

Akram Alishahi

Curriculum Vitae

🏠 Room 501, Boyd GSRC
University of Georgia
Athens, GA 30602

✉ akram.alishahi@uga.edu

EMPLOYMENTS

Associate Professor <i>University of Georgia, Athens, GA</i>	AUG 2023–
Assistant Professor <i>University of Georgia, Athens, GA</i>	AUG 2019 – JULY 2023
Ritt Assistant Professor <i>Columbia University, New York, NY</i>	JUL 2015 – JUL 2019
Postdoctoral Research Fellow <i>Max Planck Institute for Mathematics, Bonn, Germany</i>	MAR 2014 – JUN 2015
Student Researcher <i>Max Planck Institute for Mathematics, Bonn, Germany</i>	NOV 2013 – FEB 2014
Student Researcher <i>Institute for Research in Fundamental Sciences (IPM), Tebran, Iran</i>	OCT 2009 – SEP 2013

SHORT TERM POSITIONS

Research Member for “Floer Homotopy Theory” <i>Mathematical Science Research Institute, MSRI, Berkeley, CA</i>	SEP 2022 – DEC 2022
Visiting Student and Research Collaborator <i>Princeton University, Princeton, NJ</i>	JAN 2012 – MAY 2012
Program associate in “Homology Theories of Knots and Links” <i>Mathematical Science Research Institute, MSRI, Berkeley, CA</i>	FEB 2010 – MAR 2010

EDUCATION

Ph.D. in Mathematics, Advisors: Eaman Eftekhary, Alireza Bahraini
Feb 2009–Feb 2014 Sharif University of Technology (Iran)

M.Sc. in Mathematics
Sep 2007–Feb 2009 Sharif University of Technology (Iran)

B.S. in Mathematics
Sep 2004–Jun 2007 Sharif University of Technology (Iran)

RESEARCH INTEREST

- Low dimensional topology: Heegaard Floer homology and knot homology theories
- Contact and symplectic geometry

PUBLICATIONS

PAPERS

1. With Eugene Gorsky and Beibei Liu, *Splitting maps in link Floer homology and integer points in permutahedra*, in preparation.
2. With Linh Truong and Melissa Zhang, *Khovanov homology and the involutive Heegaard Floer homology of branched double covers*, ArXiv:2305.07172.
3. *Upsilon invariant for graphs and the homology cobordism group of homology cylinders*, ArXiv:2202.10614.
4. With Joan Licata, Ina Petkova and Vera Vértesi, *A friendly introduction to the bordered contact invariant*, The Open Book Series 5 (1), 1-30, 2022.
5. With Viktória Földvári, Kristen Hendricks, Joan Licata, Ina Petkova and Vera Vértesi, *Bordered Floer homology and contact structures*, Forum of Mathematics: Sigma, 11, E30. doi:10.1017/fms.2023.19
6. With N. Dowlin, *Relating tangle invariants for Khovanov homology and knot Floer homology*, ArXiv:1909.03865, submitted.
7. With N. Dowlin, *A link invariant related to Khovanov homology and knot Floer homology*, ArXiv:1810.13406, submitted.
8. With E. Eftekhary, *Knot Floer homology and the unknotting number*, Geom. Topol. 24 (5) 2435 - 2469, 2020.
9. With N. Dowlin, *The Lee spectral sequence, unknotting number, and the knight move conjecture*, Topology and its Applications, 254: 29-38, 2019.
10. *Unknotting number and Khovanov homology*, Pacific Journal of Mathematics, 301 (1), 15-29, 2019.
11. With R. Lipshitz *Bordered Floer homology and incompressible surfaces*, Ann. Inst. Fourier, Grenoble 69(4): 1525-1573, 2019.
12. With E. Eftekhary *Tangle Floer homology and cobordisms between tangles*, Journal of Topology, 13: 1582-1657, 2020.
13. With E. Eftekhary *A refinement of sutured Floer homology*, J. Symplectic Geom., 13(3): 609-743, 2015.
14. With E. Eftekhary *On the construction of sutured Floer complex*, Proceeding of 20th Gokova Geometry-Topology conference 97-109.

THESIS

- PhD thesis on “*Heegaard Floer homology and the sutured manifolds*” (in Persian),
Advisors: Eaman Eftekhary, Alireza Bahraini, Feb 2014.
- Master thesis on “*Seiberg-Witten invariants and low dimensional topology*” (in Persian),
Advisors: Eaman Eftekhary, Alireza Bahraini, Feb 2009.

AWARDS AND GRANTS

- NSF CAREER grant: DMS- 2238103, *Principal investigator*, July 2023 – June 2028
Title: *Low dimensional topology via Floer theory*
- NSF Topology grant: DMS-2000506 (Previously DMS-1811210), *Principal investigator*, August 2019-June 2023
Title: *Homological Invariants in Low Dimensional Topology*
- Junior Faculty Teaching Excellence Award, Columbia University Mathematics Department, 2017
- Outstanding Student: awarded to 2 or 3 top students and guarantees admission without entrance exam to the Ph.D. program, Sharif University of Technology (Iran), 2008

- Outstanding Student: awarded to 2 or 3 top students and guarantees admission without entrance exam to the M.Sc. program, Sharif University of Technology (Iran), 2007
- Silver Medal in the National Mathematical Olympiad for high school students, 2003

CONFERENCE TALKS

Southeastern Sectional Meeting of the AMS, University of South Alabama <i>A Contact invariant from Heegaard Floer homology</i>	November 2021
Perspectives on quantum link homology theories <i>Braid invariant related to knot Floer homology and Khovanov homology</i>	August 2021
Tech Topology Conference <i>A Contact invariant from Heegaard Floer homology</i>	December 2020
UCLA Geometry and Topology workshop 2020 <i>An algebraic braid invariant vs holomorphic invariants</i>	January 2020
Central Sectional Meeting of the AMS, University of Wisconsin, Madison <i>Braid invariants relating Khovanov homology and knot Floer homology</i>	September 2019
Frontiers in Floer homology, Boston College <i>Braid invariants relating Khovanov homology and knot Floer homology</i>	July 2019
Virginia topology conference <i>Cobordism maps for tangle Floer homology</i>	December 2018
UCLA Topology workshop 2018 <i>Bordered Floer homology and compressibility</i>	January 2018
Western Sectional Meeting of the AMS, University of Denver <i>Heegaard Floer homology for tangles and tangle cobordisms</i>	October 2016
Homological invariants in low dimensional topology, IPM <i>Heegaard Floer homology for tangles and tangle cobordisms</i>	August 2016
Frontiers in Mathematical Sciences, Sharif University of Technology <i>Heegaard Floer homology for tangles and tangle cobordisms</i>	July 2016
Topology and invariants of 4-manifolds, Simons center for geometry and physics <i>Cobordisms between tangles</i>	August 2014
Frontiers in Mathematical Sciences, Sharif University of Technology <i>A refinement of sutured Floer homology</i>	December 2012

SEMINAR AND COLLOQUIUM TALKS

Gauge Theory Virtual	April 2023
Homotopy Types in Low-Dimensional Topology Seminar, MSRI	December 2022
Geometry and Topology Seminar, LSU	September 2022
Geometry and Topology Seminar, Georgia Tech	April 2022

Topology Seminar, Princeton University	April 2022
Topology Seminar, University of Iowa	March 2022
Algebraic Geometry and Differential Topology Seminars, Alfréd Rényi Institute of Mathematics	February 2021
Geometry and Topology Seminar, MIT	Nov 2021
[K-OS] Knot online Seminar	March 2021
Topology seminar, MSU	November 2019
Geometry/Topology seminar, Rutgers	October 2019
Topology seminar, UGA	September 2019
Colloquium, Vassar College	April 2019
Topology seminar, USC	March 2019
Topology seminar, Dartmouth	March 2019
Joint GT-UGA geometry and topology seminar, University of Georgia	August 2018
Geometry and Topology seminar, Binghamton University	April 2018
Geometry/Topology seminar, Duke	April 2018
Topology and Symplectic Geometry seminar, Stony Brook University	March 2018
Topology seminar, University of Oregon	March 2018
Topology seminar, Princeton University	February 2018
Colloquium, Rutgers University-Newark	February 2018
Undergraduate Mathematics Society seminar, Columbia University	November 2017
Topology Seminar, Caltech	February 2017
Topology Seminar, Princeton University	November 2015
Topology Seminar, UCLA	November 2015
Topology in Pairs seminar, MPIM	June 2015
Topology and Geometry seminar, IPM	February 2015
Algebraic and Symplectic geometry seminar, Oxford University	November 2014
"Sarenakh" Seminar, Sharif University of Technology	October 2012
Topology seminar, Brandeis University	February 2012
Topology and Geometry seminar, IPM	August 2010
Topology and Geometry seminar, IPM	December 2009

TEACHING EXPERIENCE

INSTRUCTOR

University of Georgia

Spring 2023	Math 8230: Modern knot invariants
Spring 2023	Math 2260: Calculus II
Fall 2021	Math 8230: Characteristic classes
Fall 2021	Math 2260: Calculus II (2 sections)
Spring 2021	Math 8230: Heegaard Floer homology
Spring 2020	(co-teach with Weiwei Wu) Math 8230: Topics in Top. and Geo.
Fall 2019	Math 2250: Calculus I (2 sections)

Columbia University

Fall 2018	Calculus III (169 students)
Spring 2018	Algebraic Topology II (Graduate course, 9 students)
Fall 2017	Calculus III (82 students)
Spring 2017	Introduction to algebraic topology (8 students)
Fall 2016	Calculus III (125 students)
Summer 2016	Ordinary differential equations (16 students)
Spring 2016	Linear algebra (80 students)
Fall 2015	Calculus II (17 students)

Sharif University of Technology

Spring 2011	Elementary differential equations
Fall 2009	An introduction to linear algebra
Fall 2008	An introduction to linear algebra

INDEPENDENT STUDY SUPERVISION

University of Georgia

Spring 2022	directed reading course in “Heegaard and knot Floer homology”
Spring 2020	directed reading course in “Knot theory”

Columbia University

Spring 2018	independent reading course in “Morse theory and h-cobordism theorem”
Spring 2017	independent reading course in “Knot Theory”
Spring 2016	independent reading course in “Morse Theory”

SERVICES AND OTHER ACTIVITIES

Mentorship	-	REU project at University of Georgia, Joint with Peter Lambert-Cole (4 Students)	Summer 2022
	-	REU project at University of Georgia, Joint with Melissa Zhang (4 Students)	Summer 2021
	-	REU project at Columbia University, Joint with Linh Truong (6 Students)	Summer 2018
Conference Co-organizer	-	AMS Special Session on Contact and Symplectic Topology in Dimensions 3 and 4, Georgia Tech	2023
	-	Georgia Topology Conference, UGA	2021 – present
	-	Homological invariants in low dimensional topology workshop, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran	August 2016

Seminar (Co-)organizer	- Student/Floer homology and Arnold conjecture reading seminar, University of Georgia	Spring 2020
	- Student/ Heegaard Floer homology reading seminar, University of Georgia	Fall 2019
	- Topology Seminar, University of Georgia	2019-
	- Symplectic Geometry, Gauge Theory, and Categorification Seminar, Columbia University	2016-2019
	- Student/ Low dimensional topology reading seminar, Columbia University	2016-2017
	- Student/ Knot invariants reading seminar, Sharif University of Technology	2012
Referee	- American Journal of Mathematics	
	- Journal of Symplectic Geometry	
	- Quantum Topology	
	- Proceedings of the 2019 WiSCon Workshop	
	- Proceedings of the London Mathematical Society	
	- Proceeding of AMS	
	- Algebraic and Geometric Topology	
Others	- Plenary speaker for the conference “Empowering Women in Mathematics” at Wake Forest University	Spring 2023
	- Mentor for <i>Topology Students Workshop</i> at Georgia Tech	Summer 2022
	- PhD Preliminary Advisor for 1 student at UGA	
	- PhD Advisory Committee Member for 6 students at UGA	
	- Departmental representative (official faculty contact and organizer) for Columbia Summer Session in Mathematics	Summer 2017
	- PhD Dissertation Committee Member for 2 students, Columbia University	2017-2018
	- Teacher, National Olympiad summer camp, Tehran	2005-2006