

# Curriculum Vitae of Reto Buzano

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## Personal Information

Birth: 16 July 1980 in Uster, Switzerland as Reto Müller. Swiss Nationality.  
Civil Status: Married to Maria Buzano. Name change to Reto Buzano in 2015.  
Languages: Fluent in Swiss German, German and English. Advanced knowledge of Italian.

## Expertise

Research: Nonlinear geometric partial differential equations, geometric analysis and the calculus of variations with main focus on geometric heat flows, minimal surfaces, and conformal geometry in higher dimensions.

Teaching: Lecture courses, tutorials, reading classes and seminars at all levels (for Bachelor, Master, and Ph.D. students, as well as postdocs) in mathematics. Experience in teaching courses in English and German.

## Education

May 05 – Apr 09 Ph.D. in Mathematics, ETH Zürich  
Thesis: Ricci flow coupled with harmonic map heat flow  
Advisor: Prof. Michael Struwe

Oct 00 – Apr 05 Diploma in Mathematics with distinction, ETH Zürich  
Thesis: Differential Harnack inequalities for parabolic equations  
Advisor: Prof. Michael Struwe

Aug 95 – Jan 00 Swiss Matura Type C (Mathematics and Natural Sciences), KZO  
Filiale Glattal, Dübendorf (as the best student of my year)

## Academic Employment

Oct 17 – present Senior Lecturer in Pure Mathematics, Queen Mary University of London  
Sep 13 – Sep 17 Lecturer in Pure Mathematics, Queen Mary University of London

Nov 11 – Aug 13 Junior Research Fellow, Imperial College London  
Aug 09 – Oct 11 Postdoctoral Research Fellow, Scuola Normale Superiore, Pisa  
Jan 10 – Mar 10 Postdoctoral Research Fellow, University of Warwick

May 09 – Jul 09 Postdoctoral Assistant, ETH Zürich  
Apr 05 – Apr 09 Teaching Assistant, ETH Zürich  
Oct 02 – Mar 05 Tutor and Junior Assistant, ETH Zürich

## Grants (as Principal Investigator) and Awards

- Feb 15 – Feb 17    EPSRC First Grant EP/M011224/1 (GBP 100,521).  
 Nov 14 – Dec 14    Research in Pairs Grant from the London Mathematical Society (GBP 1,200).  
 Nov 11 – Oct 14    Imperial College Junior Research Fellowship (GBP 124,650).  
 November 2005    ETH Medal for outstanding Diploma Thesis<sup>1</sup>.

## Selected Publications

- Articles and preprints
- L. Ambrozio, R. Buzano, A. Carlotto, and B. Sharp, *Bubbling analysis and geometric convergence results for free boundary minimal surfaces*, preprint 2018 (pp. 40, submitted), ArXiv:11807.00632.
  - L. Ambrozio, R. Buzano, A. Carlotto, and B. Sharp, *Geometric convergence results for closed minimal surfaces via bubbling analysis*, preprint 2018 (pp. 16, submitted), ArXiv:1803.04956.
  - R. Buzano, R. Haslhofer, and O. Hershkovits, *The moduli space of two-convex embedded tori*, Int. Math. Res. Not. IMRN (pp. 15, published online 2017), DOI: 10.1093/imrn/rnx125.
  - R. Buzano and H. Nguyen, *The higher-dimensional Chern-Gauss-Bonnet formula for singular conformally flat manifolds*, J. Geom. Anal. (pp. 32, published online 2018), DOI: 10.1007/s12220-018-0029-z.
  - R. Buzano, R. Haslhofer, and O. Hershkovits, *The moduli space of two-convex embedded spheres*, preprint 2016 (pp. 29, submitted), ArXiv:1607.05604.
  - R. Buzano and B. Sharp, *Qualitative and quantitative estimates for minimal hypersurfaces with bounded index and area*, Trans. Amer. Math. Soc. **370** (2018), 4373–4399.
  - R. Buzano and M. Rupflin, *Smooth long-time existence of Harmonic Ricci Flow on surfaces*, J. Lon. Math. Soc. **95** (2017), 277–304.
  - R. Buzano and H. Nguyen, *The Chern-Gauss-Bonnet formula for singular non-compact four-dimensional manifolds*, Commun. Anal. Geom. (pp. 28, to appear), ArXiv:1503.06602.
  - R. Haslhofer and R. Müller, *A note on the compactness theorem for 4d Ricci shrinkers*, Proc. Amer. Math. Soc. **143**, No. 10 (2015), 4433–4437.
  - R. Haslhofer and R. Müller, *Dynamical stability and instability of Ricci-flat metrics*, Math. Ann. **360** (2014), 547–553.
  - C. Mantegazza and R. Müller, *Perelman’s entropy functional at Type I singularities of the Ricci flow*, J. Reine Ang. Math. (Crelle) **703** (2015), 173–199.
  - R. Haslhofer and R. Müller, *A compactness theorem for complete Ricci shrinkers*, Geom. Funct. Anal. **21** (2011), 1091–1116.
  - J. Enders, R. Müller, and P. Topping, *On Type I singularities in Ricci flow*, Commun. Anal. Geom. **19** No. 5 (2011), 905–922.
  - R. Müller, *Ricci flow coupled with harmonic map flow*, Ann. Sci. Ec. Norm. Sup. **45**, fascicule 1 (2012), 101–142.
  - R. Müller, *Monotone volume formulas for geometric flows*, J. Reine Ang. Math. (Crelle) **643** (2010), 39–57.
- Book
- R. Müller, *Differential Harnack inequalities and the Ricci flow*, EMS Series Lect. Math. (2006).

Preprints of all my articles are available on the ArXiv.

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<sup>1</sup>Published in slightly revised and extended version as a book in the EMS Series of Lectures in Mathematics.

## Selection of Invited Talks

I have given **over 80 invited talks** in research seminars, workshops and colloquia, at universities in Europe, North America, Australia, India, Korea, and Japan and at major conference centres including BIRS (Banff), Centro De Giorgi (Pisa), Fields Institute (Toronto), Hausdorff Institute (Bonn), KIAS (Seoul), ICMS (Edinburgh), Institut Fourier (Grenoble), MFO (Oberwolfach), MSRI (Berkeley), etc.

The following is a list of selected **talks since 2015**:

- Workshop *Geometric Analysis, Submanifolds and Geometry of PDE's*, Politecnico di Torino (Sep 9–13, 2019).
- Analysis Seminar, ETH Zürich (Dec 18, 2018).
- Workshop *Ricci flow, mean curvature flow and related flows*, Universität Hamburg (Sep 3–6, 2018).
- Workshop *Geometric Analysis*, ICMS Edinburgh (May 28–Jun 1, 2018).
- Geometry and Analysis Seminar, University of Oxford (Jan 29, 2018).
- Journée De Géométrie, Université Paris-Est Créteil (Dec 11, 2017).
- Geometry Seminar, Université Libre de Bruxelles (Dec 5, 2017).
- Workshop *Mean curvature flow and Ricci flow*, Fields Institute Toronto (Nov 6–10, 2017).
- AG Geometrische Analysis, Karlsruher Institut für Technologie (Jun 27, 2017).
- Seminar on Differential Geometry and Analysis, Universität Magdeburg (Apr 27, 2017).
- Workshop *Differential Geometry Days*, Università degli studi di Torino (Apr 5–7, 2017).
- Geometry Seminar, University of Leeds (Mar 15, 2017).
- EPSRC Symposium *Geometric PDEs*, University of Warwick (Dec 12–16, 2016).
- Suddhodan Ghosh Memorial Lecture at *International Conference on Applications of Mathematics*, Calcutta Mathematical Society (Dec 9–11, 2016).
- CIMPA-INDIA Research School *On Geometric Flows*, Jadavpur University (Dec 4–8, 2016).
- PDE Seminar, University of Oxford (Oct 24, 2016).
- Geometry and Analysis Seminar, Queen Mary University of London (Oct 4, 2016).
- Workshop *Geometric Analysis*, Institut Fourier, Grenoble (Jun 27–Jul 1, 2016).
- Workshop *Nonlinear Evolution Equations*, Oberwolfach (May 29–Jun 4, 2016).
- Differential Geometry Seminar, Università degli studi di Torino (Feb 26, 2016).
- Geometry and Analysis Seminar, Queen Mary University of London (Feb 2, 2016).
- Pure Mathematics Seminar, University of Queensland in Brisbane (Jan 27, 2016).
- *Geometry Conference*, King's College London (Dec 14–18, 2015).
- Geometric Analysis Seminar, Max Planck Institut für Mathematik in Bonn (Aug 19, 2015).
- Oberseminar Analysis, Universität Leipzig (Jul 9, 2015).
- Oberseminar Differentialgeometrie, Universität Münster (Jun 1, 2015).
- Analysis Seminar, University of Warwick (May 21, 2015).
- Workshop *Geometric Flows*, BIRS Banff (Apr 12–17, 2015).
- Geometry and Analysis Seminar, Imperial College London (Feb 5, 2015).
- Geometry and Analysis Seminar, Queen Mary University of London (Feb 3, 2015).

## Organisation of Seminars, Schools and Workshops

- Reading seminar *PDE & Geometric Analysis*, Queen Mary University of London (since 2017).
- *Geometric Analysis Day*, Queen Mary University of London (Apr 2017, as main organiser).
- CIMPA Research school *On Geometric Flows*, Jadavpur University, India (Dec 2016).
- International workshop *Geometric Flows & Related Topics*, Queen Mary University of London (Jan 2016, as main organiser).
- Quarterly *Brussels-London Geometry Seminar* (since 2013).
- Research seminar *Geometry and Analysis*, Queen Mary University of London (2014–17).
- Research seminar *Geometry and Analysis*, Imperial College London (2012–13).
- Reading group *Topics in Geometric Analysis*, Imperial College London (2012–13).
- International workshop *Ricci Solitons Days*, Centro De Giorgi a Pisa (Apr 2011).
- Graduate seminar *Geometric Flows*, ETH Zürich (2007–08, as main organiser).
- Undergraduate student seminar *Geometric Flows*, ETH Zürich (AY 2005/06).
- Graduate colloquium, ETH Zürich (AY 2005/06).

## Teaching Experience

### Lecture courses, mini-courses and tutorials:

- *Metric Spaces and Topology*, Queen Mary University of London (QMUL), AY 2017/18 (BSc Math).
- Tutorials for *Metric Spaces and Topology*, QMUL, AY 2017/18 (BSc Math).
- *Convergence and Continuity*, QMUL, AY 2013/14, 2014/15, 2015/16, 2016/17 (BSc Math).
- Tutorials for *Convergence and Continuity*, QMUL, AY 2013/14, 2014/15, 2015/16, 2016/17 (BSc Math).
- Tutorials for *Differential and Integral Analysis*, QMUL, AY 2016/17 (BSc Math).
- Tutorials for *Mathematical Structures*, QMUL, AY 2013/14, 2014/15, 2016/17 (BSc Math).
- *The Singularity Formation in Mean Curvature Flow and Ricci Flow*, Research School Mini-Course, Jadavpur University Calcutta, Dec 2016 (PhD Students and Postdocs).
- *Third-Year/MSci Projects* (Lectures and Training Sessions), QMUL, AY 2014/15 (BSc and MSci Math).
- *Research Methods in Mathematical Sciences*, QMUL, AY 2014/15 (MSc/MSci Math).
- Tutorials for *Research Methods in Mathematical Sciences*, QMUL, AY 2014/15 (MSc/MSci Math).
- Tutorials for *Calculus III*, QMUL, AY 2013/14 (BSc Math).
- Tutorials for *Introduction to Algebra*, QMUL, AY 2013/14 (BSc Math).
- *Riemannian Geometry*, Imperial College London, AY 2012/13 (MSc/MSci Math).
- *The Formation of Singularities in the Ricci Flow*, Research School Mini-Course, Korea Institute for Advanced Study, Jan 2013 (PhD Students and Postdocs).
- *Convergence and Collapsing Results in Geometry*, Imperial College London (Oxford based TCC Course), AY 2012/13 (PhD Students and Postdocs).
- *Einstein Manifolds*, Università di Pisa, AY 2010/11 (MSc/MSci Math and PhD Students).
- Tutorials for *Analysis for Engineers*, ETH Zürich, AY 2008/09 (BSc Engineering).
- Tutorials for *Functional Analysis II*, ETH Zürich, AY 2007/08 (BSc Math/Phys).
- Tutorials for *Analysis I & II*, ETH Zürich, AY 2002/03, 2003/04, 2004/05, 2006/07 (BSc Math/Phys).
- Tutorials for *Measure Theory*, ETH Zürich, AY 2005/06 (BSc Math/Phys).
- Tutorials for *Complex Analysis*, ETH Zürich, AY 2004/05 (BSc Math/Phys).

### Supervision of BSc and MSci theses:

- *The  $CAT(\kappa)$  condition is preserved under Gromov-Hausdorff limits*, Amina Assouda Ladjali, QMUL, AY 2017/18 (MSci Math).
- *Birkhoff's Curve Shortening Process*, Shazada Begum, QMUL, AY 2017/18 (MSci Math).
- *On Maximum Principles*, Sania Kibria, QMUL, AY 2016/17 (MSci Math).
- *Closed geodesics on Surfaces*, Maria Beresford, QMUL, AY 2014/15 (MSci Math).
- *Maximum Principles*, Chiagoziem Nwobodo, QMUL, AY 2014/15 (BSc Math).
- *Curve Shortening*, Tanjina Ali, QMUL, AY 2013/14 (MSci Math).
- *Non-collapsing in mean convex mean curvature flow*, Lewis Smith, Imperial College London, AY 2012/13 (MSci Math).

### Teaching Recognitions:

- *Fellow of the UK Higher Education Academy (FHEA)*, Mar 2017.
- *Fellowship Academic Development, Education and the Promotion of Teaching (ADEPT)*, Mar 2017.
- *Nomination for Teacher of the Year at QMUL*, Apr 2015.
- *Reduced version of Postgraduate Certificate in Academic Practice*, QMUL, Aug 2014.

## Supervision of PhD Students

- Gianmichele Di Matteo, Project: *Singularities in Geometric Flows*, Queen Mary University of London (QMUL), since 2017, as main supervisor.
- Florian Litzinger, Project: *Singularities and geometric partial differential equations*, QMUL, since 2017, as co-supervisor.
- Ali Imad Raad, Project: *Cartan subalgebras in  $C^*$ -algebras*, QMUL, since 2017, as co-supervisor.
- Edgar Gasperin Garcia, Thesis: *Applications of conformal methods to the analysis of global properties of solutions to the Einstein field equations*, QMUL, 2013–17, as co-supervisor.

## Invited Academic Visits

- Università degli studi di Torino, Sep 2017 (3 weeks) and Feb – Mar 2016 (4 weeks).
- Karlsruher Institut für Technologie, Jun 2017 (1 week) and Dec 2012 (1 week).
- University of Queensland, Jan 2016 (1 week).
- Universität Leipzig, Jul 2015 (1 week).
- ETH Zürich, Jun 2015 (1 week), Jul 2012 (1 week), and Aug 2010 (4 weeks).
- New York University, Apr 2015 (1 week) and Apr 2013 (1 week).
- McMaster University, Mar 2013 (1 week) and Jun 2013 (1 week).
- University of Missouri, Apr 2013 (1 week).
- Universität Freiburg, Jul 2012 (1 week).
- Scuola Normale Superiore di Pisa, Jul 2012 (1 week).
- Goethe Universität Frankfurt, May 2011 (1 week).
- University of Warwick, Dec 2010 (1 week).
- Centro di Ricerca Matematica Ennio De Giorgi a Pisa, May – Jul 2009 (3 months).
- Freie Universität Berlin and Max Planck Institut Potsdam, Nov 2006 – Feb 2007 (4 months).

## Academic Visitors

- Jasmin Hörter, Karlsruher Institut für Technologie, Sep – Dec 2018 (4 months).
- Lothar Schiemanowski, Universität zu Kiel, Oct 2017 – Feb 2018 (5 months).
- Jason Ledwidge, Universität Tübingen, Mar – Apr 2017 (4 weeks).
- Sylvain Maillot, Université Montpellier, Feb 2017 (1 week).
- Carlo Mantegazza, Università di Napoli, Jan – Feb 2017 (1 week).
- Anna Fino, Università degli studi di Torino, Nov – Dec 2016 (1 week).
- Or Hershkovits, Stanford University, Nov 2016 (1 week).
- Miles Simon, Universität Magdeburg, Nov 2016 (1 week).
- Huy Nguyen, University of Queensland, Jul 2016 (2 weeks), Nov – Dec 2015 (2 weeks) and Nov – Dec 2014 (4 weeks).
- Melanie Rupflin, Universität Leipzig, Feb 2015 (1 week).
- Robert Haslhofer, New York University, Feb 2012 (1 week).

## Miscellaneous

- **Director of Postgraduate Research Studies (DPGR)**, Queen Mary University of London (since April 2017). Previously Deputy Director of PGR, PGR Recruitment Coordinator, and PGR Admissions Tutor (Sep 2013 – Sep 2015).
- **Editor** for Geometric Flows (De Gruyter Journal).
- **Referee** for over 25 different peer-reviewed mathematical journals, including in particular: Annali SNS, Calc. Var. PDE, Comm. Anal. Geom., Comm. PDE, GAFA, Crelle, J. Diff. Geom., J. Funct. Anal., J. EMS, J. Geom. Anal, Math. Ann., Math. Z., Proc. AMS, and Trans. AMS.
- **Reviewer** for Mathematical Reviews (AMS).
- **Reviewer** for EPSRC Grant Proposals.
- **External Examiner** for the PhD viva of Michael Coffey, University of Warwick (March 2015) on *Ricci Flow and Metric Geometry*.
- **Member** of the London Mathematical Society (since 2014), European Mathematical Society (since 2012), and the American Mathematical Society (since 2007).
- **Member** of the following committees at Queen Mary University of London: Senior Management Team (since Sep 2018), Research Committee (AY 2013–14, 2017–18, 2018–19), Postgraduate Research Committee (AY 2013–14, 2014–15 and as chair since Apr 2017), Director of Postgraduate Studies Forum of the Faculty of Science and Engineering (since Apr 2017), Teaching and Learning Committee (AY 2017–18), Head of School Advisory Group (AY 2016-17, 2017-18), Student Experience Working Group (AY 2016–17), and several hiring committees.
- **Outreach Activities** at Queen Mary University of London: Taster Day Talk “Spheres”, seminar for Year 10 high-school students (Jul 2017); Goldsmiths’ Company Course “Game Theory”, mini-course for high-school teachers (Jul 2014); Taster Day Talk “I’ve Got Proof – Infinite Sums” (Apr 2014).