

Bram Mesland

Curriculum Vitae

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Personal Information

Citizenship Dutch
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Scientific Interests

Bivariant K-Theory and Index Theory, Cohomology of arithmetic groups, Noncommutative Geometry, Hyperbolic Dynamical Systems

Preprints

- *Operator *-correspondences in analysis and geometry* (with D. Blecher and J. Kaad), arXiv1703.10063.
- *Hecke operators in KK-theory and the K-homology of Bianchi groups* (with M.H. Sengun, 48 pages), arXiv1610.06808.
- *Spectral triples on O_N* (with M. Goffeng, 15 pages), arXiv:1610.01356.
- *Boundaries, spectral triples and K-homology* (with I. Forsyth, M. Goffeng and A. Rennie, 49 pages), arXiv:1607.07143.

Publications

- *Wieler solenoids, Cuntz-Pimsner algebras and K-theory* (with R.J. Deeley, M. Goffeng and M.F. Whittaker, 38 pages), to appear in Ergodic Th. Dynam. Sys., published online (2017) DOI: 10.1017/etds.2017.10
- *Nonunital spectral triples and metric completeness in unbounded KK-theory* (with A. Rennie, 79 pages), J. Funct. Anal. **271**, Issue 9 (2016), 2460–2538.
- *Shift tail equivalence and an unbounded representative of the Cuntz-Pimsner extension* (with M. Goffeng and A. Rennie, 33 pages), to appear in Ergodic Th. Dynam. Sys., published online (2016) DOI:10.1017/etds.2016.75.
- *The bordism group of unbounded KK-cycles* (with R.J. Deeley and M. Goffeng, 46 pages), to appear in J. Topol. Anal., published online (2016) DOI:10.1142/S1793525318500012
- *Gauge theory for spectral triples via the unbounded Kasparov product* (with S. Brain and W.D van Suijlekom, 72 pages), J. Noncomm. Geom. **10** (2016) 135–206.

- *Spectral triples and finite summability for Cuntz-Krieger algebras* (with M. Goffeng, 81 pages), Documenta Math. **20** (2015), 89–170.
- *Dense domains, symmetric operators and spectral triples* (with I. Forsyth and A. Rennie, 15 pages), New York J. Math. **20** (2014), 1001–1020.
- *Unbounded bivariant K -theory and correspondences in noncommutative geometry* (72 pages), J. Reine Angew. Math. **69** (2014), 101–172 (published online September 2012).
- *Spectral triples and KK -theory, a survey* (17 pages), Clay Math. Proceedings **16**, "Topics in Noncommutative Geometry"(2012), 197–213.
- *Groupoid cocycles and K -theory* (24 pages), Münster J. of Math. **4** (2011), 233–256.

Editorial

- *Operator spaces and noncommutative geometry in interaction* (S. Brain, M. Goffeng, J. Kaad and B. Mesland (editors), 30 pages), Oberwolfach reports **13**, (2016), 267-296.

Education and employment history

- April 2017-current **Vertretungs Professor**, *Universität Bonn, Germany.*
- April 2015 -current **Wissenschaftliche Mitarbeiter**, *Leibniz Universität Hannover, Germany.*
- April 2012-March 2015 **Postdoctoral Fellow**, *University of Warwick, UK.*
- September 2009-March 2012 **Postdoctoral researcher**, *Utrecht University, the Netherlands.*
- January 2007-July 2009 **Doctoral degree (summa magna cum laude)**, *Mathematics, Universität Bonn / MPI for Mathematics, Germany*, Thesis: *Bivariant K -theory of groupoids and the noncommutative geometry of limit sets*, <http://hss.ulb.uni-bonn.de/2009/1829/1829.htm>.
Advisor: Prof. dr. M. Marcolli.
- August 2005-May 2006 **Ph.D. student**, *Pennsylvania State University, State College, USA.*, .
- September 1998-June 2005 **M.Sc. Mathematics (cum laude)**, *University of Amsterdam*, Thesis: *Algebraic K -theory, periodic cyclic homology and the Connes-Moscovici index theorem*.
Advisor: prof. dr. N. P. Landsman.

Teaching experience

- June 2017 **Second thesis advisor of M. Barthelme, M. Sc.**, *Universität Bonn*, Thesis: *The scalar curvature of the noncommutative 4-torus*.
- April 2017- current **Index theory and Dirac operators (in English)**, *Master course, Universität Bonn, Germany.*

- October 2015-March 2017 **Einführung in die Biomathematik (in German)**, *Leibniz Universität Hannover, Germany*.
Reference: M.J. Gruber, gruber@math.uni-hannover.de
- April-July 2015 **Mathematik für Ingenieure (in German)**, *Leibniz Universität Hannover*.
- January-May 2014 **Maths in Action projects**, *University of Warwick*.
- November 2011 **Thesis supervisor of E.L.Jacobs, M.Sc.**, *Utrecht University*, Thesis: *Types of von Neumann algebras*.
- September 2011-February 2012 **Wiskundige Technieken (in Dutch), 1st year bachelor course for scientists and engineers**, *Utrecht University, the Netherlands*.
- September 2010-December 2010 **Rings and modules (in English), 3rd year bachelor course**, *Utrecht University, the Netherlands*.
- January 2006-May 2006 **College algebra (in English), 1st year course**, *The Pennsylvania State University, State College, USA*.
Reference: J. Sellers, sellersj@math.psu.edu

Events organised

- November 5-30, 2018 **Thematic Programme Bivariant K-theory in Geometry and Physics**, *Erwin Schrödinger International Institute for Mathematics and Physics, Austria (with A. Carey, H. Grosse, A. Rennie, and W. van Suijlekom)*.
- June 12-16, 2017 **Conference Analysis, noncommutative geometry and operator algebras**, *Chalmers University of Technology, Gothenburg, Sweden (with M. Goffeng and A. Usachev)*.
- February 7-13, 2016 **Oberwolfach Mini-Workshop Operator Spaces and Noncommutative Geometry in Interaction**, *Mathematisches Forschungsinstitut Oberwolfach, Germany (with S. Brain, M. Goffeng and J. Kaad)*.
- October 6-9, 2014 **Conference Methods of Noncommutative Geometry in Analysis and Topology**, *Leibniz Universität Hannover, Germany (with M. Goffeng, R. Deeley, S. Mahanta)*.
- May 2014 **Visitor program Noncommutative geometry, number theory and dynamics**, *May 2014, University of Warwick, UK (with R. Sharp)*.

Selected invitations

- July 2017 **Lecture course Unbounded KK-theory in noncommutative geometry and physics**, *CIMPA research school Noncommutative Geometry and applications to quantum physics, Qui Nhon, Vietnam*.
- March 2017 **Workshop KK-theory, gauge theory and topological phases**, *Lorentz Center Workshop, Leiden, Netherlands*.
- February 2017 **Workshop Geometric and Singular Analysis**, *Universität Potsdam, Potsdam, Germany*.
- September-October 2016 **Simons Visiting Professor**, *Simons program Noncommutative Geometry the Next Generation, Banach Center, Warsaw, Poland*.

- August 2016 **Lecture course *Frames and connections in KK -theory***, *Masterclass Sums of self-adjoint operators: Kasparov products and applications*, Copenhagen, Denmark.
- July 2016 **Lecture course *KK -theory and dynamics***, *MATRIX program Refining C^* -algebraic invariants for dynamics using KK -theory*, Melbourne, Australia.
- June 2016 **Lecture course *A categorical approach to spectral triples and KK -theory***, *Villa de Leyva, Colombia*.
- December 2015 **Program *Higher Structures in String Theory and Quantum Field Theory***, *Erwin Schrödinger Institute, Vienna, Austria*.
- September-December 2014 **Hausdorff Trimester program *Noncommutative Geometry and its Applications***, *Hausdorff Institute for Mathematics, Bonn, Germany*.

A selection of invited talks

- June 2017 **Analysis and probability seminar, Chalmers University, Gothenburg, Sweden**, *Talk: Hecke operators, KK -theory and arithmetic groups*, .
- May 2017 **Oberseminar C^* -algebren, Münster, Germany**, *Talk: Spectral triples on Cuntz-Krieger-Pimsner algebras*, Organisers: S. Echteroff, T. de Laat, W. Winter.
- December 2016 **GQT-colloquium Den Dolder, Netherlands**, *Talk: Hecke operators and K -homology of arithmetic groups*, Organiser: M. Solleveld.
- November 2016 **Oberseminar Globale Analysis, Bonn, Germany**, *Talk: Hecke operators and K -homology of arithmetic groups*, Organiser: M. Lesch.
- May 2016 **Operator algebra seminar, Odense, Denmark**, *Talk : Hecke operators and K -homology of arithmetic groups*, Organiser: D. Kyed.
- May 2016 **Operator algebra seminar, Copenhagen, Denmark**, *Talk : Hecke operators and K -homology of arithmetic groups*, Organiser: D. Enders.
- March 2016 **Analysis seminar, Glasgow, UK**, *Talk: The noncommutative geometry of Cuntz-Pimsner algebras*, Organiser: M. Whittaker.
- December 2015 **Program “Higher Structures in String Theory and Quantum Field Theory”, ESI, Vienna, Austria**, *Talk: The noncommutative geometry of Bianchi groups*, Organisers: R. Szabo, D. Stevenson, H. Grosse.
- November 2015 **KK_1 -day, RU Nijmegen, The Netherlands**, *Talk: The noncommutative geometry of Bianchi groups*, Organisers: J. Kaad, W.D. van Suijlekom.
- September 2015 **Workshop: Hilbert modules and index theory, SISSA, Trieste, Italy**, *Talk: Shift tail equivalence and the extension class for certain Cuntz-Pimsner algebras*, Organisers: L. Dabrowski, G. Landi, F. Arici.
- April 2015 **KK -day, RU Nijmegen, The Netherlands**, *Talk: Metric aspects of KK -theory*, Organisers: S. Brain and J. Kaad.
- March 2015 **Number Theory Seminar, Sheffield, UK**, *Talk: Noncommutative Bianchi manifolds*, Organiser: M.H. Sengun.
- January 2015 **GAGA Seminar, Utrecht, The Netherlands**, *Talk: Metric aspects of KK -theory*, Organiser: G. Cornelissen.

- December 2014 **Oberseminar Topologie, Universität Münster, Germany**, *Talk*: Metric aspects of KK -theory, Organiser : M. Joachim.
- September 2014 **Workshop Noncommutative Geometry's interactions with mathematics, Hausdorff Institute for Mathematics, Bonn, Germany**, *Talk*: Nonunital spectral triples, KK -theory and metric completeness, Organisers: A. Carey, M. Lesch, W.D. van Suijlekom.
- August 2014 **Conference K -homology and graph C^* -algebras, Trieste, Italy**, *Talk*: Unbounded Fredholm modules for Cuntz-Krieger algebras, Organisers: S. Brain, G. Landi, F. Arici.
- June 2014 **Conference on Noncommutative Geometry and Mathematical Physics, Scalea, Italy**, *Talk*: Spectral triples with unbounded commutators, Organisers: M. Schlichenmaier, R. Nest.
- January 2014 **GQT graduate school, Zeist, the Netherlands**, *Course*: What is noncommutative geometry?.
- November 2013 **GRK Kolloquium, Georg August Universität Göttingen, Germany**, *Talk*: Nonunital spectral triples, KK -theory and metric completeness, Organiser: D. Bahns.
- May 2013 **Cardiff Mathematical Physics Seminar, Cardiff University, UK**, *Talk*: Gauge theory for spectral triples via the unbounded KK -product, Organiser: D. Evans.
- February 2013 **Analysis seminar, University of Glasgow, UK**, *Talk*: Gauge theory for spectral triples via the unbounded KK -product, Organiser: C. Voigt.
- July 2012 **Workshop on K -theory and Quantum Fields, Erwin Schrödinger Institute, Vienna, Austria**, *Talk*: Gauge theory via correspondences in KK -theory, Organizer: A.L. Carey.
- November 2011 **Invited lecturer, SISSA, Trieste, Italy**, *Course*: Spectral triples and KK -theory, Organiser: L.D. Dabrowski.

Language skills

Dutch	native
English	fluent
Spanish	fluent
German	fluent
French	passive