

# AMJAD KHAN

## Contact:

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## Employment:

- Postdoctoral Fellow, Faculty of Computer Science, Dalhousie University, Halifax, Canada (April, 2020 - Present)
- Limited-Term Assistant Professor, Department of Mathematics and Statistics, Dalhousie University, Halifax, Canada (January 1, 2021 to April 30, 2021)
- 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., Dmitry Pelinovsky, [Approximations of the lattice dynamics](#). April 21, 2015, Department of Mathematics and Statistics, McMaster University, Hamilton, ON.

#### **Awards and Scholarships**

- 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
- T<sub>E</sub>X (L<sup>A</sup>T<sub>E</sub>X)
- Maple