

CURRICULUM VITAE
FOR
BREMNER, Murray Ronald
Department of Mathematics & Statistics

1. PERSONAL

Born February 3, 1959
Employee No. 8725722

2. ACADEMIC CREDENTIALS

B.Sc., High Honours, University of Saskatchewan, 1981, Department of Mathematics and Department of Far Eastern Studies.
M.Comp.Sc., Concordia University, 1984, Department of Computer Science.
Ph.D., Yale University, 1989, Department of Mathematics.

3. OTHER CREDENTIALS

Nil

4. APPOINTMENT(S) AND PROMOTIONS (U OF S)

Assistant Professor, July 1, 1993, Department of Mathematics and Statistics.
Associate Professor, July 1, 1995, Department of Mathematics and Statistics.
Associate Professor, Tenured, July 1, 1997, Department of Mathematics and Statistics.
Full Professor, July 1, 2002, Department of Mathematics and Statistics.

5. ASSOCIATE MEMBERSHIPS

Nil

6. LEAVES

Sabbatical Leave, July 1, 1999 to December 31, 1999, Department of Mathematics, Iowa State University, Ames, Iowa.
Sabbatical Leave, January 1 2004 to June 30, 2004, Department of Mathematics, Iowa State University, Ames, Iowa, and Instituto de Matematica e Estatistica, Universidade de Sao Paulo, Brazil.
Sabbatical Leave, January 1, 2008 to June 30, 2008, University of Sao Paulo, Brazil.

7. HONOURS (MEDALS, FELLOWSHIPS, PRIZES)

Nominated for USSU Teaching Excellence Award, March 1997.
Teaching Excellence Award, College of Arts and Science, April 2005.
Nominated for USSU Teaching Excellence Award (Math 110, Commerce section, Term 1, 2005-06).

8. PREVIOUS POSITIONS RELEVANT TO U OF S EMPLOYMENT

Postdoctoral Fellow, Mathematical Sciences Research Institute, Berkeley, California, USA, 1989-90.
 Assistant Professor (Contractually Limited Term Appointment), University of Toronto, Toronto, Canada, 1990-93.

9. TEACHING RECORD:**9.1 SCHEDULED INSTRUCTIONAL ACTIVITY**

YEAR	COURSE	INSTR. TYPE	ENRL.	YIH	YCSH
2008-2009	Math 121.3 T1 Math Analysis for Business & Econ	LEC	163	39	6357
2008-2009	Math 125.3 T1 Mathematics for the Life Sciences	LEC	38	39	1482
2008-2009	Math 872.3 T2 Special Topics in Pure Math (Math 872-Lattice Basis Reduction, a new course I developed based on research papers in the area)	LEC	6	39	234

2007-2008

Term 1:

Math 115: Calculus for Pharmacy Students (Section for Biology Students)

Math 121: Mathematical Analysis for Business and Economics

Math 872: Special Topics in Pure Mathematics (Computational Algebra)

Term 2: On sabbatical

2006-2007

Term 1

Math 110.3: Calculus I (Commerce section)

Math 115.3: Calculus for Pharmacy Students

Math 401.0: Honours Seminar

Term 2

Math 266.3: Linear Algebra 1

Math 401.0: Honours Seminar

2005-2006

Term 1

Math 110.3: Calculus I (Commerce section)

Math 360.6: Algebra 1 (reading course for two students)

Math 364.3: Number Theory

Math 401.0: Honours Seminar

Term 2

Math 116.3: Calculus II

Math 328.3: Combinatorics and Enumeration

Math 360.6: Algebra 1 (reading course for two students)

Math 401.0: Honours Seminar

Math 818.3: Special Topics in Applied Mathematics (graduate level version of Math 328.3 for one student)

2004-2005

Term 1

Math 110.3: Calculus I (Arts & Science - I was the course coordinator)

Math 110.3: Calculus I (special section for Commerce students)

Math 401.0: Honours Seminar on Mathematical Biology
Term 2
Math 116.3: Calculus II
Math 327.3: Graph Theory
Math 401.0: Honours Seminar on Mathematical Biology

2003-2004

Term 1
Math 110.3: Calculus (special section for Commerce students)
Math 401.0: Honours Seminar
Math 872.3: Computational Algebra (a new graduate class)
Term 2
On sabbatical

2002-2003

Math 110.3 T1 - Calculus I
Math 264.3 T1 - Linear Algebra
Math 266.3 T2 - Linear Algebra I
Math 328.3 T2 - Combinatorics and Enumeration
Math 401.0 T1 - Honours Seminar

2001-2002

MATH 116.3 T2 – Calculus II
MATH 266.3 T2 – Linear Algebra I
MATH 862.3 T1 – Algebra I

2000-2001

MATH 110.3 T1 – Calculus I
MATH 266.3 T2 – Linear Algebra I
MATH 360.6 T1T2 – Algebra I

1999-2000

MATH 101.3 T2 – Elementary Calculus
MATH 116.3 T2 – Calculus II
MATH 401.0 T2 – Honours Seminar

1998-99

MATH 116.3 T2 (2 sections) – Calculus with Applications
MATH 238.3 T1 – Introduction to Differential Equations and Series
MATH 366.3 T1 – Linear Algebra II
MATH 401.0 T1T2 – Honours Seminar

1997-98

MATH 264.3 T2 – Linear Algebra
MATH 266.3 T1 – Linear Algebra I
MATH 862.3 T1 – Algebra I

1996-97

MATH 110.3 T1 - Introduction to Calculus
MATH 116.3 T2 - Calculus with Applications
MATH 264.3 T2 - Linear Algebra
MATH 266.3 T1 - Linear Algebra I

1995-96

MATH 266.3 T2 - Linear Algebra I
 MATH 358.6 T1T2 - Projective Geometry and Linear Algebra
 MATH 872.3 T1 - Quantum Groups

1994-95

MATH 358.6 T1T2 - Projective Geometry and Linear Algebra
 MATH 360.6 T1T2 - Algebra I

1993-94

MATH 110.3 T1 – Introduction to Calculus
 MATH 223.3 T1 – Intermediate Calculus
 MATH 224.3 T2 – Differential Equations

9.2 UNSCHEDULED INSTRUCTIONAL ACTIVITY

2008-2009:

Supervised Marina Tvalavadze, Postdoctoral Fellow, Mathematics and Statistics (Marina was awarded a PIMS postdoctoral fellowship to continue her work with me during the academic year 2009-2010).

2006-2007:

Summer: May - June: I supervised full-time summer undergraduate research assistant (Yunfeng Piao) working on "Polynomial identities for Bernstein algebras of simple Mendelian inheritance".

2005-2006:

May 1 to August 18: I supervised two summer research assistants (M. Hancock, full-time; Peter Park, part-time) working on the project "DNA computing and nonassociative algebra".

2004-2005:

Supervision of USTEP Summer Student Sheldon Richards

9.3 POSTGRADUATE STUDENTS SUPERVISED OR ON THEIR COMMITTEE

Type	Name	Degree	Department	Time Frame
<u>2008-2009:</u>				
Supervisor	Jiaxiong Hu	M.Sc.	Math & Stats	2008-2009
Supervisor	Hader Elgendy	Ph.D.	Math & Stats	2008-2009
<u>2007-2008:</u>				
Supervised:	Jiaxiong Hu, M.Sc., Mathematics and Statistics, 2007- Hader Elgendy, Ph.D., Mathematics and Statistics, January 2008-			
<u>2004-2005:</u>				
Co-supervisor	Bogdan Lataianu	Ph.D.	Math & Stats	2004-2005

10. THESES SUPERVISED

Supervised Jiaxiong Hu M.Sc. Invariant Lie Polynomials in Two and Three Variables 2008-2009.
 (The thesis supervision took place during the review period; the defence took place on August 7, 2009).

11. BOOKS, CHAPTERS IN BOOKS, EXPOSITORY AND REVIEW ARTICLES:

M.R. Bremner, L. I. Murakami, I. P. Shestakov, 2006. Nonassociative Algebras. Chapter 69 (pages 69-1 to 69-26) of Handbook of Linear Algebra edited by Leslie Hogben, Chapman & Hall / CRC, Boca Raton, 2007.

M.R. Bremner, R.V. Moody, J. Patera, 1985. Tables of Dominant Weight Multiplicities for Representations of Simple Lie Algebras. New York: Marcel Dekker, 340 pages. (MR 86f:17002).

12. PAPERS IN REFEREED JOURNALS:**PUBLISHED:**

M.R. Bremner and L. A. Peresi, 2009. Nonhomogeneous subalgebras of Lie and special Jordan superalgebras. Journal of Algebra, 322, 2000-2026.

M.R. Bremner and L. A. Peresi, 2009. An application of lattice basis reduction to polynomial identities for algebraic structures. Linear Algebra and its Applications, 430, 642-659.

M.R. Bremner and L.A. Peresi, 2009. Polynomial identities for the ternary cyclic sum. Linear and Multilinear Algebra, 57, 595-608.

M.R. Bremner and H. Usefi, 2009. Enveloping algebras of the nilpotent Malcev algebra of dimension five. Algebras and Representation Theory, published online February 17, 2009.

M.R. Bremner and L.A. Peresi, 2007. Classification of trilinear operations. Communications in Algebra; 35: 2932-2959.

M. R. Bremner, 2007. An algebra which is power associative but not strictly power associative. Communications in Algebra, 35, 261-264.

M.R. Bremner and I. R. Hentzel, 2006. Identities relating the Jordan product and the associator in the free nonassociative algebra. Journal of Algebra and its Applications, 5, 77-88.

M.R. Bremner and L.A. Peresi, 2006. Ternary analogues of Lie and Malcev algebras. Linear Algebra and its Applications, 414, 1-18.

M. R. Bremner, I. R. Hentzel and L. A. Peresi, 2005. Dimension formulas for the free nonassociative algebra. Communications in Algebra, 33, 11, 4063-4081.

M.R. Bremner, 2005. Jordan algebras arising from intermolecular recombination. Formally Reviewed Article, Communications in Computer Algebra (SIGSAM Bulletin), December, V. 39, No. 4, Issue 154, 106-117.

M.R. Bremner, I.R. Hentzel, L.A. Peresi, 2004. Dimension formulas for the free nonassociative algebra (lecture notes of my talk at the Second International Conference on Lie and Jordan Algebras and their Representations and Applications, Guarujá, Brazil, May 2004). Resenhas IME-USP 6, 2/3, 141-151 (Resenhas do Instituto de Matematica e Estatística da Universidade de São Paulo).

- M.R. Bremner**, I.R. Hentzel, 2004. Invariant nonassociative algebra structures on irreducible representations of simple Lie algebras. Experimental Mathematics, 13, 2, 231-256.
- M.R. Bremner**, I.R. Hentzel, 2004. Identities for algebras of matrices over the octonions. Journal of Algebra, 277, 73-95.
- M. Bremner**, 2002. Additive structure of free left-symmetric and assosymmetric rings. International Journal of Mathematics, Game Theory and Algebra, 12, 23-37.
- M.R. Bremner**, I. Hentzel, 2002. Identities for the associator in alternative algebras. Journal of Symbolic Computation, 33, 255-273.
- M.R. Bremner**, I. Hentzel, 2001. Identities for algebras obtained from the Cayley-Dickson process. Accepted by the Communications in Algebra, 29, 3523-3534.
- M.R. Bremner**, 2001. New ternary versions of Jordan algebras. Algebra Colloquium, 8, 11-24.
- M.R. Bremner**, I. Hentzel, 2000. Identities for generalized Lie and Jordan products on totally associative triple systems. Journal of Algebra, 231, 387-405. (MR 2001g:17005).
- M.R. Bremner**, 2000. On free partially associative triple systems. Communications in Algebra, 28, 2131-2145. (MR 2000m:17004).
- M.R. Bremner**, 1999. On the **Z**-module structure of a free semialternative ring. Communications in Algebra, 27, 1951-1965. (MR 2000a:17002).
- M.R. Bremner**, 1999. Quantum octonions. Communications in Algebra, 27, 2809-2831 (MR 2000c:17016).
- M.R. Bremner**, 1998. Identities for the ternary commutator. Journal of Algebra, 206, 615-623. (MR 99h:16071).
- M.R. Bremner**, 1998. Lie invariants of degree ten. International Journal of Mathematics, Game Theory and Algebra, 8, 115-122. (MR 99h:17004).
- M.R. Bremner**, 1997. Varieties of anticommutative n-ary algebras. Journal of Algebra, 191, 76-88. (MR 99f:17002).
- M.R. Bremner**, 1997. Quantum deformations of simple Lie algebras. Canadian Mathematical Bulletin, 40, 143-148. (MR 98d:17020).
- M.R. Bremner**, 1996. Classifying varieties of anti-commutative algebras. Nova Journal of Mathematics, Game Theory and Algebra, 4, 119-127. (MR 97d:17001).
- M.R. Bremner**, 1995. Four-point affine Lie algebras. Proceeding of the American Mathematical Society, 123, 1981-1989. (MR 95i:17025).
- M.R. Bremner**, 1994. Universal central extensions of elliptic affine Lie algebras. Journal of Mathematical Physics, 35, 6685-6692. (MR 95i:17024).
- M.R. Bremner**, 1994. Generalized Kac-Moody Lie algebras over localizations of the polynomial ring in one variable. Canadian Mathematical Bulletin, 37, 21-28. (MR 95d:17025).
- M.R. Bremner**, 1991. Structure of the Lie algebra of polynomial vector fields on the Riemann sphere with three punctures. Journal of Mathematical Physics, 32, 1607-1608. (MR 92i:17030).

M.R. Bremner, 1990. On a Lie algebra of vector fields on a complex torus. Journal of Mathematical Physics, 31, 2033-2034. (MR 91j:17040).

M.R. Bremner, 1990. Modular invariant Virasoro modules and elliptic curves. Letters in Mathematical Physics, 20, 113-123. (MR 92a:11065).

M.R. Bremner, 1990. Tensor products of unitary super-Virasoro modules with central charge 7/10. Canadian Journal of Mathematics, 42, 561-574. (MR 91m:17042).

M.R. Bremner, 1988. Tensor products of unitarizable representations of the Virasoro algebra with central charge 1/2. Communications in Algebra, 16, 1513-1523. (MR 90e:17027).

M.R. Bremner, 1986. Fast computation of weight multiplicities. Journal of Symbolic Computation, 2, 357-363. (MR 88a:17010).

ACCEPTED:

M.R. Bremner and M. El Bachraoui, 2009. On the semigroup algebra of binary relations. Communications in Algebra, 6 pages. (accepted for publication, March 24, 2009)

M.R. Bremner, Y. F. Piao and S. W. Richards, 2008. Polynomial identities for Bernstein algebras of simple Mendelian inheritance. Communications in Algebra, 18 pages. (accepted for publication, September 16, 2008)

13. PAPERS IN NON-REFEREED JOURNALS:

PUBLISHED:

M.R. Bremner, 1990. Superconformal extensions of the Witt algebra. MSRI preprint 03308-90, March, (13 pages).

ACCEPTED:

Nil

14. INVITED PAPERS IN PUBLISHED CONFERENCE PROCEEDINGS AND ABSTRACTS:

M.R. Bremner, I.R. Hentzel, L.A. Peresi and H. Usefi, 2008. Universal enveloping algebras of the four-dimensional Malcev algebra. Proceedings of the Conference on Algebras, Representations and Applications, (Maresias, Sao Paulo, Brazil, August 2007) in Honor of Ivan Shestakov's 60th Birthday, Edited by V. Futorny, V. Kac, I. Kashuba and E. Zelmanov, Contemporary Mathematics, American Mathematical Society, 483, 73-90.

M.R. Bremner and I.R. Hentzel, 2003. Alternating triple systems with simple Lie algebras of derivations. Oaxtepec, Morelos, Mexico, July 27–Aug 2, 2003. Non-Associative Algebra and its Applications, 55 - 82. Chapman & Hall / CRC (2006) ISBN 0-8247-2669-3.

15. CONTRIBUTED PAPERS IN PUBLISHED CONFERENCE PROCEEDINGS AND ABSTRACTS:

M.R. Bremner, M. J. Hancock and Y. F. Piao, 2007. Nonassociative structures on polynomial algebras arising from bio-operations on formal languages. Proceedings of ISSAC'07 (International Symposium on Symbolic and Algebraic Computation, Waterloo, Ontario, July 29 to August 1,

2007), Association for Computing Machinery, 2007. (This is a refereed contribution to the leading international conference on computer algebra.)

M.R Bremner, 2005. DNA computing, insertion of words and left-symmetric algebras. Editor, Illias S. Kotsireas, Proceedings of Maple Conference 2005, July 17–20, 461–516. Waterloo, Canada. Published by Waterloo Maple Inc., ISBN 1-894511-85-9.

M. R. Bremner and M. V. Kochetov (translators), 2003. The Dniester Notebook: Unsolved Problems in the Theory of Rings and Modules Fourth edition, 1993 (Compiled by V. T. Filippov, V. K. Kharchenko and I. P. Shestakov) Non-Associative Algebra and its Applications. Proceedings of the Fifth International Conference (27 July - 2 August 2003, Oaxtepec, Morelos, Mexico) Chapman & Hall / CRC (2006) ISBN 0-8247-2669-3 pages 461-516.

M. R. Bremner and N. P. Fomenko (translators), 2003. Some problems in the theory of rings that are nearly associative (Survey article by A. I. Shirshov) Non-Associative Algebra and its Applications. Proceedings of the Fifth International Conference (27 July - 2 August 2003, Oaxtepec, Morelos, Mexico) Chapman & Hall / CRC (2006) ISBN 0-8247-2669-3 pages 441-459.

16. TECHNICAL REPORTS RELEVANT TO ACADEMIC FIELD:

M. Bremner, M. Kochetov, Translation from Russian of Dniester Notebook: Unsolved problems in the theory of rings and modules (fourth edition, 1993), 54 pages. Available on-line at <http://math.usask.ca/~bremner/research/translations/index.html>

M. Bremner, N. Fomenko, Translation from Russian of A. I. Shirshov, Some problems in the theory of rings that are nearly associative (Uspekhi Matematicheskikh Nauk, XIII, 6, 1958, 3-20), 18 pages. (Available on-line at <http://math.usask.ca/~bremner/research/translations/index.html>).

M.R. Bremner, 1999. Identities for the ternary commutator, II, May, (9 pages).

17. BOOK REVIEWS:

Nil

18. INVITED LECTURES OUTSIDE U OF S AND INVITED CONFERENCE PRESENTATIONS:

M.R. Bremner, 2009. Enveloping algebras of Malcev algebras. Main Lecture (50 minutes), Second Mile High Conference on Nonassociative Mathematics, June 21-27, 2009, University of Denver, Denver, Colorado.

M.R. Bremner, 2009. Special identities for quasi-Jordan algebras. Seminar (50 minutes), Lie and Jordan Algebras and their Representations, University of Sao Paulo, May 28, 2009, Sao Paulo, Brazil.

M.R. Bremner, 2008. Polynomial identities for Bernstein algebras of simple Mendelian inheritance. Regular Lecture (20 minutes), Special Session on Biomathematics: Newly Developed Applied Mathematics and New Mathematics Arising from Biosciences, First Joint International Meeting of the American Mathematical Society and the Shanghai Mathematical Society, December 17-21, 2008, Shanghai, China.

M.R. Bremner, May 15, 2008. Lattice Basis Reduction and Polynomial Identities. Colloquium of the Department of Mathematics, United Arab Emirates University, Al-Ain, UAE. (50 minutes)

- M.R. Bremner, April 2, 2008. Lattice Basis Reduction and Polynomial Identities. Colloquium of the Department of Mathematics, University of Sao Paulo, Brazil. (50 minutes)
- M.R. Bremner, March 13, 2008. Polynomial Identities for Bernstein Algebras of Simple Mendelian Inheritance. Algebra Seminar, University of Sao Paulo, Brazil. (50 minutes)
- M. Bremner, 2006. An evolutionary algorithm for finding an optimal basis for a subspace. Seminar on Lie and Jordan Algebras and their Representations. February 23. Department of Mathematics, University of Sao Paulo, Brazil.
- M. Bremner, 2005. Polynomial identities for algebras of matrices over the octonions. Seminar on Lie and Jordan Algebras and their Representations. August 25. Department of Mathematics, University of Sao Paulo, Brazil.
- M. Bremner, 2005. Jordan algebras arising from intermolecular recombination. Seminar on Lie and Jordan Algebras and their Representations. August 18. Department of Mathematics, University of Sao Paulo, Brazil.
- M. Bremner, 2005. DNA computing, insertion of words, and left-symmetric algebras. Seminar on Lie and Jordan Algebras and their Representations. Instituto de Matematica e Estatistica. February 23, Universidade de Sao Paulo, Brazil.
- M. Bremner, 2004. Alternating triple systems with simple Lie algebras of derivations, Seminar on Lie and Jordan Algebras and their Representations, Instituto de Matematica e Estatistica. May 20, Universidade de Sao Paulo, Brazil.
- M. Bremner, 2004. Dimension formulas for free nonassociative algebras, Second Conference on Lie and Jordan Algebras, their Representations and Applications. May 3-8, Hotel Delphin, Guarujá, Sao Paulo, Brazil.
- M. Bremner, 2004. Dimension formulas for free nonassociative algebras, Colloquium, Department of Mathematics. February 17, Iowa State University, Ames, Iowa.
- M. Bremner, 2004. Statistical aspects of John Cage's "Etudes Australes", Session on Mathematical Techniques in Musical Analysis, Joint Mathematics Meetings (American Mathematical Society and Mathematical Association of America). January 7-10, Phoenix Civic Plaza, Phoenix, Arizona.
- M. Bremner, 2003. Invariant nonassociative algebra structures on irreducible representations of simple Lie algebras, Fifth International Conference on Nonassociative Algebra and its Applications. July 27 - August 2, Universidad Autonoma del Estado de Morelos, Oaxtepec, Morelos, Mexico.
- M. Bremner, 2002. Quantization of Lie and Jordan triple systems, Contributed Paper Session, Canadian Mathematical Society Winter Meeting. December 8-10, Ottawa, Ontario.
- M. Bremner, 2002. Quantization of Lie and Jordan triple systems, Conference on Topics in Linear Algebra. September 12-13, Iowa State University.
- M. Bremner, 2002. Quantization of Lie and Jordan triple systems, Conference on Polynomial Identities in Algebras. August 29 to September 3, Memorial University of Newfoundland.
- M. Bremner, 2002. Using Maple to discover identities for nonassociative algebras, Maple Summer Workshop. July 28-30, University of Waterloo.

- M. Bremner, 2002. Matrices over the octonions as a source of nonassociative algebras, International Conference on Lie and Jordan Algebras, their Representations and Applications, May 17, Guarujá, Sao Paulo, Brazil.
- M. Bremner, 2002. Classification of n-ary operations using the group ring of the symmetric group, Linear Algebra Seminar, February, 21, Department of Mathematics, Iowa State University, Ames, Iowa.
- M. Bremner, 2002. Matrices over the octonions as a source of nonassociative algebras, Colloquium, February 19, Department of Mathematics, Iowa State University, Ames, Iowa.
- M.R. Bremner, 1999. Identities for the associator in alternative algebras. Linear Algebra Seminar, October 26 and November 16, Iowa State University, Ames, Iowa.
- M.R. Bremner, 1999. Identities for the ternary commutator. September 15, University of Isfahan, Iran.
- M.R. Bremner, 1999. Lie invariants of degree ten. September 12, University of Tabriz, Iran.
- M.R. Bremner, 1996. Quantum Lie algebras. July 16, University of Wisconsin, Madison, Wisconsin.
- M.R. Bremner, 1994. Four-point and elliptic affine Lie algebras and generalized orthogonal polynomials. February 1, University of Toronto, Toronto, Ontario.
- M.R. Bremner, 1993. Commutative rings and infinite dimensional Lie algebras. May 11, University of New Brunswick, Fredericton, New Brunswick.
- M.R. Bremner, 1993. Commutative rings and infinite dimensional Lie algebras. February 15, University of Saskatchewan, Saskatoon, Saskatchewan.
- M.R. Bremner, 1991. Virasoro and super-Virasoro algebras. March 8, University of Western Ontario, London, Ontario.
- M.R. Bremner, 1990. Super-Virasoro algebras. December 20, University of Saskatchewan, Saskatoon, Saskatchewan.

19. PRESENTATIONS AT CONFERENCES (Non-Invited):

- M.R. Bremner, May 30, 2008. Lattice Basis Reduction and Polynomial Identities. Western Canada Linear Algebra Meeting, University of Manitoba, Winnipeg (25 minutes)
- M.R. Bremner, 2007. Nonassociative structures on polynomial algebras arising from bio-operations on formal languages. ISSAC'07 (International Symposium on Symbolic and Algebraic Computation), Waterloo, Ontario, July 29 to August 1, 2007. (The paper was reported under item 15.)
- M.R. Bremner, 2006. The universal enveloping algebra of the 4-dimensional non-Lie Malcev algebra. 30-minute lecture at the XIX Escola de Algebra (19th School of Algebra), Diamantina, Minas Gerais, Brazil (July 31 to August 4, 2006).
- M. Bremner, 2005. DNA computing, insertion of words, and left-symmetric algebras. Maple Conference, July 19, Wilfrid Laurier University.

- M.R. Bremner, 2005. DNA computing, insertion of words, and left-symmetric algebras. Saskatchewan Mathematics Mini-Meeting. April 15-16, University of Regina.
- M.R. Bremner, 2004. Invariant nonassociative algebra structures on irreducible representations of simple Lie algebras. Maple Summer Workshop 2004, Wilfred Laurier University. July 11-13, Waterloo, Ontario.
- M. Bremner, 2002. Using linear algebra to discover the defining identities for Lie and Jordan algebras, Canadian Undergraduate Mathematics Conference. July 2-7, University of Calgary.
- M.R. Bremner, 1993. Verma modules over 3-point affine Lie algebras. Third "Algebraists of Western Canada" Conference. February 23, Kananaskis, Alberta.
- M.R. Bremner, 1992. Verma modules over 3-point affine Lie algebras. Seminar talk, December 9, University of Toronto, Toronto, Ontario.
- M.R. Bremner, 1992. The Lie algebra of holomorphic rational vector fields on the Riemann sphere with three punctures. Second "Algebraists of Western Canada" Conference. February 25, Kananaskis, Alberta.
- M.R. Bremner, 1992. A simple example of a Lie algebra of vector fields on a complex torus (a modification of the Krichever-Novikov algebra). Seminar talk, February 12, University of Toronto, Toronto, Ontario.
- M.R. Bremner, 1990. The Virasoro algebra, its unitary representations, and super-Virasoro algebra. Three seminar talks, October-November, University of Toronto, Toronto, Ontario.
- M.R. Bremner, 1990. Superconformal extensions of the Witt algebra. Seminar talk, April, University of California, Berkeley, California.

20. PATENTS GRANTED OR PENDING:

Nil

21. RESEARCH GRANT INFORMATION:

NSERC Discovery Grant Renewal: \$55,000 for 5 years (\$11,000 annually, 2006-2011).
 I received a used computer for research purposes from the College of Arts and Science (July 2006).
 NSERC Summer Undergraduate Research Award for my student Michael Hancock for a project on DNA Computing and Nonassociative Algebra (May to August 2006).
 My 2005 summer research assistant (Sheldon Richards) received funding from USTEP (\$2300) for his work on the project "Polynomial identities for genetic algebras of simple Mendelian inheritance" (May-June 2005).
 I received funding from the Visiting Lecturer Fund (\$437.07) for Luiz A. Peresi from the University of Sao Paulo, (14-17 May 2005).
 Banff International Research Station. Research in Teams on Speciality of Malcev Algebras. Room and board for two weeks (30 April - 14 May 2005) for three people (M. R. Bremner, I. R. Hentzel, L. A. Peresi).
 Research Grant from the University of Sao Paulo to cover hotel expenses for my visit (12 - 27 February 2005).
 Research Grant in Lieu of Salary (\$8700) for January - June 2005.
 Sabbatical Leave Research Grant in Lieu of Salary, \$8750, January 1 - June 30, 2004

My 2003 summer research assistants received funding from NSERC (Lauren Bains) and USTEP (Ying Li) for their work on the project "Invariant nonassociative algebra structures on irreducible representations of simple Lie algebras"

Awarded \$500 from Role Model Speaker Fund for visit of Sarah Witherspoon to the U. of S., March 17-23, 2003.

NSERC Discovery Grant extended for one year (2005-2006) at the same level (\$10,000).

Nonassociative algebras, \$10,000/year, NSERC, 2001-2005.

College of Arts and Science, Computer Replacement Fund, \$1250, June 2001.

Sabbatical Leave Research Grant in lieu of salary, \$10,000, 1999.

NSERC Research Grant increased from \$8,000 to \$9,240/year, 1999-2001.

Infinite dimensional algebras and their representations, \$8000/year, NSERC, 1997-2001.

Infinite dimensional Lie algebras, \$8,000/year, NSERC, 1993-96.

Infinite dimensional Lie algebras, \$14,000/year, NSERC 1990-93.

22. ARTISTIC EXHIBITIONS, PERFORMANCES OR RELATED ACTIVITIES:

Nil

23. PROFESSIONAL PRACTICE:

2008-2009:

I was one of four local organizers of the Third Annual Meeting of the Prairie Network for Research in Mathematical Sciences, April 29 to May 1, 2009, University of Saskatchewan, Saskatoon, SK.
<http://math.usask.ca/~bremner/PN2009.html>.

2007-2008:

I was principal organizer (assisted by I.R. Hentzel and L.A. Peresi) of the Special Session on Representation Theory and Nonassociative Algebra at the 114th Annual meeting of the American Mathematical Society in San Diego, January 6-9, 2008.

I refereed some papers for journals, wrote some reviews for MathSciNet, and was an external examiner for an NSERC grant application.

2006-2007:

I refereed one paper for each of these journals: Ars Combinatoria, Boletín de la Sociedad Matemática Mexicana, Communications in Algebra, Experimental Mathematics, Proceedings of the American Mathematical Society.

I was an external reviewer for grant applications to the following organizations: Civilian Research and Development Foundation (branch of the National Science Foundation), Fondecyt (Chilean national science and technology research foundation), NSERC (Killam Research Fellowship).

I wrote 5 reviews for MathSciNet (online version of Mathematical Reviews).

I gave a lecture in the Math Readiness Program on August 30, 2006.

2005-2006:

DNA computing, insertion of words, and left-symmetric algebras Bioinformatics Seminar, Department of Computer Science, 5 August 2005.

Lecture for Math Readiness Program on graphs of trigonometric functions, 31 August 2005.

Presentation on the paper by Yehuda Rav, Philosophical problems of mathematics in the light of evolutionary epistemology Philosophy of Mathematics Seminar, Department of Philosophy, 26 October 2005.

An evolutionary algorithm for finding an optimal basis of a subspace Bioinformatics Seminar, Department of Computer Science, 11 January 2006.

University Council approves CALC (Centre for Algebra, Logic and Computation) with founding members M. Bremner, F. V. Kuhlmann, S. Kuhlmann, M. Marshall, 26 January 2006.

I refereed one NSERC Discovery Grant application.

I refereed one paper for each of the following journals: Bulletin of the Mexican Mathematical Society, Communications in Algebra, Experimental Mathematics, Journal of Algebra, Proceedings of the American Mathematical Society.

I wrote six reviews for MathSciNet (On-line version of Mathematical Reviews of the American Mathematical Society).

I was external referee in a promotion case to full professor at the University of Chile.

I was external referee for a research grant application to FONDECYT (Chile).

2004-2005:

I refereed one paper each for the following four journals:

Advances in Applied Mathematics, Discrete Mathematics, Journal of Lie Theory, Journal of Pure and Applied Algebra

I wrote eight published reviews of research papers for MathSciNet (Mathematical Reviews on the Web from the American Mathematical Society)

I gave one lecture for the Math Readiness Program (August 2004)

2003-2004:

I refereed one paper for each of the following three journals:

Journal of Algebra, Journal of Pure and Applied Algebra, International Journal of Mathematics and Mathematical Sciences

I reviewed a Discovery Grant application for NSERC.

February 13, 2004. Dimension formulas for free nonassociative algebras, Joint DMS/MSG Colloquium, University of Saskatchewan.

January 7-10, 2004. I was the principal organizer (together with Irvin Hentzel, Iowa State University, Ames, Iowa, and Luiz A. Peresi, Universidade de Sao Paulo, Brazil) of the Special Session on Nonassociative Algebra at the American Mathematical Society meeting in Phoenix, Arizona.

September 19, 2003. Invariant nonassociative algebra structures on irreducible representations of simple Lie algebras, Joint DMS/MSG Colloquium, University of Saskatchewan.

August 2003. One lecture for the Math Readiness Program.

May to August, 2003: Supervisor of summer undergraduate research assistants Lauren Bains (NSERC USRA winner) and Ying Li (USTEP Board of Governors subsidy winner).

2002-2003:

September 2002 to May 2003. Extra-curricular mathematics tutoring of pre-university students Bobby Xiao and Raymond Ko.

February 12, 2003. Submission to the Planning Committee of University Council of the Letter of Intent for the Centre for Algebra, Logic, and Computation by M. Bremner, F.V. Kuhlmann, S. Kuhlmann, M. Marshall.

January 31 to February 1, 2003. Invariant algebra structures on irreducible representations of simple Lie algebras. Second Saskatchewan Algebra and Number Theory Mini-Meeting, University of Saskatchewan.

December 18, 2002 to January 3, 2003. Research collaboration at the University of Saskatchewan with Irvin Hentzel, Department of Mathematics, Iowa State University.

November 22, 2002. Using linear algebra to discover the defining identities for Lie and Jordan algebras (30 minutes). Colloquium, Mathematical Sciences Group, University of Saskatchewan.

November 18, 2002. Submission of my evaluation of a grant application to FONDECYT, the Chilean national science research grant agency.

November 13, 2002. Musical composition with a computer algebra system. Math/Music Seminar, University of Saskatchewan.

September 27, 2002. Quantization of Lie and Jordan triple systems. Colloquium, Mathematical Sciences Group, University of Saskatchewan.

September 20-21, 2002. Cohomology of infinite dimensional Lie algebras isn't as hard as it sounds! First Saskatchewan Algebra and Number Theory Mini-Meeting, University of Regina.

Coordinator, Visit by 3 U. of S. students to the Canadian Undergraduate Mathematics Conference, University of Calgary, July 2-7, 2002.

May-August 2002: I was supervisor of two summer research students, Kris Mihilewicz and Ying Li. I organized a weekly seminar on the book *Quantum Calculus* by V. Kac and P. Cheung. I participated in S. Berman's weekly seminar on the book *Reflection Groups and Invariant Theory* by R. Kane.

2001-2002:

March-May, 2002: I tutored a gifted high-school student (Bobby Xiao) for one hour each week in extra math beyond the high school curriculum.

M. Bremner, 2002. Matrices over the octonions as a source of nonassociative algebras, Departmental Colloquium, University of Saskatchewan, March 8.

2000-2001:

May-August 2001. I was co-supervisor (with S. Berman) of an NSERC summer research student (Jonathan Lee). This project began with two weeks of introductory lectures by S. Berman and myself on nonassociative algebras (especially free Lie and Jordan algebras), and continued with a computer programming project under my supervision.

28 January 2000. Identities for the associator in alternative algebras. Colloquium, Department of Mathematics and Statistics.

1999-2000:

22 January 1999. Free partially associative triple systems. Colloquium, Department of Mathematics and Statistics.

10-22 June 1999. Pre-sabbatical research visit to begin joint work with Irvin Hentzel, Department of Mathematics, Iowa State University, Ames, Iowa.

1996-1997:

I was the organizer and principal speaker for the Quantum Groups Seminar which met weekly from January to April 1996 and from September 1996 to April 1997.

I was the organizer and principal speaker for the Financial Mathematics Seminar which met weekly from September to December 1996, and monthly from January to April 1997.

I reviewed three papers for the Zentralblatt fur Mathematik, one in May 1996 and two in September 1996.

1993-1994:

I refereed two papers for the Journal of Mathematical Physics in January and July 1993, one for the Canadian Journal of Mathematics in February 1994, and one for the Journal of Algebra in September 1994.

The software I wrote for my Master's thesis has been incorporated into Simplie, a software system for calculations with representations of simple complex Lie algebras, published by the Centre de Recherches Mathematiques of the Universite de Montreal.

24. CONSULTING WORK UNDERTAKEN:

2006 I received \$300 for reviewing a new linear algebra textbook for Thomson Nelson.

In March 2002, I was paid \$300 for my review of the textbook *Elementary Linear Algebra* by W. Keith Nicholson, published by McGraw-Hill Ryerson.

25. DEPARTMENTAL AND COLLEGE COMMITTEES:

Library Committee, Chair, 2000-2009.

I was external examiner for the M.Sc. thesis of Dai Chen, Department of Computer Science (August 23, 2006).

Department of Mathematics and Statistics, Library Committee, Chair, 2000-2006.

External examiner, M.Sc. thesis defence of David Paquette, Department of Computer Science, 21 November 2005.

Dean's Advisory Council, College of Arts and Science (from 1 July 2005).

Dean's Designate for the Ph.D. defence of David Pinelle, Department of Computer Science, 16 November 2004.

Dean's Designate for the Ph.D. defence of Daniel Teng, Department of Electrical Engineering, December 13, 2002.

College of Arts and Science, Aboriginal Programs and Student Equity Committee, Chair, 2001-2003.

Department of Mathematics and Statistics, Resources Committee, Chair, 2001-2002.

College of Arts and Science Affirmative Action Committee, Chair, 2000-2001.

Department of Mathematics and Statistics, Subcommittee elected by the Tenure Committee to prepare a revision of the Departmental standards for tenure, February-March 2001.

College of Graduate Studies and Research, Chair (Dean's Designate) of the Examining Committee for the Degree of Doctor of Philosophy of Vivekanandan Kumar, Department of Computer Science. The dissertation, Helping the helper in peer help networks, was successfully defended on June 15, 2001.

Department of Mathematics and Statistics, Graduate Advisory Committee member for Mehdi Zekavat, Ph.D. (student of M. Marshall). Orderings, Cuts and Formal Power Series, Accepted April 2000.

College of Arts and Science Affirmative Action Committee, Member, January-June, 2000.

College of Graduate Studies and Research, Chair (Dean's Designate) of the Examining Committee for the Degree of Doctor of Philosophy of David Lee Hornidge, Department of Physics and Engineering Physics. The dissertation, Elastic photon scattering from deuterium, was successfully defended on April 16, 1999.

Honours Committee, Department of Mathematics and Statistics, Chair, 1998-99. I coordinated the Honours Seminar: six students lectured on the first 100 pages (including the proof of Mordell's Theorem) of Silverman and Tate, Rational points on elliptic curves. I also made various proposals to the Department and conducted a survey of the Department regarding possible revisions to the Honours Program.

College of Arts and Science Affirmative Action Committee, Member, 1997-99.

Department of Mathematics and Statistics, Graduate Advisory Committee member for Shaobin Tan, Ph.D. (student of S. Berman). A Study of Vertex Operator Constructions for Some Infinite Dimensional Lie Algebras. Accepted March, 1998.

Mathematical Competitions Committee, Department of Mathematics and Statistics, Member, 1997-98.

Department of Mathematics and Statistics, Graduate Advisory Committee member for Saeid Azam, Ph.D. (student of S. Berman). Extended Affine Lie Algebras and Extended Affine Weyl Groups. Accepted May 1997.

Competitions Committee, Department of Mathematics and Statistics, Member, 1996-97.

Undergraduate Curriculum Review Committee, Department of Mathematics and Statistics, Member, 1995-96.

Honours Committee, Department of Mathematics and Statistics, Member, 1994-95; 1995-96.

Putnam Competition Committee, Department of Mathematics and Statistics, Member, 1994-95.

Department of Mathematics and Statistics, Graduate Advisory Committee member for Yun Gao, Ph.D. (student of S. Berman). Skew-dihedral homology and involutive Lie algebras graded by finite root systems. Accepted May, 1994.

External examiner of Xian-wei Ha, Ph.D. (student of J. Repka), University of Toronto. Invariant measure on sums of symmetric matrices and its singularities and zero points. Accepted January, 1994.

Computer Committee, Department of Mathematics and Statistics, Member, 1993-94.

Putnam Competition Committee, Department of Mathematics and Statistics, Member, 1993-94.

26. UNIVERSITY COMMITTEES:

Renewals and Tenure Appeal Panel, Member (1 July 2005 to 30 June 2008).

University Council, member, 2000-2005.

Budget Committee of University Council, member, 2001-2004.

Facilitator for Workshop on the Foundational Document on Research, Scholarly and Artistic Work, May 13, 2003.
 Subcommittee of the Budget Committee reporting on the Foundational Document on Research, Scholarly, and Artistic Work, Chair, January 2003.
 Subcommittee of the Budget Committee reporting on the Bioinformatics Program, Chair, May 2002.
 Student Academic Hearing and Appeal Panel of University Council, Member of the Appeal Panel for the case of Trevor Schoenroth, April 8, 2002.
 Budget Committee of University Council, appointed for a three-year term, 2001-2004; attended the last two meetings for 2000-2001 as a guest.
 Student Academic Hearing and Appeal Panel of University Council, appointed for a three-year term, 2000-2003.
 University Review Committee, Faculty Association Observer, two meetings in January 2000.
 Faculty Association Executive Committee, Secretary, 1998-99.
 University Review Committee, Faculty Association Observer, 1997-99.
 Faculty Association Executive Committee, Member, 1997-98.

27. PROFESSIONAL AND ASSOCIATION OFFICES AND COMMITTEE ACTIVITY OUTSIDE UNIVERSITY:

Member, ACM SIGSAM (Association for Computing Machinery Special Interest Group on Symbolic and Algebraic Manipulation) 2002-2006.
 Saskatchewan Learning, K-5 Mathematics Reference Committee, College of Arts and Science representative (nomination letter 8 March 2005, first meeting 30 September 2005).
 Canadian Mathematical Society, Member, 1996-2006.
 American Mathematical Society, Member, 1996-2006.
 Mathematical Association of America, Member, 1996-2006.
 Saskatchewan Learning, Calculus Reference Committee, member (attended meeting of September 18, 2003 in Regina).
 Association for Computing Machinery, Member, 2002-2003.
 Finance Committee, Canadian Mathematical Society, 1/1/2003-31/12/2005.
 Board of Directors, Canadian Mathematical Society, 1/7/2003-30/6/2007.
 Local Organizing Committee, Summer 2001 Meeting of the Canadian Mathematical Society, Member, University of Saskatchewan, June 2-4, 2001.
 Departmental Council, Member, University of Toronto, 1991-1993.
 Graduate Committee, Member, University of Toronto, 1990-91.

28. PUBLIC AND COMMUNITY CONTRIBUTIONS:

UNIVERSITY RELATED:

I gave a 50-minute presentation on the Game of Nim at Experience US (October 13, 2006).
 I supervised math activity with Daryl Lesyshyn's Grade 5 class at John Lake School: November 13, 2003, 9:45 - 11:45 am.
 A Day of Math at Warman School, with Keith Taylor, May 12, 2003.
 Super Saturday Mathematics Session Leader, March 8 and May 3, 2003.
 Mathematical outreach program at Marion Graham Collegiate, Spring 2003.
 Saskatoon Regional Science Fair, Judge, April 3, 2003.

NOT UNIVERSITY RELATED:

Nil

29. EXTENSION ACTIVITIES:

Nil