Using Single Cell Based Model Mkrtyan, Anna Western University	11:50-12:10 #238 Magnetic field effect on the natural convection flow in a cavity Bozkaya, Canan Middle East Technical University	11:50-12:10 #134 Mixed-integer optimization of material and energy integrations in an eco-industrial park network Kantor, Ivan University of Waterloo	11:50-12:10 # 312 Modeling HIV-1 virus dynamics Zou, Xingfu Western University	11:50-12:10 #289 Dominatedly Non-Decreasing Approximations for Waiting Time Asymptotics of the M/G/2 Queue with Heterogeneous Servers Sani, Sulaiman University of Botswana
	12:10-12:30 #497 A CFD Optimization of Airflow Efficiency for an Electric Motor Driven Centrifugal Fan System for Residential HVAC Applications Cocks, Rachele Regal Beloit Corporation		12:10-12:30 # 118 Using within-host mathematical modelling to predict the long-term outcome of human papillomavirus vaccines Smith?, Robert University of Ottawa	12:10- 12:30 #592 Modelling Mass Transfer in a Rotating Disk Reaction Vessel Bohun, C Sean UOIT
				12:30-12-50 # 448 3D Modeling of some industrial processes of steel heat treating Garcia Vazquez, Conception University of Cadiz

Room BA202	Room BA208	Room BA209	Room BA210	Room BA211
CS-CPC-1 Computational Physics and Chemistry - 1 Session Chairs: Marek Wartak Wilfrid Laurier University	SS-MMNN Mathematical Models for Nanoscience and Nanotechnology Session Chairs: Lyon, K., Anicic, R. University of Waterloo	SS-QCTA-1 Quantum Control: Theory and Application -1 Session Chairs: Lian-Ao Wu IKERBASQUE, Basque Foundation of Science and University of the Basque Country	SS-DBCNDE-1 Dynamics and bifurcations in coupled networks of differential equations: theory and applications - 1 Session Chairs: Luciano Buono UOIT	SS-NMDAEA Numerical methods for differential-algebraic equations and applications Session Chairs: Griewank, A., Nedialkov, N., Pryce, J. Humboldt University, Cardiff University
10:30-10:50 #22 Avoiding the coordinate singularity problem in the numerical solution of the Dirac equation in cylindrical coordinates Fillion-Gourdeau, Francois Centre de recherches mathématiques	10:30-10:50 #93 An integral equation solver for the simulation of two-dimensional metallic nanoplasmonics Kurkcu, H. Gulf University of Science and Technology, Kuwait	10:30-10:50 #20 Fast and Robust Spin Manipulation in a Quantum Dot by Electric Fields Sherman, Eugene University of Basque Country	10:30-10:50#553 Network synchronization and mixed couplings: when friends turn enemies and vice versa Belykh, Igor Georgia State University	10:30-10:50#90 Optimization of large scale DAE systems in chemical process design and control using parallel computing Washington, Ian McMaster University
10:50-11:10 #50 A discrete stochastic model for pitting corrosion Van der Ween, Pieter Ghent University, Belgium	10:50-11:10 #363 Tackling Surface Roughness in Graphene Plasmonics Lyon, K. University of Waterloo	10:50-11:10 #24 Tight-binding models for ultracold atoms in honeycomb optical lattices Modugno, Michele University of Waterloo	10:50-11:10#628 Chaos and reliability in fluctuation-driven, balanced spiking networks Lajoie, Guillaume University of Washington	10:50-11:10# 296 Progress on the DAESA tool for structural analysis of DAEs Pryce, John Cardiff University
11:10-11:30 #122 GKS Scheme for Compressible Two-phase Flow Models Containing Non-conservative Products Zhao, Guiping National Natural Science of China	11:10-11:30 #416 Piezo-electromechanical effects in embedded nanowire superlattices Prabhakar, S. Wilfrid Laurier University	11:10-11:30 #37 Cooling and probing a nanomechanical resonator coupled to a double quantum dot You, Jianqiang Beijing Computational Research Center	11:10-11:30# 178 Low-dimensional descriptions of neural networks Barreiro, Andrea Southern Methodist University	11:10-11:30# 605 Symbolic application of the Pryce Σ-method for index reduction of DAEs in CyModelica Harman, Peter CyDesign Ltd.
11:30-11:50 #635 Nonequilibrium Green's function approach to simulations of active photonic nanostructures Wartak, Marek Wilfrid Laurier University	11:30-11:50 #427 Effects of finite ion size and dielectric saturation of water in electrolytically top-gated graphene Sharma, P. University of Waterloo	11:30-11:50 #260 Experimental novel and robust quantum control of single electron spin in diamond Du, Jiangfeng University of Science and Technology of China	11:30-11:50 #227 Emergent Collective Behaviour on Stochastic Coupled Cell Networks DeVille, Lee University of Illinois	11:30-11:50 #441 Structural analysis and dummy derivatives - some relations McKenzie, Ross Cardiff University
11:50-12:10 #603 We obtain complete set of constraints on the moduli of $N=4$ superstring compactifications that permit rare marginal decays of $1/4$ -BPS dyons to take place Nigam, Rahul BITS-Pilani, India	11:50-12:10 #576 Spectra of Few-body complexes in Quantum Dot Molecules Khoshnagar, M. University of Waterloo	11:50-12:10 #48 Stochastic Schrödinger Equation for Open Fermionic Systems Yu, Ting Stevens Institute of Technology	11:50-12:10#160 Instabilities in delayed regulatory loops of the haematopoietic system Bélair, Jacques Université de Montréal	11:50-12:10 # 491 A simple method for Quasilineararity Analysis of DAEs Nedialkov, Ned McMaster University
12:10-12:30 #650 Adaptive Matrix Transpose Algorithms for Distributed Multicore Processors Bowman, John University of Alberta	12:10-12:30 #389 Substrate structure effects on electrical properties of graphene R. Anicic University of Waterloo	12:30-12:50#579 Effect of Microwave and Terahertz Radiation on Superconducting Nanowires Jafari Salim, Amir University of Waterloo		
12:30-12:50 #558 Partial dynamic structure factors of molten sodium chloride investigated by molecular dynamics simulation Germano, Guido Philipps-Universität Marburg				

9.11 Friday, August 30 – 15:30 - 18:00

Room BA101	Room BA102	Room BA111	Room BA112
SS-SSMBP-6 Simulations in soft matter and molecular Bio-Physics - 6 Session Chairs: Joel Berry McMaster University	SS-CFDRA-2 Computational Fluid Dynamics for Real Applications - 2 Session Chairs: Lakhdar Remaki, Stéphane Moreau, Abdelkader Baggag BCAM, Sherbrooke, Laval	SS-MIPD-2 Mathematical Immunology and Pathogen Dynamics - 2 Session Chairs: Stanca Ciupe Virginia Tech	SS-SAEEM Statistical Aspects of Environmental and Ecological Modeling Session Chairs: Vyacheslav Lyubchich University of Waterloo
15:30-15:50 #485 Understanding beta-sheet stabilization - Lessons from a model hairpin peptide Narayanan, Chitra New Jersey Institute of Technology	15:30-15:50 #535 Wake Topology for Steady Flow past an Inclined Elliptic Cylinder Young, Peter NATO Communications and Information Agency	15:30-15:50 #187 A study of recurrent infection in deterministic in-host models Zhang, W. Western University	15:30-15:50 #450 Estimation of Absolute and Relative Abundance Horrocks, Julie University of Guelph
15:50-16:20 #197 Principles of Protein Folding from Coarse-Grained Modeling Chan, Hue Sun University of Toronto	15:50-16:10 #612 A robust computational procedure for nonlinear thermo-electrical problems in fractured media based on XFEM Baggag, Abdelkader	15:50-16:10 #161 Modeling within-host dynamics of influenza virus infection Rong, L. Oakland University	15:50-16:10 #354 Censored Gamma Regression with Applications McLeod, Ian Western University
16:20-16:50 #223 Intrachain ordering and segregation of polymers in a confined space Ha, Bae-Yeon University of Waterloo	16:10-16:30 #622 CFD Simulation of Biomass Gasification using Circulating Fluidized Bed by Eulerian-Eulerian Approach Liu, Hui University of Waterloo	16:10-16:30 # 226 The importance of cell-to-cell transmission during the acute stage of HIV infection Wells, Chad Yale University	16:10-16:30 # 286 Analyzing Inter-Annual Variability in North America Net Ecosystem CO2 Exchange Luus, Kristina University of Waterloo
16:50-17:20 #527 Dynamics of water molecules: Rockin' and jumping Karttunen, Mikko University of Waterloo	16:30-16:50 #644 Influence Of Thermal Radiation on Natural Convection In Porous Enclosure Due To Lateral Heat flux Pippal, Sarita	16:30-16:50 #440 Immunology and the Dynamics of Hepatitis Delta Virus Infection Forde, Jonathan Hobart and William Smith Colleges	16:30-16:50 #412 Accounting for Temperature when Modeling Population Health Risk Due to Air Pollution Burr, Wesley Queen's University
17:20-17:50 #512 Nonequilibrium Methods for Calculating the Potential of Mean Force for Biomolecular Systems Gray, Chris University of Guelph	16:50-17:10 #213 Dendritic Growth Velocity Calculation and Microstructural Evolution of Ni-Cu-Si Alloy X. Ma Northwestern Polytechnical University	16:50-17:10#436 The known unknowns and the unknown unknowns Beauchemin, C. Ryerson University	16:50-17:10 #554 Testing for synchronism among trends in environmental data Lyubchich, Vyacheslav University of Waterloo
18:00-18:15 Presentation of AMMCS Student and Young Researcher Awards. Chair: Manuele Santoprete	17:10-17:30 #92 Non-equilibrium solidification in undercooled faceted-faceted Ni-56.2 Si at % eutectic alloy Lu, Yiping Dalian University of Technology	17:10-17:30 #657 Changing stream flow augmented challenges: Modeling of water allocation policy for eco-hydrological sustainability in Maine, USA Khan, Md. Rakibul University of Maine	

Room BA202	Room BA208	Room BA209	Room BA210
CS-CPC-2 Computational physics and chemistry - 2 Session Chairs: Lin Wang University of New Brunswick	SS-RPSETS Recent progress in spintronics: Experiment, theory and simulation Session Chairs: Jingrun Chen and Xu Yang UC Santa Barbara	SS-QCTA-2 Quantum Control: Theory and Application - 2 Session Chairs: Lian-Ao Wu IKERBASQUE, Basque Foundation of Science and University of the Basque Country	SS-DBCNDE-2 Dynamics and bifurcations in coupled networks of differential equations: theory and applications - 2 Session Chairs: Pietro Luciano Buono UOIT
15:30 - 15:50 #388 Properties of Dimethylimidazolium Chloride- Molecule of the Mono-substituted Benzene at T=400K by Molecular Dynamics Simulation Atamas, Natalija Kiev Taras Shevchenko University	15:30 - 15:50 #263 Switching current and thermal stability of perpendicularly-anisotropic CoFeB-MgO based magnetic tunnel junctions Sato, Hideo Center for Spintronics Integrated Systems, Tohoku University	15:30 - 15:50 #116 Correlation Dynamics and Scaling Behavior of Two-Qubit System in the Spin-Chain Environments Lin, Hai-Qing Beijing Computational Science Research Center	15:30 - 15:50 #264 Collective Behavior of a Network of Spin Torque Nano-Oscillators Palacios, Antonio San Diego State University
15:50-16:10 #431 Polarizability Calculations of Linearly Conjugated Systems Using Matrix Product States Kim, Taewon McMaster University	15:50-16:10 #532 Spin-polarized currents in ferromagnetic multilayers Garcia-Cervera, Carlos UC Santa Barbara	15:50-16:10 #328 Scaling of Spin Qubit Decoherence in Semiconductors Hu, Xuedong University at Buffalo, SUNY	15:50-16:10 # 361 A Network of Symmetrically Coupled Gyroscopes Chan, Bernard San Diego State University
16:10-16:30 #454 Using Computational Chemical Methods to Gain Insights into the Enzymatic Mechanism of LuxS Gherib, Rami University of Windsor	16:10-16:30 #241 An Introduction to Spin Effects in Organic Solar Cells Chen, Jingrun University of California, Santa Barbara	16:10-16:30 #647 Remarks on the (non)controllability of Schrödinger equations Teismann, Holger Acadia University	16:10 - 16:30 #544 Reduced dynamics and noise stabilization for stochastic delayed systems LeBlanc, Victor University of Ottawa
16:30-16:50 #494 Investigation of Calcium Chloride Aqueous Solutions/Hexane Interfaces: A Molecular Dynamics Study Pour Khiabani, Nahid University of Tehran	16:30-16:50#549 Magnetic Ordering and Thermally Enhanced Magnetism in Quantum Dots Pientka, James University at Buffalo	16:30-16:50 #630 Bifurcations of Networks of Heterogeneous Integrate and Fire Neurons Nicola, Wilten University of Waterloo	16:30-16:50 #649 Introducing chaos in a gene regulatory network by coupling an oscillating-dynamics with a hysteresis-type one Poignard, Camille Laboratory of Mathematics, J. A. Dieudonné
16:50-17:10 #606 The dynamics of the fluxion in curved Josephson junction Dobrowolski, Tomasz Institute of Physics UP, Cracow, Poland	16:50-17:10#420 Domain Wall Trajectory Determined by its Fractional Topological Edge Defects Pushp, Aakash IBM Almaden Research Center	17:10-17:30#252 Effective dynamics of electrons in crystals Yang Xu University of California, Santa Barbara	
17:10-17:30 #636 Thermodynamic and dynamic anomalies in a simple one-dimensional lattice model of water Barbosa, Fernando UnB			

Friday, August 30 – 15:30 - 17:30

Room BA211

SS-CMAIS

Control Methods for Advanced Industrial Systems
Session Chairs:
 Behzad Samadi and Jürgen Gerhard
 Maplesoft

15:30-15:50 #346
Symbolic Methods in Control Theory

Gerhard, Jürgen
 Maplesoft
 15:50-16:10 #486
Discovering Lyapunov functions for dynamical systems using simulation
 Kapinski, James
 Toyota
 16:10-16:30 #347
Using Kernel Module Bases for fast polynomial matrix arithmetic
 Labahn, George
 University of Waterloo

16:30-16:50 #469
Transverse feedback linearization and exterior differential systems
 Nielsen, Christopher
 University of Waterloo
 16:50-17:10 #479
Model Predictive Control via Triangular Decompositions of Semi-Algebraic Systems
 Chen, Changbo

17:10-17:30 #398
An optimal predictive control strategy for a plug-in hybrid electric powertrain
 Taghavipour, Amir
 University of Waterloo

Room BA305

SS-VPPO

Variational Problems of Physical origin
Session Chairs
 Robert Jerrard, Andrew Lorent
 University of Toronto, University of Cincinnati

15:30-15:50 #344
Global stability and instability of solutions to nonlinear parabolic and hyperbolic equations

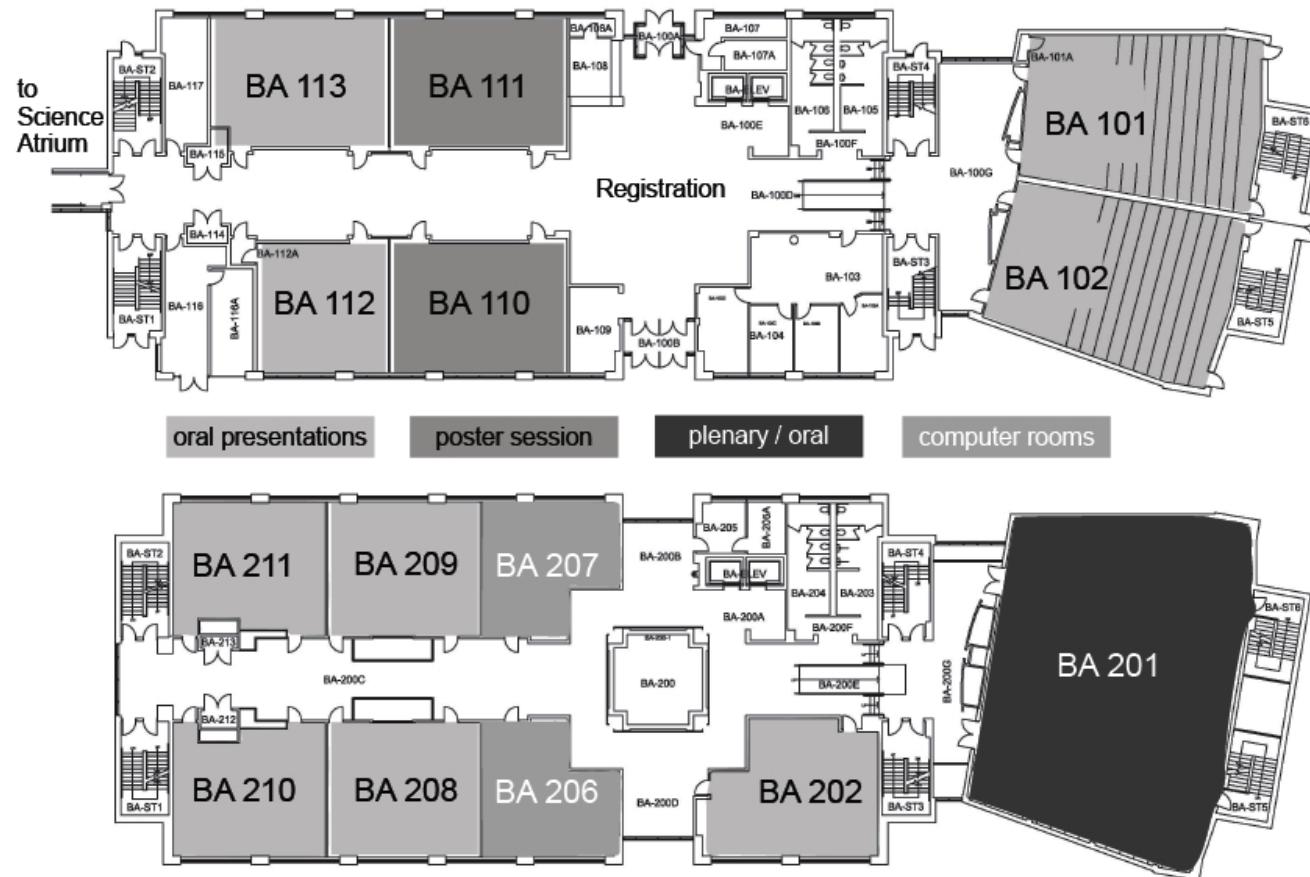
Kalantarov, Varga
 Koc University, İstanbul, Turkey
 15:50-16:10 # 654
Front speed enhancement by large incompressible flows in 3 dimensions
 El Smaily, Mohamad
 University of Toronto
 16:10-16:30#387
Variational problems with non-local operators

Melgaard, Michael
 University of Sussex
 16:30-16:50#476
Thin limit theories in nonlinear elasticity and infinitesimal isometries
 Pakzad, Reza
 University of Pittsburgh
 16:50-17:10#587
A generalized Stoilow decomposition and applications

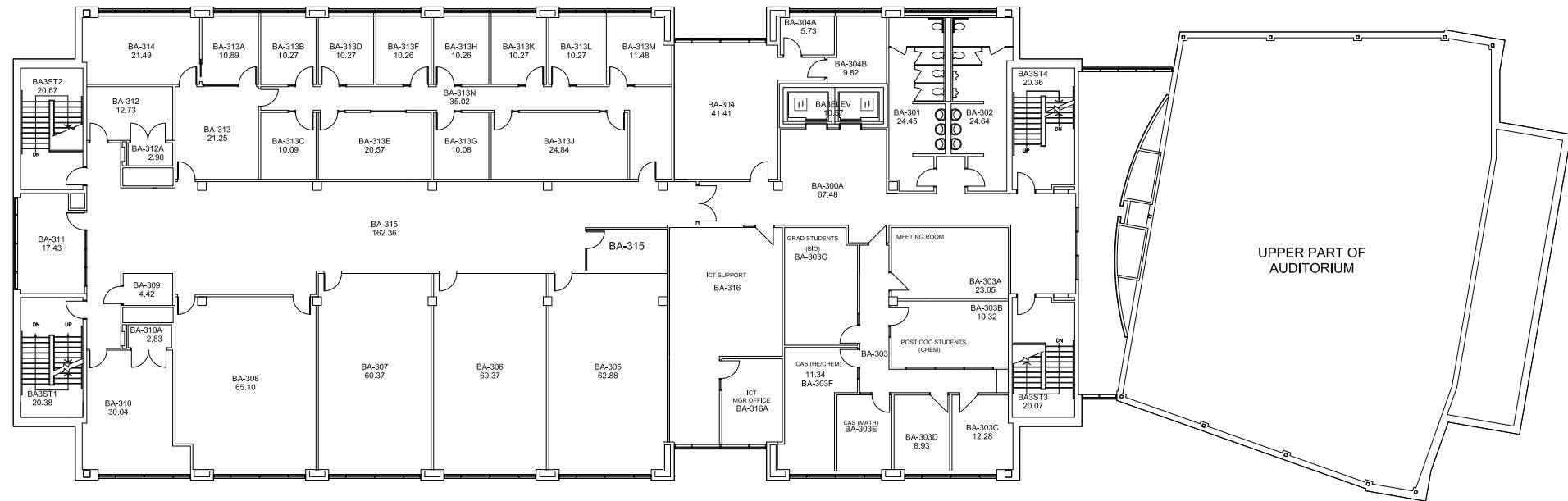
Lorent, Andrew
 University of Cincinnati
 437
Stable Vortex States in Superconductivity
 Contreras, Andres
 McMaster University

10 Maps

10.1 Bricker Academic Building - Floors 1 and 2 Map

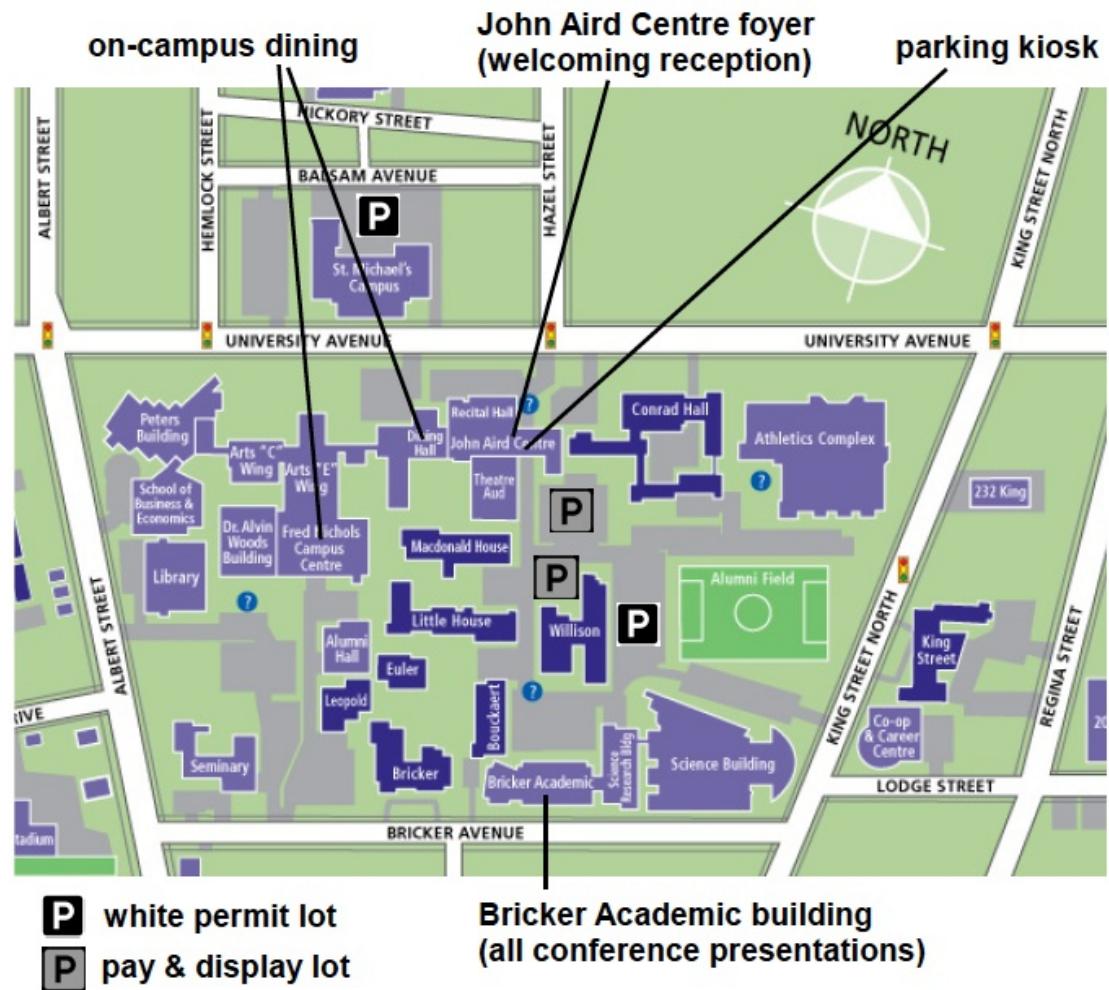


10.2 Bricker Academic Building - Floor 3 Map



BLDG. CODE - 43
FLOOR CODE - 43L03
EXTERIOR GROSS AREA =
19522.30 sq. ft.
1813.62 sq. m.

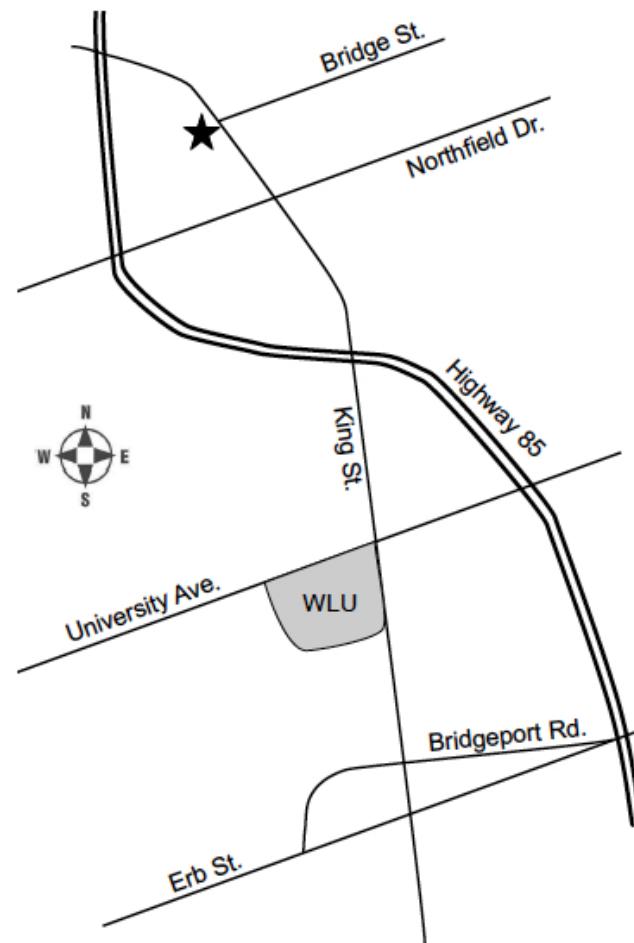
10.3 Wilfrid Laurier University Campus



10.4 Directions to the Conference Banquet

St. George Hall, 665 King St. N, Waterloo (at Bridge St.)

10 minute drive from Wilfrid Laurier University campus



11 Index of Participants

Plenary speakers are marked in *italics*; co-authors are marked with their abstract ID number

A	B	C	D
Abbasi , Ghosel, c, #186	Babaoglu , Ceni, 37	Bozkaya , Canan, 57	Cheng , Juan, 41
Abdelrahman , Mahmoud, 46	Baboulin , Marc, 38	Brams , Steven, 17, 39	Cheng , Chad Shouquan, 45
Abudiaib , Mufid, 25, 46, 54	Baetens , Jan, c, #50	Brams , Steven, c, #341	Cheng , Jian, c, #213
Abueida , Atif, c, #245	Bagayogo , A.Bass, 45	Bramson , Jonathan, c, #542	Chenouri , Shoja, 26, 37
Abukhdeir , Nasser Mohieddin, 52	Baggag , Abdelkader, 24, 57, 59	Brooks , Charles, c, #503	Chenouri , Shoja, c, #365
Achour , Noura, c, #402	Bahramian , Alireza, c, #494	Brown , Joel, c, #242, #336	Cheyne , Helen, 42
Adamescu , Adrian, 44	Ball , Kenneth, 42	Brunet , Dominique, 37	Ching , Shinung, c, #417
Adeyeye , John, c, #182	Balsim , Igor, 45	Brunet , Dominique, c, #386	Chit , Ayman, c, #350
Aghayan , Reza, 41, 44	Bandrauk , Andre, D., c, #22	Bruzon , Maria S, 38	Chou , Ching-Shan, 41
Akram , Farooq, c, #38	Bandyopadhyay , Arghya, 40	Bruzon , Maria S, c, #196	Chow , Amenda, 40
Al-Abadleh , Hind, c, #170, #188	Barbosa , Fernando, 60	Bunker , Alex, 48	Christara , Christina, c, #206
Alexopoulos , Leonida, c, #460	Barclay , Pat, 45	Buono , Pietro-Luciano, 24, 58, 60	Christlieb , A., c, #475, #528, #551
Alfaki , Mohammed, c, #157	Barreiro , Andrea, 58	Buono , Pietro-Luciano, c, #264, #361	Chryst , Marcin, c, #373
Ali , Hani, 52	Barelli , Helene, c, #143	Burlica , Monica-Dana, 47	C#Montiel , Lorena, 55
Ali , Naamat, 43	Bauch , Chris, c, #127, #179, #268, #301, #359, #350, #392, #515, #516	Burlica , Monica-Dana, c, #152	Ciupe , Stanca, 25, 57, 59
Almaatani , Dalia, c, #351	Bazeia , Dionisio, c, #534	Burr , Wesley, 25, 41, 44, 59	Cleary , Erin, 44
Almansoori , Ali, 54	Bazmara , Hossein, c, #536, #539	Busch , Arthur, c, #245	Cocks , Rachele, 57
Almansoori , Ali, c, #133, #134	Beauchemin , Catherine, 59	Bush , Lawrence, 39	Coifman , Ronald, 7, 27, 28
Almowanes , A., c, #421	Beauchemin , Catherine, c, #510	Bush , Lawrence, c, #550	Cojocaru , Monica, 1, 33, 34, 35, 36, 42, 43
Aoki , Yasunori, c, #309, #310	Bélair , Jacques, 40, 58	Bussi , Giovanni, c, #377	Cojocaru , Monica, c, #215, #268, #301, #473
Al Salman , Hassan, 50	Belcastro , Vincenzo, c, #460	Butler , Leo, 51	Colberg , Peter, 51
Alwan , Mohamad, 26, 47, 49	Behrad , Khalaf, c, #494	Byelobrov , Volodymyr, 42	Colbry , Dirk, c, #482
Amarante , Massimiliano, 41	Bellale , Sidheshwar, 43	C	Collinson , Shannon, 52
Anand , Madhur, c, #179	Belmiloudi , Aziz, 45	Campanelli , Manuela, c, #99	Conca , Carlos, c, #453
Andrews , Michael, c, #663	Belykh , Igor, 58	Campbell , Sue Ann, c, #630	Conitzer , Vince, c, #577
Anco , Stephen, 46	Benes , Michal, c, #300	Campolieti , Giuseppe, 25, 31, 32, 46, 48	Consta , Styliani (Stella), 54
Anco , Stephen, c, #326	Benedict , Alex, c, #434	Canizares , Priscilla, c, #571	Contreras , Andres, 61
Andersen , Garrett, 41	Berezovskaya , Faina, 49	Carl , Michael, 25, 38, 40	Cook , Kathryn, c, #537
Anderson , James, 39, 55	Berezovskaya , Faina, c, #530	Carl , Michael, c, #585	Cooper , Chris, c, #230
Andrews , Paul, c, #540	Berry , Joel, 46, 59	Carloni , Paolo, c, #377	Costanzino , Nick, 46
Anicic , Rastko, 58	Betancourt-Torcat , Alberto, 54	Carr , Michael, 5, 31, 32	Coté , Sébastien, 54
Anselmi , Jonathan, c, #136	Betancourt-Torcat , Alberto, c, #134	Carter , Emily, 6, 29, 30	Cressman , Ross, 24, 48
Antipova , Alena, 46	Bhattacharya , Pathikrit , c, #52	Causley , Matthew, 46	Cressman , Ross, c, #185, #242
Apaloo , Joe, 24, 48	Berzins , Martin, 41	Chaalal , Mohammed, 40	Cross , James, c, #199
Apaloo , Joe, c, #242	Bilal , Erhan, c, #460	Chakrabarti , Bikas, c, #52	Cruz Cortes , Nareli, 46
Ardaneh , Kazem, 43	Billel , Neggal, 50	Chalishajar , Dimplekumar	Cruz Cortes , Nareli, c, #499
Argaez , Carlos, c, #297	Biondini , Gino, 46	Chamoli , Neeraj, 57	Cuevas-Saavedra , Rogelio, 39
Arino , Julien, 16, 49	Biros , George, c, #299	Chan , Bernard, 60	Cui , Kaijie, 47
Arora , Kaurnesh, 40	Blahut , Kenneth, 47	Chan , Hue Sun, 59	Cui , Zhenyu, c, #562
Arsie , Alessandro, 54	Bloch , Anthony, c, #158	Chan , Matthew, 39	Cushman , John, c, #349
Arya , Gaurav, 24, 40	Boguslawski , Katharina, 44	Chan , Matthew, c, #290	D
Astrom , Jan, c, #356	Bohn , Bastian, 57	Chan , Raymond, c, #174	Dabrowski , Christine, c, #264
Atamas , Nataliaia, 60	Bohun , C Sean, 25, 57	Chen , Changbo, 61	Dai , Binxiang, 53
Athar , Safia, 1	Bolker , Ben, c, #540	Chen , Geng, c, #411	Dang , Duy-Minh, 24, 51, 55
Avelino , Pedro, c, #534	Bonyah , Ebenezer	Chen , Jingrun, 26, 60	Dang , Duy-Minh, c, #234
Awad , Asmaa , 47	Bonilla , Luis, c, #416	Chen , Jingrun, c, #532	Danks , Ryan, 25, 38, 40
Awad , Asmaa, c, #371	Borodin , Volodymyr, 45	Chen , Nan, 46	Darlington , Gerarda, c, #146
Ayala , Diego, 43	Bovard , Luke, 50	Chen , Pu, c, #494	Das , Tushar, 57
Ayers , Paul, c, #141, #281, #283, #290, #431, #521, #607, #608	Bowman , John, 58	Chen , Weitao,c, #96	Davison , Matt, c, #172, #221
Azimzadeh , Parsiad, 51		Chen , Yuming, 24, 53, 56	D'Azevedo , Eduardo, c, #474

Index of Participants

Plenary speakers are marked in *italics*; co-authors are marked with their abstract ID number

De Baerdemacker , Stijn, c, #141
De Sanctis , Bianca, 50
De Sterck , Hans, 25, 40, 52, 55
De Sterck , Hans, c, #337, #432
Deghdak , Messaoud, 41
Del Rey Fernández , David C., 55
Demmel , Franz, c, #558
Demircioglu , Emre, c, #313
Dénes , Attila, 55
Denniston , Colin, 46
Denniston , Colin, c, #275, #489
deBaets , Bernard, c, #49, #50
DeVille , Lee, 58
Dezern , David, 44
Dezern , David, c, #182
Dhote , Rakesh, 1, 51
Diacu , Florin, 51
Diagne , Salimata, c, #351
Dias , Cristiano, 26, 57
Dias , Cristiano, c, #485
Diaz Moreno , Jose Manuel, c, #448
Ding , Xiangdong, 54
Dlamini , Phumlani, 38
Do , Trang, 46
Dobrowolski , Tomasz, 60
Dogan , Abdulkadir, 43
Dogan , Abdulkadir
Dongarra , Jack, c, #443
Dragicevic , Suzana, 46
Dragomirescu , Florica Ioana, 43
Drapaca , Corina, 25, 38, 40
Dryden , John, c, #189
Dryuma , Valerii
Du , Jiangfeng, 58
Duncan , Grant, 50
Dur-e-Ahmad , Muhammad, 38
Dujimovic , Jozo, c, #574
Dutta , Rohan, 39
Dutta , Debjit, 56
Dziubek , Andrea, c, #546
E
Earn , David, 52
Earn , David, c, #487
Eberl , Hermann, 53
Efendiev , Messoud, c, #455
Eftekharian , Amin, c, #579
Elder , Ken, c, #321
Elkamel , Ali, c, #133, #134, #370, #371, #372, #536, #539
El Smaily , Mohammad, 61

El-Sirafy , Ibrahim, 57
Elmoataz , Abderahim, 55
Erkip , Albert, c, #100
Erbay , Husnu Ata, c, #100
Erdol , Nurgun, 44
Erdol , Nurgun, c, #611
Erol Genevois , Mujde, 54, 57
Erol Genevois , Mujde, c, #313
Eschen , Elaine, 51
Escobar , Marcos, 48
Ezike , R. O., c, #89
F
Faghihi , Niloufar, 48
Farahbakhsh , Bahram, 51
Farahbakhsh , Bahram, c, #253
Farbiz , Taherer, c, #18
Farrag , Abdel Aziz, 44
Feld , Jordan, c, #510
Feng , Wei, c, #457
Fernandez , Oscar, 51
Ferreira , Rogelma
Fgaier , Hedia, c, #371, #372, #539
Fialho , Joao, 47
Field , Scott, 41
Fillion-Goudreau , Francois, c, #
Fillion-Goudreau , Francois, 58
Filochi , Marcel, c, #107
Filsmoser , Peter, c, #269
Flori , Cecilia, 52
Forde , Jonathan, 25, 57, 59
Forsyth , Peter, 24, 52, 55
Forsyth , Peter, c, #207, #250
Fowler , Michael, c, #134
Freire , Igor, c, #61
Fu , Kai, 55
Fusai , Gianluca, c, #559, #567
Fujiwara , Toshiaki, 51
Fukuda , Hiroshi, c, #444
G
Gair , Jonathan, c, #571
Gallego , Maria, 37
Galvani , Alison, c, #226
Gan , Hin Hark, 40
Gandarias , Maria Luz, 46
Garvie , Marcus, c, #452
Gasser , Ingenuin, c, #21
Garcia-Cervera , Carlos, 60
Garcia Vazquez , Conception
Gasperowicz , Malgorzata, 40
Gavious , Arieh, c, #80

Gel , Yulia, c, #286, #554
Gerchak , Yigal, 39
Gerhard , Jürgen, 24, 61
Germano , Guido, 39, 42, 45, 51, 58
Gherib , Rami, 60
Ghezavati , Vahidreza, 47
Ghose , Shohini, 52, 55
Ghose , Shohini, c, #188
Giannakis , Dimitrios, 11 Haynes , Ronald, 52
Gillis , Dan, c, #450
Ginting , Victor, 52
Ginting , Victor, c, #552
Giordan , Judith, 52
Gligorijevic , Vladimir, c, #94
Gningue , Youssou, 41
Gningue , Youssou, c, #351
Golubitsky , Martin, 8, 35, 36
Gomez , hector, c, #401
Goncalves , Jose, 49
González , Alvaro, c, #439
González , Maria, c, #500
González Espinoza , Cristina Elizabeth, 39
Gorjii , Masoumeh, c, #121
Gottesman , Daniel, c, #548
Grant , Martin, c, #321, #429
Gray , Chris, 59
Gray , Chris, c, #513
Grebenkov , Denis, 40
Greenhalgh , Scott, 24, 42, 45, 47
Grigorieva , Ellina, 53, 55
Groth , Clinton, 52
Groth , Clinton, c, #285, #337, #430, #432
Grover , Deepak
Guchu , Yaman, 42
Guchu , Yaman, c, #475, #528
Guidoboni , Giovanna, c, #546
Gumel , Abba, 57
Gung-wei , Yuan, c, #201
Gunsalus , Kristin, c, #362
Gure , Ugur, c, #298
H
Ha , Bae-Yeun, 59
Habbal , Abderrahmane, 40
Habibi , Mona, 48
Hadjiliadis , Olympia, 46
Haj Mohammad Jafar , Reza, c, 56
Haley , Charlotte, 25, 41, 44
Hall , Brent, c, #499
Hamilton , David, c, #450
Hamilton , Ian, 24, 37, 39, 44

Hamilton , Ian, c, #102, #170
Han , Jong, c, #549
Han , Meng, 52
Harman , Peter, 58
Hasan , Majid, 45
Haslam , Michael, 55
Hautesserres , Denis, 38
Hayami , Ken, c, #310
Heesterbeek , Hans, c, #484
Heffernan , Jane, 25
Heidar Zadeh , Farnaz, 39, 52
Hempel , Karsten, 52
Hendel , Philip, c, #506
Hendel , Raymond, c, #506
Hinnov , Linda, 41
Hirani , Anil, c, #546
Hitchon , William, c, #551
Hoang , Chinh, 26, 51
Hoeng , Julia, c, #460
Hofmann , Bernd, 18, 39
Hoopes , Matthew, c, #329
Hopkins , Brian, 37, 41
Horan , Sean, 37
Horrocks , Julie, 59
Horrocks , Julie, c, #146
Hou , Nicolas, c, #317
Hrykiv , Volodymyr, c, #40
Hu , Xuedong, 60
Hu , Zhiang, c, #474
Huang , Zhiyue, 37
Hung , Jo-Tzu, c, #328
Hunter , John, 44
Hurd , Tom, 46
Hussain , Malik Zawwar
Hussain , Muhammad, 51
Hyndman , Cody, 48
I
Ifram , Mihaela, 446
Ijioma , Ekeoma Rowland, 43
Imielinski , Tomasz, c, #113
In , Visarath, c, #264
Ivan , Lucian, 41, 52
Ivan , Lucian, c, #337
J
Jackson , Ken, 24
Jackson , Ken, c, #206, #234, #236
Jafari Salim , Amir, 58

Index of Participants

Plenary speakers are marked in *italics*; co-authors are marked with their abstract ID number

- Jangid , Kamlesh, 57
Jegdic , Katarina, 44
Jelokhani , Masoud, c, #513
Jenssen , Kris, 39
Jeon , Jee Seon, c, #68
Jerrard , Robert, 1, 26, 61
Ji , Liangyue, c, #333
Jia , Junguo, c, #112
Jian , Jianzhong, c, #139
Jin , Zhen, 56
Jing-yan , Yue, c, #201
Jiwari , Ram, 49
Jones , Michael, A., 38
Jones , Glynnis, 44
Jones , Vaughn, 9, 31, 32
Johnson , Paul, c, #141
Johnson , Sam, 50
Jung , Jae-Hun, 25, 46, 48
K
Kadioglu , Samet, 49
Kaffel , Ahmed
Kail , Andrew, c, #474
Kakiashvili , Tamar, 45
Kakiashvili , Tamar, c, #425, #506
Kalantarov , Varga, 61
Kalugin , German, 40
Kamal , Kamal, 40
Kamal , Ankit, 56
Kantor , Ivan, 54
Kao , Kiu-Yen, c, #96
Kapinski , James, 61
Kapral , Raymond, c, #511
Karev , Georgiy, 47
Kari , Lila, 10, 33, 34
Karttunen , Mikko, 59
Karttunen , Mikko, c, #275, #321, #329, #356
Kassmann , Moritz, c, #222
Kaufman , Justin, c, #45
Kaushik , Aditya, 42
Kaveh , Sarikhani, c, #494
Kawaji , M., c, #135
Kazemlou Sheikhi , Ahmad, 50
Kelly , Richard, c, #286
Keyfitz , Barbara, c, #106
Kenettinkara , Sudarshan Kumar, 55
Khalique , Chaudry Masood, 25, 46, 48, 54
Khalique , Chaudry Masood, c, #60
Khan , Hamid, c, #38
Khan , Adnan, 46
Khan , Md. Rakibul, 62
Khanna , Faqir, c, #471
Khattar , Dinesh, 56
Khor , Susan, 49
Khorasani , Sina
Khoshnegar , Milad, 58
Kilgour , Marc, 33, 35, 36
Kilgour , Marc, c, #246
Kim , Taewon
Klein , Eili, 18, 44
Klein , Eili, c, #127
Kleinsteiner , Steven, c, #226
Klinke , David J., c, #542
Kloosterman , Matt, 50, 57
Kobelevskiy , Petr, c, #365
Koczkodaj , Waldemar, 37
Koczkodaj , Waldemar, c, #421, #425, #506
Koff , David, c, #386
Kohandel , Mohammed, c, #176
Kohaupt , Ludwig, 25, 42, 45, 47, 49
Kohut , Sviataslav, 39
Kolkiewicz , Adam, 48
Konayaga , Akihiko, c, #310
Konstorum , Anna, 38
Korobeinikov , Andrei, c, #27
Kowalik-Urbaniak , Ilona, 57
Kreinin , Alex, c, #236
Krivan , Vlastimil, c, #185
Krivodonova , Lilia, 25, 37, 41, 44, 52, 55
Krivodonova , Lilia, c, #466
Krupicka , Lukas, 38
Krzeminski , Mark, 56
Kuljanin , Miljan, c, #513
Kumar , Manoj, c, #44
Kumar , Atul, 40
Kunik , Mathias, c, #183
Kunze , Herb, 1, 24, 37, 39, 44
Kunze , Herb, c, #359, #360, #452
Kurkcu , Harun, 58
Kutz , Nathan, J., c, #178
L
L. Azad , Nasser, c, #398
Labahn , George, 61
Lacroix , Rémi, c, #443
Lai , Yongzeng, c, #413
Lajoie , Guillaume, 58
Lakhdari , Zakaria, c, #203
Lakhany , Asif, c, #206
Lander , Arthur, c, #591
La Torre , Davide, c, #348, #360
Lau , Stephen, 48
Lau , Stephen, c, #434
Laverty , Sean, 57
Lechner , Luis,
Leok , Melvin, c, #221
Leonenko , Nikolai,c, #79
Lepage , Kyle, 41
Levere , Kimberly, 24, 39, 41, 44
Leviyang , Sivan, 57
Levy , Mel, 20, 29, 30, 37, 45
Lewicka , Marta, c, #476
Li , Eric, 38
Li , Meili, 53
Li , Pengfei, c, #490
Li , Tingju, c, #92
Li , Yan-Chao, c, #116
Li , Xianguo, c, #483
Li , Xiaozhou, c, #333
Liang , Dong, 24, 52, 55
Liang , Dong, c, #130
Liang , Jiaxi , 37
Liang , Haixia, c, #174
Liang , Yawei, 49
Lidgerding , Burton, c, #542
Liebling , Steven, 48
Limacher , Peter, 37
Limacher , Peter, c, #283, #431
Lin , Hai-Qing, 60
Lin , John, c, #286
Lindstrom , Ulf, c, #157
Linhananta , Apichart, 57
Liu , Bin, 50
Liu , Bin, c, #258
Liu , Hui, 59
Liu , Xin, c, #266
Liu , Xinzhi, 26, 47, 49
Liu , Xinzhi, c, #393, #403, #483, #508
Lohi , Ali, c, #370
Lorent , Andrew, 26, 61
Lorenzoni , Paolo, c, #381
Lorin , Emmanuel, 46
Lorin , Emmanuel, c, #22
Losano , Laércio, c, #534
Lousto , Carlos, 48
Lowengrub , John, c, #591
Lu , Yiping, 54, 59
Lu , Yiping, c, #93
Lu , Yongjun, 51
Lu , Weixun, c, #138
Lundgren , Jeff, 38
Lyon , Keenan, 58
Lyubchich , Vyacheslav, 26, 59
M
- M. Perera , Sirani, 52
Ma , Junling, c, #181
Ma , Kai, 51
Ma , Xiaobo
Ma , Xiaobo, c, #213
Mackay , Frances, 46, 51
Mahdipour-Shirayeh , Ali,c, #469
Majedi , Hamed, c, #579
Makarov , Roman, 1
Malandian , Gregoire, c, #143
Malek , Alaeddin, 40, 45
Malevanets , Anatoly, 51
Malevanets , Anatoly, c, #519
Mandl , Wilhelm
Manuge , Derek, 45
Marazzina , Daniele, c, #559, #567
Maroufy , Vahed, 37
Marriott , Paul, 26
Marriott , Paul, c, #490
Marzouki , Mohamed Amine, 54
Matysiak , Silvina, 21, 54
Mavriplis , Catherine, 52, 55
McAlister , Kevin, c, #68
McCluskey , Connell, 25, 49, 56
McCluskey , Connell, c, #200, #626
McKenzie , Ross, 58
McLaurin , David, c, #482
McLeish , Don, 48
McLenaghan , Ray, 26, 51, 54
McLeod , Ian, 59
McNickle , Gordon, 48
McPhee , John, c, #398
Meerschaert , Mark M, 26, 39
Meerschaert , Mark M, c, #79
Mehroust , Farshid, c, #639
Meier , Genevieve, c, #350
Melgaard , Michael, 37, 61
Melnik , Roderick, 1, 4, 27, 28, 31, 32
Melnik , Roderick, c, #401, 416, 583
Melnikov , Yuri, c, #159
Meluzzi , Dario, c, #262
Mendez-Villuendas , Eduardo, c, #408
Mendivil , Franklin, 41
Menezes , Josinaldo, 48
Meng , Qinghui, c, #92
Menil , Junia, c, #607
Mesgarani , Hamid, c, #18
Metzler , Adam, 25, 46, 48, 51
Meyer , Pablo, c, #460
Meyer , Ralf, 51
Meyer , Ralf, c, #594
-

Index of Participants

Plenary speakers are marked in *italics*; co-authors are marked with their abstract ID number

- Meyer , Ralf, c, #594
Mhlanga , Isaiah Elvis, 54
Mia , Abdus Sattar, 43
Michailovich , Oleg, c, #409
Mielkie , Melissa, 42
Miller , Richard, 40
Miller , Richard, c, #254
Miloszewski , Jacek, c, #635
Min , Misun, 37
Miskovic , Zoran, 25
Miskovic , Zoran, c, #363, #389, #427
Misra , Dawn, 38
Misra , Dawn, c, #255
Mitchell , Jennifer, 40
Mitchell , Forrest, c, #40
Mkrtychyan , Anna, 57
Mneimneh , Saad, c, #237
Modugno , Michele, 58
Moghadas , Seyed M., 56
Mohammadi , Bijan, c, #205
Mohammad , Reza, c, #494
Mohammed , Ahmed, 42
Mohiudin , Mohammad, c, #326
Molavian , Hamid, 40
Molina , Chai, 55
Mongin , Phillippe, c, #117
Morano , Lisa, c, #40
Moreno Maza , Marc, c, #479
Morgan , Simon, c, #137
Moro , Antonio, c, #381
Morris , Kirsten, c, #396
Morsky , Bryce, 42, 47
Moseley , Douglas, c, D-458
Mothibi , Dimpho Millicent, 54
Muatjetjeja , Ben, 54
Muir , Paul, 52
Mukhi , Sunil, c, #603
Murcia , Juan, c, #439
Mustafa , Ibrahim, 38, 40
Mustafa , Ibrahim, c, #372
N
Naeem , Imran, 54
Narayanan , Chitra, 54, 59
NategolEslam , Mostafa, c, #513
Ncube , Israel, 40
Nedialkov , Ned, 26, 58
Nedialkov , Ned, c, #296, #441, #491
Nespolo , Massiomo, c, #335
Newlands , Nathaniel, 50
Nguyen , Anh Tuan, c, #40
Nguyen , Sylvia, 1, 41
Nicola , Wilten, 60
Nichols , Matthew, c, #513
Nielsen , Christopher, 61
Nigam , Rahul, 58
Nikolaev , Alexey, 45
Nikolova , Mila, c, #174
O
O'Malley , Daniel, 39
Obabyi , Olawale, 45
Ocakoglu , Kaya O., c, #298
Ohsawa , Tomoki, 51
Oliveira , Breno, c, #534
Oliveira , Fernando, 46
Olshevsky , Vadim, c, #395
Onkabetsse , A. Daman, c, #289
Ortegón , Francisco, G., 43
Ortegón , Francisco, G., c, #448
Oswaldowski , Rafal, c, #549
Oyono , Ngou, c, #405
Ozaki , Hiroshi, c, #444
P
Pagnutti , Chris, 24, 42, 45, 47
Pakzad , Reza, 61
Palacios , Antonio, 60
Palacios , Antonio, c, #361
Pan , Ronghua, 44
Pandit , Sapna, 53
Panigrahi , Saroj, 49
Papanicolaou , George, 12, 31, 21
Pardalos , Panos , 13, 33, 34
Parelson , Alan, c, #226
Park , Jeffrey, 41
Patra , Abani, 37
Pavlika , Vasos, 57
Petrov , Lev, 49
Petukov , Andre, c, #549
Peyman , Pourafshary, c, #494
Phillips , Duncan, c, #585
Pientka , James, 60
Pietsch , Manuel, c, #460
Pilgrim . Wolf-Christian, c, #558
Pippal , Sarita, 59
Piri , Farzaneh, c, #639
Pirjol , Dan, 46
Pirvu , Traian, 42, 43, 45, 47
Pivato , Marcus, 24, 26, 37, 39, 41
Planque , Benjamin, c, #157
Plattner , Alain, c, #493
Plouffe , Cameron, 46
Poignard , Camille, 60
Polyakova , Anna, 37
Pomès , Régis, 54
Ponakala , Nagarani, c, #19
Poore , Keith, 49
Porcelli , Tracy, c, #138
Pour Khiabani , Nahid, 60
Poussin , Carine, c, #460
Prabhakar , Sanjay, 1, 50, 58
Preso , Michael, c, #550
Protas , Bartos, c, #355
Provatas , Nikolas, c, #321
Pryce , John, 26, 58
Pryce , John, c, #441, #491
Pugh , Mary, 39
Pushp , Aakash, 60
Q
Qin , Ruibin, 37
Quaife , Bryan, 38
R
Radivojevic , Tijana, c, #136
Rahman , Ashrafur, 53
Rahmani , Fouad Lazhar, 53
Rajaratnam , Krishan, 54
Rang , Marcus, c, #222
Rangan , Aaditya, 40
Rangan , Chitra, 52
Rapallo , Fabio, c, #136
Rattan , Minto, 54
Reesor , Mark, 48
Reesor , Mark, c, #385
Regmi , Laxmi, 40
Reipas , Katie, c, #585
Reitich , Fernando, c, #93
Remaki , Lakhdar, 24, 57, 59
Ren , Peng, 47
Resch , Janelle, 52
Rheinstadter , Maikel, 48
Rhrissorrakrai , Kahn, 40
Riah , Daniel,c, #273
Rice , John, c, #460
Ricardez-Sandoval , Luis, c, #133
Rimbu Pruncut , Andreea, c, #160
Ringa , Notice, 55
Rivera Zamarripa , Luis Alberto, c, #407
Roberts , Steven, 24, 46
Roberts , Steven, c, #407
Robertson , Colin, 24, 46
Robertson , Colin, c, #581
Rocha , Paulo, 50
Rocha Filho , Tarcisio, c, #471
Rohlf , Katrin, c, #472
Rong , Libin, 59
Rost , Gergely, c, #91
Rosadi , Dedi, 42
Rosa , Maria, c, #196
Rosu , Daniela, 47
Rosu , Daniela, c, #153
Roy , Barnana, 53
Roy , Ranadhir, 47
Rueffer , Matt, c, #450
Ruiz Galan , Miguel, c, #360
Rumschitzki , David,c, #306
Runborg , Olof, 1, 55
Rusjan , Edmond, 49
Ryan , Jennifer, 37
Rybicki , Martin, 55
S ,
Saghir , Z., c, #135, #253
Salafia , Carolyn, 38, 40
Salafia , Carolyn, c, #107, #137, #199, #255, #257
Salahi , Maziar, 45
Salehi-Ashtiani , Kourosh, 40
Salehian , Armaghan, 57
Samadi , Behzad, 24, 61
Samadi , Behzad, c, #346
San Martin , Jorge, c, #447, #453
Sani , Sulaiman, 57
Santana , Admir, c, #471
Santoprete , Manuele, 1, 26, 50, 51, 54, 59
Sari , Nadir, 55
Sato , Hideo, 60
Sawada , Joe, 51
Saxton , Katarzyna, 39
Saxton , Ralph, 39
Scalas , Enrico, 26, 39
Scalas , Enrico, c, #248, #556
Scheid , Jean Francois, c, #447
Schofield , Norman,c, #68
Schupp , Sophie, c, #203
Schwartz , Elissa, c, #65
Schwartz , Nadav, c, #254
Schwab , Russell, 39
Seal , David, 41
Seco , Luis, 46
Sefidgar , Mostafa, c, #536, #539
Selmane , Schehrazed, 38, 43
Seo , Gunog, c, #190
Serfaty , Sylvia, c, #437
-

Index of Participants

Plenary speakers are marked in *italics*; co-authors are marked with their abstract ID number

Serov , Alexander, c, #107	Stechlinski , Peter, 49	Tripathy , Arun Kumar, 40	Wartak , Marek, 24, 42, 58
Shams , Taimur, 54	Stefan , Radek, c, #300	Trogon , Thomas, c, #588	Washington , Ian, 58
Sharma , Puneet, 58	Stewart , Jimena, c, #346	Tse , Long Yiu, 47	Watmough , James, c, #168
Shea-Brown , Eric, c, #178	Stockie , John, 57	Tsikkou , Charis, 44	Waterman , Marian, c, #591
Sherman , Eugene, 58	Stolowitzky , Gustavo, c, #460	Tully , Stephen, 1, 24, 42, 45, 47	Weerderman , Marion, c, #190
Shi , Xiaoqi, c, #430	Subbey , Sam, 44, 47	Tuomela , Jukka, 42	Wei , Bingbo, c, #135, #259
Shi , Yikai, c, #98, #244	Su , Shiquan, c, #474	Turtle , James, c, #264	Wei , Su Hua, 37
Shin , Hwashin H., c, #412	Sun , Gui-Quan, c, #181	U	Wells , Chad, 42, 45, 47, 59
Shiva , Ramasamy, c, #289	Susanto , Andree, 52	Ulukan , Hakki Ziya, c, #298	Welling , Ulrich, c, #558
Shlakhter , Oleksandr, 25, 38, 40	Susanto , Andree, c, #433	Usman , Muhammad, 54	West , Brian, 1
Shlakhter , Oleksandr, c, #254, #257	Suvakov , Milovan,c, #94	V	Westhoff , Joshua, c, #497
Shlizermann , Eli, c, #178	Sven-Acke , Gustafson, c, #155	Vadori , Nelson, c, #51	Whitehead , Hal, c, #450
Shodiev , Hasan, 1, 55	Svetov , Ivan, 37	Vafaei , Shaghayegh, 57	Wilcox , Marianne, c, #151
Shontz , Suzanne, 25, 38, 40	Swartz , Chris, c, #90	Van der Driessche , Pauline, c, #484	Wild , Erin, 42
Shu , Chi-Wang, c, #109	Sweatman , Winston, 51, 57	Van der Weeen , Pieter, 58	Wild , Geoff, 45
Shu , Hongying, c, #168	Swishchuk , Anatoliy, 48	Van Neck , Dmitri, c, #141, #431	Wilder , Sara, c, #40
Shuai , Zhisheng, 52, 55	Sytnyk , D., c, #583	Vanninathan , Muthusamy, c, #453	Willms , Allan, 40
Shymanska , Alla, 42	T	Varani , Gabriele, c, #377	Willms , Allan, c, #468
Sigal , Israel Michael, 14, 27, 28	Tadic , Bosiljka, 42	Vass , József, 41	Wodak , Shoshana, c, #419
Sigdel , Ram, 49	Taghavipour , Amir, 61	Verma , Pooja Raj	Wolf , Eric, c, #475
Sikorskii , Alla, 39	Verwaeren , Jan, c, #49	Wolf , Thomas, 54	Wolf , Thomas, c, #457
Sikorskii , Alla, c, #114	Tan , Gary, c, #296	Viglialoro , Giuseppe, 43	Wolkowicz , Gail, 56
Sikosek , Tobias, 51	Tan , Guangning, c, #441	Viglialoro , Giuseppe, c, #448	Wollner , Winnifred, c, #21
da Silva Leal , Priscila, 50	Tan , Qiuzi, 42	Vrabie , Ioan, c, #152	Wong , Kwai, 42
Singh , Sharandeep, 56	Tang , Sanyi, 53	Vrscay , Edward, 37	Wong , Sarah, c, #450
Sinha , Anjana, 38	Tang , Vincent, 38	Vrscay , Edward, c, #386, #409	Wouters , Sebastian, c, #431
Sivaloganathan , Siv, c, #176	Taniguchi , Tetsuya, c, #444	Vuijk , Thea, 37	Wrzosek , Dariusz, c, #455
Skelton , Andrew, 41	Tarfulea , Nicolae, 22, 45, 47	W	Wu , Jianliang, c, #258
Small , Christopher, 37	Tchier , Fairouz, 41	Wachowiak-Smolikova , Renata, 46	Wu , Lian-Ao, 58, 60
Small , Christopher, c, #456	Teboh-Ewungkem , Miranda, 42	Wachowiak-Smolikova , Renata, c, #424	Wu , Yan, 42, 45, 47, 49
Smaranda , Loredana, 43, 45	Tecmer , Pawel, 44	Wahl , Lindi, c, #187	X
Smirnov , Roman, 47, 54	Teismann , Holger, 60	Wallace , Bill, c, #386	Xia , Qinglan, 38
Smirnov , Ilya, 45	Tesdall , Allen, 25, 37, 39	Wang , Chunlin, 37	Xiao , Yanni, 56
Smith , Silvija, 44	Thomas-Sebastian , Binil, 45	Wang , Haipeng, 51, 54	Xiao , Hong, 41
Smith? , Robert, 57	Thommes , Edward, 47	Wang , Huijian, 51	Xie , Wei-Chau, c, #393, #402
Smolarski-Koff , Nadine, c, #386	Thommes , Edward, c, #215, #268, #663	Wang , Jiheng, c, #386	Xin , Xin, 50
Socolowsky , Jrgen, 38, 45	Thomson , David J., 25, 41, 44	Wang , Jinlian, 47	Xu , Fei, 52
Soleev , Akhmadjon, 46, 47	Thomson , David J., c, #422	Wang , Jun, 46	Xu , Xiaojian, c, #459
Soltani , Madjid, 38, 49	Tian , Yun, 47	Wang , J. Y. , 50	Y
Soltani , Madjid, c, #494	Tieleman , Peter, 23, 48	Wang , Lili, 55	Yabo , Fu
Song , Wen, c, #112	Tieleman , Peter, c, #408	Wang , Lin, 52, 55, 60	Yadav , R. R., c, #380
Song , Jianhui, 51	Tiglio , Manuel, c, #571	Wang , Qing, 47	Yamin , Dan, 47
Sood , Anju, 38	Tiwari , Surabhi, 47	Wang , W., c, #130	Yampolsky , Michael, 25, 38, 40
Souvignier , Bernd, c, #335	Tobaldini Neto , Luiz, 52	Wang , Wendong, 51	Yampolsky , Michael, c, #199,
Sprowl , Stephanie, c, #591	Tomberli , Bruno, c, #513	Wang , Wendong, c, #244	#254, #255, #257
Sriharan , R., 51	Toon , Verstraelen, 37	Wang , Xiao-Ping, c, #532	Yan , Na, 53
Sriharan , R., c, #537	Toon , Verstraelen, c, #281, #290, #608	Wang , Xiaoliqiang, c, #537	Yan , Na, 54
Tai , Xue-Cheng, c, #174	Toppozini , Laura, 51	Wang , Ying	Yang , Junyuan, 56
Srivastava , Sanjay, c, #145	Toussaint , Godfried, 15, 35, 36	Wang , Zhijun, c, #542	Yang , Min, 55
Staroverov , Viktor, c, #115, #156	Tran , Tan, 48	Wang , Zhou, c, #386	

Index of Participants

Plenary speakers are marked in *italics*; co-authors are marked with their abstract ID number

Yang , Ning, 54
Yang , Xu, 60
Yang , Xu, c, #532
Yao , David, c, #266
Yi , Taishan, 53
Yodzis , Michael, 41
Yoon , Jeong-Mi, 53
You , Jianqiang, 58
Young , Peter, 59
Young , Robin, 44
Yousefi , Tooraj, c, #253
Yu , Pei, 38
Yu , Pei, c, #187, #239
Yu , Ting, 58
Yuan , Xiaoqing, c, #98, #244
Z
Zenkov , Dmitry, c, #158, #228
Ziochower , Yosef, c #99
Zhang , Fengqin, 24, 49, 53, 56
Zhang , Lijun, 46
Zhang , Wenjing, 59
Zhang , Kexue, 48
Zhang , Hongtao, 48
Zhang , Lucy Liuxuan, 51
Zhang , Xiao-Guang, c, #181
Zhao , Guiping, 57
Zhou , Kai, c, #213
Zhou , Zhan, 48
Zhu , Gui-Quan, c, #181
Zhuang , Hanqi, c, #611
Zimmerling , Jonathan, c, #424
Zingg , David, c, #366
Zongo , Frederic, c, #387
Zou , Xingfu, 52, 55
Zou , Xingfu, c, #599
Zu , Jean, c, #401
Zutik , Igor, c, #549
Zwicker , William S., 40
