

## Curriculum Vitae

# Michael R. Bush

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## Academic Positions

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|------------------------|--|
| Jul. 2007 – present    | <b>Visiting Assistant Professor</b> , Smith College, Northampton.            |
| Sept. 2004 – Aug. 2007 | <b>Visiting Assistant Professor</b> , University of Massachusetts, Amherst.  |
| Jan. 1997 – Dec. 1997  | <b>Research Support Worker</b> (Chemistry), University of Sydney, Australia. |

## Academic Degrees

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|-----------------------|---|
| Aug. 1998 – May 2004  | <b>Ph.D. Mathematics</b> , University of Illinois, Urbana-Champaign.<br>Thesis Advisor: Prof. Nigel Boston. |
| Feb. 1993 – Dec. 1996 | <b>B.Sc. (Hons)</b> , University of Sydney, Australia.  |

## Publications

6. M. R. Bush, F. Hajir, *An irreducibility lemma*, J. Ramanujan Math. Soc., **23**, No. 1 (2008), 1–9.
5. M. R. Bush, J. Labute, *Mild pro- $p$  groups with 4 generators*, J. Algebra **308** (2007), 828–839.
4. L. Bartholdi, M. R. Bush, *Maximal unramified 3-extensions of imaginary quadratic fields and  $SL_2(\mathbb{Z}_3)$* , J. Number Theory **124** (2007), 159–166.
3. M. R. Bush, *Computation of the Galois groups associated to the 2-class towers of some quadratic fields*, J. Number Theory **100** (2003), 313–325.
2. M. R. Bush, M. Leeming, R. F. C. Walters, *Computing left Kan extensions*, J. Symbolic Comput. **35** (2003), 107–126.
1. M. R. Bush, M. Booth, A. D. J. Haymet, A. G. Schlijper, *Integral equation approximation for inhomogeneous fluids: functional optimization*, Molecular Physics, Vol. **95**, No. 3 (1998), 601–619.

## Theses

2. M. R. Bush,  *$p$ -class towers of imaginary quadratic fields*, Ph.D. Thesis, University of Illinois, Urbana-Champaign (May 2004).
1. M. R. Bush, *The Todd-Coxeter procedure and its generalizations*, Honours Thesis, University of Sydney (November 1996).

## Awards, Fellowships and Other Achievements

- Apr. 2004 **Irving Reiner Memorial Award in Algebra**, University of Illinois. Awarded each year for outstanding scholastic achievement in the field of algebra.
- Apr. 2004 **Department TA Instructional Award**, University of Illinois. Awarded each year for excellence in teaching.
- Aug. 2003 – May 2004 **Bateman Fellowship in Number Theory**, University of Illinois. Awarded each year by faculty to a current outstanding student in number theory.
- Spring 2002 Placed on **The Incomplete List of Teachers Recognized as Excellent by Their Students** at the University of Illinois. Awarded to top 10% of instructors across UIUC campus based on student evaluations of instructor effectiveness.
- Apr. 2002 **Hohn-Nash Award**, University of Illinois. Awarded for outstanding scholarship and promise in applied mathematics. In my case, for some computational results in number theory.
- 1998 – 2002 **University Fellowships** (one full year and two individual semesters), University of Illinois.
- May 1997 Graduated with first class honours. Awarded **University Medal** for overall excellence in undergraduate studies at the **University of Sydney, Australia**.

## Teaching Experience and Related Activities

- Sept. 2007 – present **Visiting Assistant Professor**, Smith College, Northampton. Taught: Calculus I (F 2007); Calculus II (S 2008); Number Theory (F 2007, F 2008); Abstract Algebra I (S 2008); Abstract Algebra II (F 2008); Expect to teach linear algebra and discrete mathematics in Spring 2009.
- Jun. 2008 – Aug. 2008 **Summer REU**, Smith College. Research advisor for three Smith students on an 8 week project supported by the Smith Summer Research Fellows program. **Topic:** *Algebraic and combinatorial properties of De Bruijn sequences*.
- Sept. 2007 – May. 2008 Provided **local tutoring and support** for Smith students taking graduate abstract algebra courses at the University of Massachusetts. (3 students in F 2007, 1 in S 2008).
- Jul. 2006 – Aug. 2006 **Summer REU**, University of Massachusetts, Amherst. Co-advised two students with Prof. F. Hajir and Prof. D. Yasaki. **Topic:** *Asymptotic properties of cyclic codes*.
- Oct. 2005/ Mar. 2007/  
Feb. 2008 **Undergraduate Math Club Talks**, Gave undergraduate level math talks at the University of Massachusetts, University of Connecticut and Smith College ( $\times 2$ ).
- Sept. 2004 – May 2007 **Visiting Assistant Professor**, University of Massachusetts, Amherst. Taught: Calculus I (F 2004  $\times 2$ , F 2006 honors); Calculus II (S 2005  $\times 2$ , S 2007, F 2005 honors); Undergraduate Group Theory (F 2005 honors); Undergraduate Ring and Field Theory (S 2006); Math 499C/D (F 2006 – S 2007) – co-organized this two semester honors capstone course with Prof. F. Hajir.
- Aug. 1998 – May 2003 **Teaching Assistant**, University of Illinois, Urbana-Champaign. Experience as full responsibility instructor for various undergraduate courses including: Calculus I (1 recitation section); Calculus II (2 sections – one taught in the active learning style as part of the *Calculus & Mathematica* program); Calculus III (1 section); Linear Algebra (4 sections).

## Invited Talks

- Dec. 2007 *The structure of Galois groups of maximal  $p$ -extensions.* Number Theory Seminar, **Dartmouth University**.
- Nov. 2007 *Mild groups in number theory.* A conference in honour of John Labute, **McGill University and CRM, Montreal**.
- Oct. 2007 *Orbits of mild groups.* Maine-Québec Number Theory Conference, **University of Maine**.
- Jan. 2007 *Arithmetic Galois groups and number theory.* Colloquium, **University of Nebraska, Lincoln**.
- May. 2006 *Maximal unramified 3-extensions of imaginary quadratic fields and  $SL_2(\mathbb{Z}_3)$ .* Workshop: Pro- $p$  Extensions of Global Fields and pro- $p$  groups, **Mathematisches Forschungsinstitut Oberwolfach**.
- Apr. 2006 *Mild pro- $p$  groups and  $p$ -extensions with restricted ramification* (Galois theory special session); *Maximal unramified 3-extensions of imaginary quadratic fields and  $SL_2(\mathbb{Z}_3)$*  (number theory special session). AMS Sectional Meeting, **University of New Hampshire**.
- Nov. 2005 *Mild pro- $p$  groups and  $p$ -extensions with restricted ramification.* Number Theory Seminar, **Harvard University**.
- Oct. 2005 *Mild groups and  $p$ -extensions with restricted ramification.* Maine-Québec Number Theory Conference, **University of Maine**.
- Apr. 2005 *Galois groups of  $p$ -class towers.* Algebra Seminar, **University of Connecticut**.
- Feb. 2004 *Maximal unramified  $p$ -extensions and  $p$ -groups of deficiency zero.* Number Theory Seminar, **University of Wisconsin, Madison**.
- Sept. 2003 *Class towers of number fields.* Number Theory Seminar, **University of California, Berkeley**.

## Recent Conferences and Workshops

- Sep. 29–30, 2007 **Maine/Québec Conference on Number Theory and Related Topics**, University of Maine.
- Jul. 9–14, 2006 **Canadian Number Theory Association IX Meeting**, University of British Columbia, Vancouver.
- May 21–27, 2006 **Workshop on pro- $p$  extensions of global fields and pro- $p$  groups**, Mathematisches Forschungsinstitut Oberwolfach, Germany.
- Apr. 22–23, 2006 **AMS Sectional Meeting**, University of New Hampshire, Durham.
- Nov. 18–19, 2005 **Current Developments in Mathematics**, Harvard University.
- Oct. 1–2, 2005 **Maine/Québec Conference on Number Theory and Related Topics**, University of Maine.
- Aug. 8–11, 2005 **Workshop on Profinite Groups and Applications**, Carleton University, Ottawa.
- Jun. 13–17, 2005 **Open Questions and Recent Developments in Iwasawa Theory**, Boston University.
- Mar. 12–16, 2005 **Arizona Winter School (Topic: Arithmetic Fundamental Groups)**, University of New Mexico.

## Professional Societies

1998 – present	<b>American Mathematical Society.</b>
2004 – present	<b>Mathematical Association of America.</b>

## Service

Sep. 2008 – May 2009	<b>Organizer of the monthly math problem contest</b> , Department of Mathematics & Statistics, Smith College.
Sep. 2008 – Dec 2008	<b>Putnam Team Organizer</b> , Department of Mathematics & Statistics, Smith College.
2008	<b>Referee</b> , Mathematische Annalen (1 paper); American Mathematical Monthly (1 note).
2004 – present	<b>Reviewer for Mathematical Reviews</b> , 13 reviews written to date. Available on-line at: <a href="http://www.ams.org/mathscinet">http://www.ams.org/mathscinet</a> .
Aug. 2003 – May 2004	<b>Organizer of the Math 500 Graduate Student Seminar</b> , Department of Mathematics, University of Illinois. Talks aimed at second and third year graduate students, given by postdocs and senior graduate students.
Aug. 2002 – Jul. 2003	<b>Graduate Affairs Committee</b> , Department of Mathematics, University of Illinois.
Aug. 2001 – Jul. 2002	<b>Office Space Committee</b> , Department of Mathematics, University of Illinois.
Aug. 2001	<b>Assisted with the New Teaching Assistant Orientation</b> , Department of Mathematics, University of Illinois.
2000 – 2003	<b>New Graduate Student “Buddy” Program (Mentoring)</b> , Department of Mathematics, University of Illinois.

## Citizenship

Dual nationality: British/Australian; US permanent resident.

## Other Skills

Various degrees of familiarity with the following languages/packages: Magma, Gap, Kash, Pari-gp, Mathematica, C.

## References

The following people will provide letters of reference:

### Research:

- Prof. Nigel Boston, University College Dublin; email: [nigel.boston@ucd.ie](mailto:nigel.boston@ucd.ie)
- Prof. Farshid Hajir, University of Massachusetts, Amherst; email: [hajir@math.umass.edu](mailto:hajir@math.umass.edu)
- Prof. John Labute, McGill University; email: [labute@math.mcgill.ca](mailto:labute@math.mcgill.ca)

### Teaching:

- Prof. Christophe Golé, Smith College; email: [cgole@email.smith.edu](mailto:cgole@email.smith.edu)