Debananda Chakraborty

Department of Mathematics
New Jersey City University
Email: dchakraborty@njcu.edu
Phone: 201-200-3297

Education:

Doctor of Philosophy in Mathematics, State University of New York at Buffalo, 2012.
Thesis Title: *High Order Methods for Hyperbolic PDEs with Singular Source Term*
Master of Arts in Mathematics, State University of New York at Buffalo, 2006
Master of Science in Mathematics, Jadavpur University, India, 2001
Bachelor of Science in Mathematics, Jadavpur Univeristy, India, 1994

Academic and Professional Appointments:

September 2014 - present:
Assistant Professor, Department of Mathematics, New Jersey City University

September 2012 - May 2014:
Assistant Professor, Department of Mathematics, Virginia Intermont College

September 2009 - July 2012:
Adjunct Instructor, Department of Mathematics, State University of New York at Buffalo

August 2003 - July 2004:
Lecturer, Department of Mathematics, Haldia Institute of Technology, India

September 1994 - November 1999:
System Engineer, G.S. Enterprise, Kolkata, India

Awards and Honors:

- Mini Grant Award, New Jersey City University, April 2015
- Who's Who Among Students in American Universities and Colleges, March 2012
- Professional Development Award, United University Professional, Buffalo Chapter, 2012
- Travel Grant Award, Society of Industrial and Applied Mathematics (SIAM), 2012
- Who's Who Among Students in American Universities and Colleges, March 2011
- Graduate Assistantship, Department of Mathematics, State University of New York at Buffalo, 2004
- Award of Merit for 1st Class 2nd in Master of Science, Jadavpur University, India, 2001

Referred Journal Publications:

1. Avner Peleg, **Debananda Chakraborty**, *Transmission stabilization in soliton-based optical-waveguide systems by frequency-dependent linear gain-loss and the Raman self-frequency shift*, Volume 98 (2018) 013853, Physical Review A,
https://journals.aps.org/pra/abstract/10.1103/PhysRevA.98.013853

2. Avner Peleg, **Debananda Chakraborty**, *Large stable oscillations due to Hopf bifurcation in amplitude dynamics of colliding soliton sequences*, Vol. 63, 2018, Communications in Nonlinear Science and Numerical Simulation,
https://www.sciencedirect.com/science/article/pii/S1007570418300844?via%3Dihub

3. **Debananda Chakraborty**, Gunhan Caglayan, *Semiregular tessellations with pattern blocks*, Mathematics Lens Department, Vol 111 (2), October 2017
https://www.jstor.org/stable/10.5951/mathteacher.111.2.0090?seq=1#page_scan_tab_contents

4.**Debananda Chakraborty**, Avner Peleg, Quan M. Nguyen, *Stabilizing soliton-based multichannel transmission with frequency dependent linear gain-loss*, Vol. 371, 2016, Optics Communications,
http://www.sciencedirect.com/science/article/pii/S0030401816302024

5. Joshua Buli, Jae-Hun Jung, **Debananda Chakraborty**, *A study of gravitational wave decay from the binary black-hole system via numerical approach, Int. Journal of Applied Nonlinear Science, Vol. 1, No. 2, 2014*,
http://www.inderscience.com/info/inarticle.php?artid=61038

6. **Debananda Chakraborty**, Avner Peleg, Jae-Hun Jung, *Stable long-distance propagation and on-off switching of colliding soliton sequences with dissipative interaction*, Phys. Rev. A, Vol. 88, 023845 (2013),
http://pra.aps.org/abstract/PRA/v88/i2/e023845

7. **Debananda Chakraborty**, Jae-Hun Jung, Emmanuel Lorin, *Efficient determination of critical parameters of nonlinear Schrodinger equation with point-like potential using generalized polynomial chaos methods*, Applied Numerical Mathematics, Vol 72, Oct 2013, pp. 115-130,
http://dx.doi.org/10.1016/j.apnum.2013.05.005

8. **Debananda Chakraborty**, Jae-Hun Jung, *A quantitative study of the nonlinear Schrodinger equation with singular potential of any derivative orders*, Applied Mathematics Letters, Vol. 26, No. 8, Aug 2013, pp. 860-866,
http://dx.doi.org/10.1016/j.aml.2013.03.008

9. **Debananda Chakraborty**, Jae-Hun Jung, *Efficient determination of the critical parameters and the statistical quantities for Klein-Gordon and sine-Gordon equations with a singular potential using generalized polynomial chaos methods*, Journal of Computational Science, Vol. 4, pp. 46–61, Mar 2013,
http://www.sciencedirect.com/science/article/pii/S1877750312000300

10. **Debananda Chakraborty**, Jae-Hun Jung, Gaurav Khanna, *A multi-domain hybrid methods for head on collision of black holes in particle limit*, International Journal of Modern Physics C,

Vol. 22, No. 5, pp. 517-541, 2011,
http://www.worldscientific.com/doi/abs/10.1142/S0129183111016415

Ready for Submission to Peer Reviewed Journal:

1. **Debananda Chakraborty**, Avner Peleg, *Radiation dynamics in fast two-soliton collisions in the presence of cubic loss.*

In Preparation:

1. **Debananda Chakraborty**, Avner Peleg, *Analysis of fast two-pulse collisions in weakly perturbed linear system*

2. **Debananda Chakraborty**, Avner Peleg, *Transmission stabilization in soliton-based optical waveguide systems by frequency dependent linear gain-loss and frequency shifting due to temporal intensity variations*

3. EunSu Lee, **Debananda Chakraborty**, Trip Generation on Oil Production Sites: A Case Study of Bakken Oil Formation

Conference Participation:

1. *SIAM Conference on Analysis of Partial Differential Equations*, December 9th - 12th, 2017, Baltimore, Maryland

2. *Transformative Learning Conference*, March 2nd - 3rd, 2017, University of Central Oklahoma, Oklahoma City

3. *Spring Topological and Dynamical Conference*, March 7th - 11th, 2017, New Jersey City University

4. *The Eighth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory*, March 25th - 28th, 2013, University of Georgia, Athens, GA

5. *New York Conference in Applied Mathematics*, Rensselaer Polytechnic Institute, October 13th, 2012, Troy, NY

6. *SIAM Conference on Uncertainty Quantification (UQ12),* April 2nd - 5th, 2012, Raleigh, North Carolina, USA

7. *Applied Math Days*, Rensselaer Polytechnic Institute, March 30th - 31st, 2012, Troy, NY

8. *AMS Joint Mathematics Meeting*, January 4th – 7th, 2012, Boston, MA

9. *Laurier Centennial Conference: AMMMC-2011*, July 25th – 29th, 2011, Waterloo, Canada

10. *Advances and Challenges in Computational General Relativity*, May 22nd, 2011, Brown University, Providence, RI

11. *New York Conference on Applied Mathematics*, April 30th, 2011, Buffalo, NY

12. *Applied Math Days*, Rensselaer Polytechnic Institute, April 8th – 9th, 2011, Troy, NY

13. *Wave 2011*, April 7th, 2011, Athens, Georgia

14. *Sigma-Xi Poster Presentation*, April 6th, 2011, State University of New York at Buffalo, Buffalo, NY

Invited Talk:

1. *New Academic Leaders*, Scientific Undergraduate Research Institute, October 27th, 2017, New Jersey City University (NJCU)

2. *STEM Career Talk to the Mathematics, Engineering, Technology and Science (METS) Charter's Students*, May 19th, 2017, NJCU

3. *STEM Career Pathways*, Scientific Undergraduate Research Institute, April 28th, 2017, NJCU

4. *Research Symposium*, Scientific Undergraduate Research Institute (SURI), April 11th, 2017, NJCU

5. *Applied Mathematics Seminar*, Haldia Institute of Technology, August 8th, 2016, Haldia, India

6. *Applied Mathematics Seminar*, Jadavpur University, July 31st, 2015, Kolkata, India

7. *Research Symposium*, Scientific Undergraduate Research Institute (SURI), April 14th, 2015, NJCU

8. *Applied Mathematics Seminar*, State University of New York at Buffalo, November 30th, 2011, Buffalo, India

Workshop Participation:

1. *Quantitative Literacy across the Curriculum*, September 23rd and October 14th, New Jersey City University

2. *Quantitative Literacy across the Curriculum*, March 24th and May 5th, New Jersey City University

3. *Blackboard for Developmental Math*, Opening the Gate Workshop, April 15th, 2016, New Jersey City University

4. *Supplemental Instruction – What Math Faculty Need to Know*, January 15th, 2016, Hudson County Community College

5. *Understanding the Trends of New Developmental Math Curriculum at NJCU: Helping Our Students Succeed,* Opening the Gate Workshop, October 30th, 2015, New Jersey City University

6. *Using "MyMathLab" in Class*: Opening the Gate Workshop, March 27th, 2015, New Jersey City University

Research Interest:

Spectral methods, Higher order finite difference methods, Discontinuous Galerkin methods, Uncertainty Quantification, Polynomial Chaos, Partial Differential Equations, Stochastic Methods, Nonlinear Optics, Financial Mathematics, High Performance Computing, Nonlinear Dynamics, Linear and Nonlinear Waves, Pattern Formation, Population Dynamics Models, Waves in random media

University Service:

Current Member of the Following Committees:

1. Senate Instructional Technology Committee

2. General Education Committee for Assessment and Policy (GECAP)

3. Department of Mathematics Curriculum Committee

4. Department of Mathematics Scheduling Committee

5. Department of Mathematics Assessment Committee

6. Scientific Undergraduate Research Institute (SURI) Executive Committee

7. Minority Science and Engineering Improvement Program (MSEIP) Grant

8. Advisor of Kappa-Mu-Epsilon National Mathematics Honor Society

9. Mentoring Team of Robert Noyce Grant

10. Alternate Senator of Department of Mathematics

Served as a Member of the Following Committees:

1. Associate Dean of Science Search Committee

2. Chair of Mathematics Department Chair Election Committee

3. Mathematics Department Statistics Faculty Search Committee

4. "High Impact Practice" Team (Spring 2018) as a part of the Grant awarded by American Association of State Colleges and Universities (AASCU)

5. General Education Assessment Team

6. Spring 2017 STEM Fellow Program in Collaboration with SURI

7. Mathematics Department Math Education Faculty Search Committee

Computer Skills:

1. *Microsoft Certified System Professional* on Windows Client-Server

2. Languages: *C++, FORTRAN, PYTHON*

3. Mathematical Software Packages: *MATLAB, MAPLE, MATHEMATICA, MINITAB, GEOGEBRA*

4. Microsoft Office 365: *MS-WORD, EXCEL, POWERPOINT, MS-ACCESS*

5. Mathematics Teaching: *MyMathLab, Web-Assign, MathXL, Blackboard*

Grant and Sponsorship:

Co-Principal Investigator: *Spring Topological Dynamical Conference*, 2017. Sponsored by National Science Foundation (NSF), funded amount: $41000 (approximately)

Principal Investigator: *Computational Thinking at an Urban Minority Serving Institute*, Submitted to NSF in March 2017. Proposal was not accepted.

Course Taught:

New Jersey City University

Linear Algebra, Selected Topics in Linear Algebra, Survey of Modern Math, Complex Variables, Differential Equations for Engineers, Numerical Analysis, Financial Mathematics, Elementary Functions, Mathematical Statistics I, Mathematical Modeling, Calculus and Analytical Geometry I, Calculus for Business, Pre-Calculus for Business, Basic Statistics, Intermediate Algebra

Virginia Intermont College

Intermediate Algebra, Differential Equations, Linear Algebra, Calculus of Single Variables, Calculus of Several Variables, Introduction to Higher Mathematics

Research Mentoring:

Summer 2018: Under HSI - STEM and MSEIP Grant

Students 1 and 2: High Order Methods for Solving Nonlinear Systems of Equations: An Application to the Global Positioning System
Student 3: Traffic Flow Modelling: Conceptual Model and Specific Implementations

Summer 2017: Under HSI - STEM and MSEIP Grant

Student 1: *Experimental Modeling with High-Order Polynomials*
Student 2: *An Algorithmic Introduction to Numerical Simulation of Stochastic Differential Equations*
Student 3: *Nonlinear Differential Equations: Application to Chemical Kinetics*
Student 4: *Mathematical Modeling of Disease of Outbreak*

Spring 2018: Master Thesis

Student 1: Compare the Effect of Cooperative Learning on Students' Understanding of Solving Word Problems

Spring 2015: Master Thesis

Student 1: *Infinite Products and the Gamma Function*
Student 2: *Team Teaching*

References:

1. Dr. Beimnet Teclezghi
Professor, Dept. of Mathematics, New Jersey City University
Email: bteclezghi@njcu.edu, Phone: 201-200-3497

2. Dr. Deborah Bennett
Professor, Dept. of Mathematics, New Jersey City University
Email: dbennett@njcu.edu, Phone: 201-200-2201

3. Dr. Jae-Hun Jung
Associate Professor, State Univeristy of New York at Buffalo
Email: jaehun@buffalo.edu, Phone: 716-645-8814