SUJOY MUKHERJEE

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WORK EXPERIENCE

- 2019- : Ross Assistant Professor | The Ohio State University.

EDUCATION

- 2014-2019: PhD in Mathematics | The George Washington University.
  Adviser: Józef H. Przytycki.
- 2014-2015: MA in Mathematics | The George Washington University.
- 2012-2014: Graduate coursework in Mathematics | Indian Institute of Science Education and Research, Mohali.
- 2009-2012: BSc in Mathematics (major), Computer Science (minor), and Statistics (minor) | Saint Xavier's College, University of Calcutta.
- 1995-2009: High school | Don Bosco School, Park Circus.

TEACHING EXPERIENCE

- Spring 2020: Calculus I (Math 1151).
- Fall 2019: Flipped and Flexible Calculus I (Math 1151).
- Fall 2018: Linear Algebra (Math 2184) + weekly calculus labs.
- Spring 2018: Calculus with Pre-calculus II (Math 1221).
- Fall 2017: Calculus II (Math 1232) + weekly calculus labs.
- Summer 2017: Calculus with Pre-Calculus II (Math 1221).
- Spring 2017: Calculus with Pre-calculus II (Math 1221) + weekly calculus labs.
- Fall 2016: Calculus I (Math 1231) + weekly calculus labs.
- Spring 2016: Calculus for the Social and Management Sciences (Math 1252).
- Fall 2015: Real Analysis I (Math 4239 and Math 6201).
- Fall 2014: Mathematics of Finance (Math 3410).

RESEARCH INTERESTS

Low dimensional topology | Algebraic structures motivated by knot theory | Graph theory | Combinatorics

PREPRINTS AND PUBLICATIONS

(1) **S. Mukherjee**, D. Schütz, **Arbitrarily large torsion in Khovanov cohomology**. ArXiV: https://arxiv.org/abs/1909.07269. (submitted)

Date: December 29, 2019.

(2) **S. Mukherjee**, **On odd torsion in even Khovanov homology**. ArXiV: https://arxiv.org/abs/1906.06278. (submitted)
(3) R. P. Bakshi, D. Ibarra, **S. Mukherjee**, and J. H. Przytycki, **A generalization of the Gram determinant of type A**. ArXiV: https://arxiv.org/abs/1905.07834. (submitted)
(4) R. P. Bakshi, D. Ibarra, **S. Mukherjee**, T. Nosaka, and J. H. Przytycki, **Schur multipliers and second quandle homology**. ArXiV: https://arxiv.org/abs/1812.04704. (submitted)
(5) R. P. Bakshi, **S. Mukherjee**, J. H. Przytycki, M. Silvero, and X. Wang, **On multiplying curves in the Kauffman bracket skein algebra of the thickened four-holed sphere**. ArXiV: https://arxiv.org/abs/1805.06062. J. Knot Theory Ramifications. (accepted)
(6) **S. Mukherjee**, **On Skein Modules and Homology Theories Related to Knot Theory**. Thesis (Ph.D.)-The George Washington University. 2019. 124 pp. ISBN: 978-1392-08901-9 ProQuest LLC (https://pqdtopen.proquest.com/pubnum/13810465.html).
(7) Z. Cheng, **S. Mukherjee**, J. H. Przytycki, X. Wang, and S. Y. Yang, **Rooted trees with the same plucking polynomial**. Osaka J. Math, 56 (2019), no. 3, 661-674.
(8) **S. Mukherjee**, J. H. Przytycki, M. Silvero, X. Wang, and S. Y. Yang, **Search for torsion in Khovanov homology**. Experimental Mathematics, (27) 2018, no. 4, 488-497.
(9) **S. Mukherjee** and J. H. Przytycki, **On the rack homology of graphic quandles**. Nonassociative mathematics and its applications, 183-197, Contemp. Math., 721, 2019.
(10) Z. Cheng, **S. Mukherjee**, J. H. Przytycki, X. Wang, and S. Y. Yang, **Strict unimodality of plucking polynomials of rooted trees**. J. Knot Theory Ramifications, 27 (2018), no. 7, 1841009, 19 pp.
(11) **S. Mukherjee**, **A homology theory for a special family of semi-groups**. J. Knot Theory Ramifications, 27 (2018), no. 3, 1840005, 27 pp.
(12) A. S. Crans, **S. Mukherjee**, and J. H. Przytycki, **On homology of associative shelves**. J. Homotopy Relat. Struct. 12 (2017), no. 3, 741-763.
(13) Z. Cheng, **S. Mukherjee**, J. H. Przytycki, X. Wang, and S. Y. Yang, **Realization of plucking polynomials**. J. Knot Theory Ramifications, 26 (2017), no. 2, 1740016, 9 pp.

HONORS AND AWARDS

- 2019-2021: Science and Engineering Research Board (SERB), India, **National Post-Doctoral Fellowship** (declined).
- 2019: The George Washington University, **Second Prize** among graduate presenters in GW research days in the area of Mathematical and Physical Sciences.
- 2019: Department of Mathematics, The George Washington University, **Green Prize**.
- 2019: Columbian College of Arts and Sciences, The George Washington University, **Dean's Travel Grant**.
- 2019: Department of Mathematics, The George Washington University, **Rodica Simion Memorial Grant**.
- 2018: Columbian College of Arts and Sciences, The George Washington University, **Dean's Dissertation Completion Fellowship**.
- 2018: Department of Mathematics, The George Washington University, **Taylor Prize**.
- 2016-2018: The George Washington University, **Graduate Fellowship**.
- 2016: American Mathematical Society, **Graduate Student Travel Grant**.
- 2014-2016: The George Washington University, **Presidential Merit Fellowship**.
- 2012-2014: National Board of Higher Mathematics, India, **Masters' Fellowship**.
- 2014: Indian Institute of Science Education and Research, Mohali, **M.S.-Ph.D. Scholarship**.

INVITED TALKS

- 2020: Spring western sectional American Mathematical Society meeting, California State University, Fresno. **TBD**. (upcoming)
- 2020: Joint Mathematics Meetings, Denver. **Arbitrarily large torsion in Khovanov homology**. (upcoming)

- 2019: Fall western sectional American Mathematical Society meeting, University of California, Riverside. **On even Khovanov homology and odd torsion**.
- 2019: Fall eastern sectional American Mathematical Society meeting, Binghamton University, Binghamton. **Odd torsion in even Khovanov homology**.
- 2019: Spring eastern sectional American Mathematical Society meeting, University of Connecticut, Hartford. **On odd torsion in the even Khovanov homology of closed braids**.
- 2019: Joint Mathematics Meetings, Baltimore. **Even Khovanov homology and odd torsion**.

- 2018: Fall southeastern sectional American Mathematical Society meeting, University of Arkansas, Fayetteville. **On the rack homology of graphic quandles**.
- 2018: Indian Institute of Science Education and Research, Mohali. **On self distributive algebraic structures**.
- 2018: Knots in Washington, The George Washington University, Washington DC. **On odd torsion in even Khovanov homology**.
- 2018: Spring western sectional American Mathematical Society meeting, Portland State University, Portland. **The graphic axiom and self-distributivity**.
- 2018: Spring central sectional American Mathematical Society meeting, Ohio State University, Columbus. **Graphic quandles**.

- 2017: Graduate Student Seminar Series 2017-2018, The George Mason University. **Algebraic structures in knot theory**.
- 2017: Fall central sectional American Mathematical Society meeting, University of North Texas, Denton. **Khovanov homology and torsion**.
- 2017: Fourth Mile High Conference on Nonassociative Mathematics, University of Denver, Denver. **Semigroups and shelves**.
- 2017: Knots in Washington, The George Washington University, Washington, DC. **On lbo homology**.
- 2017: Spring western sectional American Mathematical Society meeting, Washington State University, Pullman. **Properties of lbo homology**.

- 2016: Fall south eastern sectional American Mathematical Society meeting, North Carolina State University, Raleigh. **A homology theory for associative shelves**.
- 2016: Knots in Hellas, Olympia, Greece, 2016. **The role of associativity in the homology of self-distributive structures**.
- 2016: Spring western sectional American Mathematical Society meeting, University of Utah, Salt Lake City. **From Gaussian polynomials to plucking polynomials**.
- 2016: Advances in Quantum and Low-Dimensional Topology 2016, Iowa City. **Lbo homology: Between associativity and self-distributivity**.
- 2016: Spring south eastern sectional American Mathematical Society meeting, University of Georgia, Athens. **Associative shelves**.

- 2015: Fall eastern sectional American Mathematical Society meeting, Loyola University, Chicago. **Associative and unital shelves**.

OTHER PRESENTATIONS AND SCIENTIFIC MEETINGS

- 2019: Biology, Analysis, Geometry, Energies, Links (BAGEL): A Program on Low-dimensional Topology, Geometry, and Applications, IMA , University of Minnesota, Minneapolis.
- 2019: Knots in Washington, The George Washington University, Washington DC.
- 2019: Poster presentation, The George Washington University Research Days. **Closed braids and torsion in Khovanov homology**.
- 2019: Winter Braids IX, Reims, France. **Closed braids and torsion in Khovanov homology**.
- 2019: Knots in Washington, The George Washington University, Washington DC.

- 2018: Workshop on volume conjecture and related topics in knot theory, Indian Institute of Science Education and Research, Pune, India.
- 2018: Graduate Student Seminar Series 2018-2019, The George Washington University. **Khovanov homology and the PS braid conjecture**.
- 2018: Geometry and topology of 3-manifolds workshop, Okinawa Institute of Technology, Okinawa, Japan.
- 2018: 54th Topology Festival, Cornell University, Ithaca, New York.
- 2018: Graduate Student Topology and Geometry conference, 2018, The University of Illinois, Chicago.

- 2017: Knots in Washington, The George Washington University, Washington DC.
- 2017: Graduate Student Seminar Series 2017-2018, The George Washington University. **From knot theory to self distributive algebraic structures**.
- 2017: 53rd Topology Festival, Cornell University, Ithaca, New York.
- 2017: Poster presentation, The George Washington University Research Days. **On torsion in Khovanov homology**.
- 2017: Graduate Student Topology and Geometry conference, 2017, Michigan State University, East Lansing. **Torsion in Khovanov homology**.

- 2016: Knots in Washington, The George Washington University, Washington, DC.
- 2016: Graduate Student Seminar Series 2016-2017, The George Washington University. **Homological properties of algebraic structures arising from knot theory**.
- 2016: Research visit (invited by Krishnendu Gongopadhyay and Mahender Singh) at Indian Institute of Science Education and Research (IISER), Mohali during summer.
- 2016: Knots in The Triangle, North Carolina State University, Raleigh.
- 2016: Poster presentation, The George Washington University Research Days. **Homology of associative shelves**.

- 2015: Knots in Washington, The George Washington University, Washington DC.
- 2015: Centennial MathFest of the Mathematical Association of America at Washington DC.
- 2015: Invited by Slavik Jablan for a research visit to the Mathematical Institute of the Serbian Academy of Sciences and Arts.
- 2015: 30th Ramanujan Mathematical Society annual conference, Indian Institute of Science Education and Research, Mohali.
- 2015: Spring western sectional American Mathematical Society meeting, University of Nevada, Las Vegas.
- 2015: Knots in Washington, The George Washington University, Washington DC.
- 2015: Spring eastern sectional American Mathematical Society meeting, Georgetown University, Washington DC.
- 2015: Knots in Dallas, University of Texas, Dallas.

- 2014: Fall south eastern sectional American Mathematical Society meeting, University of North Carolina, Greensboro.
- 2014: Summer project student at Indian Institute of Science Education and Research, Mohali.

- 2013: International Centre of Theoretical Sciences Knot Theory Conference and Workshop, Indian Institute of Science Education and Research, Mohali.
- 2013: Summer project student at Indian Institute of Science Education and Research, Mohali.
- 2013: Visiting summer student at The Institute of Mathematical Sciences, Chennai.

SOFTWARE FAMILIARITY

C++ | Java | LaTeX | Mathematica

PROFESSIONAL MEMBERSHIPS AND SERVICE

- 2020: Co-organizer of the special session on **Knots and Links in 3-Manifolds** at the AMS Spring Central Sectional Meeting, Purdue University, West Lafayette, IN.
- 2017- : Reviewer for MathSciNet.
- 2018- : Reviewer for zbMATH.
- 2014-2019: Student co-organizer of the Knots in Washington conference.
- 2014- : Member of the American Mathematical Society.

OTHER INTERESTS

Photography | Indian classical music | Chess

REFERENCES

- Micah W. Chrisman | chrisman.76@osu.edu
- Krishnendu Gongopadhyay | krishnendu@iisermohali.ac.in
- Valentina S. Harizanov | harizanv@gwu.edu
- Józef H. Przytycki | przytyck@gwu.edu
- Alexander N. Shumakovitch | shurik@gwu.edu