Graduate Studies in Pure Mathematics

Nice Guy
on behalf of
Nico Spronk, Associate Chair for Graduate Affairs

September 17, 2015
Why be a Pure Math Graduate Student?

- To become a mathematician
- Personal interest

Preparation for professional careers
- Computer industry
- Finance
- Government
- Education
## Being a Pure Math Graduate Student

### Courses
We offer a variety of intellectually stimulating and challenging courses.

### Project/thesis
- work one-one-one with a supervisor, or multiple advisors.
- learn how to do mathematical research.
- explore a topic in depth.

### Financial support (MMath)
- $\geq 26 300/\text{year (domestic)}$; $33 000/\text{year (visa)}$
- $\geq 31 680/\text{year (OGS)}$; $\geq 34 180/\text{year (NSERC)}$
## Research area: Analysis

### Faculty

<table>
<thead>
<tr>
<th>K. Davidson</th>
<th>B. Forrest</th>
<th>K.E. Hare</th>
<th>M. Kennedy</th>
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<tbody>
<tr>
<td>L. Marcoux</td>
<td>A. Nica</td>
<td>H. Radjavi</td>
<td>N. Spronk</td>
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- **harmonic analysis**
  - abstract
  - commutative/real line
  - Lie groups
- **non-commutative probability**
- **fractal analysis**
- **operator theory**
  - single operators
  - operator/C*-algebras
  - operator spaces
- **topological quantum groups**
- **financial mathematics**
Research area: Number Theory

Faculty

J. Bell  K.G. Hare  W. Kuo
Y.-R. Liu  D. McKinnon  M. Rubinstein
M. Satriano  C. Stewart  S. Yazdani

- analytic number theory
  - Diophantine equations
  - modular forms/L-functions
  - $p$-adic analysis
  - function fields
  - circle methods
  - probabilistic number theory

- algebraic number theory
  - algebraic geometry
  - arithmetic geometry
  - elliptic curves

- computational number theory
  - fractal analysis

- automatic sequences
Research area: Geometry and Topology

Faculty

B. Charbonneau  S. Karigiannis  D. McKinnon  R. Moosa
R. Moraru  B.D. Park  M. Satriano

- Differential/algebraic geometry
  - mathematical physics
  - global analysis
  - PDEs on manifolds
  - gauge theory
  - complex geometry
- low dimensional topology
  - 4-manifolds
  - exotic smooth structures
- algebraic topology
- differential fields
  - Galois theory of Lie groups
Research area: Algebra and Logic

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Research Areas</th>
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<tbody>
<tr>
<td>J. Bell</td>
<td>model theory</td>
<td>computability theory</td>
</tr>
<tr>
<td>B. Csima</td>
<td>universal algebra</td>
<td>logical limit laws</td>
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<tr>
<td>W. Kuo</td>
<td>ring theory</td>
<td>representation theory</td>
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<tr>
<td>D. McKinnon</td>
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<td>R. Moosa</td>
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<td>M. Satriano</td>
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<td>R. Willard</td>
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- dimension theory
- Grobner bases
- constraint satisfaction problems

- lie groups
- algebraic geometry
- Langlands program
Next steps – thinking about Pure Math

Course preparation

- Take advanced sections
- Take a broad selection of the hardest, deepest mathematics courses.

Undergraduate research

- Apply for a USRA; learn more:
  http://math.uwaterloo.ca/pure-mathematics/

Faculty mentorship

- Engage a PMath faculty member to advise you on a possible academic plan, based on your interests.
Practicalities of applying

Applying

- Application deadline January 15.
  — start thinking about suitable people to write letters of reference.
  [http://math.uwaterloo.ca/pure-mathematics/graduate-studies/application-procedure-admissions](http://math.uwaterloo.ca/pure-mathematics/graduate-studies/application-procedure-admissions)

Scholarships

- Apply for NSERC and OGS through Pure Math.
- For important information, visit the

  Graduate Scholarship Information Meeting
  Sept. 14, 2015, 4:00 - 6:00 p.m.
  or, Sept. 17, 2015, 5:00 - 7:00 p.m.
  J.G. Hagey Hall of the Humanities, Theatre of the Humanities
Contact information

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