

# Dr. Jonathan Paul Elmer

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CONTACT INFORMATION	Department of Design Engineering and Mathematics, Middlesex University, The Burroughs, Hendon, London NW4 4BT.	<i>Tel:</i> 0208 4113024 <i>Mobile:</i> 07950 818775 <i>E-mail:</i> j.elmer@mdx.ac.uk <i>D.O.B.:</i> 07-03-1981, Nottingham, UK.
RESEARCH INTERESTS	Invariant theory and representation theory of algebraic groups, modular invariant theory and representation theory of finite groups, separating invariants and related aspects of algebraic geometry and commutative algebra.	
FURTHER AND HIGHER EDUCATION	<b>University of Kent</b> , Canterbury, Kent, England Ph.D. Pure Mathematics. Awarded 23rd November 2007. Funded by EPSRC case study studentship. Thesis Title: "Symmetric Algebras and the Depth of Invariant Rings" Supervisor: Peter Fleischmann Date of viva: 21st August 2007	October 2003 – June 2007
	<b>Magdalene College</b> , University of Cambridge MA (Hons) Mathematics including Part III with merit.	October 1999 – June 2003
	<b>Parkview Sixth Form Centre</b> , Bramcote, Nottingham A Levels: Mathematics (A), Further Maths (A), Physics (A), Music (B).	September 1997 – June 1999
MEMBERSHIP OF PROFESSIONAL BODIES	<b>London Mathematical Society</b> <i>Ordinary Member</i>	February 2009 - present
	<i>Representative for Middlesex University</i>	September 2016 - present
	<b>Higher Education Academy</b> <i>Fellow</i>	September 2015 - present
CURRENT AND PREVIOUS EMPLOYMENT	<b>Middlesex University</b> The Burroughs, Hendon, London NW4 4BT. <i>Lecturer in Mathematics (Full Time)</i> Self-directed research in Invariant Theory. Develop and teach courses in logic, discrete mathematics and geometry. Write new courses in advanced algebra.	1st November 2015 - present
	<b>University of Aberdeen</b> King's College, Aberdeen AB24 3UE <i>Teaching Fellow in Pure Mathematics (Full Time)</i> Teach five undergraduate lecture courses per year, and supervise undergraduate projects.	10th September 2012 - 10th September 2015

**University of Bristol**

University Walk, Brisol BS8 1TW

*Temporary Teacher in Mathematics (Full Time)*

1st September 2010 - 30th June 2012

Self-directed research in Invariant Theory. Teaching up to four undergraduate courses.

**Queen Mary, University of London**

Mile End Road, London E1 4NS, England.

*Temporary Lecturer in Pure Mathematics (Full Time)*

1st September 2009 - 31st July 2010

Self-directed research in Invariant Theory. Teaching two undergraduate courses.

**RWTH-Aachen**

Templergraben 55, Aachen 56062, Germany.

*Research Fellow (Full Time)*

3rd November 2008 - 30th June 2009

Research in Computer Algebra and Invariant Theory, with Prof. Julia Hartmann.

**University of Aberdeen**

King's College, Aberdeen AB24 3UE.

*Research Fellow (Full Time)*

17th September 2007 – 19th September 2008

Research in Invariant Theory and Cohomology, with Prof. David Benson.

TEACHING  
ACTIVITIES

**Middlesex University**

- Module leader for Logic and Structures, (first year)
- Lecturer for Discrete Mathematics and Geometry (second year)
- Module leader for Groups and Rings (second year)
- Module leader for Advanced Algebra (third year)
- Module leader for Foundation Mathematics (Law)

**University of Aberdeen**

- Undergraduate projects co-ordinator (2014-15)
- Course co-ordinator for Introductory Mathematics 2 (service, 2014-15)
- Course co-ordinator for Understanding Data, (first year, 2014-15)
- Course co-ordinator for Mathematics in Everyday Life (service, 2014-15)
- Course co-ordinator for Algebra, (first year, 2013-14)
- Course co-ordinator for Complex Analysis, (third year, 2012-14)
- Course co-ordinator for Linear Algebra, (second year, 2012-14)
- Course co-ordinator for Galois Theory, (fourth year, 2012-14)
- Lecturer for Engineering Analysis and Methods, (service, 2012-2015)
- Academic advisor and personal tutor (2013-15).

**University of Bristol**

- Course co-ordinator for Further Topics in Analysis, (first year, 2011-12)
- Course co-ordinator for Algebra 2, (second year, 2010-11)
- Co-lecturer for Linear Algebra 2, (second year, 2010-11).
- Lecturer for 1AM/AS Mathematics, part two (service, 2010-11).

**Queen Mary, University of London**

- Course co-ordinator for Discrete Techniques for Computing, (service)
- Course co-ordinator for Geometry 2, (second year)
- Academic advisor.

**RWTH-Aachen**

- Co-lecturer for *Diplom*-level course on Invariant Theory.

**University of Aberdeen**

- Course co-ordinator for Introductory Mathematics, (service)
- Co-lecturer for Mathematical Methods (service)
- Co-lecturer for Linear Algebra (second year)

**University of Kent**

- Teaching Assistant for Computational Algebra, (third year, 2004-2007).
- Tutor for Disabled Services Unit - gave private tuition on a variety of mathematical topics to a student with Asperger's Syndrome (2004-2006).

**GRANTS AND AWARDS****Edinburgh Mathematical Society***Research Support Fund*

April 2013

“The  $\delta$ -number of linear algebraic groups”, project award of £900 to be used in support of the visit of Dr. M. Kohls to Aberdeen.

*Research Support Fund*

July 2015

“Modular Coinvariants”, project award of £600 to be used in support of the visit of Dr. M. Sezer to Aberdeen.

**London Mathematical Society***Celebrating New Appointments (Grant Scheme 1)*

March 2017

Award of £600 to host a one-day meeting at Middlesex in June 2017.

ACADEMIC SERVICE Referee for Journal of Algebra, Journal of the London Mathematical Society and Forum Mathematicum. Reviewer for Zentralblatt Mathematik. Peer review for EPSRC.

PUBLICATIONS AND PREPRINTS J. Elmer, P. Fleischmann *On the depth of modular invariant rings for  $\mathbb{Z}_p \times \mathbb{Z}_p$*  - in Proceedings of Symmetry and Spaces, Fields Institute, 2006 (Progress in Math **278**, pp 45–63, 2009).

J. Elmer *Associated primes for cohomology modules* - Arch. Math **91** issue 6, pp 481–485 (2008).

J. Elmer *Depth and detection in modular invariant theory* - J. Algebra **322** issue 5, pp 1653 – 1666 (2009).

E. Dufresne, J. Elmer, M. Kohls *On the Cohen-Macaulay property of separating invariants* - Trans. Groups **14** issue 4, pp 771–785 (2009).

J. Elmer *On the depth of separating algebras of finite groups* Beiträge Algebra Geom. **53** issue 1, pp 31-39 (2012).

J. Elmer, M. Kohls *Separating invariants for the basic  $\mathbb{G}_a$ -actions.*, Proc. Amer. Math. Soc. **140** issue 1, pp 135–146 (2012).

E. Dufresne, J. Elmer, M. Sezer *Separating invariants for arbitrary linear  $\mathbb{G}_a$ -actions*, Manuscripta Math. **143** issue 1-2, pp 207–219 (2014).

J. Elmer, M. Kohls *Zero-separating invariants for finite groups*, J. Algebra, **411** pp 92–113 (2014).

J. Elmer, M. Kohls *Zero-separating invariants for linear algebraic groups*, Proc. Edin. Math. Soc, **59** pp 911–924 (2016)

J. Elmer, M. Kohls *On separating fixed points from zero by invariants*, Comm. Alg **45** issue 1, pp 371–375 (2017, published online 18 Oct 2016)

J. Elmer, Symmetric powers and modular invariants of elementary abelian  $p$ -groups, submitted (2016) ArXiv 1503: 07797.

J. Elmer, M. Sezer Modular coinvariants and locally nilpotent derivations, submitted (2016) ArXiv 1605: 06363.

## SEMINARS AND COLLOQUIA

Symmetric Algebras and the Depth of Invariant Rings, 37th BLOC (Bristol Leicester Oxford Colloquium), Oxford, August 2006.

Depth and Cohomological Detection in Modular Invariant Theory, IWR Heidelberg, February 2009.

Depth and Cohomological Detection in Modular Invariant Theory, TU München, April 2009.

On the Cohen-Macaulay Property of Separating Invariants, University of Kent, October 2009.

Separating Invariants, London Algebra Colloquium, November 2009.

Separating Invariants for Linear  $\mathbb{G}_a$ -actions, University of Bristol, December 2010.

Separating Invariants, University College Cork, October 2011.

Globally Reductive Groups, University of Birmingham, May 2014.

Symmetric Powers of Modular Representations of Elementary Abelian  $p$ -groups, Queen Mary University of London, October 2014.

Symmetric Powers and Invariants of Elementary Abelian  $p$ -groups, University of Kent, February 2016.

Symmetric Powers and Invariants of Elementary Abelian  $p$ -groups, London Algebra Colloquium, Imperial College London, May 2016.

Symmetric Powers and Invariants of Elementary Abelian  $p$ -groups, Bilkent University, Ankara,

Turkey, September 2016.

Symmetric Powers and Invariants of Elementary Abelian  $p$ -groups, University of Nottingham Algebra and Analysis Seminar, March 2017.

#### CONFERENCES ATTENDED

Red Raider Symposium, Lubbock, Texas, November 2004 (participant).

Symmetry and Spaces, Fields Institute, Toronto, 2006 (participant).

British Mathematical Colloquium, Swansea, April 2007 (contributed talk).

Niklaus Conference, Aachen December 2008 (contributed talk)

Summer Meeting of the Canadian Mathematical Society, Memorial University, St John's NF, June 2009 (contributed talk).

Group Representation Theory and Related Topics, EPFL Lausanne, June 2010 (participant)

Summer Meeting of the Canadian Mathematical Society, University of New Brunswick, Fredericton NB, June 2010 (contributed talk).

British Mathematical Colloquium, University of Kent, April 2012 (contributed talk).

Modular Algebras, Friedrich Schiller Universität, Jena, Germany, May 2012 (invited speaker).

Meeting on Combinatorial Commutative Algebra, Trento, Italy, September 2014 (participant).

India-UK Seminar on Commutative Algebra and Applications to Classical Rings, Chennai Mathematical Institute, India, January 2015 (invited speaker).

Algebraic Topology and Representation Theory, University of Lille, France, June 2017 (invited speaker).

#### COMPUTING SKILLS

- Research in computer algebra using MAGMA/GAP.
- Proficient in MS Office and Linux.
- Experience of using and teaching MATLAB and L<sup>A</sup>T<sub>E</sub>X.
- Experience of programming using HTML, Python and C.

#### OTHER RELEVANT INFORMATION

- Basic German (written and spoken).
- Full clean driving license.
- Grade 7 piano
- Appeared on Channel Four's "Countdown", July 2011, winning three shows.

## REFERENCES

Prof. Mehmet Karamanoglu (current HoD)  
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Middlesex University,  
The Burroughs, Hendon, London NW4 4BT.  
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Prof. Peter Fleischmann (former PhD supervisor)  
Head of Pure Mathematics  
Institute of Mathematics, Statistics and Actuarial  
Science,  
University of Kent,  
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Prof. Dr. Gregor Kemper  
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