

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, Computer Algebra.  
Ph.D., Yale University, 1989, Department of Mathematics, Representation Theory.

**3. OTHER CREDENTIALS**

Nil

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

Assistant Professor, Without Tenure, July 1, 1993 - June 1995, Department of Mathematics and Statistics.  
Associate Professor, Without Tenure, July 1, 1995 - June 1997, Department of Mathematics and Statistics.  
Associate Professor, Tenured, July 1, 1997 - June 2002, Department of Mathematics and Statistics.  
Professor, Tenured, July 1, 2002 to present, 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 Department of Mathematics and Statistics, University of Sao Paulo, Brazil.  
Sabbatical Leave, January 1, 2008 to June 30, 2008, Department of Mathematics, University of Sao Paulo, Brazil.

**7. HONOURS (MEDALS, FELLOWSHIPS, PRIZES)**

Nil

**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			INTR. TYPE	ENRL.	YIH	YCSH
2010-2011	Math 125.3	T1	Mathematics for Life Sciences	LEC	176	39	6864
2010-2011	Math 401.0	T1	Honours Seminar (w/ Y. Choi)	SEM	6	39	234
2010-2011	Math 360.6	T2	Algebra I (T1: F.-V. Kuhlmann)	LEC	6	39	234
2010-2011	Math 328.3	T2	Combinatorics and Enumeration	LEC	4	49	156
2010-2011	Math 994	T1T2	Research (M.Sc. Supervision)	RES	1		
2010-2011	Math 996	T1T2	Research (Ph.D. Supervision)	RES	1		

YEAR	COURSE			INTR. TYPE	ENRL.	YIH	YCSH
2009-2010	Math 121.3	T1	Math Analysis for Business & Econ	LEC	180	39	7020
2009-2010	Math 125.3	T1	Mathematics for the Life Sciences	LEC	119	39	4641
2009-2010	Math266.3	T2	Linear Algebra I	LEC	25	39	975
2009-2010	Math 401.0	T1T2	Honours Seminar (w/ E. Samei)	SEM	5	39	195
2009-2010	Math 994	T1T2	Research (M.Sc. Supervision)	RES	1		
2009-2010	Math 996	T1T2	Research (Ph.D. Supervision)	RES	1		

YEAR	COURSE			INTR. 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	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

2010-2011:

Supervised Marina Tvalavadze, PIMS Postdoctoral Fellow, Mathematics and Statistics  
 Supervised Juana Sanchez Ortega, Postdoctoral Fellow, University of Malaga, Spain, April 2011-June 2011.

2009-2010:

Supervised Marina Tvalavadze, PIMS Postdoctoral Fellow, Mathematics and Statistics

2008-2009:

Supervised Marina Tvalavadze, PIMS Postdoctoral Fellow, Mathematics and Statistics

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	DEPT.	THESIS SUBJECT AREA	TIME FRAME
Supervisor	Hader Elgendy	Ph.D.	Math & Stats	Pure Math	2010-2011
Supervisor	Stavros Stavrou	M.Sc.	Math & Stats	Pure Math	2010-2011
Committee	Mehdi Ghasemi	Ph.D.	Math & Stats	Pure Math	2010-2011

TYPE	NAME	DEGREE	DEPT.	THESIS SUBJECT AREA	TIME FRAME
Supervisor	Jiaxiong Hu	M,Sc.	Math & Stats	Pure Math	2009-2010 (Defense-08/2009)
Supervisor	Hader Elgendy	Ph.D.	Math & Stats	Pure Math	2009-2010
Committee	Mehdi Ghasemi	Ph.D.	Math & Stats	Pure Math	2009-2010

TYPE	NAME	DEGREE	DEPT.	THESIS SUBJECT AREA	TIME FRAME
Supervisor	Jiaxiong Hu	M. Sc.	Math & Stats	Pure Math	2008-2009
Supervisor	Hader Elgendy	Ph.D.	Math & Stats	Pure Math	2008-2009

TYPE	NAME	DEGREE	DEPT.	THESIS SUBJECT AREA	TIME FRAME
Supervisor	Jiaxiong Hu	M. Sc.	Math & Stats	Pure Math	2007-2008
Supervisor	Hader Elgendy	Ph.D.	Math & Stats	Pure Math	2007-2008

TYPE	NAME	DEGREE	DEPT.	THESIS SUBJECT AREA	TIME FRAME
Co-Supervisor	Bogdan Lataianu*	Ph.D.	Math & Stats	Pure Math	2004-2005

\*NOTE: Bogdan Lataianu started with Ph.D. program and completed M.Math)

## 9.5 SUBSTANTIALLY REVISED OR NEW COURSES DEVELOPED AND APPROVED

Math 872 - Lattice Basis Reduction, a new course I developed based on research papers in the area.

## 9.8 TEACHING AWARDS OR RECOGNITIONS RECEIVED

Nominated for USSU Teaching Excellence Award for Math 125 (Letter from USSU dated 8 November 2010).

Nominated for USSU Teaching Excellence Award: Math 125.3 (Mathematics for the Life Sciences), T1, 2009-2010.

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

Nominated for USSU Teaching Excellence Award, March 1997.

## 9.9 OTHER TEACHING RELATED ACTIVITIES

Peer teaching evaluator for Yemon Choi, Math 110, November, 2010.

Organizer of the Nonassociative Algebra Seminar, which met 24 times for 50 minutes each time from September 2010 to June 2011.

Preparation of May 2010 Graduate Qualifying Examination in Algebra (with F. V. Kuhlmann and M. A. Marshall).

Peer Teaching Evaluator for Serban Belinschi, Math 379.3, Complex Analysis, March 3, 2010.

Peer Teaching Evaluator for Ebrahim Samei, Math 875.3, Functional Analysis, November 12, 2009.

Peer Teaching Evaluator for Artur Sowa, Math 366, Linear Algebra II, October 19, 2007.

Organizer of the Nonassociative Algebra Seminar, which met weekly for one hour.

The schedule for term 2 is available at: <http://math.usask.ca/~bremner/nonassociative.html>.

Co-organizer (with Ebrahim Samei) of the Lie Groups Seminar, which met weekly for one hour.

The schedule for term 2 is available at: <http://math.usask.ca/~samei/LieGroupSeminar.html>.

## 10. THESES SUPERVISED

Jiaxiong Hu, M.Sc., Invariant Lie Polynomials in Two and Three Variables, Thesis defended August 7, 2009.

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

Selected Works of A. I. Shirshov. Translated from the Russian by **Murray R. Bremner** and Mikhail V. Kochetov. Edited by L. A. Bokut, V. N. Latyshev, I. P. Shestakov and E. I. Zelmanov. Birkhauser, Basel-Boston-Berlin, 15 July 2009, 242 pages, ISBN 9783764388577.

**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.

**Bremner, Murray R.**, 1989. On Tensor Products of Modules over the Virasoro Algebra. Ph.D. Thesis, Department of Mathematics, Yale University.

**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).

**Bremner, Murray R.**, 1984. Computation of Weight Multiplicities in Representations of Lie Algebras. M.Comp.Sc. Thesis, Department of Computer Science, Concordia University.

## 12. PAPERS IN REFEREED JOURNALS:

### ACCEPTED:

**M. R. Bremner**, and J.-X. Hu, 2011. Lie invariants in two and three variables. Algebra Colloquium, (accepted for publication, 27 January 2011, 21 pages).

**M. R. Bremner**, and H. A. Elgendy, 2011. Universal associative envelopes of  $(n+1)$ -dimensional  $n$ -Lie algebras. Communications in Algebra (accepted for publication, 24 January 2011, 13 pages).

**Murray R. Bremner** and Marina V. Tvalavadze, 2010. Enveloping algebras of solvable Malcev algebras of dimension five. 18 pages (preprint version). To appear in Communications in Algebra, (accepted 30 April 2010).

### PUBLISHED:

**M. R. Bremner**, 2011. How to compute the Wedderburn decomposition of a finite-dimensional associative algebra. Groups, Complexity and Cryptology: **3**, 3 (2011) 47-66.

**M.R. Bremner**, 2011. Polynomial identities for ternary intermolecular recombination. Discrete and Continuous Dynamical Systems (Series S), **4**: 6, 1387-1399.

**M.R. Bremner** and Luiz A. Peresi, 2011. Special identities for quasi-Jordan algebras. Communications in Algebra, **39**: 7, 2313-2337.

**M. R. Bremner** and J. Sanchez-Ortega, 2010. The partially alternating ternary sum in an associative dialgebra. Journal of Physics A: Mathematical and Theoretical, **43**, 455215, (18 pages).

**M.R. Bremner** and Hader A. Elgendy, 2010. Alternating quaternary algebra structures on irreducible representations of  $sl(2, \mathbb{C})$ . Linear Algebra and its Applications, **433**: 8-10, 1686-1705.

**M.R. Bremner**, 2010. On the definition of quasi-Jordan algebra. Communications in Algebra, **38**: 12, 4695-4704.

**M.R. Bremner** and M. El Bachraoui, 2010. On the semigroup algebra of binary relations. Communications in Algebra, **38**: 9, 3499-3505.

- 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**, Y. F. Piao and S. W. Richards, 2009. Polynomial identities for Bernstein algebras of simple Mendelian inheritance. Communications in Algebra, 37, no. 10, pages 3438-3455.
- 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, 13, #4, pp. 407-425.
- 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**, 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 and L. A. Peresi, 2005. Dimension formulas for the free nonassociative algebra. Communications in Algebra, 33, 11, 4063-4081 (journal publication). 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 (published in a local journal)], Guarujá, Brazil, May 2004). Resenhas IME-USP 6, 2/3, 141-151 (Resenhas do Instituto de Matemática 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  $\mathbf{Z}$ -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).

**13. PAPERS IN NON-REFEREED JOURNALS:****ACCEPTED:**

Nil

**PUBLISHED:**

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

**14. INVITED PAPERS IN PUBLISHED CONFERENCE PROCEEDINGS AND ABSTRACTS:**

**Murray R. Bremner**, Irvin R. Hentzel, Luiz A. Peresi, Marina V. Tvalavadze, and Hamid Usefi, 2009. Enveloping algebras of Malcev algebras. CMUC - Commentationes Mathematicae Universitatis Carolinae, 51, 2 (2010) 157-174 (accepted 8 February 2010). Proceedings of the Mile High Conference on Nonassociative Mathematics (University of Denver, Denver, Colorado, June 2009), Editors: Michael K. Kinyon, Jonathan D. H. Smith and Petr Vojtechovsky.

**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, (Mareias, 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:**

**M. R. Bremner**, Review of "V. Mazorchuk, Lectures on  $sl(2, \mathbb{C})$ -modules", Imperial College Press, London, 2010. x+263 pp., MathSciNet, (Mathematical Reviews on the Web), MR2567743, 2011b:17019).

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

**M. R. Bremner**, 2011. Invited 50-minute talk on "Jordan structures arising from intermolecular recombination" in the Applied Mathematics Seminar at CIMAT (Centro de Investigacion en Matematicas), 21 February 2011, Guanajuato, Mexico.

**M. R. Bremner**, 2011. Invited 50-minute talk on "Cayley's hyperdeterminant: a combinatorial approach via representation theory" in the CIMAT (Centro de Investigacion en Matematicas), Colloquium, 23 February 2011, Guanajuato, Mexico.

**M. R. Bremner**, 2011. Invited 25-minute talk on "Cayley's hyperdeterminant: a combinatorial approach via representation theory". Special Session on Lie Algebras, Algebraic Transformation Groups and Representation Theory, AMS Spring Western Section Meeting, 30 April - 1 May 2011, University of Nevada, 30 April 2011, Las Vegas, NV, USA.

**M. R. Bremner**, 2011. Invited 10-minute presentation at the Engaging Mathematicians Conference, Saskatoon Public School Board, 20 May 2011, Saskatoon, SK, Canada.

**Murray R. Bremner**, 2010. Special identities for quasi-Jordan algebras. (Joint work with Luiz A. Peresi). 20-minutes talk in the Special Session on Representation Theory and Nonassociative Algebra at the 116th Annual Meeting of the American Mathematical Society. Moscone West Center, San Francisco, California, January 14, 2010.

**Murray R. Bremner**, 2010. How to compute the Wedderburn decomposition of an associative algebra. 20-minute talk in the Special Session on Groups, Computations, and Applications at the 2010 Spring Eastern Sectional Meeting of the American Mathematical Society. New Jersey Institute of Technology, Newark, New Jersey, May 23, 2010.

**Murray R. Bremner**, 2010. Universal enveloping algebras of  $n$ -Lie algebras. (Joint work with Hader A. Elgendy.) 20-minute talk in the Special Session on Lie Algebras and Representation Theory at the 2010 Spring Eastern Sectional Meeting of the American Mathematical Society. New Jersey Institute of Technology, Newark, New Jersey, May 23, 2010.

**Murray R. Bremner**, 2009. Special identities for quasi-Jordan algebras. (Joint work with Luiz A. Peresi.). 50-minute talk at the University of Malaga, Spain, July 31, 2009.

- Murray R. Bremner**, 2009. Lattice Basis Reduction and its Applications. Short course (10 hours), July 20-24, 2009, University of Malaga. (Attended by approximately 10-12 faculty, postdoctoral fellows, and graduate students.)
- Murray 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.
- Murray 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.
- Murray 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.
- Murray 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)
- Murray R. Bremner**, April 2, 2008. Lattice Basis Reduction and Polynomial Identities. Colloquium of the Department of Mathematics, University of Sao Paulo, Brazil. (50 minutes)
- Murray R. Bremner**, March 13, 2008. Polynomial Identities for Bernstein Algebras of Simple Mendelian Inheritance. Algebra Seminar, University of Sao Paulo, Brazil. (50 minutes)
- Murray R. 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.
- Murray R. 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.
- Murray R. 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.
- Murray R. 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.
- Murray R. 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.
- Murray R. 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.
- Murray R. Bremner**, 2004. Dimension formulas for free nonassociative algebras, Colloquium, Department of Mathematics. February 17, Iowa State University, Ames, Iowa.
- Murray R. 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.

- Murray R. 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.
- Murray R. Bremner**, 2002. Quantization of Lie and Jordan triple systems, Contributed Paper Session, Canadian Mathematical Society Winter Meeting. December 8-10, Ottawa, Ontario.
- Murray R. Bremner**, 2002. Quantization of Lie and Jordan triple systems, Conference on Topics in Linear Algebra. September 12-13, Iowa State University.
- Murray R. Bremner**, 2002. Quantization of Lie and Jordan triple systems, Conference on Polynomial Identities in Algebras. August 29 to September 3, Memorial University of Newfoundland.
- Murray R. Bremner**, 2002. Using Maple to discover identities for nonassociative algebras, Maple Summer Workshop. July 28-30, University of Waterloo.
- Murray R. 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, Guaruja, Sao Paulo, Brazil.
- Murray R. 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.
- Murray R. Bremner**, 2002. Matrices over the octonions as a source of nonassociative algebras, Colloquium, February 19, Department of Mathematics, Iowa State University, Ames, Iowa.
- Murray R. Bremner**, 1999. Identities for the associator in alternative algebras. Linear Algebra Seminar, October 26 and November 16, Iowa State University, Ames, Iowa.
- Murray R. Bremner**, 1999. Identities for the ternary commutator. September 15, University of Isfahan, Iran.
- Murray R. Bremner**, 1999. Lie invariants of degree ten. September 12, University of Tabriz, Iran.
- Murray R. Bremner**, 1996. Quantum Lie algebras. July 16, University of Wisconsin, Madison, Wisconsin.
- Murray R. Bremner**, 1994. Four-point and elliptic affine Lie algebras and generalized orthogonal polynomials. February 1, University of Toronto, Toronto, Ontario.
- Murray R. Bremner**, 1993. Commutative rings and infinite dimensional Lie algebras. May 11, University of New Brunswick, Fredericton, New Brunswick.
- Murray R. Bremner**, 1993. Commutative rings and infinite dimensional Lie algebras. February 15, University of Saskatchewan, Saskatoon, Saskatchewan.
- Murray R. Bremner**, 1991. Virasoro and super-Virasoro algebras. March 8, University of Western Ontario, London, Ontario.
- Murray R. Bremner**, 1990. Super-Virasoro algebras. December 20, University of Saskatchewan, Saskatoon, Saskatchewan.

**19. PRESENTATIONS AT CONFERENCES (Non-Invited):**

- M.R. Bremner**, 2010. Universal enveloping algebras of  $n$ -Lie algebras. 20-minute talk at the Fourth Annual Meeting of the Prairie Network for Research in Mathematical Sciences, May 1, 2010, University of Manitoba, Winnipeg, Manitoba.
- 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, Wilfrid 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, 2011-2016), 2010-2011.  
NSERC Discovery Grant Renewal: \$55,000 for 5 years (\$11,000 annually, 2006-2011), 2006-2007, 2007-2008, 2008-2009, 2009-2010.

Role Model Speaker Grant, \$500, for the visit of Dr. Juana Sanchez Ortega of the University of Malaga, Spain, May 31 - June 16, 2010.

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:**

2010-2011:

During the review period, I refereed seven papers for the following journals:

- Communications in Algebra (two papers)
- Journal of Algebra
- Journal of Algebra and its Applications
- Journal of Geometry and Physics
- Journal of Physics A: Mathematical and Theoretical

- Proceedings of the American Mathematical Society

During the review period, I wrote the following 15 reviews for MathSciNet:

MR2567743 (see also item 17 above), MR2587436, MR2587815, MR2600013, MR2602666, MR2647632, MR2652710, MR2650375, MR2661164, MR2718940, MR2724228, MR2725201, MR2732048, MR2735072, MR2760682.

Member, PIMS Postdoctoral Fellowship Selection Panel, University of British Columbia, 15 January 2011.

I was invited by Efim Zelmanov (Fields Medallist) to be a member of the Program Committee of the International Ring Theory Conference, 9 July 2010, in Novosibirsk, Russia (14-18 July 2011).

I was one of four guest co-editors for the Proceedings of the Special Session on "Biomathematics: Newly Developed Applied Mathematics and New Mathematics Arising from Biosciences" at the First Joint International Meeting of the American Mathematical Society and the Shanghai Mathematical Society (Shanghai, China, 17-21 December 2008); which appeared in a special issue of Discrete and Continuous Dynamical Systems, Series S 4:6 (2011).

2009-2010:

During the review period, I refereed papers for the following journals:

Communications in Algebra  
Linear Algebra and its Applications  
Pacific Journal of Mathematics

During the review period, I wrote 18 reviews of journal papers for MathSciNet:

MR2470531, MR2470913, MR2473348, MR2488391, MR2497959, MR2499555, MR2501481, MR2506262, MR2509150, MR2509152, MR2536928, MR2540960, MR2551507, MR2559178, MR2562564, MR2568353, MR2568404, MR2572686.

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 114<sup>th</sup> 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:**

- External examiner for M.Sc. thesis of Craig Thompson, Department of Computer Science, 25 May 2011.
- College of Arts and Science, Canada Research Chair (CRC) in Mathematical Modeling Sub-search Committee, Member, 2008-2009, 2009-2010.
- Department of Mathematics and Statistics, Pure Math Sub-search Committee, Member, 2006-2007, 2008-2009, 2009-2010.
- Department of Mathematics and Statistics, Undergraduate Committee, Chair, 2009-2010, 2010-2011. 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, 2000-2010, 2010-2011.
- 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:

Member, Tenure Appeal Committee for Joanne Rochester, Department of English, 13 April 2011.

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, Publications Committee, Canadian Mathematical Society, January 2010 - June 2011.

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