Felix Schulze

Contact

Department of Mathematics
University of Warwick
Zeeman Building
Gibbet Hill Road
Coventry CV7 4AL, UK

Email: felix.schulze@warwick.ac.uk

www: www.felixschulze.eu

Research Interests

Differential Geometry, Partial Differential Equations, Geometric Analysis

Education

2008	Hablilitation in Mathematics, Free University Berlin
2002	PhD in Mathematics, University of Tübingen, Thesis advisor: Gerhard Huisken
1999	Degree in Mathematics (Diplom), University of Tübingen, Thesis advisor: Gerhard Huisken

Appointments

from 02/2020	Professor of Mathematics, University of Warwick, UK
10/2019 - 01/2020	Professor of Mathematics, University College London, UK
02/2013 - 09/2019	Associate Professor (Reader) in Pure Mathematics, University College London, UK
05/2008 - 01/2013	Junior Research Group Leader, Emmy Noether Program of the German Research Foundation, Free University Berlin, Germany
10/2003 - 04/2008	'Assistent', Geometric Analysis Group of K. Ecker, Free University Berlin, Germany
10/2002 - 09/2003	Postdoctoral Fellow, ETH Zürich, Switzerland

Grants and Awards

02/2023	HIMR Small Grant *'Geometric Flows and Applications'* as PI, together with J. Lotay (Co-PI) (3000 GBP)
02/2020 - 06/2020	Visiting Professorship at the University of Chicago (US)
09/2019 - 12/2019	Leverhulme Visiting Professorship on behalf of Prof O. Munteanu to visit UCL (23,000 GBP)
06/2019	DFG SPP 2026 Geometry at Infinity grant for the workshop *'Geometric Analysis and General Relativity (60th birthday G. Huisken)'* at ETH Zürich, together with C. Cederbaum, E. Kuwert and J. Metzger (26,000 EUR)

12/2017 - 09/2019	Royal Society International Exchanges Grant, together with M. Saez as Co-PI (6,000 GBP)
05/2018 - 02/2019	Leverhulme Visiting Professorship on behalf of Prof M. Saez to visit UCL (20,000 GBP)
01/2018	HIMR Focused Research Grant *'Lagrangian Mean Curvature Flow: Progress and Problems'* as Co-PI, together with J. Lotay (PI) (7,500 GBP)
01/2017 - 03/2022	Leverhulme research grant 'Advances in contact topology via Lagrangian mean curvature flow' as PI, together with J. Lotay (Co-PI) (338,000 GBP)
01/2016 - 05/2016	Eisenbud Research Professorship at MSRI Berkeley
05/2008 - 01/2013	Emmy Noether Fellowship of the German Research Foundation (733,000 EUR)
01/2008 - 03/2010	Feodor Lynen Fellowship of the Alexander von Humboldt Foundation (27,000 EUR)
06/2007 - 06/2009	Project Grant in the Program 'Global Differential Geometry' of the German Research Foundation, joint with O. Schnürer (5,000 EUR)
09/1997 - 08/1999	Travel Grant of the Fulbright Foundation
10/1996 - 04/2000	Fellowship of the German National Academic Foundation

Institutional responsibilities

Pure Graduate Tutor, UCL, 09/2018 - 01/2020

Member of the Departmental Teaching Comittee, UCL, 09/2018 - 01/2020

Summer Project Coordinator, UCL, 02/2013 - 08/2018

Editorial Boards

Editorial Board, Advances in Differential Equations, since 2019

Editorial Advisor, Publications of the LMS (Bulletin of the LMS, Journal of the LMS, Proceedings of the LMS), since 2015

Editorial Advisory Board, Geometric Flows, 2014–2020

Invited Lecture Series

09/2022	Conference "Geometric Analysis in Granada", University of Granada, Spain
06/2021	Summer School in Mathematics "Curvature Constraints and Spaces of Metrics", Grenoble, France
05/2021	Rutgers Geometric Analysis Conference, Rutgers, USA
07/2014	ERC School on Geometric Evolution Problems, Centro De Giorgi, Pisa, Italy
01/2013	KIAS Winter School in Differential Geometry, Korea

Organised workshops and seminars

07/2023	Workshop "Geometric Flows and Applications", ICMS Edinburgh, joint with T. Daskalopoulos (Columbia), J. Lotay (Oxford), N. Sesum (Rutgers)
12/2022	PDE Workshop at Warwick as part of the network "Generalised and Low-Regularity Solutions of Nonlinear PDEs", joint with P. Topping (Warwick)
03/2022	"Geometric analysis and partial differential equations", Minisymposium at the SIAM Conference on Analysis of Partial Differential Equations Berlin, joint with P. Feehan (Rutgers)
2020 - 2022	B.O.W.L. Online Geometry Seminar (Brussels, Oxford, Warwick, London); with C. Bellettini (UCL), J. Fine (ULB Brussels), L. Foscolo (UCL), M. Guaraco (Imperial), J.D. Lotay (Oxford), H.T. Nguyen (QMUL), B. Premoselli (ULB Brussels), M. Singer (UCL), P. Topping (Warwick)
2020 - present	Warwick Analysis Seminar, with D. Bate (Warwick), P. Rindler (Warwick) and P. Topping (Warwick)
2020 - present	Warwick Geometric Analysis Reading Seminar, with P. Topping (Warwick)
from 09/2021	Series of Oberwolfach Workshops on *Partial Differential Equations*, together with A. Fraser (UBC), R. Schoen (Irvine) and G. De Philippis (Courant)
06/2019	Conference *Geometric Analysis and General Relativity* on the occasion of the 60th birthday of G. Huisken at ETH Zürich, organizer, together with B. Andrews (ANU Canberra), C. Cederbaum (Tübingen), J. Isenberg (Oregon), E. Kuwert (Freiburg), J. Metzger (Potsdam), T. Riviere (ETH), M. Struwe (ETH) and P. Topping (Warwick)
2018 - 2020	Brussels–London Geometry Seminar, with J. Fine (ULB Brussels) and J. Lotay (Oxford), once per term
2018 - 2020	Joint KCL/UCL Geometry Seminar, with Y. Lekili (KCL), weekly
01/2018	2 day workshop *Lagrangian Mean Curvature Flow: Progress and Problems* at UCL, together with J. Lotay (UCL), funded by the Heilbronn Institute for Mathematical Research
2013 - 2021	London Geometric Analysis Reading Seminar, together with C. Bellettini (UCL), J. Lotay (Oxford) and H. Ngyuen (QMUL), weekly, UCL
05/2013	UCL Geometry and Topology Day 3
2008 - 2013	Oberseminar Geometry and Physics, weekly, joint with K. Ecker and G. Huisken, Free University Berlin
2004 - 2005	Seminar Wave Equations, weekly, joint with K. Ecker and G. Huisken, Max-Planck-Insitute for Gravitational Physics, Potsdam

Publications

[28] *Huisken-Yau-type uniqueness for area-constrained Willmore spheres*, with M. Eichmair, T. Koerber and J. Metzger, `arXiv:2204.04102`, (2022), to appear in Duke Math. J.

[27] *Mean curvature flow with generic low-entropy initial data*, with O. Chodosh, K. Choi and C. Mantoulidis, `arXiv:2102.11978`, (2021), to appear in Duke Math. J.

[26] *A relative entropy and a unique continuation result for Ricci expanders*, with A. Deruelle, `arXiv:2101.02638`, (2021), to appear in CPAM

[25] *Uniqueness of asymptotically conical tangent flows*, with O. Chodosh, Duke Math. J. **170** (2021), no. 16, 3601–3657

[24] *Positive solutions to Schrödinger equations and geometric applications*, with O. Munteanu and J. Wang, J. Reine Angew. Math. 774 (2021), 185–217

[23] *On the regularity of Ricci flows coming out of metric spaces*, with A. Deruelle and M. Simon, J. Eur. Math. Soc. (JEMS) **24** (2022), no. 7, 2233–2277

[22] *Ancient solutions in Lagrangian mean curvature flow*, with B. Lambert and J.D. Lotay, Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) **22** (2021), no. 3, 1169–1205

[21] *Generic uniqueness of expanders with vanishing relative entropy*, with A. Deruelle, Math. Ann. **377**, No. 3-4, 1095–1127 (2020).

[20] *Optimal isoperimetric inequalities for surfaces in arbitrary codimension in Cartan-Hadamard manifolds*, Geom. Funct. Anal. 30 (2020), no. 1, 255–288.

[19] *Remarks on the self-shrinking Clifford Torus*, with C.G. Evans and J.D. Lotay, J. reine angew. Math. **765** (2020). 139–170.

[18] *Local foliation of manifolds by surfaces of Willmore type*, with T. Lamm and J. Metzger, Ann. Inst. Fourier (Grenoble) **70** (2020), no. 4, 1639–1662,

[17] *Ricci flow from spaces with isolated conical singularities*, with P. Gianniotis, Geom. Topol. 22 (2018), no. 7, 3925–3977.

[16] *Consequences of strong stability of minimal submanifolds*, with J.D. Lotay, Int. Math. Res. Not. IMRN, (2020) no. 8, 235–2360.

[15] *On Short Time Existence for the planar network flow*, with A. Neves and T. Ilmanen, J. Diff. Geom., **111** (1), (2019).

[14] *A local regularity theorem for mean curvature flow with triple edges*, with B. White, J. Reine Angew. Math. 758 (2020), 281–305.

[13] *Uniqueness of compact tangent flows in Mean Curvature Flow*, J. Reine Angew. Math. (690), 163–172 (2014).

[12] *The Half-Space Property and entire positive minimal graphs in $M \times \mathbb{R}$*, with H. Rosenberg and J. Spruck, J. Differ. Geom., **95** (2), 321–336 (2013).

[11] *Expanding solitons with non-negative curvature operator coming out of cones*, with M. Simon, Math. Z. 275 (1-2), 625–639 (2013).

[10] *Stability of Hyperbolic space under Ricci-flow*, with O.C. Schnürer and M. Simon, Comm. Anal. Geom. **19**, No. 5, 1023–1047 (2011)

[9] *Foliations of asymptotically flat spacetimes by surfaces of Willmore type*, with T. Lamm and J. Metzger, 2009, Math. Ann. **350**, No. 1, 1–78 (2011).

[8] *Evolution of convex lens-shaped networks under curve shortening flow*, with O.C. Schnürer, M. Saez, A. Azzouani, M. Georgi, J. Hell, N. Jangle, A. Koeller, T. Marxen, S. Ritthaler, and B. Smith, Trans. Amer. Math. Soc. **363**, No. 5, 2265–2294 (2011).

[7] *Stability of Euclidean space under Ricci-flow*, with M. Simon and O.C. Schnürer, Comm. Anal. Geom. **16**, No. 1, 127–158 (2008).

[6] *Self-similarly expanding networks to curve shortening flow*, with O.C. Schnürer, Ann. Scuola Norm. Sup. Pisa Cl. Sci. (5) Vol. VI (2007), 511-528.

[5] *No mass drop for mean curvature flow of mean convex hypersurfaces*, with J. Metzger, Duke Math. J., Vol. 124 (2) (2008), 283–312.

[4] *Nonlinear evolution by mean curvature and isoperimetric inequalities*, J. Differ. Geom. **79** (2008), 197–241.

[3] *Stability of translating solutions to mean curvature flow*, with J. Clutterbuck and O.C. Schnürer, Calc. Var. Partial Differential Equations **29** (2007), no. 3, 281–293.

[2] *Convexity estimates for flows by powers of the mean curvature*, appendix with O.C. Schnürer, Ann. Scuola Norm. Sup. Pisa Cl. Sci. (5), Vol. V (2006), 261–277.

[1] *Evolution of convex hypersurfaces by powers of the mean curvature*, Math. Z. **251** (2005), no. 4, 721–733.

Preprints

[10] *Mean curvature flow with generic low-entropy data II*, with O. Chodosh and C. Mantoulidis (2023), `arXiv:2309.03856`

[9] *Improved generic regularity of codimension-1 minimizing integral currents*, with O. Chodosh and C. Mantoulidis (2023), `arXiv:2306.13191`

[8] *A short proof of Allard's and Brakke's regularity theorems*, with G. De Philippis and C. Gasparetto, `arXiv:2306.02490`

[7] *Mean curvature flow with generic initial data II*, with O. Chodosh and K. Choi (2023), `arXiv:2302.08409`

[6] *Generic regularity for minimizing hypersurfaces in dimensions 9 and 10*, with O. Chodosh and C. Mantoulidis (2023), `arXiv:2302.02253`

[5] *Neck pinches along the Lagrangian mean curvature flow of surfaces*, with J. Lotay and G. Szkelyhidi (2022), `arXiv:2208.11054`

[4] *Ancient solutions and translators of Lagrangian mean curvature flow*, with J. Lotay and G. Székelyhidi (2022), `arXiv:2204.13863`

[3] *Initial stability estimates for Ricci flow and three dimensional Ricci-pinched manifolds*, with A. Deruelle and M. Simon (2022), `arXiv:2203.15313`

[2] *Stability of neckpinch singularities*, with N. Sesum, `arXiv:2006.06118`, (2020)

[1] *Mean curvature flow with generic initial data*, with O. Chodosh, K. Choi and C. Mantoulidis, `arXiv:2003.14334`, (2020)

Surveys

[1] *Evolution of networks with triple junctions*, with C. Mantegazza, M. Novaga and A. Pluda, `arXiv:1611.08254`, (2016), to appear in Astérisque.

Invited talks over the last 4 years

2023 · Conference 'Recent advances in geometric analysis' CIRM Luminy, Marseille, France
· Oberwolfach Workshop 'Differential geometry in the large', MFO, Germany
· Yorkshire Durham Geometry Day, Leeds, UK
· Paris-London Geometry Day, UCL, UK
· Workshop 'Ricci flow and related topics', University of Warwick, UK
· Analysis Session, BMC, Bath, UK
· PDE Seminar, Oxford, UK

2022 · Mathematics Colloquium, University College London, UK
· One World PDE Seminar, online
· Wilhelm Killing Colloquium, University of Münster, Germany
· MATH-IMS Joint Colloquium in Pure Mathematics, Chinese University of Hong Kong, online
· 'Northeast Workshop in Geometric Analysis (NEWGA)', UConn, USA
· Geometric Analysis Seminar, P. Universidad Catolica de Chile, Santiago de Chile
· Conference 'Geometric Analysis in Granada', Granada, Spain
· Oberwolfach Workshop 'Calculus of Variations', MFO, Germany
· Workshop 'Mean Curvature Flow and related topics', QMUL, London, UK
· '11. Norddeutschen Tag der Differentialgeometrie', Hannover, Germany
· Workshop 'Regularity Theory for Free Boundary and Geometric Variational Problems', Pisa , Italy
· Oxbridge PDE Conference, Oxford, UK
· Oxford Geometry and Analysis Seminar
· Conference 'Geometric Analysis in Castro', Italy
· AIM workshop 'Stability in mirror symmetry', San Jose, USA
· Hot Topics Workshop: Regularity Theory for Minimal Surfaces and Mean Curvature Flow, MSRI, Berkeley, USA
· Conference 'Differential Geometry and Geometric Analysis', Florence, Italy
· Workshop 'Connections between String Theory and Special Holonomy', Oxford, UK
· MATRIX-SMRI Symposium: Singularities in Geometric Flows: An Ancient Perspective, Australia

2021 · BIRS workshop on Geometric flows, Banff
· Geometric Analysis Seminar, University of Tennessee, Knoxville, USA
· Online Seminar Geometric Analysis

- · Geometry Seminar, University of Magdeburg, Germany
- · Workshop on Riemannian Geometry and Geometric Analysis, Grenoble, France
- · Mathematics Colloquium, University of Darmstadt, Germany
- · Rutgers Geometric Analysis Conference, Rutgers, USA
- · Geometry and Topology Seminar, The Hebrew University, Israel
- · NCTS International GMT Seminar, Taipeh, Taiwan
- · London Analysis Seminar, London, UK

2020
- · AIM workshop 'Stability in mirror symmetry', (virtual)
- · KIAS Geometry and Analysis Seminar, Seoul, South Korea
- · UC-Berkeley Differential Geometry Seminar, USA
- · Mathematics Colloquium, University of Warwick, UK
- · Geometric Analysis Seminar, Rutgers, USA
- · Geometric Analysis Seminar, Notre Dame, USA
- · Geometric Analysis Seminar, University of Chicago, USA
- · Geometry and Topology Seminar, Stony Brook, USA
- · Seminar on Dirac operators, Paris, France
- · Colloquium, Notre Dame, USA
- · Geometry Seminar, Paris Jussieu, France (postponed)
- · Geometric Analysis Seminar, MIT, USA
- · JHU-UMD Geometry Seminar, Johns Hopkins, USA
- · Differential Geometry/Geometric Analysis Seminar, Princeton, USA
- · Mini-symposium in Nonlinear Geometric Partial Differential Equations, OIST, Okinawa, Japan
- · Geometry Day in Como, Italy