

Submittee: Rustum Choksi

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Title: PIMS Workshop on Nonlocal Variational Problems and PDEs

Event Type: Conference-Workshop

Location:

PIMS UBC

Dates:

Start Date: 06/13/2016

End Date: 06/17/2016

Topic:

Nonlocal variational problems and PDEs. Particularly:

- 1) Nonlocal diffusivity, nonlocal minimal surfaces and regularity.
 - 2) Nonlocal variational problems arising in differential geometry; pattern formation and phase transitions.
 - 3) Equations with nonlocal transport terms and the modelling of crowd/population dynamics.
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Methodology:

The workshop had two mini-courses. One with a focus more on mathematical analysis and geometry. The other with a focus on computation and making connections with other disciplines. The rest of the workshop consisted of 50 minute presentations by senior and junior researchers.

Objectives Achieved:

Two objectives were achieved:

- 1) Bring together two groups, one pure the other applied, who are currently working on nonlocal problems, and foster a fruitful exchange of ideas, approaches, results, and mathematical problems ripe for study.
 - 2) Collect and present the state of the art in a recently very well developed subject: nonlocal minimal surfaces.
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Scientific Highlights:

Two scientific highlights:

- 1) The mini-course by Enrico Valdinoci (Weiertrass Institute) was on

Nonlocal equations from various perspectives. This beautiful series of lectures was taped and is accessible to advanced graduate students.

2) The two talks on hydraulic fracture by Anthony Pierce (UBC) and Antoine Mellet (Maryland). Pierce gave a survey on the mathematical modelling of hydraulic fracture and the resulting treasure trove of untouched nonlocal mathematical problems. Mellet then followed with a talk on the analysis of one of these problems, highlighting the mathematical difficulties in this new area.

Organizers:

Rustum Choksi (Mathematics, McGill), Michael Ward (Mathematics, UBC), Juncheng Wei (Mathematics, UBC)

Speakers:

Theodore Kolokolnikov, Dalhousie University
Enrico Valdinoci, Weierstrass Institute
Weiwei Ao, University of British Columbia
Laurent Betermin, University of Heidelberg
David Bourne, Durham University
Katy Craig, University of California, Los Angeles
Riccardo Cristoferi, Carnegie Mellon University
Qiang Du, Columbia University
Razvan Fetecau, Simon Fraser University
Eliot Fried, Okinawa Institute of Science and Technology
Xin Yang Lu, McGill University
Antoine Mellet, University of Maryland
Cyrill Muratov, New Jersey Institute of Technology
Monica Musso, Pontifical Catholic University of Chile
Anthony Pierce, University of British Columbia
Xiaofeng Ren, George Washington University
Xavier Ros-Oton, University of Texas at Austin
Ovidiu Savin, Columbia University
Yannick Sire, Aix-Marseille University
Ihsan Topaloglu, McMaster University
Enrico Valdinoci, Weierstrass Institute

Links:

<https://www.pims.math.ca/scientific-event/160613-pwnvpp>

File Uploads:

Additional Upload 1: http://www.pims.math.ca/files/final_report/PDE_Final_06_10.pdf
