
DR. SAHANA H. BALASUBRAMANYA

Webpage : <http://hbsahana.com/math/index.htm>

PERSONAL INFORMATION

Date of Birth: 16 October, 1989
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APPOINTMENTS

- 2023 – *Assistant Professor*, Department of Mathematics
Lafayette College, USA
- 2022 – 23 *Visiting Assistant Professor*, Department of Mathematics
State University of New York at Buffalo, USA
Mentors: Dr.Johanna Mangahas
- 2019 – 22 *Postdoctoral Research Associate*, Cluster of Excellence
Westfälische Wilhelms- Universität Münster, Germany
Mentor: Dr.Katrin Tent
- 2018 – 19 *Visiting Assistant Professor*, Department of Mathematics
The University of North Carolina at Greensboro, USA
Mentor: Dr.Talia Fernós

EDUCATION

- 2013 – 18 *Ph.D. Mathematics*, Vanderbilt University, Nashville, TN, USA
Thesis advisor: Dr. Denis Osin
Thesis title : Hyperbolic structures on groups
- 2013 – 15 *Master of Science Mathematics*, Vanderbilt University, Nashville, TN, USA
- 2010 – 12 *M.A. Mathematics*, Lady Shri Ram College for Women, University of Delhi, New Delhi, India
Result: First Division with Distinction
- 2007 – 10 *B.A. Mathematics*, Lady Shri Ram College for Women, University of Delhi, New Delhi, India
Result: First Division with Distinction

RESEARCH AREAS

- *Geometric group theory*: Constructing, studying and classifying (isometric) group actions on hyperbolic spaces, actions on products of hyperbolic spaces, quasi-parabolic actions, acylindrical actions and acylindrically hyperbolic groups
- *Model theory*: First order theory of countable graphs, first order rigidity
- *Applications of mathematics to economic theory*: Ground water conservation, Impact assessment

ACADEMIC AWARDS & HONORS

- 2023 Selected for President's Postdoctoral Fellowship Program (PPFP), School of Mathematics, Georgia Institute of Technology (*declined*)
- 2022 Recipient of start-up grant, SUNY Buffalo (USD 5000)
- 2021 Selected for the 'Erstklassig!' mentoring program for postdoctoral researchers, University of Münster
Mentor: Dr.Ursula Hamenstädt, University of Bonn
- 2019-22 Awarded multiple travel grants from Cluster of Excellence, University of Münster
- 2020 Awarded Oberwolfach Leibniz Graduate (OWLG) Travel Grant, MFO
- 2019 Recipient of department travel grant, UNC Greensboro (USD 1000)
- 2018 B.F. Bryant Prize for Excellence in Teaching, Department of Mathematics, Vanderbilt University (USD 1000)
- 2015-17 Awarded Graduate student travel grants by the Graduate school, Vanderbilt University (USD 500 each year)
- 2012 Highest scorer in University of Delhi, South Campus for M.A.Mathematics, University of Delhi
- 2012 Best Student in Mathematics, Semesters III & IV for M.A. Mathematics, University of Delhi
- 2011 South Campus Endowment Scholarship for academic excellence, University of Delhi (Tuition covered)
- 2011 Best Student in Mathematics, Semesters I & II for M.A. Mathematics, South Campus, University of Delhi
- 2010 Scored among top 1% of students in B.A. Mathematics, University of Delhi
- 2009 Anupama Dua Scholarship for excellence in B.A. Mathematics, Lady Shri Ram College, University of Delhi (Tuition covered)

PUBLICATIONS

- S.Balasubramanya; A survey on classifying group actions on hyperbolic spaces; *In preparation*.
- S.Balasubramanya, M.Chesser, A. Kerr, J. Mangahas, M.Trin; A note on non-recognizing spaces for stable subgroups; *In preparation*.
- S.Balasubramanya, T.Fernós; The semi-simple theory of higher rank acylindricity; *In preparation*.
- S.Balasubramanya, F. Fournier-Facio, A.Genevois; Property (NL) for hyperbolic group actions, with Appendix by A.Sisto; arXiv:2212.14292; To appear in *Groups, Geometry & Dynamics*, 2023, 44 pgs.
- C.Abbott, S. Balasubramanya, A.J.Rasmussen; Valuations, completions and hyperbolic actions of metabelian groups, with Appendix A co-authored with S.Payne; arXiv:2207.12945 (2022, 67 pgs, Submitted).
- C.Abbott, S. Balasubramanya, A.J.Rasmussen; Higher rank confining subsets and actions of solvable groups, arXiv:2108.08175; To appear, *Advances in Mathematics*, 2023, 34 pgs.
- S. H Balasubramanya; Finite extensions of \mathcal{H} - and \mathcal{AH} -accessible groups, *Topology Proceedings* Volume 56 (2020), pg 297-304 (8 pgs)
- S. H Balasubramanya; Hyperbolic structures on wreath products, *Journal of Group Theory* (2020), ISSN (Print) pg 357-383 (27 pgs).
- C. Abbott, S. Balasubramanya, D. Osin; Hyperbolic structures on groups, *Algebraic & Geometric Topology* 19-4 (2019), pg 1747-1835 (89 pgs).
- S. H Balasubramanya; Acylindrical group actions on quasi-trees, *Algebraic & Geometric Topology* 17 (2017) pg 2145-2176 (32 pgs)

APPLIED MATH PAPERS (ECONOMIC THEORY)

- S. Balasubramanya, S. Balasubramanya, A.Mitra; Positive incentives for ground water, *In preparation*.
- Balasubramanya, S., Balasubramanya, S., Brozovic, N., Buisson, M., Chandra, A., Durga, N., Kafle, K., Kishore, A., Minh, T., Mitra, A., Mukherji, M., Ringler, C., Schmitter, P., Varshney, D., Verma, S., Yashodha, Y.; Solar irrigation in South Asia and Sub-Saharan Africa: opportunities, challenges, risk and knowledge gaps; *Background paper for The World Bank Flagship Report on Groundwater*; Submitted.
- (Assisted with) S. Balasubramanya, J. Price, T. Horbulyk; Impact assessments without true baselines: assessing the relative effects of training on the performance of water user associations in Southern Tajikistan. *Water Economics and Policy* (2017), 4(3), pp. 1850007.

RESEARCH WITH UNDERGRADUATES (* denotes an undergraduate coauthor)

- S.Balasubramanya, G. Burkhalter*, R.Niebler*, R. Shapiro; Property (NL) in Coexter groups; *In preparation*.

LANGUAGES

- Programming languages: R, LaTeX, C++, Qbasic, FORTRAN
- Fluent in English and Hindi, German (B1 level)

TEACHING EXPERIENCE

<i>Lafayette College</i>	Fall 2023	– Instructor, Calculus III (2 sections) – Designing Your First Lafayette Courses, Online Module Certificate; Designed by the CITLS and Learning & Research Technologies
<i>SUNY Buffalo</i>	Spring 2023	– Instructor, Calculus III (2 sections) Supervised 3 TA's and 1 grader
	Fall 2022	– Instructor, Survey of Calculus and Applications I (2 sections) Supervised 2 TA's and 1 grader
<i>Summer Schools</i>	May 2022	– Instructor, Introductory course on hyperbolic groups and boundaries – ICMAT (Ian Agol Lab), Spain
	June 2020	– Instructor, Mini-course on Acylindrically and Relatively hyperbolic groups, Geometric group theory without boundaries II
<i>University of Münster</i>	Fall 2021	– Teaching Assistant, Geometric Group Theory II

<i>UNC Greensboro</i>	Spring 2019	–	Instructor, Calculus I (1 section), Calculus II (2 sections) Supervised 2 graders
	Fall 2018	–	Instructor, Pre-Calculus (2 sections), Calculus I (1 section) Supervised 1 grader
<i>Vanderbilt University</i>	Spring 2018	–	Instructor, Calculus 1301 Supervised 1 TA
	Spring 2017	–	Teaching Assistant, Calculus 1301
	Fall 2016	–	Instructor, Calculus 1200 Supervised 1 TA
	Spring 2016	–	Teaching Assistant, Calculus 1301
<i>Vanderbilt University (contd.)</i>	Fall 2015	–	Instructor, Statistics Laboratory
	Spring 2015	–	Teaching Assistant, Probability and Statistics
	Fall 2014	–	Teaching Assistant, Calculus 1200
	Spring 2014	–	Teaching Assistant, Linear Algebra
	Fall 2013	–	Grader, Calculus 1301

SERVICE – OUTREACH – LEADERSHIP

<i>REU Experience</i>	o	Mentor and Project leader, REU at Georgia Tech University, Summer 2023 Supervised by Dan Margalit	
<i>Conference organizer</i>	o	Special session on Geometric group theory, STDC, UNC Charlotte, March 2024	
	o	AMS Special session on Geometric Group Theory, Georgia Tech University, 2023 (with Dan Margalit, Ryan Dickmann, Abdoul Karim Sane)	
	o	NCNGT, Topics group on ‘Group actions on hyperbolic metric spaces’, 2022 (with Alex Rasmussen)	
<i>Project Leader</i>	o	Projection complexes and course cubulations (with J. Mangahas); Women in Groups, Geometry and Dynamics (WiGGD) Workshop, July 2023	
<i>Committee member</i>	o	Bratati Som, PhD candidacy exam, SUNY Buffalo	
	o	Arya Vadnere, PhD candidacy exam, SUNY Buffalo	
<i>Served as a Referee</i>	o	Bulletin of the LMS	
	o	Michigan Math Journal	
	o	Journal of Topology and Analysis	
<i>SUNY Buffalo University of Münster</i>	o	Designed <i>Handbook for Incoming International Math Graduate Students</i> , 2022	
	o	MM Departure Talk : Applying for academic jobs in the USA vs Europe, Fall 2022	
	o	Mentor, MINT mentoring program for women in math (Masters students), 2022– <i>present</i> Mentees: Annagret Wittig, Jorunn Mense, Doris Grothusmann	
	o	Member, Task force to help mathematicians from Ukraine, Spring 2022	
	o	Organizer, GGT Seminar, Spring 2022	
	o	Member, W2 Appointment Committee, Dept. of Mathematics, 2021	
	o	Organizer and Volunteer, MM Buddy Program, 2020–22	
	o	Organizer, MM Connect sessions, 2020–21	
	o	Organizer, Welcome Center Event meets MM, 2020	
	o	Organizer, MMGS Retreat for PhD students, 2020–22	
	o	MM Impulse talk on postdoctoral job market preparation in academia, 2019	
	<i>UNC Greensboro</i>	o	Academic career panel member, AWM conference, Wake Forest University, 2019
		o	House calls Volunteer, Housing and Residence Living, 2018
o		Chair, Diversity Committee, Department of Mathematics and Statistics, 2018–19	
o		Organizer, Ping-Pong seminar between UNCG and Wake Forest University, 2018–19	
o		Member, State Math Contest Committee, Department of Mathematics and Statistics, 2018	
<i>Vanderbilt University</i>	o	Vanderbilt Global Ambassador, 2013–18	
	o	Graduate student teaching assistant panel member, 2016–18	
	o	Instructor in Bharatanatyam, Vanderbilt Dance Program, 2014–18	
	o	Helped organize several conferences, 2013–18	
<i>University of Delhi</i>	o	Talk on ‘Career prospects in Mathematics’, Lady Sri Ram College, 2021 (<i>Virtual</i>)	
	o	Organized several seminars at Department of Mathematics, 2007–12	
	o	Editorial Board, ‘Quantum- A Mathematical Gazette’, Lady Shri Ram College, 2008–10	

LIST OF TALKS (SEMINARS & CONFERENCES)

Upcoming in 2023

- 23 Nov ○ GGT online seminar series, Mexico (*Virtual*)
- 9 Nov ○ Combinatorics, Algebra & Geometry (CAGE) seminar, Penn State & Drexel Univ, USA
- Wk of 25 Sept ○ 60th birthday conference of Katrin Tent, University of Münster, Germany

- 2023 ○ Geometry, Topology and Dynamics seminar, Boston College, USA
- World of GroupCraft III, USA (*Virtual*)
- Interactions between Algebraic Topology and GGT, BIRS-CMO Conference, Oaxaca, Mexico
- Geometry and Topology seminar, Binghamton University, USA
- Algebra and Topology seminar, SUNY Albany, USA
- Special session for Mike Mihalik's 70th birthday, AMS Sectional meeting, University of Cincinnati, USA
- Topology and Geometric group theory seminar, Cornell University, USA
- Max Dehn seminar, University of Utah, USA
- Hyperbolic Lunch seminar, University of Toronto, Canada
- Seminar talk, Skidmore College, USA
- MAAD talk, Lafayette College, USA
- 2022 ○ Algebra Seminar, Niagara University, USA
- World of GroupCraft (*Virtual*)
- Group theory seminar, ETH Zürich
- Groups in Galway meets the Irish Geometry Conference, National University of Ireland (*Virtual*)
- Group theory seminar, SUNY Buffalo, USA (*Virtual*)
- 2021 ○ Geometric Group Theory Seminar, WWU Münster, Germany
- Geometry and Analysis on Groups Research Seminar, University of Vienna, Austria
- Algebra, Geometry and Topology seminar, Universidad Madrid, Spain
- Geometric Group Theory in East Asia, GGTea webinar (*Virtual*)
- Geometry and Topology seminar, CUNY, USA (*Virtual*)
- Geometry and Topology seminar, Rice University, USA (*Virtual*)
- Post Graduate Topology Conference, University of Southampton, UK (*Virtual*)
- 2020 ○ Advanced seminar on Model Theory and Groups, WWU Münster, Germany
- Geometric Structures in Group Theory workshop, MFO Oberwolfach, Germany
- Geometric Group Theory conference, CIRM, Luminy France
- Lightning talk, YGGT IX, Saint Jacut-de-la-mer, France
- 2019 ○ Advanced seminar on Model Theory and Groups, WWU Münster, Germany
- Geometric Group Theory Seminar, WWU Münster, Germany
- WWU Münster Mathematics department colloquium "Meet the postdocs", Germany
- Spring Topology and Dynamics Conference, University of Alabama at Birmingham, USA
- Seminar talk, Spelman College, USA
- Geometry Seminar, University of Virginia, USA
- Seminar talk, Furman University, USA
- Topology and Geometric Group Theory Seminar, Cornell University, USA
- Group Theory and Topology seminar, Vanderbilt University, USA
- GANTC (Geometry, Algebra, Number Theory and Combinatorics) seminar, UNC Greensboro, USA
- WINRS symposium - Mid Atlantic Region, University of Virginia, USA
- Summer Conference on Topology and its Applications, Western Kentucky University, USA
- AMS Sectional Meeting, Vanderbilt University, USA
- Colloquium Series, Gettysburg College, USA
- AMS Special Session on Boundaries for Groups and Spaces, Joint Mathematics Meeting, USA
- AMS Contributed Paper Session on Groups, Joint Mathematics Meeting, USA

- 2017
 - Geometric Group Theory seminar, Ohio State University, USA
 - Algebra seminar, Loyola University, USA
 - Geometry and Topology seminar, Graduate Centre, CUNY, USA
 - Wasatch Topology Conference, Utah, USA
 - yGAGTA Conference, Spain
 - Research Seminar, Women and Math program, IAS, Princeton, USA
 - 51st Spring Topology and Dynamics Conference, New Jersey City University, USA
 - Geometric group theory on the gulf (G^3) conference, Florida, USA
 - Group theory and Topology seminar, Vanderbilt University, USA
- 2016
 - Group theory and Topology seminar, Vanderbilt University, USA
 - Poster presentation, YGGT V, KIT, Karlsruhe, Germany

SUMMER SCHOOLS, WORKSHOPS & CONFERENCES ATTENDED

- 2022
 - Lean for the curious mathematician, ICERM (*Virtual*)
 - Hyperbolic groups and their generalizations, IHP, Paris, France
- 2021
 - Buildings Conference, Universität Magdeburg, Germany
 - Counting Problems, Ventotene, Italy
 - YGGT X, Newcastle University (*Virtual*)
 - Modern Leadership is Female, WWU, Germany
- 2020
 - Topology Postdoc Workshop, Georgia Tech, USA
 - BiMs Seminar, Bielefeld Universität, Germany
- 2019
 - Miniworkshop - Geometric Group Theory, LMU, Germany
- 2017
 - GAGTA, Spain
- 2016
 - ‘Beyond Hyperbolicity’, Cambridge University, UK
 - Shanks workshop on Geometric Group Theory, Vanderbilt University, USA
- 2015
 - Summer school at EPFL -CIB: Probability on graphs and random walks, Switzerland
 - MSRI Geometric Group Theory Summer Graduate School, MSRI Berkeley, USA