

Carmen Rovi

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RESEARCH INTERESTS

Algebraic topology: Surgery theory, topology of manifolds and K - and L -theory. I am also interested in TQFTs and interactions between high and low dimensional topology.

EDUCATION

Mathematics Education

- 2015 **PhD in Mathematics** University of Edinburgh, UK
Advisor: [Prof Andrew Ranicki](#) Thesis: *The signature modulo 8 of fibre bundles*
- 2011 **MFoCS** University of Oxford, UK.
Advisor: [Prof Ulrike Tillmann](#) Dissertation: *Cobordism Theory*
- 2010 **M.Sc. in Mathematics** (Geometry and Topology). UNED, Spain, Erasmus at Linköping, Sweden. Advisor: [Prof Milagros Izquierdo](#), Dissertation: *Algebraic Curves over Finite Fields*. Mention: *Summa cum Laude*
- 2007 **B.Sc honours (First Class) in Mathematics** The Open University, UK

Music Education

- 1998 **Major in Piano Performance.** Conservatorio Superior, Vitoria, Spain
- 1998 **Major in Music Theory and Composition.** Conservatorio Superior, Vitoria, Spain

Languages

Spanish (C2), German (C2), English (C2), French (B2), Italian (B1), Latin.

Pedagogic

- 2000 **Certificate of Pedagogical Aptitude.** Universidad Complutense, Madrid, Spain
- 2001 - 2010 **650 hours of courses in pedagogic skills for teachers.** Education Council, Spain

EMPLOYMENT

- 2019 - Now **Postdoctoral Fellow at the Excellence Cluster "Structures", University of Heidelberg.**
- 2016 - 2019 **Zorn Postdoctoral Fellow at IU Bloomington.** Research Mentor: Prof Jim Davis.
- 2015 - 2016 **Postdoctoral Fellow at the Max Planck Institute for Mathematics in Bonn**
- Oct-Dec 2014 **Honorary contract at WWU Münster as a visitor of Prof Michael Weiss's group**
- 2011 - 2015 **PhD at the University of Edinburgh.** PhD advisor: Prof Andrew Ranicki.

- 2006 - 2010 **High School Principal** (By election of teacher's school council)
- 2000 - 2006 **High School Teacher, Head of Department** (Music)
Ranked 11 out of 2000 applicants in the examinations for tenured civil servant.

TEACHING EXPERIENCE

As Research Mentor

- 2017 **REU project for Matthew Schoenbauer in Bloomington Indiana** (Schoenbauer, who is an undergraduate at Notre Dame, has recently been awarded a prestigious Goldwater scholarship). *Results available at arxiv.org/pdf/1803.02939.pdf*
- 2018 **REU project for Benajamin Riley in Bloomington Indiana**
Results will be available shortly on the ArXiv.
- 2019 **Team Leader for the Women In Topology (WIT III) meeting**
The Women In Topology (WIT) meetings consist mostly of work in small groups of 5 or 6 women with the aim of producing a research paper. During the months coming up to the meeting, each group will start working on the project suggested by their team leader and the meeting will be the culmination of the work and the writing of the paper.

As Lecturer at Indiana University, Bloomington

- 2016 - 2019 **Graduate course: Topology II M522**
Single variable calculus M211 (Calculus 1)
Introduction to mathematical reasoning (for Mathematics Education majors)
Multivariable calculus M311 (Calculus 3)
Introduction to Probability and Statistics M365
Multivariable calculus M312 (Calculus 4)

As Class Tutor at the University of Edinburgh (during PhD)

- 2011 - 2015 **Fifth-year course: MSc in Geometry and Topology (two consecutive academic years)**
Fourth year course: Topology
Second-year courses: Facets of Mathematics and Multivariable calculus
First-year courses: Proofs and Problem Solving and Introduction to Linear Algebra

As Secondary School Teacher and School Principal

- 2000 - 2010 **High School Principal (By election, 2006-2010)**
High School Teacher (2000-2006)
On voluntary permanent leave

PUBLICATIONS

Published

- 2018 D. Benson, C. Campagnolo, A. Ranicki, C. Rovi. "Cohomology of symplectic groups and Meyer's signature theorem." arxiv.org/pdf/1710.04851.pdf *Algebraic & Geometric topology*, Vol. 18, Issue 7 (2018), 4069-4091.
- 2018 C. Rovi. "The non-multiplicativity of the signature modulo 8 of a fibre bundle is an Arf-Kervaire invariant" arxiv.org/pdf/1609.01365.pdf. *Algebraic & Geometric Topology*, Vol. 18, Issue 3 (2018) 1281 - 1322

- 2016 C. Rovi, S. Yokura. "Hirzebruch χ_y -genera modulo 8 of fiber bundles for odd integers." arxiv.org/pdf/1609.02118.pdf *Pure and Applied Mathematics Quarterly*, Vol. 12, No. 4 (2016), pp. 587-602
- 2015 V. Coufal, D. Pronk, C. Rovi, L. Scull, C. Thatcher. "Orbispace and their Mapping Spaces via Groupoids: A Categorical Approach". *Contemporary Mathematics: Women in Topology: Collaborations in Homotopy theory*. Vol 641. Providence, RI: American Mathematical Society, 2015. arxiv.org/abs/1401.4772, www.ams.org/books/conm/641/

Submitted for publication

- 2018 C. Rovi, M. Schoenbauer "Relating Cut and Paste Invariants and TQFTs." arxiv.org/pdf/1803.02939.pdf Submitted for publication at *Quarterly Journal of Mathematics, Oxford*. Received positive referee report.
- 2018 D. Benson, C. Campagnolo, A. Ranicki, C. Rovi. "Cocycles on the mapping class group and symplectic groups." arxiv.org/pdf/1811.09357.pdf Submitted for publication at *Algebraic & Geometric Topology*.
- 2020 R. Hoekzema, M. Merling, C. Rovi, J. Semikina, L. Wells. "Cut and Paste Invariants of Manifolds via Algebraic K-theory." arxiv.org/pdf/2001.00176.pdf

In preparation

- In preparation.* J. Davis, C. Rovi. "The reinterpretation of Davis-Lueck equivariant homology in terms of L -theory"
- In preparation.* J. Davis, C. Rovi. "A proof of the L -theoretic Farrell-Jones conjecture for semidirect products with the infinite cyclic group"
- Draft available.* B. Riley, C. Rovi. "Cut paste operations and bordism in an equivariant setting"

Thesis

- 2015 C. Rovi. "The Signature Modulo 8 of Fibre Bundles"
Edinburgh PhD Thesis, arxiv.org/abs/1401.4772

SELECTED ACTIVITIES AND AWARDS

Awards

- 2020 **Two-week stay at MSRI at the Summer Research in Mathematics Program**
- 2018-20 **AMS-Simons Travel Grant** (\$4,000)
- 2018 **Max Zorn Teaching Award at Indiana University** (\$1,000)
- 2018 **NSF Conference grant DMS - 1850620** (\$30,000)
- 2016 **US Junior Oberwolfach Fellow NSF Grant** (\$900)
- 2014 **Travel Prize from the University of Edinburgh** (£1,300)
- 2013 **Laura Wisewell Travel Fund from the University of Edinburgh** (£1,000)
- 2010 **Erasmus scholarship to write MSc thesis in Sweden**

Other activities

- Jan 7-18, 2019 **Co-organiser of the conference on Topology of Manifolds: geometric, topological and analytic aspects at the MATRIX conference center in Australia.**
I am co-PI for the NFS Grant (\$30,000) to support participation of US based mathematicians in this conference.
- 2017/18 **Co-organizer of the weekly Departmental Colloquium at IU Bloomington**
- 2013 **Organizer of the Young Researchers Meeting.** Edinburgh June 17-20, 2013.
Over 200 participants.
- 2011 - **Creator of a youtube channel with an online collection of topology seminars and lectures** (225 lectures at present recorded and edited by myself)
www.dailymotion.com/Carmen-Rovi/ or [my youtube channel](#)
- 2018 - **Reviewer for Mathematical Reviews (MathSciNet) and for Zentralblatt**
- 2019 **Referee for Algebraic & Geometric Topology**

Memberships

- 2018- **Member of the Sigma Xi Scientific Research Honor Society**
Nominated for serving as a Goldwater mentor for Matthew Schoenbauer.
- 2018- **Member of the American Mathematical Society (AMS)**
- 2013- **Member of the London Mathematical Society (LMS)**
- 2011- **Member of the Edinburgh Mathematical Society (EMS)**

CONFERENCES AND TALKS

44 talks in total: 18 seminar talks, 4 colloquia, 13 invited talks at conferences, 9 contributed talks at conferences, 1 radio interview (in German on hr2 Kultur).

2 posters: at the University of Cambridge (2014) and at the Humboldt Colloquium in Washington (2017).

32 conferences attended.

2019

- Nov. 2019 **Invited talk at the topology seminar at the University of Regensburg**
- Aug. 2019 **Women in Topology Meeting (WIT III) Hausdorff Institute, Bonn - Team leader**
- Aug. 2019 **Talk at the Fields Institute in Toronto during the conference "Four Manifolds: Confluence of High and Low Dimensions"**
- June. 2019 **Invited talk at the topology seminar at the University of Oregon**
- Apr. 2019 **Invited talk at the special session for the Women in Topology network at the AWM Research Symposium at Rice University in Houston**
- Apr. 2019 **Invited talk at the topology seminar in Rochester**
- Mar. 2019 **Invited talk at the Spring Topology and Dynamical Systems Conference in Birmingham, Alabama.**

- Feb. 2019 Colloquium talk at Lehman College (CUNY)
- Feb. 2019 Colloquium talk at Oklahoma State University
- Feb. 2019 Colloquium talk at Wesleyan University
- Jan. 2019 Colloquium talk at Mount Holyoke
- Jan. 2019 Topology of Manifolds: Interactions between high and low dimensional topology at the MATRIX Research Institute in Australia (coorganizer) <https://sites.google.com/view/matrix-interactions-workshop/home>

2018

- Oct. 2018 Invited talk at the topology seminar in Princeton University
- Sep. 2018 Invited talk at the topology seminar in Ohio State University
- Aug. 2018 Invited talk at the Conference on Singularities: Geometric, Topological, and Analytic Aspects at the Simons Foundation in New York www.simonsfoundation.org/event/mps-conference-on-singularities-geometric-topological-and-analytic-aspects/
- Apr. 2018 Invited talk at the Midwest Women in Mathematics Symposium, Purdue University www.math.purdue.edu/calendar/conferences/mwims18/
- Apr. 2018 Invited talk at the AMS Special Session on Recent Progress and New Directions in Homotopy Theory, Vanderbilt University

2017

- Dec. 2017 MSRI workshop for Women in Topology. www.msri.org/workshops/797
- May. 2017 Radio Interview (in German) for the Hessische Rundfunk hr2 Kultur. Doppelkopfsendung. [Podcast of the interview](#)
- Apr. 2017 Invited talk at the topology seminar in Urbana. (1 hour)
- Mar. 2017 Invited talk at the Workshop for singularities in the Midwest, IV in Madison-Wisconsin. (1 hour) www.math.wisc.edu/~maxim/Sing17.html
- Mar. 2017 Presented a poster at the Humboldt Colloquium in Washington 2017 www.humboldt-foundation.de/web/washington2017.html
- Feb. 2017 Invited talk at the topology seminar in Madison-Wisconsin. (1 hour)
- Feb. 2017 Invited talk at the Midwest Topology Seminar. (1 hour)

2016

- Dec. 2016 Invited to attend the meeting on Surface bundles in Oberwolfach (<https://www.mfo.de/>)
- Aug. 2016 Invited talk at the Focus Program on Topology, Stratified Spaces and Particle Physics at the Fields Institute for research in mathematical sciences in Toronto (www.fields.utoronto.ca/programs/scientific/15-16/stratifiedspaces/)
- Mar. 2016 Invited talk at the topology seminar in Warwick. (1 hour)
- Mar. 2016 Invited talk at the Scottish Topology Seminar. (1 hour)

2015

- Dec. 2015 Invited talk at the topology seminar in Göttingen. (90 min)
- Dec. 2015 Invited talk at the topology seminar in Regensburg. (1 hour)
- Nov. 2015 Invited talk at the topology seminar in Bonn. (1 hour)
- Oct. 2015 Invited talk at the topology seminar in Lausanne. (75 min)
- Oct. 2015 Invited talk at the Junior seminar of the Hodge Institute in Edinburgh. (1 hour)
- Sep. 2015 Invited talk at [Jóvenes Investigadores RSME Murcia, 2015](#). (45 min talk)
- Jul. 2015 Invited talk at [Topological methods in singularity theory](#) Edinburgh, ICMS 2015. (1 hour talk)
- Jun. 2015 [2015 Münster Functor Calculus Workshop](#) Münster, University 2015.
- May 2015 [Introductory school of the trimester Homotopy theory, manifolds, and field theories](#) Bonn, Hausdorff Institute 2015.

2014

- Dec. 2014 Invited talk at the topology seminar in Geneva. (1 hour)
- Nov. 2014 [NRW Topology Meeting](#) Bonn, University 2014.
- Oct. 2014 Invited talk at the Leray seminar in Münster. (4 hours)
- 2011- 2014 [Edinburgh Surgery Theory Study Group](#) University of Edinburgh, 2011 - 2014.
- Jun. 2014 [Borel Seminar 2014: Discrete group actions in geometry and topology](#), Les Diablerets, Switzerland. June 30 - July 4 2014.
- Jun. 2014 [Surgery theory and its applications in geometry](#), WWU Münster, Germany. June 9 - 13, 2014.
- Jan. 2014 [Introductory Workshop: Algebraic Topology](#), MSRI, Berkeley. January 27 -31, 2014.
- Jan. 2014 Talk at [Connections for Women: Algebraic Topology 2014](#), MSRI, Berkeley.
15 min talk: "The non-multiplicativity of the signature of fibre bundles"

2013

- Nov. 2013 Talk at [LMS Graduate student meeting 2013](#), LMS, London. November 15, 2013.
20 min talk: "Multiplicativity of the signature of fibre bundles"
- Sep. 2013 Invited talk at [British Topology Meeting \(BTM\) 2013](#), University of Aberdeen. September 9-11, 2013.
30 min talk: "A Chain complex proof of Morita's theorem on the \mathbb{Z}_8 -valued Arf invariant"
- Aug. 2013 Talk at [WIT: Women in Topology \(13w5145\)](#), Banff, BIRS, Canada. August 18-23, 2013.
20 min talk about work done during the week together with other members of the workgroup
- April. 2013 Talk at [Young Topology Meeting](#), Imperial College London. April 25-26, 2013.
30 min talk: "The non-multiplicativity of the signature of a fibre bundle and its relation to asymmetric L-theory, SK-groups and TQFT".

- April. 2013 Poster at [Higher Structure 2013: Operads and Deformation Theory](#), Newton Institute, Cambridge. April 2-5, 2013.
Poster presentation: "The non-multiplicativity of the signature of a fibre bundle SK-groups and TQFT"

2012

- Nov. 2012 Talk at [University of Cambridge, CMS Research UK afternoon](#), Represented the University of Edinburgh to encourage applications of prospective PhD students.
20 min talk about research for Part III students
- Sep. 2012 [British Topology Meeting \(BTM\) 2012](#), CMS, University of Cambridge. September 6-8, 2012.
- July. 2012 [Young Topologists Meeting](#). Copenhagen University, July 2 - 6, 2012.
- May. 2012 [Oberwolfach Seminar: Surgery Theory](#). May 27 - Jun 2, 2012.
- Apr. 2012 [Thematic school of homotopy theory](#). Lille, Laboratoire Paul Painlevé April 2 - 6, 2012.
- Mar. 2012 Talk at [Blockseminar: Surgery](#). Regensburg. March 25 - 30, 2012.
30 min talk. The odd-dimensional surgery obstruction.

2011

- Dec. 2011 Talk at [Young Women in Topology 2011](#). Hausdorff Research Center, Bonn. December 9-11, 2011.
30 min talk. "SK and SKK groups: an introduction".
- Sep. 2011 [British Topology Meeting \(BTM\) 2011](#), ICMS, Edinburgh. September 1-3, 2011.
- Jan. 2011 Talk in The Open University at Milton Keynes. *Presenting results of my first MSc thesis*

REFERENCES

(1) Prof James F. Davis.

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(2) Prof Ayelet Lindenstrauss (Teaching reference)

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(5) Prof Shoji Yokura

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