

**PERSONAL**

Birthdate: 29 March, 1955  
Nationality: New Zealand  
Residency: US Permanent Resident

**EDUCATION**

1975 B.Sc. (Hons) Canterbury, New Zealand  
1978 M.Sc. (Distinction) University of London  
1981 Ph.D. University of Leeds

**PROFESSIONAL EXPERIENCE**

1976–1978 Systems Analyst Datastream International, London  
1981–1983 Assistant Professor U.S.C.  
1983–1986 SERC Research Assistant University of Warwick  
1986–1990 Assistant Professor University of Washington  
1990–1993 Associate Professor University of Washington  
1993– Professor University of Washington

**RESEARCH GRANTS**

1984 Royal Society, UK-Israel Exchange Program  
1988–89 Noetherian Rings, Special Year in Algebra  
1989–92 US-Israel Binational Science Foundation Grant  
1991–95 Summer Workshops in Algebraic Representation Theory  
1987–present NSF summer research grants

**EDITOR**

*Algebras and Representation Theory*  
*Journal of Algebra and its Applications*

**Ph.D. STUDENTS**

P. Perkins (1988) Differential Operators on Singular Curves  
J. Staniszkis (1993) The Sklyanin Algebras  
M. Vancliff (1993) Four-dimensional Regular Algebras  
I. Mori (1998) Non-commutative Intersection Theory  
A. Nyman (2001) Non-commutative Bundles

## PUBLICATIONS

1. The Primitive Factor Rings of the Enveloping Algebra of  $sl(2, \mathbb{C})$ , *J. Lond. Math. Soc.* **24** (1981) 97-108. (MR 82i:17016).
2. The Krull Dimension of the Enveloping Algebra of  $sl(2, \mathbb{C})$ , *J. Algebra* **71** (1981) 189–194.
3. An Example of a ring Morita Equivalent to the Weyl Algebra  $A_1$ , *J. Algebra* **73** (1981) 552–555. (MR 83a: 16004).
4. Krull Dimension of factor rings of the enveloping algebra of a semi-simple Lie algebra, *Proc. Camb. Phil. Soc.* **93** (1983) 459–66. (MR 85a: 17007).
5. Central Localisation and Gelfand-Kirillov Dimension, *Israel J. Math.* **46** (1983) 33–39. (MR 85h: 16048).
6. Gelfand-Kirillov Dimension of rings of Formal Differential operators on Affine Varieties, *Proc. Amer. Math. Soc.* **90** (1984) 1–8. (MR 85d: 16019)
7. (with T. J. Hodges) Sheaves of non-commutative algebras and the Beilinson-Bernstein equivalence of categories, *Proc. Amer. Math. Soc.* **93** (1985) 379–388. (MR 86j: 17015).
8. (with T. J. Hodges) On the global dimension of primitive factors of the enveloping algebra of a semi-simple Lie algebra, *J. Lond. Math. Soc.* **32** (1985) 411–418. (MR 87g: 17015).
9. (with T. J. Hodges) Differential Operators on the Flag Variety and the Conze embedding, circulated manuscript.
10. (with K. A. Brown) Bimodules over a solvable algebraic Lie algebra, *Oxford Qu. J. Math.* **36** (1985) 129–139. (MR 87d: 17009).
11. Differential operators on the affine and projective lines in positive characteristic, 1985 *Séminaire d'Algèbre M-P. Malliavin*, Springer LNM 1220 (1986).
12. The global homological dimension of the ring of differential operators on a non-singular variety over a field of positive characteristic, *J. Algebra* **107** (1987) 98–105.
13. Differential Operators on Commutative Algebras, *Ring Theory Conference Proceedings* (Antwerp 1985), Ed. F. M. J. van Oystaeyen, Springer-Verlag, LNM 1197 (1986). (MR 87m: 16030)
14. (with J. T. Stafford) Differential operators on an affine curve, *Proc. Lond. Math. Soc.* **56** (1988) 229–259.
15. (with T. Levasseur) Primitive ideals and nilpotent orbits in type  $G_2$ , *J. Algebra* **114** (1988) 81–105.
16. (with R. Hart) Differential operators on some singular surfaces, *Bull. Lond. Math. Soc.* **19** (1987) 145–148. (MR 87m: 32027).
17. The simple  $D$ -module associated to the intersection homology complex for a class of plane curves, *J. Pure and Applied Algebra* **50** (1988) 287–294.
18. Curves, differential operators and finite dimensional algebras, 1986 *Séminaire d'Algèbre Malliavin*, Springer LNM 1296 (1987) 158–176.

19. (with T. Levasseur, J. T. Stafford) The minimal nilpotent orbit, the Joseph ideal and differential operators, *J. Algebra* **116** (1988) 480–501.
20. A class of algebras like the enveloping algebra of  $sl(2, \mathbb{C})$ , *Trans. Amer. Math. Soc.* **332** (1990) 285–314.
21. Overrings of primitive factor rings of  $U(sl(2, \mathbb{C}))$ , *J. Pure and Applied Alg.* **63** (1990) 207–218.
22. Can the Weyl algebra be a fixed ring?, *Proc. Amer. Math. Soc.*, **107** (1989) 587–589.
23. Polynomial solutions to constant coefficient differential equations, *Trans. Amer. Math. Soc.*, **329** (1992) 551-569.
24. (with M. S. Montgomery)  $U_q(sl(2, \mathbb{C}))$  and skew derivations, *Israel J. Math.*, **72** (1990) 158-166.
25. Introduction to quantum groups for ring theorists, Proceedings of 1989 MSRI Conference on Non-commutative Noetherian Rings, Ed. L.W. Small, 1991, pp. 131-178.
26. (with J. T. Stafford) Regularity of 4-dimensional Sklyanin algebras, *Compos. Math.*, **83** (1992) 259-289.
27. (with T. Levasseur) Modules over the 4-dimensional Sklyanin algebra, *Bull. Soc. Math. France*, **121** (1993) 35-90.
28. (with J. Staniszkis) Irreducible representations of the 4-dimensional Sklyanin Algebra at points of infinite order, *J. Algebra*, **160** (1993) 57-86.
29. (with L. LeBruyn) Homogenized  $sl(2, C)$ , *Proc. Amer. Math. Soc.*, **118** (1993) 725-730.
30. (with L. LeBruyn and M. Van den Bergh) Central extensions of 3-dimensional Artin-Schelter regular algebras, *Math. Zeit.*, **222** (1996) 171-212.
31. The 4-dimensional Sklyanin algebra at points of finite order, privately circulated manuscript.
32. Point modules over higher dimensional Sklyanin algebras, *Math. Zeit.*, **215** (1994) 169-177.
33. The 4-dimensional Sklyanin algebras, *K-Theory*, **8** (1994) 65-80.
34. (with J. Tate) The center of the 3-dimensional and 4-dimensional Sklyanin algebras, *K-Theory*, **8** (1994) 19-63.
35. Some finite dimensional algebras related to elliptic curves, in *Representation Theory of algebras and related topics*, CMS Conf. Proc., vol. 19, 315-348 (1996).
36. (with K. Ajitabh and J. Zhang) Auslander-Gorenstein rings, *Comm. Alg.*, **26** (1998) 2159-2180.
37. (with K. Ajitabh and J. Zhang) Injective resolutions of some regular rings, *Jour. Pure and Appl. Alg.*, **140** (1999) 1-21.
38. (with J. Zhang) Self-injective connected algebras, *Comm. Alg.*, **25** (1997), no. 7, 2243-2248.

39. (with J. Zhang) A remark on Gelfand-Kirillov dimension, *Proc. Amer. Math. Soc.*, **126** (1998), no. 2, 349-352.
40. (with J.Zhang) Curves on quasi-schemes, *Algebras and Representation Theory*, **1** (1998) 311-351.
41. (with I. Mori) Bézout's Theorem for quantum projective spaces, *Jour. Pure and Appl. Alg.*, **157** (2001) 279-299.
42. (with I. Mori) The Grothendieck group of quantum projective space bundles, *K-Theory*, **37** (2006) 263-289
43. (with J. Zhang) Fibers in Ore extensions, *Algebr. Represent. Theory*, **5** (2002) 411-431.
44. Subspaces of non-commutative spaces, *Trans. Amer. Math. Soc.*, **354** (2002) 2131-2171.
45. Integral non-commutative spaces, *J. Algebra*, **246** (2002) 793-810.
46. Maps between non-commutative spaces, *Trans. Amer. Math. Soc.*, **356** (2004) 2927-2944.
47. (with M. Van den Bergh) Noncommutative quadric surfaces, in preparation.
48. (with I. Gordon) Representations of symplectic reflection algebras and resolutions of deformations of symplectic quotient singularities, *Math. Ann.* **330** (2004) 185-200.

## PROFESSIONAL RECOGNITION

Invited participant/speaker at the following meetings and conferences:

- Enveloping Algebras, February 1982, Oberwolfach, (1 hour contributed talk).
- Non-commutative Noetherian Rings, March 1983, Oberwolfach, (1 hour contributed talk).
- Enveloping Algebras, July 1983, Durham (LMS), (2 hour invited talk).
- Ring Theory, August 1983, Antwerp (NATO), (1 hour invited talk).
- Geometry and Ring Theory, August 1984, Turkey (NATO) declined.
- Enveloping Algebras, February 1985, Oberwolfach, (1 hour contributed talk).
- Contact Franco-Belge en Algebre, April 1985, Antwerp, (1 hour invited talk).
- D-Modules, June 1985, Oberwolfach, (1 hour contributed talk).
- Non-commutative Noetherian Rings, April 1986, Oberwolfach, (1 hour contributed talk).
- Ring Theory conference, June 1986, Leeds (LMS), (1 hour contributed talk).
- Algebraic Groups, August 1986, Durham (LMS), declined.
- Herstein Retirement conference, March 1987, Chicago.
- Non-commutative Algebras, July 1987, Antwerp (NATO), declined.

- Enveloping Algebras, August 1987, Oberwolfach.
- Representation Theory and Non-commutative Algebras, Dec. 1987, LSU, (1 hour invited talk).
- Non-commutative Ring Theory, May 1988, Northern Illinois, DeKalb, (1 hour invited talk).
- Amitsur Retirement conference, January 1989, Israel, (1 hour contributed talk).
- Colloque en l'honneur de J. Dixmier, June 1989, Paris.
- Noetherian Rings, June 1989, Oberwolfach, (1 hour contributed talk).
- Non-commutative Rings, July 1989, MSRI, Berkeley, (3 hour invited talk).
- Deformations of Algebras, June 1990, Amherst (AMS-IMS), (1 hour invited talk).
- Quantum Groups, N. Carolina, Sept. 1991 (NSF), (1 hour invited talk).
- Conference in Honour of M. Artin, Antwerp, May 1992, (1 hour invited talk).
- Non-commutative Rings - new directions, Durham (LMS), July 1992 (3 hour invited talk).
- Finite Dimensional Algebras, Aug. 1992, Canada, (1 hour invited talk) (declined).
- Noetherian Rings and Repr. Theory, Aug. 1993, Oberwolfach, (1 hour contributed talk).
- Summer Algebra School, June 1994, Spain, (5 hour invited talk).
- Representation Theory of Algebras, August 1994, Mexico, (2 hour invited talk).
- European Algebra Meeting, February 1995, Edinburgh (2 hour invited talk) (declined).
- US-Belgium Science Days, May 1995, Belgium, (1 hour invited talk) (declined).
- Quantum groups and non-commutative geometry, May 1995, Italy, (2 hour invited talk) (declined).
- University of Wales Mathematics Colloquium, May 1995, Wales (1 hour invited talk).
- China-Japan Ring Theory Symposium, October 1995, Japan, (1 hour invited talk) (declined).
- Noetherian Rings and Repr. Theory, August 1997, Oberwolfach, (1 hour contributed talk)
- Representation Theory of Algebras, August 1998, Norway, (declined).
- Homological Invariants in Representation Theory, March 1999, Greece, (declined).
- Non-commutative Algebraic Geometry, July 1999, Bonn (1 hour invited talk).
- Quantum Groups, August 1999, Durham, England (declined).
- Interactions between Non-commutative Algebra and Algebraic Geometry, February 2000, MSRI (1 hour invited talk).
- Non-commutative algebra and geometry, April 2002, Oberwolfach (1 hour invited talk)

- International Conference on Representations of Algebras, August 2002, Toronto, (1 hour invited talk, declined)
- Derived Categories and their Applications, June 2003, Edinburgh.
- Coxeter Groups, Hecke Algebras, and related topics, June 2003, Birmingham (1 hour invited talk)
- Third International Symposium on Quantum Theory and Symmetries, September 2003, Cincinnati (1 hour invited talk)
- AMS Regional meeting, April 2004, Los Angeles (1 hour invited talk)
- Non-commutative Algebraic Geometry, January 2004, Mittag-Leffler Institute (1 hour invited talk)
- Algebras and Representation Theory, May 2005, Univ. of Warwick (1 hour invited talk, declined)
- Non-commutative Algebra (Leverhulme Grant group), June 2005, Edinburgh (1 hour invited talk)
- Recent Progress in Non-commutative Ring Theory, May 2006, Leeds, 1 hour invited talk
- Non-commutative algebra and geometry, May 2006, Oberwolfach
- AMS Special Sessions (various).
- British Mathematical Colloquium Special Sessions (various).

I have given invited talks at the following universities:

- UC San Diego, UC Los Angeles, UC Riverside, UC Santa Barbara, USC, Cincinnati, Duke, Montana, Utah, Oregon (Eugene), Nebraska, Texas (Austin), Penn State, UBC (Vancouver), Ottawa, Institut Henri Poincaré, Paris VI, Strasbourg, Antwerp, Nijmegen, London, Warwick, Leeds, Manchester, Edinburgh, Glasgow, Oxford, Sheffield, Bristol, Auckland (New Zealand), Christchurch (New Zealand), Weizmann Institute, Beersheva, Bar Ilan, Copenhagen, Universidad Nacional Autónoma de México,

I have been an invited visitor at the following universities and Institutes:

- Manitoba, Canada, 1982 (invited by G. Krause) 4 weeks.
- Limburgs, Belgium, 1984 (A. Ooms) 2 weeks.
- Weizmann Institute, Israel, 1984 (A. Joseph) 6 weeks (supported by Royal Society).
- Nijmegen, Holland, 1985 (A. van den Essen) 2 weeks.
- Paris, France, 1985 (R. Rentschler) 3 weeks.
- Paris, France, 1990 (R. Rentschler and A. Joseph) 2 weeks.
- Univ. de Bretagne, France, 1990 (T. Levasseur) 2 weeks.

- Weizmann Institute, Israel, 1990 (A. Joseph) 4 weeks (supported by US-Israel Binational Science Foundation).
- M.I.T., 1991 (M. Artin) 1 week.
- Antwerp, Belgium, 1991 (L. LeBruyn, M. van den Bergh) 3 weeks.
- Beijing Normal University, 1995 to deliver 30 hours of lectures over 3 weeks.
- Universidad Nacional Autonoma de Mexico, 1998, 2 weeks (R. Martinez-Villa).
- Paris, France, 1998, 4 weeks (M.-P. Malliavin).
- Copenhagen, Denmark, 1998, 2 weeks (P. Jorgensen).
- Copenhagen, Denmark, 1999, 2 weeks (P. Jorgensen).
- MSRI, 2001, 8 weeks
- Mittag-Leffler Institute: 2004, 6 weeks
- University of Glasgow, 2005, 3 weeks (I.G. Gordon)
- Newton Institute, 2007, 11 weeks (Non-commutative Geometry Program)

I have been a reviewer/referee for:

- Journal of Algebra, Journal of Pure and Applied Algebra, Communications in Algebra, Pac. J. Math., Math. Zeit., Math. Ann.,
- Journal, Bulletin, Proceedings, LMS
- Transactions, Proceedings, Memoirs, AMS
- Zentralblatt, Math Reviews
- NSF, NSA
- Academic Press, Pitman (Research Notes in Mathematics), Cambridge University Press, Kluwer Academic Press, Marcel Dekker, Harper Collins