AMJAD KHAN

Contact:

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Employment:

- Postdoctoral Fellow, Faculty of Computer Science, Dalhousie University, Halifax, Canada (April, 2020 - Present)
- Teaching & Research Assistant, Department of Applied Mathematics, University of Western Ontario (UWO), London, Canada (September 2015 - February 2020)
- Teaching & Research Assistant, Department Of Mathematics & Statistics, McMaster University, Hamilton, Canada (September 2013 - April 2015)
- Lecturer in Mathematics, National University of Sciences and Technology (NUST), Islamabad, Pakistan (2009 - 2013)

Education:

- PhD in Applied Mathematics, Western University, Canada (2015–2020)
  Thesis Title: Phage-Bacteria Interaction and Prophage Sequences in Bacterial Genomes
  Supervisor: Lindi M. Wahl

- MSc in Mathematics, McMaster University, Canada (2013–2015)
  Thesis Title: Approximations of lattice dynamics
  Supervisor: Dmitry Pelinovsky

- MPhil in Mathematics, NUST, Pakistan (2006–2009)
- BSc in Mathematics & Computer Sciences, Pakistan (2000–2004)

Research Interests:

- Mathematical Modeling & Differential Equations
- Mathematical Biology
- Bioinformatics
- Dynamical Systems & Bifurcation Analysis

Teaching Experience

- Instructor, *Financial Mathematics, MATH 3900 / ECON 3900*, Department of Mathematics and Statistics, Dalhousie University, Halifax, NS, Canada – Winter 2021
- Teaching Assistant, *Differential Equations, Probability for Life Sciences*, Department of Applied Mathematics, Western University, London, ON, Canada– 2019
- Teaching Assistant, *Calculus with Analysis for Statistics*, Department of Applied Mathematics, Western University, London, ON, Canada – 2018
- Instructor, *Calculus 2*, School of Applied Science and Technology, Fanshawe College, London, ON, Canada – 2018
- Instructor, *Business Mathematics*, Lawrence Kinlin School of Business, Fanshawe College, London, ON, Canada – 2017
- Teaching Assistant, *Applied Mathematics for Engineers*, Department of Applied Mathematics, Western University, London, ON, Canada – 2015, 2016 & 2017

- Teaching Assistant, *Introduction to Differential Equations*, Department of Mathematics & Statistics, McMaster University, Hamilton, On, Canada – 2015
- Teaching Assistant, *Engineering Mathematics*, Department of Mathematics & Statistics, McMaster University, Hamilton, On, Canada – 2014
- Teaching Assistant, *Linear Algebra*, Department of Mathematics & Statistics, McMaster University, Hamilton, On, Canada – 2014
- Teaching Assistant, *Linear Algebra*, Department of Mathematics & Statistics, McMaster University, Hamilton, On, Canada – 2013
- Instructor, *Differential Equations & Transforms*, NUST Institute of Civil Engineering, NUST, Islamabad, Pakistan – 2013
- Instructor, *Numerical Methods*, NUST Institute of Civil Engineering, NUST, Islamabad, Pakistan – 2012
- Instructor, *Calculus and Analytical Geometry*, NUST Institute of Civil Engineering, NUST, Islamabad, Pakistan – 2012
- Instructor, *Probability & Statistics*, NUST Institute of Civil Engineering, NUST, Islamabad, Pakistan – 2011
- Instructor, *Calculus and Analytical Geometry*, NUST Institute of Civil Engineering, NUST, Islamabad, Pakistan – 2011
- Instructor, *Calculus and Analytical Geometry*, NUST Institute of Civil Engineering, NUST, Islamabad, Pakistan – 2010
- Instructor, *Numerical Methods*, NUST Institute of Civil Engineering, NUST, Islamabad, Pakistan – 2009

Publications:

- Amjad Khan, Alita R. Burmeister and Lindi M. Wahl. Evolution along the parasitism-mutualism continuum determines the genetic repertoire of prophages. *PLoS Comput Biol*, Accepted, 2020
- Amjad Khan and Lindi M.Wahl. Quantifying the forces that maintain prophages in bacterial genomes. *Theoretical Population Biology*, 133:168-179, 2020. Fifty years of Theoretical Population Biology.
- Amjad Khan, Lindi M. Wahl, and Pei Yu. Phage Therapy and Antibiotics for Biofilm Eradication: A Predictive Model. In: D. Marc Kilgour, Herb Kunze, Roman Makarov, Roderick Melnik, and Xu Wang, editors, *Recent Advances in Mathematical and Statistical Methods*, volume 259, pages 375-383, 2018. & Statistics.
- Amjad Khan and Dmitry E. Pelinovsky. Long-time stability of small FPU solitary waves. *Discrete & Continuous Dynamical Systems - A*, 37(4):2065-2075, 2017.

Conferences, Poster and Presentations

- Amjad Khan, Lindi M. Wahl and Robert G Beiko, The role of temperate bacteriophages in the maintenance and distribution of Antibiotic Resistance Genes (ARGs). "Canadian Society of Applied and Industrial Mathematics (CAIMS 2021)" June 21- 24, 2021 Virtual (hosted by the University of Waterloo, Waterloo, ON, Canada).
- Amjad Khan, Robert G Beiko, Modeling the transmission and loss of an important class of mobile genetic elements. Virtual Society for Mathematical Biology (SMB 2021), June 13-17, SMB 2021.
- Systems Modeling in the Pharmaceutical Industry - Problem Solving Workshop. August 12 - 16, 2019, The Fields Institute, Toronto, ON, Canada
- Amjad Khan, Lindi M. Wahl, The Evolutionary Forces Acting on Prophages: A Mathematical Study. Annual Meeting and Conference of the Society for Mathematical Biology (SMB 2019), July 21-26, SMB 2019 Annual Meeting at Montral, Qubec, Canada
- Lindi M. Wahl, Khan A., Blurring the Lines between Predator and Prey: The Evolution of Temperate Viruses. Pokhara, Nepal June 28, 2019
- Amjad Khan, Lindi M. Wahl, Mathematical Model of the Prophage Size Distribution in Bacterial Genomes. "Canadian Society of Applied and Industrial

Mathematics (CAIMS 2018)" June 4 to 7, 2018 at Ryerson University in Toronto, ON
- Amjad Khan, Lindi M. Wahl, Population dynamics of phages and biofilm bacteria. "The IV AMMCS International Conference" Waterloo, Ontario, Canada, August 20-25, 2017
- Amjad Khan A., Dimitry Pelinovsky, Approximations of the lattice dynamics. April 21, 2015, Department of Mathematics and Statistics, McMaster University, Hamilton, ON.

Awards and Scholarships

- My article with Prof. Lindi M. Wahl, "Quantifying the forces that maintain prophages in bacterial genomes", has been acknowledged as deserving of honorable mention in Theoretical Population Biology. An announcement will appear in an upcoming issue of the journal (most likely February 2022).
- Student paper prize, AMMCS International Conference, Waterloo, Ontario, Canada -August 20-25, 2017.
- Graduate Research Scholarship (2015-2019), Western University, London, Ontario, Canada
- Graduate Research Scholarship (2013- 2015), McMaster University, Hamilton, Ontario, Canada
- Scholarship for M.Phil. studies (2007- 2009), Higher Education Commission (HEC), Islamabad, Pakistan

Technical Skills

Experience with computers and programming languages on Linux and windows operating systems:
- C++
- Python
- MATLAB
- TEX (LATEX)
- Maple