

CURRICULUM VITA

Noureen A. Khan

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Major research interests include Biomathematics, low dimensional topology and Knot Theory. Current focus is on “virtual invariants of links preserved by tangle replacement moves”, topological probing of DNA and application to Genetics. My current research in Mathematics Education is in two main areas:
(1) Evaluating the effectiveness of math curricula, and (2) bridge the gap between research and classroom practice.

Academic Degrees

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|---|---------------------|------------|
| University of Texas at Dallas Richardson, TX U.S.A | Applied Mathematics | Ph.D. 2009 |
| University of Texas at Dallas Richardson, TX U.S.A | Applied Mathematics | M.Sc. 2008 |

PROFESSIONAL EXPERIENCE

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|---------------|---------------------------------------|--|
| 2015- Present | Associate Professor of Mathematics | University of North Texas Dallas Dallas, Texas |
| 2009- 2015 | Assistant Professor of Mathematics | University of North Texas Dallas Dallas, Texas |
| 2005- 2009 | Research Scientist | University of Texas at Dallas Richardson, Texas |

Publications and Research

A. Refereed Publications

Khan N. A, Invariants of Virtual Tangle Moves, Journal of Knot Theory and Its Ramifications (JKTR), Vol. 23, No. 6 (2014), July 8, **2014**.

Khan N. A, The Warping Degree of the Virtual Knot Diagrams, International Journal of Mathematics and Computation (IJMC), Volume 6 no.1, **2014**, 1- 12.

Jator S, Sahi R, Khan N. A, Continuous Fourth Derivative Method for third order boundary value problems, International Journal of Pure and Applied Mathematics, Volume 85 no.5, **2013**, 907-923.

Khan N. A, Lie Ring of 4-move Invariant Group $R_4(L)$ and Kawauchi's 4-move Conjecture, Journal of Applied Mathematics & Bioinformatics, vol. 2, no. 3, **2012**, 115-129

Jator S, Sahi R, Khan N. A, A Simpson's type Second Derivative Method for Stiff Systems International Journal of Pure and Applied Mathematics, vol. 81, no. 4, **2012**, 619-633.

Khan N. A, The Invariants of 4-Moves, Applied Mathematical Sciences (AMS), Vol. 6, **2012**, no. 14, 667 – 674.

Khan N. A, Sahi R, Dabkowski M, on 4-move equivalence classes of knots & links of two components, Journal of Knot Theory and Its Ramifications, **2011**, 47-90.

B. Article Published

Khan N. A, A zero polynomial of virtual knots, Jeong, Myeong-Ju, J. Knot Theory Ramifications 25 (2016), no. 1, 1550078, MR3449532 (2016).

Khan N. A, Kauffman, Louis Hirsch, Virtual knot cobordism. World Sci. Publ. (2015) MR3381329 (2016).

Khan N. A, Finite type invariants and the Kauffman bracket polynomials of virtual knots, Jeong, Myeong-Ju; Park, Chan-Young; Yeo, Soon Tae, no. 4, 639–654 - MR3298650 (2015).

Khan N. A, Classification of knots of small complexity in thickened tori. Akimova, A. A.; Matveev, S. V. J. Math. Sci. (N. Y.) 202, no. 1, 1–12 - MR3256123 (2015).

Khan N. A, 4-moves and the Dabkowski-Sahi invariant for knots. Brittenham, Mark; Hermiller, Susan; Todd, Robert G. J. Knot Theory Ramifications 22, no. 11, 1350069, 20 - MR3143585 (2015).

C. Papers under review (Pre-print)

Khan N. A, Bridge Index of Connected Sums of Virtual Knots, Involve 151013.

Khan N. A, Virtual Rational Tangles and Conway's Theorem, Journal of Knot Theory and Its Ramifications, JKTR-D-15-00078.

Khan N. A, Sahi R, New Bounds on Virtual Bridge Number and Virtual Ascending Number, Journal of Knot Theory and Its Ramifications, JKTR-D-15-00079.

Khan N. A, Warping Degree of Virtual Link Diagrams, Journal of Knot Theory and Its Ramifications, JKTR-D-14-00107.

Grant Awards and Scholarship

A: Research Projects Grants

2016 - National Research Experience for Undergraduates Program (NREUP) Grant award by Mathematical Association of America (MAA), funded by National Science Foundation (NSF) and National Security Agency (NSA).

2016 - Tensor-SUMMA for the Dallas Area Mathematics Partnership Grant award by Mathematical Association of America (MAA), funded by National Science Foundation (NSF) and National Security Agency (NSA).

2016 – CURM Award- Center for Undergraduate Research in Mathematics Grant award by Mathematical Association of America (MAA), funded by National Science Foundation (NSF) and National Security Agency (NSA).

2015 - National Research Experience for Undergraduates Program (NREUP) Grant award by Mathematical Association of America (MAA), funded by National Science Foundation (NSF) and National Security Agency (NSA).

2014 - National Research Experience for Undergraduates Program (NREUP) Grant award by Mathematical Association of America (MAA), funded by National Science Foundation (NSF) and National Security Agency (NSA).

2013 - National Research Experience for Undergraduates Program (NREUP) Grant award by Mathematical Association of America (MAA), funded by National Science Foundation (NSF) and National Security Agency (NSA).

2012 - National Research Experience for Undergraduates Program (NREUP) Grant award by Mathematical Association of America (MAA), funded by National Science Foundation (NSF) and National Security Agency (NSA).

2011 - Mathematics Research Communities (MRC) Scholars Award, American Mathematical Society (AMS), National Science Foundation (NSF).

2011 - CCRS Grant Award, Texas College and Career Readiness Standards & Faculty Collaborative Initiative in Mathematics.

B: Teacher Scholar Grant Awards

2016 CIES Fulbright Specialist, Qatar University Qatar.

2015 CIES Fulbright Scholar Roster Candidate (2015 – 2020).

2015 UNT Dallas Research Symposium Grant Award.

2014 Minnie Stevens Piper Foundation, Excellence in Teaching (Finalist).

2013 Mentoring Award, IAS/Park City Mathematics Institute (PCMI) Utah, Mathematical Association of America (MAA).

2010- 2012 New Experience of Teaching (NExT) Fellowship Award, Mathematical Association of America (MAA).

C: Travel Grant Awards

- Geometric Group Theory Workshop, Mathematical Sciences Research Institute (MSRI), University of California Berkeley, CA, August 17- 19, 2016.

- Inquiry Based Learning Workshop The Academy of Inquiry Based Learning (AIBL), Cal Poly San Luis Obispo, CA, June 20-25, 2016.

- The Topology Festival What Next?
The mathematical legacy of Bill Thurston, Cornell University, Ithaca, NY. June- 2014.
- Algebraic Topology Workshop,
Mathematical Sciences Research Institute (MSRI), University of California Berkeley, CA,
January 27- 28, 2014.
- Workshop for Mentors,
National Research for Undergraduate Mathematics Minority Students, Institute for
Advanced Studies (IAS), Mathematics Institute, Park City Utah, July 8-12, 2013.
- Discrete Lattice Models in Mathematics, Physics and computing workshop,
Mathematical Sciences Research Institute (MSRI), University of California Berkeley,
Berkeley, CA January 16 – 20, 2012.
- Lattice Models and Combinatory,
Mathematical Sciences Research Institute (MSRI), University of California Berkeley,
Berkeley, CA, January 12 – 13, 2012.
- Computational and Applied Topology Workshop,
Mathematics Research Communities (MRC), Snowbird, Utah on June 19–25, 2011.

Invited Peer Reviewed Presentations

A. Keynote Speaker and Session Panelist:

Mentoring Minorities, National Research Experience for Undergraduate Program (NREUP) at University of North Texas Dallas 2013, Joint Mathematics Meetings (JMM), Baltimore, MD. Jan., 2014.

Closing the Loop, College and Career Readiness Standards Initiatives (CCRSI), Texas State University, Round Rock, TX. April 27, 2012.

B. International and National Presentations

Virtual Rational Tangles and Conway's Theorem
Joint Mathematics Meetings (JMM), Seattle, WA, January 06 - 09, 2016.

Obstacles in Implementation of a successful undergraduate research program.
Joint Mathematics Meetings (JMM), Seattle, WA, January 06 - 09, 2016.

On Warping Degree of Virtual Links

Joint Mathematics Meetings (JMM), San Antonio, TX, January 10 - 13, 2015.

Intentional Mentoring

Joint Mathematics Meetings (JMM), San Antonio, TX, January 10 - 13, 2015.

Ascending Number of Virtual Knot Diagrams

Joint Mathematics Meetings (JMM), San Antonio, TX, January 10 - 13, 2015.

New Bounds on Virtual Bridge Number and Virtual Ascending Number

Conference on Knot Theory and Its Applications to Physics and Quantum Computing,
University of Texas at Dallas, TX, January 6-9, 2015.

On Virtual Group Presentation,

Joint Mathematics Meetings (JMM), Baltimore, MD, January 15 - 18, 2014.

New Invariants of Virtual Rational Tangle Moves,

Joint Mathematics Meetings (JMM), Baltimore, MD. January 15 - 18, 2014.

On Warping Degree of virtual knots,

Joint Mathematics Meetings (JMM), San Diego, California, MA. January 12, 2013.

Warping Degree of virtual knot diagrams,

International Conference on Mathematical Science and Applications, Abu Dhabi
University, UAE, December 26-31, 2012.

On Kawauchi's 4-moves Question,

American Mathematical Society Special Topic Session, Joint Mathematics Meetings,
Boston, MA. January 4 - 7, 2012.

Closing the Loop,

Mathematical Association of America Math Education Session, Joint Mathematics
Meetings, Boston, MA. January 4 - 7, 2012.

Pre-Service Teachers Mathematics Content Knowledge, Confidence Levels, & Math
Anxiety, NCTM Regional Conference, Atlantic City, NJ. October 19 – 21, 2011.

Second Derivative Adams-type methods for boundary value problems,

Joint Mathematics Meetings, New Orleans, LA, January 6 – 9, 2011.

Linking Number of Virtual Link Diagrams, Mathematical Association of America's 10th Annual Texas Section Mathematics Conference, Stephen F. Austin State University, Nacogdoches, October 17-18, 2014.

A secure journey of knots, Mathematical Association of America Texas section 92nd Conference, El Centro College Dallas, TX April 12 – 14, 2012.

No More Hate for Math, Mathematical Association of America's 7th Annual Texas Undergraduate Mathematics Conference, Tyler Texas, October 21- 22, 2011.

Equivalence Classes of Links of two components modulo 4-move, Mathematical Association of America Spring Meeting, University of Texas at Tyler, April 14 - 16, 2011.

Introducing 4-moves Invariants, Mathematical Association of America's 6th Annual Math Conference, Tyler Texas October 22-23, 2010.

On 4-move equivalence classes of knots and links of two components, American Mathematical Society, Western Sec. Meeting, Albuquerque, New Mexico April 17, 2010.

All knots in Family 6* are reduced by 4-move, Mathematical Association of America 90th Annual Meeting, Abilene Christian University, Abilene, Texas April 8–10, 2010.

C. Presentations with Students

Virtual Bridge Presentation of Virtual Knots and Links, Alex Fuchs and Noureen Khan, MAA Sectional meeting, Tylor TX, October 6-9, 2015.

Invariants of virtual DT codes, Kareem Hamdan and Noureen Khan, MAA Sectional meeting, Tylor TX, October 6-9, 2015.

Path Width and Bridge Presentation of Virtual Knots, Alex Fuchs and Noureen Khan, MAA Math Fest, Washington DC, August, 2015.

Manipulation of DT codes, Kareem Hamdan and Noureen Khan, MAA Math Fest, Washington DC, August, 2015.

Knot Permutations of Prime Knots, Javier Mondragon and Noureen Khan, Math Fest, Portland, OR. August, 2014.

Invariance of Virtual Operator on Involuntary Quandles, Delia Rojas and Noureen Khan, Math Fest, Portland, OR. August, 2014.

On Equivalence Classes of Virtual Knots, Mark Lugo and Noureen Khan, Math Fest, Portland, OR. August, 2014.

On Virtual Group Presentation, Mayra Lopez and Noureen Khan, Joint Mathematics Meetings (JMM), Baltimore, MD. January, 2014.

On Virtual Group Presentation, Mayra Lopez and Noureen Khan, Texas Mathematics Conference, St. Mary's University, San Antonio. October, 2013.

Virtually Knotted Strings, Sara Rocha-Juarez and Noureen Khan, Texas Mathematics Conference, St. Mary's University San Antonio. October, 2013.

Tangle Solutions for Site-Specific Gin Recombinase on DNA, Jennifer Lazarus and Noureen Khan, At the Capitol, Austin TX. February, 2013.

Tangle Solutions for Site-Specific Hin Recombinase on DNA, Jennifer Lazarus and Noureen Khan, Joint Mathematics Meetings (JMM), San Diego, CA January, 2013.

Java Implementation of C. Ernst's Tangle Equations II, Jonathan Kirkpatrick Sullivan and Noureen Khan, Joint Mathematics Meetings (JMM), San Diego, CA January, 2013.

Algebra of tangles for classical and virtual knots, Elizabeth Reyes and Noureen Khan, Joint Mathematics Meetings (JMM), San Diego, CA January, 2013.

Java Implementation of C. Ernst's Tangle Equations II, Jonathan Sullivan and Noureen Khan, 8th TUMC, Stephen F. Austin State University Nacogdoches, TX October, 2012.

Algebra of tangles for classical and virtual knots, Elizabeth Reyes and Noureen Khan, 8th TUMC, Stephen F. Austin State University Nacogdoches, TX October 26-27, 2012.

Tangle Model Applied To Site Specific Gin Recombinase On DNA, Jennifer Lazarus and Noureen Khan, Stephen F. Austin State University Nacogdoches, TX October, 2012.

Knots in Arts, Cindy Valles, Mikiko Okura and Noureen Khan, MAA Texas section 92nd Conference, El Centro College Dallas, TX. Apr. 12 – 14, 2012.

Knotted Knots, Jennifer Lazarus, Elizabeth Reyes and Noureen Khan, MAA Texas section 92nd Conference, El Centro College Dallas, TX. Apr. 12 – 14, 2012.

Knotted Virtual Knots, Jennifer Lazarus and Elizabeth Reyes and Noureen Khan, MAA Conference Texas section, El Centro College Dallas, TX. Apr. 12 – 14, 2012.

Knots and Arts, Cindy Valles, Mikiko Okura and Noureen Khan, MAA Conference Texas section, El Centro College Dallas, TX. Apr. 12 – 14, 2012.

Symmetries of Things, Achille Tiam and Noureen Khan, Research Day at the Capitol, Austin TX. February 14, 2011.

Professional Development Workshops

BESTEX (Bilingual Educators for Students of Texas) ESL Summer Academy, University of North Texas at Dallas, Jun 16 – 20, 2014.

BESTEX (Bilingual Educators for Students of Texas) ESL Summer Academy, University of North Texas at Dallas, Jun 17 – 21, 2013.

College and Career Readiness Initiatives Faculty Collaboration Culminating Conference, Houston Texas, May 16-17, 2013.

Professional Goals and Institutional Expectations, Professional Development Seminar Series: University of North Texas at Dallas, fall 2012 – spring 2013.

Blended Learning Scholars, Series of 10 workshops, Office of Distance Learning and Instructional Technologies, University of North Texas at Dallas, sp 2012 – sp 2013.

STAAR and EOC Era, Preparing Mathematics Teachers for Success in the STAAR and EOC Era, College and Career Readiness Initiatives, Round Rock TX, September 14, 2012.

Maximizing Your Research Efforts, College & Career Readiness Standards Initiatives in Mathematics (CCRSIM) Workshop, Woodlands, TX, November 11th, 2011.

Supporting Success in College Science, College & Career Readiness Standards Initiatives in Mathematics (CCRSIM) Workshop, Dallas TX, November 3rd, 2011.

Developmental Math Success Strategy Workshop, Workshop by McGraw Hill implementing ALEX in developmental courses, Tarrant County College, TX, Oct, 2011.

Closing the Loop! College and Career Readiness Standards grant funded workshop III, University of North Texas at Dallas, Dallas TX. September 30th, 2011.

Developments in Mathematics Education, College and Career Readiness Standards Initiatives in Mathematics (CCRSIM) Workshop, Round Rock TX, September 16, 2011.

Strategies for Helping Underprepared Learners Achieve, College and Career Readiness Standards Initiatives in Mathematics (CCRSIM) Workshop, Austin TX, January 28, 2011.

Mathematics & Science Summit, College and Career Readiness Standards Initiatives in Mathematics (CCRSIM) Workshop, San Antonio TX, September 24, 2010.

New Experience in Teaching (NExT), Developmental workshop for new and junior faculty, University of Texas at Tyler, Tyler TX October 22, 2010.

Mathematics Event, College and Career Readiness Standards Initiatives in Mathematics (CCRSIM) Workshop, Austin TX, October 19, 2010.

Service and Public Engagement Activities (Selected)

External Board of Directors:

- Georgia Women's Research Fellowship Program (GWFP) - 2014.
- MAA Early Career Mentoring (ECM) Network (2013 – 2016)

Editorial Committee Member and Reviewer—

- External Advisory Council UT Dallas – (2014-present)
- Math Reviews, MathSciNet – (2012 – present)
- Zentralblatt MATH – (2010 – present)

Judge— Research Posters/ Presentations—

- MAA Poster Sessions Judge at Joint Mathematics Meetings (2010 – 2016).
- MAA Student Presentation Session Judge (2012 - 2016).

Advising Experience

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| 2015 – Present | Co-director, Student Research Center |
| 2009 – Present | Advisor, Undergraduate Research Program |
| 2009 – Present | Advisor (founding), Math Club of UNT Dallas |
| 2011 – 2013 | Director, Texas Instrument Scholarship Program |