Ashish Poonia

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PhD
Department of Mathematics
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EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
PhD	Indian Institute of Technology, Guwahati	8.00	2020-Present
Integrated M.Sc. (Mathematics)	Central University of Rajasthan	67.2 %	2014-2019
Senior Secondary	RBSE	72.00%	2014
Secondary	RBSE	78.33%	2012

RESEARCH INTEREST

My research efforts mainly focus on dealing with different aspects of ecological and epidemiological problems using various modelling methodologies and analyzing them with the help of qualitative analysis tools such as stability and bifurcation theory, center manifold theory etc. As a young researcher, I want to expand my knowledge of analytical tools to connect the real world ecological, medical and environmental challenges with different modelling approaches.

PUBLICATION

Peer Reviewed Articles

1. **A. Poonia**, S.P. Chakrabarty (2024). Dynamics of a multi-strain HIV/AIDS epidemic model with treatment and its adherence. **The European Physical Journal Plus**, 139(8), 1-22.

2. S. Shreya, S. Anindita, **A. Poonia**, and S.P. Chakrabarty (2023). Deterministic and stochastic models for Chronic Myelogenous Leukemia cellular populations in presence of immune response. **The Journal of Innovation Sciences and Sustainable Technologies**, 3(2), 79-98.

3. **A. Poonia**, S.P. Chakrabarty (2022). Two strains and drug adherence: An HIV model in the paradigm of community transmission. **Nonlinear dynamics**, 108(3), 2767-2792.

4. J.P. Tripathi, P.S. Mandal, **A. Poonia**, and V.P. Bajiya (2021). A widespread interaction between generalist and specialist enemies: The role of intraguild predation and Allee effect. **Applied Mathematical Modelling**, 89, 105-135.

Preprints

1. A. Kumar, **A. Poonia** (2023). Dynamical analysis and optimal harvesting policy of a prey-predator model with Holling type-III functional response.

TECHNICAL SKILLS

- **Programming**: MATLAB, Python, Mathematica
- **Utilities**: LaTeX, MS Office
- **Language**: English, Hindi
- **Misc.**: Academic Research, Teaching, LaTeX Typesetting and Publishing

TEACHING ASSISTANCE

- **DA 105: Linear Algebra** — *Dec. 2024 - March 2025*
  Cohort 2, Bachelor of Science in Data Science & AI — Coursera
- **DA 105: Linear Algebra** — *Feb. 2024 - May 2024*
  Cohort 1, Bachelor of Science in Data Science & AI — Coursera
- **MA 668: Algorithmic and High Frequency Trading** — *Winter 2024*
  Department of Mathematics — IIT Guwahati
- **MA 101: Mathematics-I** — *Fall 2023, Fall 2022, Fall 2020*
  Department of Mathematics — IIT Guwahati
- **MA 102: Mathematics-II** — *Winter 2022*
  Department of Mathematics — IIT Guwahati
- **MA 201: Mathematics-III** — *Fall 2021*
  Department of Mathematics — IIT Guwahati
- **Mathematical Portfolio Theory** — *Sept. 2020 - Dec. 2020*
  National Programme on Technology Enhanced Learning (NPTEL) — NPTEL

Achievements/Fellowships

- Senior Research Fellowship (CSIR)   Jan. 2022-Dec. 2024
- Junior Research Fellowship (CSIR)   Jan. 2020-Dec. 2024
- CSIR-UGC NET (JRF) in Mathematical Sciences (AIR-155)   June 2019
- CSIR-UGC NET (Lectureship) in Mathematical Sciences (AIR-82)   Dec. 2018

Key Courses Taken

Calculus, Differential Equation, Real Analysis, Complex Analysis, Linear Algebra, Abstract Algebra, Numerical Analysis, Functional Analysis, Mathematical Tools & Software, Modelling & Simulation, Dynamical Systems, Statistical Methods, Probability Theory, Advanced Probability, Statistical Foundation for Data Science, Programming in C, Scientific Computing with Python and its Applications, Comprehensive Data Science for Beginners

Professional Presentations

- **HIV Community Transmission under Treatment: A Two-strain Modelling Approach**
  The International Conference on Scientific Computation and Differential Equations **(SciCADE-2024)**, *National University of Singapore (NUS), Singapore.*
- **HIV Community Transmission: A Multi-strain Modelling Approach**
  10th International Congress on Industrial and Applied Mathematics **(ICIAM-2023)**, *Waseda University, Tokyo, Japan.*
- **Community Transmission of Multiple Strains under Treatment: A Mathematical Modelling Approach**
  89th Annual Conference of Indian Mathematical Society: an International Meet **(IMS-2023)**, *Department of Mathematics, BITS-Pilani, Hyderabad Campus, Telangana, India.*
- **Two Strain Dynamics of HIV Community Transmission: Competition vs Cooperation**
  International Conference on Advances in Biomathematics **(ICABM-2022)**, *Indian Society of Mathematical Modelling & Computer Simulation (ISMMACS), Amity University Uttar Pradesh, Lucknow Campus, India.*
- **Dynamics of a Widespread Food Web System Consisting Intraguild Predation with Allee Effect**
  Online National Conference on Recent Trends in Mathematical Modeling and Its Applications **(NCRTM-MA-2021)**, *Department of Mathematics, ICFAI Science School, ICFAI University, Tripura, India.*

Professional Development

- **Comprehensive Data Science for Beginners**
  Online Course Organised by iHUB Divyasampark (Joint initiative of Government of India, Department of Science & Technology and IIT Roorkee) in association with Ritvij Bharat Pvt. Ltd.
- **Modelling of Complex Systems using Mathematics**
  Faculty Development Programme, Division of Mathematics, School of Advanced Sciences (SAS), Vellore Institute of Technology, Chennai, India.
- **High-End Workshop (KARYASHALA) on Bifurcations and Chaos: Computations and Applications**
  Department of Mathematics, Indian Institute of Technology Indore, Indore, India.
- **Scientific Computing with Python and its Applications**
  Online Course Organised by Electronics & ICT Academy at Indian Institute of Technology Guwahati in association with Ritvij Bharat Pvt. Ltd.
- **Mathematical Modelling of Biosystems with Special Focus on Epidemiology**
  International Faculty Development Programme, Mizoram University, Mizoram, India.
- **Advanced LaTeX**
  Faculty Development Programme, Division of Mathematics, School of Advanced Sciences (SAS), Vellore Institute of Technology, Chennai, India.
- **Pandemic and Socio-Economic Determinants: The Uses, Mathematics and Computations behind the Modeling to Inform Decision Makers**
  Virtual International Workshop (VIW), National Institute of Technology, Uttarakhand, India.
- **Workshop on Bio-Mathematics (WoBM-2020)**
  Indian Institute of Technology Patna, Patna, India.
- **Faculty Development Programme on Biomathematics**
  Department of Mathematics, P.G.D.A.V. College, University of Delhi & Mahatma Hansraj Faculty Development Center, Hansraj College, University of Delhi, Delhi, India.
- **Celestial Mechanics & Dynamical Astronomy (CMDA-2019)**
  Department of Mathematics, Central University of Rajasthan, Rajasthan, India.
- **Short Term Training Course in Wildlife Biology: Tools and Techniques**
  Ecology and Rural Development Society & Wildlife Wing of Jodhpur Division, Rajasthan State Forest Department, Rajasthan, India.

Positions of Responsibility

- **HMC Member (Sports Secretory)**, Disang Hostel, IIT Guwahati *2021-2022*
- **PhD Placement Coordinator**, Department of Mathematics, IIT Guwahati *2023-2024*

Reviewer

- International Journal of Modelling and Simulation 2023-Present

Memberships

- Indian Mathematical Society Feb. 2024-Present

References

- **Prof. Siddhartha Pratim Chakrabarty** (Supervisor)
  Professor
  Department of Mathematics
  Mehta Family School of Data Science and Artificial Intelligence
  School of Business
  Indian Institute of Technology Guwahati, Guwahati-781039, Assam, India
  E-mail: pratim@iitg.ac.in

- **Prof. Natesan Srinivasan** (Head of Doctoral Committee)
  Professor, Department of Mathematics
  Indian Institute of Technology Guwahati, Guwahati-781039, Assam, India
  E-mail: natesan@iitg.ac.in

- **Dr. Jai Prakash Tripathi** (Master's Thesis Supervisor)
  Assistant Professor, Department of Mathematics
  School of Mathematics, Statistics & Computational Science
  Central University of Rajasthan, Ajmer-305817, Rajasthan, India
  E-mail: jaiprakash_math@curaj.ac.in