

# Prof. Dr. Julie Rowlett

## *Curriculum Vitae*

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<https://orcid.org/0000-0002-5724-3252>  
🌐 US citizen, Swedish permanent resident  
✍ published as Julie (Marie) Rowlett, 罗茉莉

## RESEARCH

### Geometric analysis and its applications

Interests include geometric, functional, and microlocal analysis; differential geometry; complex analysis and geometry; spectral theory; mathematical physics; dynamical systems; game theory; and interdisciplinary collaboration.

## WORK EXPERIENCE

	CURRENT
Chalmers University <b>Professor</b> <b>Program Director for Engineering Mathematics</b> Associate Professor 2016–2022, Senior Lecturer 2015–2016, Master's Program Director for Engineering Mathematics 2016-2019.	
Technische Hochschule Ingolstadt <b>Professor (W2)</b>	2014-2015
Leibniz Universität Hannover <b>Privatdozent (docent)</b>	2013-2014
Georg-August Universität Göttingen <b>Vertretungsprofessor (substitute professor, W3)</b>	2012-2013
Max Planck Institute of Mathematics, Bonn <b>Researcher</b>	2011-2012
Hausdorff Center for Mathematics & Rheinische Friedrich Wilhelms Universität Bonn <b>Researcher and teaching assistant</b>	2009-2011
University of California Santa Barbara <b>Visiting assistant professor</b>	2007-2009
Centre de Recherches Mathématiques & McGill University <b>Researcher and teaching assistant</b>	2006
Stanford University Education Program for Gifted Youth <b>Teacher</b>	SUMMER 2006 & 2007

## EDUCATION

2020	<b>Diploma of Higher Education</b> <i>Chalmers</i>
2013	<b>Habilitation</b> Mathematics <i>Georg-August Universität Göttingen</i>
2006	<b>Doctor of Philosophy</b> Mathematics <i>Stanford University</i>
2001	<b>Bachelor of Science</b> CUM LAUDE AND WITH HONORS, RANKED #1 IN MAJOR Pure Mathematics <i>University of Washington</i>

## AWARDS

2021	<b>WISE Equality Award</b> <i>Chalmers University &amp; MedTech West</i>
2018	<b>Innovation Prize</b> <i>Chalmers University &amp; Vinnova</i>
2018	<b>Golden Apple Teaching Award</b> <i>Chalmers University</i>
2016	<b>Halmos Ford Expository Prize</b> <i>Mathematical Association of America</i>
2008	<b>Mochizuki Memorial Fund for teaching</b> <i>University of California Santa Barbara</i>
2007	<b>Pi Beta Phi sorority teaching award</b> <i>University of California Santa Barbara</i>
2001	<b>Outstanding Senior Award</b> <i>University of Washington</i>

## INVITED RESEARCH VISITS

2019 & 2008	<b>Research Member</b> <i>Mathematical Sciences Research Institute</i>
2016 & 2009	<b>Research in pairs</b> <i>Mathematisches Forschungsinstitut Oberwolfach</i>
2011	<b>Bonn-Kyoto Cooperation Program</b> <i>Kyoto University</i>

## PEER-REVIEWED PUBLICATIONS

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E. Nilsson, **J. Rowlett**, & F. Rydell (2022). The isospectral problem for flat tori from three perspectives, *Bulletin of the AMS*, published online September 30 (2022).

**J. Rowlett**, C.J. Karlsson, & M. Nursultanov (2022). Diversity strengthens competing teams, *Royal Society Open Science*, **9**, 211916.

L. Bandara, M. Nursultanov & **J. Rowlett** (2021). Eigenvalue asymptotics for weighted Laplace equations on rough Riemannian manifolds with boundary. *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)*, vol. 22, issue 4, 1843–1878.

S. Menden-Deuer, **J. Rowlett**, M. Nursultanov, S. Collins, T. Rynearson (2021). Biodiversity of marine microbes is safeguarded by phenotypic heterogeneity in ecological traits. *PLoS ONE* 16(8):e0254799.

**J. Rowlett**, M. Blom, H. Nordell, O. Thim & J. Vahnberg. (2021). Crystallographic groups, strictly tessellating polytopes, and analytic eigenfunctions. *American Math. Monthly*, vol. 128, issue 5, 387–406.

H. Hezari, Z. Lu & **J. Rowlett** (2021). The Dirichlet isospectral problem for trapezoids. *J. Math. Phys.* vol. 62, no. 5.

C.J. Karlsson & **J. Rowlett** (2020). Decisions and disease: a mechanism for the evolution of cooperation. *Scientific Reports*, 10, article # 13113.

K. Fedosova, **J. Rowlett**, & G. Zhang. (2020). Second variation of Selberg zeta functions and curvature asymptotics. *Ann. Glob. Anal. Geom.* 57(1), 23-60.

N. Charalambous & **J. Rowlett** (2019). The heat trace for the drifting Laplacian and Schrödinger operators on manifolds. *Asian J. Math.* vol. 23, no. 4, 539-560.

Z. Lu & **J. Rowlett** (2019). 武侠和数学 (Martial arts and mathematics). 数学文化 (Mathematical Culture) 10, 104–107 (in Chinese).

M. Nursultanov, **J. Rowlett** & D. Sher (2019). How to hear the corners of a drum 2017 *MATRIX* annals, 243-278, *MATRIX* Book Ser. 2, Springer, Cham.

S. Menden-Deuer & **J. Rowlett** (2019). The theory of games and microbe ecology. *Theor. Ecology*, vol. 12, no. 1, 1–15.

C. Aldana & **J. Rowlett** (2018). A Polyakov formula for sectors. *J. Geom. Anal.* 28, no. 2, 1773-1839. (2019) Erratum.

H. Hezari, Z. Lu & **J. Rowlett** (2017). The Neumann isospectral problem for trapezoids. *Ann. Henri Poincaré* 18, no. 12, 3759-3792.

Z. Lu & **J. Rowlett** (2016). One can hear the corners of a drum. *Bull. London Math. Soc.* 48, no. 1, 85-93.

Z. Lu & **J. Rowlett** (2015). The sound of symmetry. *Amer. Math. Monthly*, 122, no. 9, 815-835. **Awarded Halmos-Ford prize.**

N. Charalambous, Z. Lu & **J. Rowlett** (2015). Eigenvalue estimates on Bakry-Émery Manifolds. *Springer Proc. in Math. International Workshop on Elliptic and Parabolic Equations*, Hannover, Germany, 10-12 September 2013 (2190-5614). vol. 119, 45-61.

R. Mazzeo & **J. Rowlett** (2015). A heat trace anomaly on polygons. *Mathematical Proceedings of the Cambridge Philosophical Society*, vol. 159, no. 02, 303-319.

K. Bever & **J. Rowlett** (2015). Love games: a game theory approach to compatibility. *J. Humanistic Math.* vol. 5, no. 1, 82-104.

## FELLOWSHIPS

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2005 **Mary V. Sunseri Walker Beach fellowship**  
*Stanford University*

2001 **Royden fellowship**  
*Stanford University*

1996 **President's scholar**  
*University of Washington*

## GRANTS

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2018–2022 *Swedish Research Council*

Principal Investigator, awarded **3 375 000 SEK** for the research project *geometric analysis and applications to microbe ecology*.

2019 *National Science Foundation (NSF)*

Awarded **\$15,000** to spend the fall semester at the Mathematical Sciences Research Institute program on microlocal analysis.

2009 *Association for Women in Math & NSF*

Mentoring travel grant.

2008 *Mathematical Association of America*

Awarded **\$ 5,000** to support the activities of the Hypatian seminar for women in math.

2008 *University of California Santa Barbara*

Non-senate faculty research travel grant.

## TEACHING

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2015–present *Chalmers University*

Fourier analysis, calculus, fractals, spectral theory of the Laplacian, the ubiquitous heat kernel.

2014–2015 *Technische Hochschule Ingolstadt*

Mathematics for computer scientists, mathematics for User Experience Design, systems of differential equations.

2013–2014 *Leibniz Universität Hannover*

Functional analysis, mathematics for physicists, seminar pearls of mathematics, dynamical measure theory.

2012–2013 *Georg-August Universität Göttingen*

Functional analysis, mathematics for biologists and geologists, seminars pearls of mathematics & the mathematics of heat and waves.

2007–2009 *University of California Santa Barbara*

Calculus, honors seminar, transition to higher math, introduction to analysis, real analysis.

2006–2007 *Stanford University*

Linear algebra & multivariable calculus, number theory, mathematical Olympiad.

## PHD SUPERVISION

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2024 CHALMERS Carl-Joar Karlsson

**J. Rowlett**, P. Suarez-Serrato & S. Tapie (2015). Dynamics and zeta functions on conformally compact manifolds. *Trans. Amer. Math. Soc.* 367, 2459-2486.

Z. Lu & **J. Rowlett** (2014). The fundamental gap and one-dimensional collapse. *Contemporary Mathematics*, vol. 630, Amer. Math. Soc., Providence, RI, 223-246.

**J. Rowlett** (2014). The level sets of typical games. *Notices of the A. M. S.* 61, no. 8, 840-847.

S. Menden-Deuer & **J. Rowlett** (2014). Many ways to stay in the game: Individual variability maintains high biodiversity in planktonic microorganisms. *J. R. Soc. Interface*, vol. 11, issue 95.

B. Birnir & **J. Rowlett** (2013). Mathematical models for erosion and the optimal transportation of sediment. *Int. J. of Nonlinear Sciences and Num. Sim.* vol. 14, no. 6, 323-337.

**J. Rowlett** (2013). Blast into Math! A fun and rigorous introduction to pure mathematics. bookboon.com (Ventus Publishing ApS) ISBN 978-87-403-0330-8.

Z. Lu & **J. Rowlett** (2013). The fundamental gap of simplices. *Comm. Math. Phys.* 319, no. 1, 111-145.

Z. Lu & **J. Rowlett** (2012). Eigenvalues of collapsing domains and drift Laplacians. *Math. Res. Lett.* vol. 19, no. 3, 627-648.

Z. Lu & **J. Rowlett** (2012). On the discrete spectrum of quantum layers. *J. Math. Phys.* 53, no. 7, 073519, 22 pages.

**J. Rowlett** (2010). On the spectral theory and dynamics of asymptotically hyperbolic manifolds. *Ann. de l'Institut Fourier*, vol. 60, no. 7, 2461-2492.

T. Jeffres & **J. Rowlett** (2010). Conformal deformations of conic metrics to constant scalar curvature. *Math. Res. Lett.* 17, no. 3, 449-465.

**J. Rowlett** (2009). Dynamics of asymptotically hyperbolic manifolds. *Pac. J. Math*, 242, no. 2, 377-397. (2014) Erratum.

**J. Rowlett** (2008). Spectral geometry and asymptotically conic convergence. *Comm. Anal. Geom.* 16, no. 4, 735-798.

## INVITED PUBLICATIONS & REPORTS

**J. Rowlett** (2021). Donut choirs and Schiemann's symphony. *Oberwolfach Report*, no. 27, 33-36.

**J. Rowlett** (2020). Mathematics Indicates That an HIV-Style Strategy Could Be Applied to Manage the Coronavirus. *Mathematics in the time of Corona*, Mathematics Online First Collections, Springer.

Z. Lu & **J. Rowlett** (2015). Can one hear the corners of a drum? Well, yes! *Oxford University Press blog*.

**J. Rowlett** (2013). La géométrie de Bakry-Émery et l'écart fondamental. *Séminaire de Théorie Spectrale et Géométrie*, vol. 28, (2009-2010), 147-157, (in French).

**J. Rowlett** (2012). Zeta-regularized determinants of Laplacians on polygons. *Oberwolfach Report*, no. 25, 36-38.

## PRE-PRINTS UNDER REVIEW

K. Fedosova, A. Pohl, & **J. Rowlett** (2022). Fourier expansions of vector-valued automorphic functions with non-unitary twists.

C. Aldana, K. Kirsten & **J. Rowlett** (2020). Polyakov formulas for conical singularities in two dimensions.

M. Nursultanov, **J. Rowlett** & D. Sher (2019). The heat kernel on curvilinear polygonal domains in surfaces.

2019 UNIVERSITY OF GOTHENBURG Medet Nursultanov

## MASTERS SUPERVISION

2022 UNIVERSITY OF GOTHENBURG Josef Gullholm

2022 CHALMERS Jonathan Ståhlberg

2021 CHALMERS Max Blom

2020 UNIVERSITY OF GOTHENBURG Felix Rydell

2019 CHALMERS Erik Nilsson

2015 LEIBNIZ UNIVERSITÄT HANNOVER Jil Klünder

## BACHELOR SUPERVISION

2019 CHALMERS Max Blom  
Henrik Nordell  
Oliver Thim  
Jack Vahnberg

2018 CHALMERS Johan Friemann  
Artur Karlsson  
Simon Larsson  
Albin Skiljie

2014 UNIVERSITÄT HANNOVER Paul Bauer  
Annalena Dierkes  
Julia Kirsten  
Nadja Klintworth  
Maike Lügering  
Lea Mitschker  
Jacqueline-Mariska Raschczyk  
Marisa Tiede  
Michael Radke  
Daniel Vogt

2013 UNIVERSITÄT GÖTTINGEN Kerstin Bever

## INVITED SEMINAR &

## COLLOQUIUM LECTURES

23.08.2022

Colloquium, Instituto de Investigaciones en Matemáticas Aplicadas y en Sistemas, UNAM, Ciudad de México.

07.06.2022

Seminars on inverse problems, online.

04.05.2022 & 01.12.2021

Analysis seminar, Stockholm University & KTH.

29.09.2021

Colloquium, University of Helsinki.

16.12.2020

Analysis-Applied Math-Physics seminar, Dalhousie University.

27.07.2020

Spectral geometry in the clouds, Université de Montréal.

15.01.2020

PDE and differential geometry seminar, University of Washington.

## INVITED LECTURES AT CONFERENCES & WORKSHOPS

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2.9.2022–5.9.2022

Geometric applications of microlocal analysis 2022, Stanford University.

20.7.2022–22.7.2022

Workshop on Microlocal Analysis & PDEs, University College London.

28.3.2022–1.4.2022

Geometry and analysis on non-compact manifolds, CIRM, Luminy, France.

21.02.2022–25.02.2022, 15.02.2021–19.02.2021 & 04.03.2019–08.03.2019

Microlocal and Global Analysis, Interactions with Geometry, Universität Potsdam.

12.07.2021–23.07.2021

Mathematical Congress of the Americas, Spectral Geometry Session.

07.06.2021–11.06.2021

Analysis, Geometry and Topology of singular PDE, MFO.

30.09.2019–04.10.2019

Asymptotic Analysis and Spectral Theory, University Paris-Sud.

29.08.2019–30.08.2019

Connections for Women in Microlocal Analysis, MSRI.

05.08.2019–09.08.2019

7th Bremen Summer School and Symposium on Dynamical Systems.

21.06.2019–24.06.2019

St. Petersburg Conference in Spectral Theory, Euler Institute.

15.04.2019–19.04.2019

Probing the earth and the universe with microlocal analysis, Banff International Research Station.

6.11.2018–9.11.2018

Conference on Partial Differential Equations and Applications in Memory of Professor B.Yu. Sternin, RUDN University, Moscow.

17–21.09.2018

Geometric Analysis and Mathematical Physics, University of Oldenburg.

2–6.09.2018 4th

Croatian Conference on Geometry and Graphics, Vodnjan (Peroj), **plenary speaker.**

9–13.07.2018

AMSI Winter School, lecture series, University of Queensland.

11–13.06.2018

Joint International Meeting of the Chinese and American Mathematical Societies, Special Session, Shanghai, China.

7–11.05.2018

Interfaces between geometric analysis and mathematical physics, Mittag-Leffler Institute.

19–23.03.2018

AMSI-ANU Workshop on Microlocal Analysis and its Applications, Murrumbidgee.

10.03.2018

02-03.12.2019

Colloquium and analysis seminar, University of Oregon.

28.10.2019

Spectral and scattering theory seminar, Purdue University.

21.05.2019

PDEs and applications seminar, Uppsala Universitet.

03.05.2019

Natural Sciences Seminar, New College Florida.

26.10.2018

Oberseminar Geometry, Topology & Analysis, Universität Köln.

15.06.2018

Colloquium, Fudan University.

11.4.2017

Analysis seminar, Cal State University Northridge.

28.9.2016

Analysis seminar, Linnéuniversitet, Växjö.

7.6.2016

Rainwater (Analysis) seminar, University of Washington.

11.12.2015

Analysis seminar, University of Cyprus.

6.5.2015

Analysis seminar, University of Loughborough.

14.7.2015 & 5.12.2014

Oberseminar Analysis, Universität Hannover.

29.10.2014

Colloquium, Universität Potsdam.

6.3.2014

Colloquium, Australian National University.

24.2.2014

Analysis Seminar, Australian National University.

6.11.2012

Oberseminar Analysis and Theoretical Physics, Universität Hannover.

7.6.2016 & 11.10.2012 & 3.11.2010

Differential geometry and analysis seminars, University of Washington.

14.06.2012

Mathematisches Kolloquium, Universität Mainz.

30.04.2012

Born-Hilbert-Seminar, Universität Göttingen.

12.01.2012

Oberseminar Analysis, Universität Oldenburg.

26.07.2011

Oberseminar Geometrie, Universität Jena.

02.12.2010

Women and Mathematics: Differential Geometry, Istanbul Center for Mathematical Sciences.

23–27.10.2017

Elliptic PDE of second order: celebrating 40 years of Gilbarg and Trudinger's book, Matrix Research Institute, Australia.

11–15.9.2017

Mathematical methods in inverse scattering and spectral theory, University of Leeds.

7–9.4.2017

Geometry and analysis on manifolds, UCSB.

3–5.4.2017

Young Women in Geometry, Max Planck Institute for Mathematics, **plenary speaker.**

7–10.3.2017

International Conference on PDEs, Geometric Analysis and Functional Inequalities, University of Sydney, Australia.

9–13.1.2017

Youth geometric analysis, TSIMF, Sanya, China.

11–16.12.2016

Geometric and spectral methods in PDE, CMO-BIRS, Oaxaca, Mexico.

6–8.10.2016

Elmar Schrohe 60th Birthday Conference on Analysis, Hannover.

25–29.4.2016

Evolution equations on singular spaces, CIRM, Luminy, France.

29.6–3.7.2015

Shape optimization and spectral geometry, ICMS, Edinburgh.

9–12.9.2014

Summer school on spectral geometry, Universität Göttingen.

12–13.6.2014

PDE Days, Universität Köln.

24–28.3.2014, 25–29.3.2013, 12–16.03.2012, 07–11.03.2011

Geometric and singular analysis, Universität Potsdam.

10.9–12.9.2013

Elliptic and Parabolic PDEs Workshop, Universität Hannover.

08.02–10.02.2013

Texas Geometry and Topology Conference.

07.05–11.05.2012, 27.06–03.07.2010, and 19–26.08.2007

Analysis and geometric singularities, MFO.

18–19.02.2011

Geometry Workshop, University of Tsukuba, Japan.

9–13.08.2010

Topics in spectral and scattering theory, Penn. State University.

8–12.03.2010

Operators on singular spaces, Universität Potsdam.

15.01.2010 and 08.01.2008

Joint Mathematics Meetings Special Session.

23–26.10.2009

London Analysis Seminar, Kings College.

29.11.2010

Analysis Seminar, University of Bristol.

18.11.2010

Graduierten Kolloquium, Universität Göttingen.

12.12.2014 & 8.10.2010 & 9.02.2010

Seminaire de la géométrie, Université de Nantes, (in French).

1.05.2010

Seminaire de la géométrie, Université de Provence, (in French).

15–16.04.2010

Geometric analysis and optimal transport seminars, Princeton University.

18.03.2010

Max Planck Institut für Mathematik, Bonn.

25.02.2010

Spectral theory and geometry seminar, Institut Fourier

14.04.2015 & 12.01.2010 & 4.03.2008

Geometry seminar, U.C. Irvine.

13.12.2011, 7.12.2010, 9.11.2009, 15–16.08.2007

Oberseminar Globale Analysis, Universität Bonn.

24.04.2009

Geometry seminar, U.C. San Diego.

5.01.2009

Dynamics seminar, University of Chicago.

19.09.2008

Postdoctoral seminar, MSRI.

29.04.2008

Geometry seminar, Duke University.

30.11.2007

Geometry seminar, California Institute of Technology.

19.10.2006

Geometry & Analysis seminar, Columbia University.

18.10.2006

PDE & Analysis seminar, MIT.

## OUTREACH

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2022 SCIENTIFIC AMERICAN

Interview

2022 VISBY GOTLAND organized and moderated panel discussion in Sweden's largest annual political event.

Almedalsvecka

2021 MALMÖ UNIVERSITY lecture for high schoolers.

Sonja Kovalevsky

2021 LE MONDE

Article

2019 MITTAG-LEFFLER INSTITUTE development of school math curriculum.

Kleindagarna



Microlocal analysis and spectral theory on singular spaces, Penn. State Univ.

1–5.06.2009

Spectral theory and geometry, Institut Fourier, Grenoble.

## LANGUAGE SKILLS

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NATIVE SPEAKER	English
FLUENT	French, German, Swedish
INTERMEDIATE	汉语
CONVERSATIONAL	Spanish, Russian, Korean, US Sign Language

## REFERENCES

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*Carolyn Gordon, Dartmouth University*

email: carolyn.s.gordon@dartmouth.edu, phone: +1-603-646-3047

*Rafe Mazzeo, Stanford University*

email: mazzeo@math.stanford.edu, phone: +1-650-723-1894

*Richard Melrose, Massachusetts Institute of Technology*

email: rbm@math.mit.edu, phone: +1-617-253-2950

*Sylvie Paycha, Universität Potsdam*

email: paycha@math.uni-potsdam.de, phone: (+45)3319771186

2018 UNIVERSITY OF QUEENSLAND	Public lecture.
2012 UNIVERSITÄT GÖTTINGEN	Night of Science
public lecture and music performance.	
2012 UNIVERSITÄT BONN	Kinder-Uni.
2011 UNIVERSITÄT BONN	Schülerwoche.

## COMMISSIONS OF TRUST

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2020 UNIVERSITÄT OLDENBURG	PhD Committee Mohammad Talebi.
2019 KUNGLIGA TEKNISKA HÖGSKOLA	PhD Committee Simon Larson.
2019 MSRI	Graduate student seminar organizer.
2018–2021 CHALMERS	Vice-president Math faculty advisory board.
2017–PRESENT ROYAL ACADEMY	Swedish National Committee for Math.
2017 HUMBOLDT UNIVERSITY BERLIN	PhD Committee Asyilia Suleymanova.
2015 LEIBNIZ UNIVERSITÄT HANNOVER	PhD Committee Karsten Bohlen.
2014 UNIVERSITÄT POTSDAM	Co-organizer Geometric & singular analysis workshop.
2006–PRESENT REVIEWER FOR	Math. Annalen, Scientific Reports, JDG, Trans AMS, JMAA, Proc. LMS, Australian Math. Soc., Acta Math., CCM, J. Geom. Anal., J. Public Health Pol., Math. Nach., J. Spec. Theory, AGAG, Amer. Math. Monthly, Bull. Kor. Math. Soc.