

# PROFESSOR ALEXANDRE V. BOROVIK

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<b>Personal</b>	Born: 1956 in Republic of Buriatia, Russia Nationality: British	
<b>Education</b>	INSTITUTE OF MATHEMATICS, MINSK PhD in Mathematics	1982
	NOVOSIBIRSK STATE UNIVERSITY MSc in Mathematics	1978
<b>Appointments</b>	Professor of Pure Mathematics, University of Manchester Professor of Pure Mathematics, UMIST. Reader, Department of Mathematics, UMIST Lecturer, Department of Mathematics, UMIST Visiting Associate Professor, Rutgers University Visiting Associate Professor, University of California, Irvine Associate Professor (half time position), Omsk University, Russia Assistant Professor (half time position), Omsk University, Russia Research Fellow, Russian Academy of Sciences, Omsk, Russia	2004- 1998-04 1996-98 1992-95 1991-92 1990-91 1982-90 1980-82 1978-91
<b>Membership</b>	London Mathematical Society — Trustee and Council Member British Logic Colloquium — Trustee and Member of the Committee American Mathematical Society European Mathematical Society Fellow of Higher Education Academy	2007–12, 2014–   2010–2016
<b>Awards</b>	The Royal Society Leverhulme Trust Senior Research Fellowship	2000-01
<b>Editorships</b>	Journal of Group Theory The De Morgan Gazette	2000–2017 from 2012

## Research

<b>Research Interests</b>	<ul style="list-style-type: none"> <li>• Group theory (probabilistic and non-deterministic methods in group theory, including black box recognition of finite groups; complexity of algorithms).</li> <li>• Model theory (classification of simple groups of finite Morley rank; pseudofinite groups).</li> <li>• Combinatorics (matroids; combinatorial structures related to Coxeter groups).</li> <li>• Computer Science (genetic algorithms; algorithms for trace groups and monoids; data structures for algebraic computations).</li> <li>• Philosophy of mathematics and cognitive aspects of mathematics.</li> <li>• Mathematics education.</li> </ul>
<b>Principal Results</b>	<p><b>Model Theory:</b> Classification of simple groups of finite Morley rank and even type (a series of papers and a book with T. Altinel and G. Cherlin).</p> <p><b>Combinatorics:</b> Development of the theory of Coxeter matroids (a series of papers and a book with I. M. Gelfand and N. White).</p> <p><b>Group Theory:</b> Centralisers of involutions method in black box recognition of finite groups.</p> <p>For a list of publications, see pages 15–20.</p>
<b>Grants</b>	<p>THE JOHN TEMPLETON FOUNDATION <span style="float: right;">2008 – 10</span>        By-invitation-only grant for a research project in philosophy and methodology of mathematics, “A Dialogue on Infinity”.</p>
<b>Invited Plenary Talks on Hardcore Mathematics, 2000–</b>	<p>LYMOT <span style="float: right;">2017</span>        21 October 2017, Preston. “Permutation groups of finite Morley rank”</p> <p>GROUPS, RINGS, AND THEIR AUTOMORPHISMS <span style="float: right;">2016</span>        31 August – 2 September 2016, Lincoln. “Black box groups”</p>
<b>For talks on teaching, education, philosophy, cognitive science see Page 8</b>	<p>ASYMPTOTIC GROUP THEORY <span style="float: right;">2015</span>        17-21 August, 2015, Renyi Institute, Budapest. “Black Box Philosophy”</p> <p>ANTALYA ALGEBRA DAYS        Şirince, Turkey, 20–24 May 2015. “Black box groups: back to basics”</p> <p>JOURNÉES EN MÉMOIRE D’ERIC JALIGOT <span style="float: right;">2014</span>        Institut Camille Jordan, Lyon, 26-27 juin 2014        “Reification of involutions in black box groups ”</p> <p>BRITISH MATHEMATICAL COLLOQUIUM        London, 07–10 April 2014        “Black box algebra”</p> <p>MODELS AND GROUPS 2        İstanbul Center for Mathematical Sciences, 27–29 March 2014        “Black box algebra and black box model theory”</p> <p>ANTALYA ALGEBRA DAYS XIII <span style="float: right;">2012</span>        Antalya, Turkey, 16–20 May 2012. “The Hrushovski Programme”</p>

- ANTALYA ALGEBRA DAYS XII 2011  
 Antalya, Turkey, 18–22 May 2011  
 “Permutation groups of finite Morley rank”
- ALCOP2011: ALGEBRA AND COALGEBRA MEET PROOF THEORY  
 Bern, Switzerland, 27–29 April 2011  
 “Blurring the line between proof and (probabilistic) computation”
- 5<sup>TH</sup> DE BRÚN WORKSHOP: GROUPS, COMBINATORICS, COMPUTING  
 Galway, Ireland, 11–16 April 2011  
 “Black box groups and pseudofinite groups”
- 4<sup>TH</sup> DE BRÚN WORKSHOP ON GROUP ACTIONS 2010  
 Galway, Ireland, 6–11 December 2010  
 “Group actions in model theory”
- WORKSHOP ON TOPICS IN ALGORITHMIC AND GEOMETRIC GROUP AND SEMIGROUP  
 THEORY  
 Centre de recherches mathématiques, Montreal, Canada, 23–27 August 2010  
 “Pseudofinite groups and black box groups”
- ANTALYA ALGEBRA DAYS XI  
 Antalya, Turkey, 20–24 May 2010  
 “Pseudofinite groups and groups of finite Morley rank” .
- GROUPS AND MODELS: CHERLIN BAYRAMI 2009  
 Istanbul 8–12 June 2009  
 “Black box groups, profinite groups, groups of finite Morley rank”
- ANTALYA ALGEBRA DAYS XI  
 Antalya 20–24 May 2009  
 “What is an ultraproduct?”
- MODNET BARCELONA CONFERENCE 2008  
 Barcelona, 3–7 Nov 2008  
 “Generic automorphisms of simple groups of finite Morley rank”
- GEOMETRIC AND ANALYTIC METHODS IN GROUP THEORY  
 Bristol, 12 May 2008  
 “Probabilistic recognition of black box groups” .
- GROUPS AND GEOMETRIES  
 Oberwolfach, Germany, 25 April 2008  
 “Model theory of black box groups” .
- CHAT YIN HO MEMORIAL CONFERENCE  
 Gainesville, Florida, USA, Feb 2008  
 “From here to infinity: (finite) black box groups and (infinite) groups of finite Morley rank” .
- PERMUTATION GROUPS 2007  
 Oberwolfach, Germany, 7 Aug 2007  
 “Permutation groups of finite Morley rank” .
- MODEL THEORY  
 Oberwolfach, Germany, 15-19 Jan 2007  
 “Permutation groups of finite Morley rank” .

ANTALYA ALGEBRA DAYS IX

Antalya, Turkey, May 2007

"Black box groups and groups of finite Morley rank".

ACID07 – ALGORITHMS AND COMPLEXITY IN DURHAM

Durham, UK, 18 September 2007

"Black box groups – between proof and computation".

LOGICUM LUGDUNENSIS

2006

Lyon, France, 22-24 June 2006

"Linear groups of finite Morley rank".

MODNET ANTALYA CONFERENCE

Antalya, Turkey, 2-11 November 2006

"Permutation groups of finite Morley rank".

LMS SPITALFIELDS DAY - GROUPS OF FINITE MORLEY RANK

2005

Isaac Newton Institute, Cambridge, UK, 16 March 2005

"Finite Group Theory: The Next Generation".

ACID.2005 – ALGORITHMS AND COMPLEXITY IN DURHAM

Durham, UK, 9 July 2005

"Stratification of complexity of algorithmic problems in combinatorial group theory".

COMBINATORIAL GEOMETRY AND APPLICATIONS

Centre International de Rencontres Mathématiques, Luminy, Marseilles, France

November 7 – 11, 2005

"The language of Coxeter matroids".

EUROGP 2004

2004

Coimbra, Portugal, 5-7 April 2004

"Coevolution of algorithms and deterministic solution of equations in free groups".

THE COXETER LEGACY: REFLECTIONS AND PROJECTIONS

University of Toronto, Toronto, Canada, May 2004

"Coxeter matroids".

GEOMETRIC GROUP THEORY

Newcastle, UK, 29 June – 1 July 2004

"The Andrews-Curtis Conjecture and Finite Groups"

GROUPES, GÉOMÉTRIE ET LOGIQUE

Centre International de Rencontres Mathématiques, Luminy, Marseilles, France

27 September – 1 October 2004

"Classification of Simple Groups of Finite Morley Rank: Lessons Learned"

and

"Some Problems on Groups of Finite Morley Rank".

COMBINATORICS IN OPORTO

2003

Oporto, Portugal, 15-17 Sept 2003

"Matroids and Coxeter Groups".

GROUPS AND PROBABILITY

Budapest, Hungary, 1-4 July 2003

"Nondeterministic aspects of the theory of infinite groups".

19TH BRITISH COMBINATORIAL CONFERENCE

Bangor, UK, June 2003

"Matroids and Coxeter Groups".

COMBINATORIAL, GEOMETRIC, AND DYNAMICAL ASPECTS OF INFINITE GROUPS

Gaeta, Italy, 1-6 June 2003

"Complexity of the conjugacy problem in amalgamated products".

GROUPS AND MODEL THEORY

Leeds, UK, April 2003

"Non-deterministic group theory: languages and complexity".

GROUPS AND COMPUTATION

Columbus, Ohio, USA, March 2003

"Probability measures and computational complexity".

GROUPS AND GEOMETRIES

2002

Oberwolfach, Germany, September 2002

"Black box groups and the Andrews-Curtis Conjecture"

NEW YORK CITY LOGIC CONFERENCE II

New York, USA, April 2002

"Groups of finite Morley rank".

INTERNATIONAL CONFERENCE ON MODERN ALGEBRA

Vanderbilt University, Nashville, USA, May 2002

"Non-deterministic methods in group theory".

ALGEBRA AND COMPUTER SECURITY

2001

New York, USA, November 2001

"Black box groups".

BRITISH LOGIC COLLOQUIUM

Manchester, UK, September 2001

"Classification of simple groups of finite Morley rank and even type".

LMS SYMPOSIUM GROUPS, GEOMETRY AND COMBINATORICS

Durham, UK, July 2001

"Geometry and identification theorems for groups of finite Morley rank".

THE JOINT MEETING OF AMS/SMF

Lyon, France, July 2001

"Classification of simple groups of finite Morley rank and even type".

ANTALYA ALGEBRA DAYS III

Antalya, Turkey, 16–20 May 2001

"Probabilistic and non-deterministic methods in algebra".

ANTALYA ALGEBRA DAYS II

2000

Antalya, Turkey, 17–21 May 2000

"Some open problems".

MODEL-THEORETIC ALGEBRA AND ALGEBRAIC METHODS OF COMPUTATION

Edinburgh, UK, 4–15 September 2000

"Probabilistic and non-deterministic computations in finite groups".

## LA CAVE DES GROUPES

Lyon, France, 2–5 November 2000

“Classification of simple groups of finite Morley rank and even type”.

## PROBABILISTIC METHODS IN GROUP THEORY

CUNY, New York, USA, 6 December 2000

“Black box groups”.

**Seminars and  
Colloquia  
Given, 2000–**

- 2018 Sabancı University, Turkey
- 2017 Birmingham Algebra Seminar; Oxford Logic Seminar, Oxford; Istanbul University, Istanbul, Turkey; University of Sao Paulo, Sao Paulo, Brazil.
- 2016 University of Sheffield.
- 2015 Boğaziçi University, Istanbul, Turkey.
- 2014 University of Konstanz, Germany; University of Newcastle.
- 2013 University of Plymouth; University of Warwick; Mimar Sinan University, Istanbul, Turkey; Mathematics Institute, Prague, Czech Republic; Liverpool University; Birmingham University.
- 2012 École Polytechnique Fédéral de Lausanne, Switzerland; Manchester-Leeds Model Theory Seminar; University of Newcastle; Logic Seminar, Oxford University; Mathematics Colloquium, Mimar Sinan University, Istanbul, Turkey; University of Lancaster.
- 2011 University of Sheffield.
- 2010 Université Paris VII, France; Logic Seminar, University of Oxford; Durham University; University of Leeds; University of Freiburg, Germany; University of Birmingham; Université Lyon 1, France; Queen Mary, University of London;
- 2009 Research Seminar, School of Systems Engineering, University of Reading; Mathematics Colloquium, Boğaziçi University, Istanbul, Turkey; Mathematics Colloquium, Bilgi University, Istanbul, Turkey; Centre for Reasoning, University of Kent; Isaac Newton Institute, Cambridge; Warwick University.
- 2008 Model Theory Seminar and Logic Seminar, Université Paris VII, France; Séminaire “Des Mathématiques”, l’Ecole Normale Supérieure, Paris, France; seminar “Géométrie & Théorie des Modèles”, l’Ecole Normale Supérieure Paris, France.
- 2007 Mideastern Technical University, Ankara, Turkey; University of Leeds; CHSTM, University of Manchester.
- 2006 MidEastern Technical University, Ankara, Turkey; Universidade do Porto (Portugal); London Algebra Colloquium.
- 2005 Algebra Seminar, DPMMS, Cambridge; Isaac Newton Institute, Cambridge; Algebra Seminar, Oxford University; Combinatorics Seminar, Université Paris VI; University of Newcastle; Logic Seminar, Université Paris VI; Colloquium, Institut Girard Desargues (Université Lyon 1), Lyon, France; Logic Seminar, Institut Girard Desargues (Université Lyon 1), Lyon, France.
- 2004 Combinatorics Seminar, Université Paris VI; London Algebra Colloquium; Model Theory Seminar, Oxford University; Universidade do Porto (Portugal); University of Giessen (Germany); NEGGTN Meeting, Nottingham; University of Birmingham; Model Theory Seminar, Université Paris VII.
- 2003 Pennsylvania State University, USA; McGill University, Montreal, Canada; Colloque de Mathématiques CRM-ISM, Montreal, Canada; University of Birmingham, UK; Institut Girard Desargues (Université Lyon 1), Lyon, France; University of Newcastle; University of Leicester; Rutgers University, USA; Manchester Algebra Seminar.
- 2002 Manchester Dynamics Seminar; University of Bielefeld (Germany).
- 2001 University of East Anglia, Norwich (UK); University of Newcastle, University of South Pacific (Fiji); Royal Holloway College (UK).

2000 London Algebra Seminar (Imperial College), Oxford; Universidade do Porto (Portugal); Graduate Centre, CUNY, New York.

**Major  
Academic  
Visits, 1997–**

2009 Visiting Fellow, Isaac Newton Institute, Cambridge, January-February.

2005 Visiting Fellow, Isaac Newton Institute, Cambridge, February-April.

2005 Visiting Researcher, Universite Paris VI, June.

2003 Visiting Professorship, Institut Girard Desargues (Université Lyon 1), Lyon, France.

2000 Visiting Professorship, Institut Girard Desargues (Université Lyon 1), Lyon, France.

1998 Visiting member, MSRI, Berkeley, USA, January.

1998 Visiting member, IHES, Bures-sur-Yvette, France, February-March.

1997 Visiting member, Fields Institute, Toronto, Canada, January.

## Teaching and Educational Research

<b>University Teaching</b>	<p>UNDERGRADUATE COURSES TAUGHT <span style="float: right;">since 1979</span>          Calculus, Advanced Calculus, Differential Equations, Linear Algebra, Probability and Statistics, Analytic Geometry with Tensor Analysis, Number Theory, Number Theory and Cryptography, Logic, Discrete Mathematics, Group Theory, Coding Theory, Mathematics Education.</p> <p>COMPUTER BASED TEACHING <span style="float: right;">1994–04</span>          Courses in Elementary Logic based on software packages SYMLOG and TARSKI'S WORLD, and a course Number Theory and Cryptography based on computer experiments with MATLAB.</p> <p>POSTGRADUATE COURSES TAUGHT <span style="float: right;">since 1980</span>          Model Theory, Multilinear Algebra, Symmetric Spaces, Linear Algebraic Groups, Classical Groups, Reflection Groups, Concrete Group Theory, Black Box Algebra.</p> <p>POSTGRADUATE SUPERVISION          10 students supervised or co-supervised by me have received their Ph.D.: Ayşe Berkman (1998), Christine Altseimer (1998), Richard Booth (1999), Matt Craven (2005), George Petrides (2006), Şükrü Yalçinkaya (2007), Pınar Uğurlu (2009), Elaine Render (2010), Omaira Alshantiti (2015), Goran Malic (2015).          A number of successful M.Sc. and M. Phil. dissertations in Combinatorics, Algebra, Applied Combinatorics, Cryptography and Mathematics Education.</p> <p>CURRICULUM DEVELOPMENT <span style="float: right;">2002</span>          Curriculum Innovation Award from University of Manchester and UMIST.</p>
<b>Membership of Professional Organisations</b>	<ul style="list-style-type: none"> <li>• Fellow of Higher Education Academy.</li> <li>• London Mathematical Society.</li> <li>• British Logic Colloquium.</li> <li>• American Mathematical Society.</li> <li>• European Mathematical Society.</li> <li>• Association Computability in Europe.</li> </ul>
<b>Conferences Related to Teaching</b>	<p>LMS EDUCATION DAY 2017 <span style="float: right;">2017</span>          Teacher shortages in mathematics: how can HE mathematics departments help reverse the trend? London, 25 May 2017. Talk "Mathematics for Teachers of Mathematics"</p> <p>PALESTRAS SOBRE O ENSINO DA MATEMÁTICA          Instituto de Matematica e Estatística, Sao Paulo, 18 April 2017.          "Didactic Transformation".</p> <p>SUBLIME SYMMETRY.          THE MATHEMATICS BEHIND DE MORGAN'S CEREMIC DESIGNS          London, 13 January 2017. "Sublime Symmetry: Mathematics and Art."</p> <p>MATHEMATICAL ASSOCIATION ANNUAL CONFERENCE <span style="float: right;">2016</span>          Oxford, 2 April. "Cute little inner wolfies."</p> <p>INGRID WINTER SCHOOL: FROM UBER TO AMAZON MECHANICAL TURK:          NON-TRADITIONAL LABOUR MARKETS</p>



DRIVEN BY TECHNOLOGICAL AND ORGANISATIONAL CHANGE 2015  
 Brussels, Center for European Policy Studies, 24–25 October 2015. “Employment and technological change: An educator’s point of view”.

34TH MATHEMATICS TEACHERS AND ADVISERS CONFERENCE  
 Leeds, 23 June 2015. ““Modelling” and “Word Problems””.

ISIS SUMMIT VIENNA 2015  
 Vienna, June 2015. “Makers and Users”

ANTALYA ALGEBRA DAYS XVII  
 . 23 May 2015. After dinner talk “Mathematics Teaching on the Deck of *Titanic*”

TEDx DURHAM 2014  
 7 June 2014, “Smoke and Mirrors”.

MATHEMATICAL CULTURES III  
 London, 10–12 April 2014  
 “Mathematics in the new pattern of division of labour”.

MATHEMATICAL CULTURES I 2012  
 London, 10–12 September 2012. “Specialist mathematics schools.”

MEETING OF THE ISRAEL MATHEMATICAL UNION  
 Bar Ilan University, Tel Aviv, Israel, 28 May 2012. “Protomathematics, metamathematics, and some challenges in philosophy of mathematics.”

PEUT-ON RÉPARER L’ENSEIGNEMENT DES MATHÉMATIQUES AU LYCÉE ET COLLÈGE? RÉUNION D’INFORMATION-DÉBAT  
 Institut Henry Poincaré, Paris, 4 April 2012. “What do children learn when we teach them mathematics?”

SUMMER SCHOOL “ADVANCED TECHNIQUES IN COMPUTER ALGEBRA SYSTEMS DEVELOPMENT” 2011  
 St Andrews, 20 August 2011. “Computer algebra systems in mathematical education: real life pedagogical challenges.”

30TH MATHEMATICS TEACHERS AND ADVISERS CONFERENCE  
 Leeds, 28 June 2011. “The eternal cycle of mathematics.”

THE LONDON MATHEMATICAL SOCIETY EDUCATION DAY  
 London, 31 May 2011. “Lecturer Training.”

MATHEMATICS HE SUMMIT  
 University of Birmingham, 12 January 2011  
 Proposer in the Debate ‘We believe that memory, subject knowledge and technical fluency remain vital for undergraduate mathematics in the digital age.’

MATHEMATICS AS PRACTICE AND CULTURE: INTERDISCIPLINARY PERSPECTIVES 2010  
 Bielefeld, Germany  
 “Is the mathematics that children learn the same as the mathematics that is taught to them?”

COGNITIVE VII. 7TH INTERNATIONAL COGNITIVE NEUROSCIENCE MEETING  
 Istanbul, Turkey, 18–20 May 2010  
 “What mathematicians would like to learn from cognitive scientists?”

SYMPOSIUM ON MATHEMATICAL PRACTICE AND COGNITION  
 De Montfort University, Leicester, 29–30 March 2010  
 “Little green men from Mars and other thought experiments in philosophy of mathematics.”

BRITISH CONGRESS OF MATHEMATICAL EDUCATION  
University of Manchester.  
Sectional talk "Childhood stories of mathematics."

TWO STREAMS IN THE PHILOSOPHY OF MATHEMATICS.  
RIVAL CONCEPTIONS OF MATHEMATICAL PROOF. 2009  
University of Hertfordshire, Hatfield, 1–3 July 2009  
"Above the streams: the philosophy of mathematics as seen by a mathematician."

FOUNDATIONS OF THE FORMAL SCIENCES VII.  
BRINGING TOGETHER PHILOSOPHY AND SOCIOLOGY OF SCIENCE 2008  
Vrije Universiteit Brussel, 21–24 October 2008.  
"Science wars: a time for a truce."

NEW DIRECTION IN PHILOSOPHY OF MATHEMATICS  
MIMS Workshop, Manchester, 4 October 2008. Co-organiser.

ARTS MEET SCIENCE  
Jodrell Bank, 23 September 2008.  
"Social Life of Infinity: from Mathematics to Kitsch."

IS MATHEMATICS SPECIAL? (PHIMSAMP 3, PHILOSOPHY OF MATHEMATICS, SOCIOLOGICAL ASPECTS AND MATHEMATICAL PRACTICE)  
University of Vienna, Vienna, Austria, 16–18 May 2008  
"Metamathematics of elementary mathematics".

THE TEACHING–RESEARCH INTERFACE: IMPLICATIONS FOR PRACTICE IN HE  
University of Stirling, UK, 29–30 April 2008  
"Didactic transformation in mathematics teaching".

MATHEMATICIANS AND MATHS EDUCATIONALISTS: HOW CAN WE COLLABORATE?  
Mathematics Institute, University of Warwick, UK, 19 March 2008  
Keynote talk "Didactic transformation".

EUROPEAN MATHEMATICAL PSYCHOLOGY GROUP 2007  
Luxembourg, 10-13 Sep 2007  
Talk "From mathematical psychology to psychology of mathematics"

MATHEMATICAL THINKING: AN INTERDISCIPLINARY APPROACH  
Nottingham, 21-22 Nov 2007  
Keynote talk: "Mathematical thinking as experienced by a mathematician"

WORLD FEDERATION OF NATIONAL MATHEMATICS COMPETITIONS CONFERENCE 2006  
Cambridge, 25 July 2006  
Keynote talk: "Mathematical abilities and mathematical skills"

WHERE WILL THE NEXT GENERATION OF UK MATHEMATICIANS COME FROM? 2005  
Manchester, 18-19 March 2005  
Co-organiser  
Conference website: <http://www.maths.manchester.ac.uk/avb/wherefrom.html>

**Seminars and  
Colloquia on  
Teaching and  
Methodology of  
Mathematics**

UNIVERSITY OF LINCOLN 2017  
Annual Boole Lecture in Mathematics, "What is Mathematics Education, Really?"

INSTITUTE OF MATHEMATICS AND ITS APPLICATIONS, NORTH WEST BRANCH MEETING 2015  
"Mathematics for Users and Mathematics for Makers"

BOĞAZIÇI UNIVERSITY, ISTANBUL, TURKEY  
Mathematics Community Seminar, "Mathematics Education on the Deck of *Titanic*"

NESIN MATHEMATİK KÖYÜ, ŞİRİNÇE, TURKEY  
"Mathematics Education on the Deck of *Titanic*"

SHEFFIELD UNIVERSITY 2011  
Mathematics Colloquium: "Proto-mathematics, meta-mathematics, and hidden abstract structures of elementary school mathematics"

QUEEN MARY, UNIVERSITY OF LONDON 2010  
Mathematics Colloquium: "Proto-mathematics, meta-mathematics, and hidden abstract structures of elementary school mathematics"

UNIVERSITY OF BIRMINGHAM  
Computer Science Colloquium: "Hidden abstract structures of elementary mathematics"

UNIVERSITY OF LEEDS  
Mathematics Colloquium: "Hidden structures of elementary mathematics"

BOĞAZIÇI UNIVERSITY 2009  
Istanbul, Turkey  
Mathematics Colloquium: "Eternity forever: social life of Infinity"

MID-EASTERN TECHNICAL UNIVERSITY  
Ankara, Turkey  
General Seminar of Mathematics Department: "Eternity forever: social life of Infinity"

BILGI UNIVERSITY, ISTANBUL  
Computer Science Colloquium: "Hidden abstract structures of elementary mathematics"

L'ÉCOLE NORMALE SUPÉRIEURE, PARIS 2008  
Séminaire "Des Mathématiques": Talk "Ubiquity and uniqueness: everyday mathematics from a model-theoretic perspective".

CENTER FOR HISTORY OF SCIENCE, MEDICINE AND TECHNOLOGY 2007  
University of Manchester  
Talk "History of mathematics as seen by a mathematician".

MID-EASTERN TECHNICAL UNIVERSITY 2007  
Ankara, Turkey  
General Seminar of Mathematics Department: "Elementary mathematics as seen by a mathematician".

UNIVERSITY OF BIRMINGHAM  
Talk "Metamathematics of Elementary Mathematics".

### Advisory Work

CAMBRIDGE UNIVERSITY 2011–13  
External Moderating Examiner of Mathematical Tripos Part IA.

THE LIVERPOOL JOHN MOORES UNIVERSITY 2011  
External Reviewer of degree programme "Mathematics with Mathematical Education"

GLASGOW UNIVERSITY, UK 2007–11  
External Examiner for degree programmes in Pure Mathematics.

ACADEMIC COUNCIL OF NESIN MATHEMATICS VILLAGE, ŞİRİNÇE, TURKEY 2007–  
Member of the Council.

UNIVERSITY OF SOUTH PACIFIC, FIJI 2001  
 Visiting Scholar/Consultant under the auspices of the Third World Academy of Sciences Programme run by the Abdus Salam International Centre for Theoretical Physics (Trieste, Italy).

**Teaching** SUMMER SCHOOL 2009 TMD 2009  
**Visits** 3 weeks course *Metamathematics of Elementary Mathematics* to a select group of Turkish undergraduate students. August 2009, Şirince, Turkey.

MID-EASTERN TECHNICAL UNIVERSITY 2009  
 Ankara, Turkey  
 Series of masterclasses given under provisions of the Erasmus Teaching Mobility Programme, April 2009.

SUMMER SCHOOL 2008 TMD 2008  
 3 weeks course *Metamathematics of Elementary Mathematics* to a select group of Turkish undergraduate students. July-August 2008, Şirince, Turkey.

SUMMER SCHOOL 2007 TMD 2007  
 Summer School 2007 TMD Yazokulu Duyurusu, Şirince, Turkey: giving a 2 week crash course *Reflection Groups* to a select group of Turkish undergraduate students. July 2007, Şirince, Turkey.

**Blogs on** MATHEMATICS UNDER THE MICROSCOPE  
**Teaching and** <http://www.micromath.wordpress.com>  
**Methodology of**  
**Mathematics** A DIALOGUE ON INFINITY  
<http://dialinf.wordpress.com/>

**Book** MATHEMATICS UNDER THE MICROSCOPE: NOTES ON COGNITIVE ASPECTS OF MATHEMATICAL PRACTICE. 2010  
 Amer. Math. Soc., Providence, RI. 317 pp. ISBN-10: 0-8218-4761-9. ISBN-13: 978-0-8218-4761-9. Available from <http://www.ams.org/bookstore-getitem/item=mbk-71>.

### Contribution to Reports

SUBMISSION OF EVIDENCE TO THE HOUSE OF COMMONS SELECT COMMITTEE PARLIAMENTARY INQUIRY: HOW SHOULD EXAMINATIONS FOR 15-19 YEAR OLDS IN ENGLAND BE RUN? 2011  
 London Mathematical Society, [http://www.lms.ac.uk/sites/default/files/files/reports/Parliamentary\\_Inquiry.pdf](http://www.lms.ac.uk/sites/default/files/files/reports/Parliamentary_Inquiry.pdf).

POSITION STATEMENT ON EXAMINATION BOARDS' INVOLVEMENT IN PRODUCTION OF TEXTBOOKS AND CONTINUING PROFESSIONAL DEVELOPMENT OF TEACHERS 2011  
 London Mathematical Society, [http://www.lms.ac.uk/sites/default/files/files/reports/LMS\\_Statement\\_on\\_Exam\\_Boards\\_and\\_Textbooks.pdf](http://www.lms.ac.uk/sites/default/files/files/reports/LMS_Statement_on_Exam_Boards_and_Textbooks.pdf).

USE AND MISUSE OF INFORMATION AND COMPUTER TECHNOLOGY IN THE TEACHING OF MATHEMATICS AT HE INSTITUTIONS. POSITION STATEMENT 2011  
 London Mathematical Society, [http://www.lms.ac.uk/sites/default/files/Mathematics/policy\\_responses/ICT\\_statement.pdf](http://www.lms.ac.uk/sites/default/files/Mathematics/policy_responses/ICT_statement.pdf).

LMS RESPONSE TO THE EDUCATION WHITE PAPER 2011  
 London Mathematical Society, [http://www.lms.ac.uk/sites/default/files/Mathematics/policy\\_responses/education\\_white\\_paper\\_response.pdf](http://www.lms.ac.uk/sites/default/files/Mathematics/policy_responses/education_white_paper_response.pdf).

COMMENTS ON REVIEW OF THE UK PROFESSIONAL FRAMEWORK FOR HIGHER EDUCATION 2011

London Mathematical Society, [http://www.lms.ac.uk/sites/default/files/Mathematics/Policy\\_reporers/2011LMS\\_Response\\_to\\_PSF\\_Consultation.pdf](http://www.lms.ac.uk/sites/default/files/Mathematics/Policy_reporers/2011LMS_Response_to_PSF_Consultation.pdf).

TECHNOLOGY IN LEARNING. A RESPONSE TO SOME QUESTIONS FROM THE DEPARTMENT  
OF BUSINESS INNOVATION AND SKILLS 2010  
Association for Learning Technology, [http://repository.alt.ac.uk/839/2/ALT\\_TEL\\_evidence\\_document\\_for\\_BIS\\_low-res.pdf](http://repository.alt.ac.uk/839/2/ALT_TEL_evidence_document_for_BIS_low-res.pdf).

AOC/ALT RESPONSE TO ROYAL SOCIETY CALL FOR EVIDENCE: COMPUTING IN SCHOOLS  
2010  
Association for Learning Technology, [http://repository.alt.ac.uk/840/2/Computing\\_in\\_schools\\_AoC\\_ALT\\_Submission\\_to\\_the\\_Royal\\_Society\\_20101105.pdf](http://repository.alt.ac.uk/840/2/Computing_in_schools_AoC_ALT_Submission_to_the_Royal_Society_20101105.pdf).

## Administrative work, since 2001

<b>Administrative work</b>	DIRECTOR OF INTERNATIONALISATION, SCHOOL OF MATHEMATICS	2017–
	SCHOOL REPRESENTATIVE AT LECTURE CAPTURE ACADEMIC ADVISORY GROUP	2016–
	MEMBER OF THE FACULTY COMMITTEE Faculty of Engineering and Physical Sciences, University of Manchester	2007–09
	MEMBER OF MANCHESTER INSTITUTE FOR MATHEMATICAL SCIENCES COMMITTEE	2004–07
	HEAD OF PURE MATHEMATICS GROUP	2004–05
	THE MERGING UNIVERSITIES Development of the new School of Mathematics in the new merged University of Manchester: I was the Research Coordinator in the Interim School Leadership Team and chaired the School's Research Working Group.	2003–04
	CHAIRMAN OF THE DEPARTMENTAL ACADEMIC BOARD	2003–04
<b>External work</b>	CAMBRIDGE UNIVERSITY — Moderating External Examiner of Mathematics Tripos Part IA — Advisor, Cambridge Mathematics Education Project	2011–14 2013–16
	OCR — Member of OCR Mathematics Consultative Forum	since 2011
	UNIVERSITY OF LINCOLN — Member of Advisory Board, School of Physics and Mathematics	since 2014
	THE LIVERPOOL JOHN MOORES UNIVERSITY — External Reviewer of degree programme “Mathematics with Mathematical Education”	2011
	THE ASSOCIATION FOR LEARNING TECHNOLOGY — Member of Research Committee	2009–12
	LONDON MATHEMATICAL SOCIETY — Trustee and Council Member — Member of Programme Committee, Research Meetings Committee — Member of Education Committee	2007–12, 2014–18 2007–10 2010–12
	BRITISH LOGIC COLLOQUIUM — Trustee and Committee Member	2010–16
	UNIVERSITY OF GLASGOW — External Examiner	2007–11

## Publications

- Books Authored**
- 2010 Mathematics under the Microscope: Notes on Cognitive Aspects of Mathematical Practice. Amer. Math. Soc., Providence, RI. 317 pp. ISBN-10: 0-8218-4761-9. ISBN-13: 978-0-8218-4761-9. Available from <http://www.ams.org/bookstore-getitem/item=mbk-71>.
- 2009 Mirrors and Reflections. The Geometry of Finite Reflection Groups. Springer, 2009. xii + 172 pp., 72 illus. (With Anna Borovik.) ISBN 978-0-387-79065-7.
- 2008 Simple Groups of Finite Morley Rank, Amer. Math. Soc. Monographs Series, Amer. Math. Soc., Providence, RI. Approx. 556 pp. ISBN-10: 0-8218-4305-2, ISBN-13: 978-0-8218-4305-5 (with T. Altınel and G. Cherlin).  
Review: D. Macpherson, *Simple groups of finite Morley rank, by T. Altinel, A.V. Borovik, and G. Cherlin*. Bull. Amer. Math. Soc. 47 no. 4 (2010), 729–734.
- 2003 Coxeter Matroids, Birkhäuser, xiv+264 pp., ISBN 0-8176-3764-8 (with I. M. Gelfand and N. White).
- 1994 Groups of Finite Morley Rank, Oxford University Press, xi+409 pp. (with A. Nesin).
- Books Edited**
- 2005 Groups, Languages, Algorithms, vol. 378 of Contemporary Mathematics, AMS, 348 pp., ISBN 0-8218-3618-8.
- 2004 Computational and Experimental Group Theory, vol. 349 of Contemporary Mathematics (co-editor, with A. G. Myasnikov), AMS, ISBN 0-8218-3483-5.
- 1995 Finite and Locally Finite Groups, Dordrecht, Kluwer Academic Publishers (NATO ASI Series C: Mathematical and Physical Sciences, vol. 471), xii+458 pp. (co-editor, with B. Hartley, G. Seitz and R. M. Bryant).
- Peer Refereed Papers on Mathematics and History and Philosophy of Mathematics**
1. Locally finite groups of finite centraliser dimension. J. Group Theory. Accepted for publication 22 Jan 2019. DOI: <https://doi.org/10.1515/jgth-2018-0109>. The Author Accepted Manuscript: [arXiv:1804.07957 \[math.GR\]](https://arxiv.org/abs/1804.07957) (With U. Karhumäki.)
  2. Groups of finite Morley rank with a generically sharply multiply transitive action. J. Algebra 513 (2018) 113–32. Available online: <http://www.sciencedirect.com/science/article/pii/S0021869318304459>. A pre-publication version (without editorial changes made by publishers): [arXiv:1802.05222 \[math.GR\]](https://arxiv.org/abs/1802.05222). (With Ayşe Berkman.)
  3. Adjoint representations of black box groups  $\mathrm{PSL}_2(\mathbb{F}_q)$ . J. Algebra 506 (2018) 540–591. Available online: <https://doi.org/10.1016/j.jalgebra.2018.02.022>. A pre-publication version (without editorial changes made by publishers): [arXiv:1502.06374 \[math.GR\]](https://arxiv.org/abs/1502.06374). (With Ş. Yalçınkaya.)
  4. Mathematics for makers and mathematics for users, in Humanizing Mathematics and its Philosophy: Essays Celebrating the 90th Birthday of Reuben Hersh (B. Sriraman ed.), Birkhauser, 2017, pp. 309–327. DOI 10.1007/978-3-319-61231-7\_22. ISBN 978-3-319-61231-7. A pre-publication version (without editorial changes made by publishers): [bit.ly/2qYHtst](https://bit.ly/2qYHtst).
  5. Economy of thought: a neglected principle of mathematics education, in Simplicity: Ideals of Practice in Mathematics and the Arts (R. Kossak and Ph. Ordng, eds.). Springer, 2017, pp. 241–265. DOI 10.1007/978-3-319-53385-8\_18. ISBN 978-3-319-53383-4. A pre-publication version (without editorial changes made by publishers): [bit.ly/293orpk](https://bit.ly/293orpk).

6. Being in Control. In *Understanding Emotions in Mathematical Thinking and Learning* (U. Xolocotzin (ed.)). Academic Press, San Diego, 2017, pp. 77–96. DOI: 10.1016/B978-0-12-802218-4.0003-0. ISBN: 9780128022184 (print), 9780128024898 (electronic). URL <http://www.sciencedirect.com/science/article/pii/B9780128022184000030>. The final pre-publication version: [bit.ly/2d6Encg](http://bit.ly/2d6Encg).
7. Cauchy's infinitesimals, his sum theorem, and foundational paradigms. *Foundations of Science* (2017), 1–30. DOI:10.1007/s10699-017-9534-y. (With T. Bascelli, P. B. Laszczyk, V. Kanovei, K. U. Katz, M. G. Katz, S. S. Kutateladze, T. Mcgaffey, D. M. Schaps, and D. Sherry.) Final pre-publication version: [bit.ly/2okfksP](http://bit.ly/2okfksP).
8. Rank 3 Bingo. *J. Symbolic Logic* 81 no. 4 2016, 1451–1480. DOI: <https://doi.org/10.1017/jsl.2016.36>. (With A. Deloro.) [Accepted for publication 14 July 2015]. arXiv:1504.00167 [math.GR].
9. A non-standard analysis of a cultural icon: The case of Paul Halmos. *Logica Universalis* 10 (2016), 393–405 (With P. Błaszczyk, V. Kanovei, M. Katz, T. Kudryk, S. S. Kutateladze, and D. Sherry.) [Accepted for publication 4 June 2016.] Available as 'Online First': <http://link.springer.com/article/10.1007/s11787-016-0153-0>. DOI 10.1007/s11787-016-0153-0.
10. Calling a spade a spade: Mathematics in the new pattern of division of labour. In *Mathematical Cultures: The London Meetings 2012-14* (B. Larvor, ed.). Trends History Science, Springer, 2016, pp. 347–374. DOI 10.1007/978-3-319-28582-5\_20. ISBN 978-3-319-28580-1. arXiv:1407.1954 [math.HO]. [Accepted for publication 6 January 2015]
11. New approaches in black box group theory. In *Mathematical Software – ICMS 2014 – 4th International Congress, Seoul, South Korea, August 5–9, 2014. Proceedings*, vol. 8592 of *Lecture Notes in Computer Science*, pp. 53–58, Springer, 2014. (With S. Yalçinkaya.)
12. A note on multivalued groups. *Ric. Mat.*, 61 no. 2 (2012) 45–253. (With H. Behravesch.)
13. An integer construction of infinitesimals: Toward a theory of Eudoxus hyperreals. *Notre Dame Journal of Formal Logic* 53 no. 4 (2012) 557–570. (With M. Katz and Renling Jin.)
14. Groups of finite Morley rank with a pseudoreflection action. *J. Algebra* 368 (2012) 237–250. arXiv:1112.3739v1 [math.GR] (With A. Berkman.)
15. Who gave you the Cauchy-Weierstrass tale? The dual history of rigorous calculus. *Foundations of Science* 17 no. 3 (2012), 245–276. DOI 10.1007/s10699-011-9235-x. arXiv:1108.2885. (With M. Katz.)
16. A note on multivalued groups, *Ricerche di Matematica*, published online 17 February 2012, DOI 10.1007/s11587-012-0127-3. ISSN 0035-5038. (With H. Behravesch.)
17. Is mathematics special? In *PhiMSAMP. Philosophy of Mathematics: Sociological Aspects and Mathematical Practice* (Eds. Benedikt Löwe, Thomas Müller). College Publications, London, 2010. Texts in Philosophy 11; pp. 1–27.
18. Permutation groups of finite Morley rank, in *Model theory with Applications to Algebra and Analysis Vol. 2* (Eds. Zoe Chatzidakis, Dugald Macpherson, Anand Pillay, Alex Wilkie). London Math Soc. Lecture Note Series No. 350, Cambridge Univ. Press 2008, pp. 59–124. ISBN-13: 9780521709088. (With G. Cherlin.)
19. Uniqueness cases in odd-type groups of finite Morley rank, *J. London Math. Soc.* 77 (2008) 240–252. (With J. Burdges and A. Nesin.) doi:10.1112/jlms/jdm106
20. A generic identification theorem for  $L^*$ -groups of finite Morley rank, *J. Algebra* 319 (2008) 50–76. (With A. Berkman, J. Burdges and G. Cherlin.)
21. A new trichotomy theorem for groups of finite Morley rank, *J. London Math. Soc.* 77 (2008) 1–14. (With J. Burdges.) doi:10.1112/jlms/jdm088.
22. Linear groups of finite Morley rank, *J. Inst. Math. Jussieu* 7 no. 4 (2008) 641–651.
23. Generic complexity of the conjugacy problem in HNN-extensions and algorithmic stratification of Miller's groups, *Internat. J. of Algebra and Computation* 17 nos. 5-6 (2007) 963–997. (With A. G. Myasnikov and V. N. Remeslennikov.)



24. Involutions in groups of finite Morley rank of degenerate type, *Selecta Math.* 13 no. 1 (2007) 1–22. (With J. Burdges and G. Cherlin.) DOI 10.1007/s00029-007-0030-z.
25. Simple groups of finite Morley rank of unipotent type, in “Algebra, Logic, Set Theory. Festschrift für Ulrich Felgner zum 65. Geburtstag” (B. Lowe, ed.). *Studies in Logic* 4 (2007) 44–61. ISBN 1-904987-28-1. (With J. Burdges and G. Cherlin.)
26. The conjugacy problem in amalgamated products I: Regular elements and black holes, *Internat. J. Algebra and Computation* 17, No. 7 (2007) 1299–1333. (With A. G. Myasnikov and V. N. Remeslennikov.)
27. Conjugacy problem in HNN extensions: regular elements and black holes // *Combinatorial methods in algebra and computational complexity*. – Herald of Omsk University, special issue. – OmSU, 2007, pp. 5–83. (With A. G. Myasnikov and V. N. Remeslennikov.)
28. Coxeter theory: cognitive aspects, in “The Coxeter Legacy: Reflections and Projections”, (C. Davis and E.W. Ellers, Eds.), Fields Institute Communications. Ser. no. 46 (2006), Amer. Math. Soc. pp. 17–43. ISBN 0-8218-3722-2.
29. Quotient tests and random walks in computational group theory, in “Topological and Asymptotic Aspects of Group Theory” (R. I. Grigorchuk et al., eds.), *Contemp. Math.* 394 (2006) (with A. G. Myasnikov).
30. Lagrangian pairs and Lagrangian orthogonal matroids, *European J. Combinatorics* 26 no. 7 (2005) 1023–1032 (with R. F. Booth and N. White).
31. The finitary Andrews-Curtis conjecture, *Progress in Maths.* 248 (2005) 15–30 (with A. G. Myasnikov and A. Lubotzky).
32. A generic identification theorem for groups of finite Morley rank, *J. London Math. Soc.* (2) 69 (2004) 14–26 (with A. Berkman).
33. Genetic algorithms and equations in free groups and semigroups, in “Computational and Experimental Group Theory”, *Contemp. Math.* 349 (2004) 63–81 (with R. F. Booth and D. Y. Bormotov).
34. Coevolution of algorithms and deterministic solutions of equations in free groups, in “Genetic Programming. 7th European Conference, EuroGP 2004. Coimbra, Portugal, April 2004” (M. Keijzer et al., eds.) *Lecture Notes Comp. Sci.* vol. 3003, Springer-Verlag, 2004, pp. 11–22 (with R. F. Booth).
35. Classification of simple  $K^*$ -groups of finite Morley rank and even type: geometric aspects, in “Groups, Combinatorics and Geometry: Durham 2001”, (A. A. Ivanov, M. W. Liebeck and J. Saxl, eds.), World Scientific, Singapore, 2003, pp. 1–12 (with T. Altinel and G. Cherlin).
36. Matroids and Coxeter groups, in “Surveys in Combinatorics 2003” (C. D. Wenseley, ed.), *London Math. Soc. Lect. Note Ser.*, vol. 307, Cambridge University Press, 2003, pp. 79–114.
37. An identification theorem for groups of finite Morley rank and even type, *J. Algebra* 266 (2003) 375–381 (with A. Berkman).
38. Parabolic 2-local subgroups in groups of finite Morley rank and even type, *J. Algebra* 269 (2003) 250–262 (with T. Altinel, G. Cherlin and L.-J. Corredor).
39. The Andrews-Curtis conjecture and black box groups, *Int. J. Algebra Comp.* 13 no. 4 (2003) 415–436 (with E. I. Khukhro and A. G. Myasnikov); math.GR/0110246.
40. Multiplicative measures on the free group, *Int. J. Algebra Comp.* 13 no. 6 (2003) 705–731 (with A. G. Myasnikov and V. N. Remeslennikov); math.GR/0204070.
41. Pushing up and a global  $C(G,T)$ -theorem for groups of finite Morley rank, *J. Algebra* 247 (2002) 541–576 (with T. Altinel and G. Cherlin).
42. On the topology of the combinatorial flag varieties, *Discrete and Computational Geometry* 27, no. 2 (2002) 195–214 (with I. M. Gelfand and D. A. Stone).

43. Centralisers of involutions in black box groups, in "Computational and Statistical Group Theory" (R. Gilman, A. Myasnikov, V. Shpilrain, eds.), Contemporary Mathematics 298 (2002), 7–20; math.GR/0110233.
44. Measuring sets in infinite groups, in "Computational and Statistical Group Theory" (R. Gilman, A. Myasnikov, V. Shpilrain, eds.), Contemporary Mathematics 298 (2002) 21–42 (with A. G. Myasnikov and V. Shpilrain).
45. Representations of matroids in semimodular lattices, European J. Combinatorics 22 (2001) 789–799 (with I. M. Gelfand and N. White).
46. Probabilistic recognition of orthogonal and symplectic groups, in "Groups and Computation III" (W. Kantor and A. Seress, eds.), de Gruyter, Berlin, 2001, pp. 1–20 (with C. Altseimer).
47. Oriented Lagrangian matroids, European J. Combinatorics 22 (2001), 639–656 (with R. F. Booth, I. M. Gelfand and N. White).
48. Lagrangian matroids and cohomology, Annals Combinatorics 4 (2000) 171–182 (with R. F. Booth, I. M. Gelfand and D. A. Stone).
49. Combinatorial flag varieties, J. Combinatorial Theory (A) 91 (2000) 111–136 (with I. M. Gelfand and N. White).
50. Groups of finite Morley rank and even type with strongly closed abelian subgroup, J. Algebra 232 (2000) 420–461 (with T. Altinel and G. Cherlin).
51. On groups of finite Morley rank with weakly embedded subgroups, J. Algebra 211 (1999) 409–456 (with T. Altinel and G. Cherlin).
52. An adjacency criterion for Coxeter matroids, J. Algebraic Combinatorics 9 (1999) 271–280 (with A. Vince).
53. Matroid homology, in "The Gelfand Mathematical Seminars, 1996-1999" (I. M. Gelfand and V. S. Retakh, eds.), Birkhauser, 1999, pp. 1–13, ISBN 0-8176-4013-4 (with T. V. Alekseyevskaya, I. M. Gelfand and N. White).
54. Exchange properties for Coxeter matroids and oriented matroids, Discrete Math. 179 (1998) 59–72 (with I. M. Gelfand and N. White).
55. Symplectic matroids, J. Algebraic Combinatorics 8 (1998) 235–252, (with I. M. Gelfand and N. White).
56. Tame groups of odd and even type, in 'Algebraic Groups and their Representations,' R. W. Carter and J. Saxl, eds., (NATO ASI Series C: Mathematical and Physical Sciences, vol. 517), Kluwer Academic Publishers, Dordrecht, 1998, pp. 341–366.
57. On the number of maximal soluble subgroups of a finite group, Communications in Algebra, 26 no. 12 (1998) 4041–4050.
58. Groups of mixed type, J. Algebra 192 (1997) 524–571 (with T. Altinel and G. Cherlin).
59. The lattice of flats and its underlying flag matroid polytopes, Annals Combinatorics 1 (1997) 17–26 (with I. M. Gelfand, A. Vince and N. White).
60. Coxeter matroid polytopes, Annals Combinatorics 1 (1997) 123–134 (with I. M. Gelfand and N. White).
61. Boundaries of Coxeter matroids, Advances Math. 120 (1996) 258–264 (with I. M. Gelfand and N. White).
62. Maximal subgroups in finite and profinite groups, Trans. Amer. Math. Soc. 348 (1996) 3745–3761 (with L. Pyber and A. Shalev).
63. Matroid maps, Commun. Omsk Univ. No. 1 (1996) 12–13.
64. Locally finite groups of finite Morley rank and odd type, in 'Finite and Locally Finite Groups,' Dordrecht, Kluwer Academic Publishers (NATO ASI Series C: Mathematical and Physical Sciences, vol. 471), 1995, pp. 243–280.

65. Coxeter groups and matroids, in 'Groups of Lie types and Their Geometries, Como 1993,' London Math. Soc. Lect. Notes Ser. 207 (1995), Cambridge University Press, pp. 13–34 (with K. S. Roberts).
66. On generic normal subgroups, in 'Automorphisms of First-Order Structures,' R. Kaye and D. Macpherson, ed., Oxford University Press, 1994, pp. 319–324 (with S. Thomas).
67. WP-matroids and thin Schubert cells on Tits systems, *Advances Math.* 103 (1994) 162–179 (with I. M. Gelfand).
68. Schur-Zassenhaus theorem revisited, *J. Symbolic Logic* 59 (1994), 283–291 (with A. Nesin).
69. On a class of doubly transitive omega-stable groups, *J. Algebra* 165 (1994), 245–257 (with M. DeBonis and A. Nesin).
70. CIT groups of finite Morley rank, I, *J. Algebra* 165 (1994) 258–272 (with M. DeBonis and A. Nesin).
71. CIT groups of finite Morley rank, II, *J. Algebra* 165 (1994) 273–294 (with A. Nesin).
72. Matroids on chamber systems, *Publ. du LaCIM* 14 (1993) 27–62 (with I. M. Gelfand).
73. On the Schur-Zassenhaus theorem for groups of finite Morley rank, *J. Symbolic Logic* 57 (1992) 1469–1477 (with A. Nesin).
74. A maximal subgroup in the simple finite group  $E_8(q)$ , *Contemporary Mathematics*, 131, Part 1 (1992) 67–79.
75. Some remarks on the structure of finite subgroups of simple algebraic groups, in 'Groups, Combinatorics and Geometry: Durham 1990,' London Math. Soc. Lect. Notes Ser. 165, Cambridge University Press, 1992, pp. 287–291.
76. A group-theoretic approach to the synthesis of systems of discrete frequency signals, Preprint 934, *Acad. Nauk SSSR Sibirsk. Otdel., Vychisl. Tsentr, Novosibirsk*, 1991, 20 pp. (with E.V. Paderin); MR 93d:94004.
77. Tores et p-groupes, *J. Symbolic Logic* 55 (1990) 478–491 (with B.P. Poizat).
78. Finite subgroups of simple algebraic groups, *Soviet Math. Dokl.* 40 (1990) 570–573.
79. Jordan subgroups of simple algebraic groups, *Algebra and Logic* 28 (1989) 97–108.
80. Structure of finite subgroups of simple algebraic groups, *Algebra and Logic* 28 (1989) 163–182.
81. Jordan subgroups and orthogonal decompositions, *Algebra and Logic* 28 (1989) 248–254.
82. On finite subgroups of simple algebraic groups, in 'Questions in Algebra,' Minsk, 1989, pp.110–115 (in Russian).
83. On groups of automorphisms of multilinear forms and mappings, *Siberian Math. J.* 30 (1989) 472–474.
84. Sylow theory for groups of finite Morley rank, *Siberian Math. J.* 30 (1989) 873–877.
85. Classification of periodic linear groups over fields of odd characteristic, *Siberian Math. J.* 25 (1984) 221–235.
86. Embeddings of finite Chevalley groups and periodic linear groups, *Siberian Math. J.* 24 (1984) 843–851.
87. Periodic linear groups of odd characteristic, *Soviet Math. Dokl.* 26 (1982) 484–486.
88. Theory of finite groups and uncountably categorical groups, preprint (*Acad. Nauk SSSR, Sibirsk. Otdel. Vychisl. Tsentr*), Novosibirsk, 1982, 21 pp. (in Russian).
89. Involutions in groups with a dimension, preprint (*Acad. Nauk SSSR, Sibirsk. Otdel., Vychisl. Tsentr*), Novosibirsk, 1982, 18 pp. (in Russian).
90. Normalizers of 2-subgroups of finite groups, *Siberian Math. J.* 22 (1981) 532–544.
91. 3-local characterisation of Held group, *Algebra and Logic*, 19 (1980) 255–266.

92. Groups of automorphisms of finite  $p$ -groups, *Math. Notes*, 19 (1976) 245–255. (With E. I. Khukhro.)

**Submitted Papers and Preprints**

1. Black box algebra and homomorphic encryption. arXiv:1709.01169 [math.GR]. (With Ş. Yalçinkaya.)
2. Black box, white arrow. arXiv:1404.7700 [math.GR] (With Ş. Yalçinkaya.)
3. Construction of some subgroups in black box groups  $PGL_2(q)$  and  $(P)SL_2(q)$ . arXiv:1403.2224 [math.GR]. (With Ş. Yalçinkaya.)
4. Mathematics invented, discovered, and inherited. Selected Passages From Correspondence With Friends, 1 no. 4 (2013), 13–27. arXiv:1309.3073 [math.HO, math.GR].
5. Fifty shades of black. arXiv:1308.2487 [math.GR]. (With Ş. Yalçinkaya.)
6. Steinberg presentations of black box classical groups in small characteristics, arXiv:1302.3059v1 [math.GR] 13 Feb 2013 (With Ş. Yalçinkaya.)
7. Uniqueness cases in odd type groups of finite Morley rank, revisited. arXiv:1111.7187v1 [math.GR]. (With J. Burdges and A. Nesin.)
8. A Generic Identification Theorem for groups of finite Morley rank, revisited. arXiv:1111.6037v1 [math.GR]. (With A. Berkman.)
9. Construction of Curtis-Phan-Tits system in black box classical groups (with Ş. Yalçinkaya). arXiv:1008.2823v1 [math.GR]
10. Definably linear groups of finite Morley rank. (With J. Burdges.) arxiv:0801.3958

**Peer-reviewed publications by PhD students based on their theses**

1. G. Petrides, Cryptanalysis of the public key cryptosystem based on the word problem on the Grigorchuk groups, in “Cryptography and Coding. 9th IMA Internat. Conf., Cirencister, UK, Dec 2003”, LNCS 2898, Springer-Verlag, 2003 234–244.
2. R. F. Booth, Oriented Lagrangian orthogonal matroid representations, *European Journal of Combinatorics* 22 (2001) 627–638.
3. A. Berkman, The classical involution theorem for groups of finite Morley rank, *J. Algebra* 243 (2001) 361–384.
4. C. Altseimer, A characterisation of  $PSp(4, K)$ , *Communications in Algebra* 27 no. 4 (1999) 1879–1888.

**Papers on Mathematics Education and Popular Mathematics**

1. What can specialist mathematics schools give to students that mainstream schools cannot? *The De Morgan Gazette* 9 no. 3 (2017), 17–25. [bit.ly/2mSXnzC](http://bit.ly/2mSXnzC)
2. What students like, *The De Morgan Gazette* 9 no. 1 (2017), 1–6. [bit.ly/2ie2WLz](http://bit.ly/2ie2WLz)
3. Comments on “Stop Ruining Math! Reasons and Remedies for the Maladies of Mathematics Education” by Rachel Steinig, *The De Morgan Gazette* 8 no. 2 (2016) 9–18. [bit.ly/2b8nSht](http://bit.ly/2b8nSht)
4. Sublime Symmetry: Mathematics and Art. *LMS Newsletter* no.458 (May 2016), 17–18.
5. Sublime Symmetry: Mathematics and Art. *The De Morgan Gazette* 8 no. 1 (2016), 1–8. ISSN 2053-1451. [bit.ly/1UT1o4s](http://bit.ly/1UT1o4s).
6. Makers and Users. In *Proceedings of the ISIS Summit Vienna 2015*, 3–7 June 2015; Vienna, Austria, T1.1014; doi:10.3390/isis-summit-vienna-2015-T1.1014
7. L'exemple de la modelisation, *Commentaire* 138 (2012) 500–502.
8. Mathematical abilities and mathematical skills, *The De Morgan Journal*, 2 no. 2 (2012) 75–86. (With A. D. Gardiner)
9. “Free Maths Schools”: some international parallels, *The De Morgan Journal*, 2 no. 2 (2012) 23–35.

10. Information and communication technology in university level mathematics teaching, The De Morgan Journal, 2 no. 1 (2012) 9–39.
11. Information technology in university-level mathematics teaching and learning: a mathematician's point of view. Research in Learning Technology 19 no. 1 (March 2011), 73–85. ISSN 0968–7769. DOI: 10.1080/09687769.2010.548504.
12. IT in university level mathematics teaching and learning: a mathematician's point of view, ALT News Online 20 (2010), <http://newsletter.alt.ac.uk/4edkkzb138s>. ISSN 1748–3603.
13. Проекция Меркатора, логарифм и мореплавание, Математическое Просвещение no. 14 (2010), 58–82 (with О. М. Худавердян).
14. Didactic transformation in mathematics teaching, in The Teaching-Research Interface: Implications for Practice in HE and FE (Muir Houston, ed.). Higher Education Academy Education Subject Centre, Bristol, 2008, pp. 30–35. ISBN 978–1-905788–81–1.
15. Boyutsal Analiz veya Elmalari Insanlara Bülmek, Matematik Dünyası, no. 2 (2008) 71–76.
16. Postane Sanısıve Çeşitlemeleri, Matematik Dünyası, no. 4 (2005) 61–66.
17. Research Globally – Teach Locally, Mathematics TODAY 41 no. 4 (August 2005) 104–105.
18. Kaybolan Açılar (Bir Karınca Hikâyesi), Matematik Dünyası, no. 2 (2004) 62–64.
19. Implementation of the Kid Krypto concept, MSOR Connections (ISSN 1473-4869), 2 no. 3 (2002) 23–25.

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