

Curriculum Vitae

ANUPAM PRIYADARSHI, Ph. D.

Personal Information:

Date of birth: 06th May 1983

Nationality: Indian

Marital Status: Married

Address: Department of Mathematics
Institute of Science
Banaras Hindu University
Varanasi-221005

Mobile: 9450352421

Email: anupam240@gmail.com



Research Interests:

Mathematical Modeling:

Applications of ODE in real world problems, Food chain and food web dynamics, Adaptive dynamics in Ecosystem, Plankton modeling (Micro-scale and Macro-scale plankton modeling), Mathematical Ecology

Nonlinear Dynamics:

Bifurcation analysis and Chaos theory, Synchronization of Chaotic systems, Chaos in High-dimensional systems, Nonlinear ODE and Simulations

Complex Dynamics in Neuroscience

Dynamics of Neurological Diseases, Signals and their data interpretations, Epilepsy seizures and its control

Education:

Post-doctoral Fellow: September 2014 – Jan 2016

Laboratory of Ocean Ecosystem Dynamics
Department of Ocean Sciences

Tokyo University of Marine Science and Technology
Tokyo, Japan

Visiting Post-doctoral Fellow: Feb 2014- July 2014

National Institute of Mathematical Biology and Synthesis
1123 Volunteer Blvd, University of Tennessee
Knoxville, TN 37996-3410

Post-doctoral Fellow: Jan 2013-August 2014

Lab. of Theoretical Ecology, Institute of Entomology
Biology Center ASCR, Academy of Science Czech Republic
37005 Ceske Budejovice, Czech Republic

Ph. D. : August 2008-September 2012

Department of Mathematics
Indian Institute of Technology Roorkee, India.

Thesis topic: **Complex Dynamical Behavior of Some Food chain and Food web Models**

M. Sc.: July 2006- June 2008

Department of Mathematics,
Banaras Hindu University, Varanasi, India.
Specialization: Pure and Applied Mathematics

Marks : 7.97 (CGPA out of 10)

B. Sc.: July 2002-June 2005

Department of Mathematics, Science College,
Patna University, Patna, India.
Specialization: Mathematics (major), Physics, Chemistry (minors)

Marks : 71.13% (University topper in BSc II and III year)

Intermediate : July 1998-June 2000

Science College, Patna

Bihar Intermediate Examination Council, Patna
Specialization: Mathematics, Physics, Chemistry, Compt. Sc. English, Hindi
Marks : **80.78%**
Secondary Exam : June 1998

Netarhat Residential School, Palamu, Ranchi
Bihar School Examination Board, Patna
Specialization: Mathematics, Physics, Chemistry, Compt. Sc. English, Hindi
Marks : **84.43%**

Professional Experience:

Feb 2016 – Present

Assistant Professor : Department of Mathematics
Banaras Hindu University, Varanasi-221005

Sept 2014- Jan 2016

Post-doctoral Fellow : Lab. of Ocean Ecosystem dynamics
Tokyo University of marine Science and
Technology, Shinagawa, **Tokyo, Japan**

Feb 2014 - July 2014

Visiting Fellow: National Institute of Mathematical Biology and Synthesis
1123 Volunteer Blvd, **University of Tennessee**
Knoxville, TN 37996-3410 USA

Jan 2013 - August 2014

Post-doctoral Fellow: Lab. of Theoretical Ecology, Institute of Entomology
Biology Center ASCR, Academy of Science Czech Republic
37005 **Ceske Budejovice, Czech Republic**

July 2012 – December 2012

Assistant Professor: National Institute of Science and Technology
Berhampur, Odissa, India.

August 2008- June 2012

IITR Assistantship: Department of Mathematics
Indian Institute of Technology Roorkee, India

Teaching Experience:

Feb 2016-Present: Banaras Hindu university, Varanasi

July 2013-Feb. 2014: Calculus I (**International Students @ Univ. of South Bohemia**)

Augt. 2012-Nov. 2012: Calculus I (BTech) Assistant Prof. @ NIST, Berhampur, India

2008-2012: Graduate Teaching Assistant

Department of Mathematics,

Indian Institute of Technology Roorkee, India.

MA-101: Calculus of Several Variables (Autumn Sem. 2008, 2009)

MA-102: Calculus of Integration (Spring Sem. 2009)

MA-202: Numerical Analysis (Spring Sem. 2010)

MA-501B: Advanced Numerical Analysis (Autumn Sem. 2010, 2011)

Projects:

[1] **BHU-UGC New Faculty start up Grant**, Awarded by BHU Rs. 1,25,000/

[2] **SERB-DST Early Career Research Award, ECR/2017/000279**, Awarded by DST Rs. 23,87,220/

[3] **UGC-Young faculty Start-up Grant in Mathematics**, Awarded by UGC Rs 10,00,000/

Honors And Awards:

NBHM Post-Doctoral Fellowship - 2012

Dr. DS Kothari Post-Doc Fellowship - 2012

CSIR – “LS” (NET) (Mathematical Sciences), Dec. 2007

GATE – Qualified (Mathematical Sciences), Feb. 2007

IITR Research Fellowship : 2008-2012

Grant no. MHR02-23-200-304.

Ministry of Human Resources and Development(MHRD), India.

Best Research Student Paper Award at International Conference CMCGS 2012, Singapore, Feb. 2012

Membership:

Member of Global Science Technology Forum – 2012

Student Membership of SIAM –since 2011

CMBE Membership – 2010

Center for Mathematical Biology and Ecology, Jadavpur University, Kolkata, India

Life membership- Mathematical Society-BHU

Languages And Skills:

English:Advanced (Reading, Writing and Oral)

Native language:Hindi

Computer languages: **MATLAB, MATHEMATICA, AUTO, XPPAUT, MATCONT, DYNAMICS, GNUPLLOT, Statical Software R, GOTM**

List of Publications:

(a). Published in Referred Journals

- [1] *micro-scale patchiness enhances trophic transfer efficiency and potential plankton biodiversity*, Priyadarshi, A., Smith, S. L., Mandal, S., Tanaka, M. & Yamazaki, H. *Sci Rep* **9**, 17243 (2019) doi:10.1038/s41598-019-53592-6 (**Nature**)
- [2] *Micro-Scale Variability Impacts the Outcome of Competition Between Different Modeled Size Classes of Phytoplankton*. S. mandal, SL Smith, Priyadarshi, A., Yamazaki, H. *Forntiers in Marine Sciences*. 22 May 2019 | <https://doi.org/10.3389/fmars.2019.00259> (**Impact Factor=3.65**)

- [3] *Modeling the combined effects of Physiological Flexibility and Micro-scale variability for Plankton Ecosystem Dynamics.* Priyadarshi, A. *Encyclopedia of Ocean Sciences(ELSEVIER)*, CH10955. *Earth System and Environment Sciences(Book)*. July 2018.
- [4] *Plant-mycorrhizal interactions mediate plant community coexistence by altering resource demand.* Jiang, J.; Moore, J. A. M.; Priyadarshi, A.; Classen, A. T. *Ecology*. 2017, 98, 187-197 doi 10.1002/ecy.1630 **(Impact Factor=5.175)**
- [5] *Micro-scale variability enhances trophic transfer and potentially sustains biodiversity in plankton ecosystems.* Priyadarshi, A.; Mandal, S.; Smith, S. L.; Yamazaki, H. *Journal of Theoretical Biology*. 2017, 412, 86-93 **(Impact factor: 2.303)**
- [6] *A 1D physical-biological model of the impact of highly intermittent phytoplankton distributions.* Mandal, S.; Homma, H.; Priyadarshi, A.; Burchard, H.; Smith, S. L.; Witz, K. W.; Yamazaki, H. *Journal of Plankton Research*. 2016, 1-13 **(Impact factor: 2.150)**
- [7] *L-shaped prey isoclines in the Gause predator-prey experiments with a prey refuge.* Krivan, V.; Priyadarshi, A. *Journal of Theoretical Biology*. 2015, 370, 21-26 **(Impact Factor: 2.303)**
- [8] *Geometry of the Poincaré compactification of a Four dimensional Food-web System.* Priyadarshi, A.; Banerjee, S.; Gakkhar, S. *Applied Mathematics and Computation*. 2014, 226, 229-237 **(Impact Factor : 1.672)**

- [9] *Dynamics of Leslie-Gower type Generalist Predator in a Tri-trophic Food Web System.* Priyadarshi, A.; Gakkhar, S. *Communications in Nonlinear Science and Numerical Simulation*. 2013, 18, 3202-3218 (**Impact Factor: 2.569**)
- [10] *Complex behavior in four species food-web model.* Gakkhar, S.; Priyadarshi, A.; Banerjee, S. *Journal of Biological Dynamics*. 2012, 6, 440-456 (**Impact Factor : 1.033**)
- [11] *Role of Protection in a Tri-trophic Food Chain Dynamics.* Gakkhar, S.; Priyadarshi, A.; Banerjee, S. *Journal of Biological Systems*. 2012, 20, 155-175 (**Impact Factor : 0.955**)
- [12] *Dynamics of Density-dependent Closure term in a Simple Plankton Model.* Priyadarshi, A.; Gakkhar, S.; Banerjee, S. *CICS*. 2012, 283, 193-200, Springer-Verlag Berlin Heidelberg 2012 (**Impact Factor not available**)
- [13] *Fluctuating Nutrient Input in a simple Plankton System.* Priyadarshi, A.; Gakkhar, S.; Banerjee, S. *Journal of Nonlinear System and Application*. 2012, 3, 10-21(**Impact Factor not available**)
- [14] *Role of Density Dependent Protection in a Food Chain System.* Priyadarshi, A.; Gakkhar, S.; Banerjee, S. *Int. Jour. of Mathematical Science and Applications*. 2012, 2, 425-433 (**Impact Factor not available**)
- [15] *Complex Dynamics of Plankton system with Hyperbolic and Sigmoidal Mortality of Zooplankton.* Priyadarshi, A.; Banerjee, S. ;Gakkhar, S. *Review Bulletin of Calcutta Mathematical Society*. 2011, 19, 219-230(**Impact Factor not available**)

(c). Papers in Conference Proceedings

[1] *Impact of higher central moment approximations in system of differential equations.*

Chandra, R; Priyadarshi, A. *AIP American Institute of Physics. June 2018.*

[2] *Mathematical modelling of Toxoplasma Gondii and host immune response.*

Gautam,A.;Priyadarshi, A. *American Institute of Physics. June 2018.*

[3] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *A Numerical Study of a Simple Plankton System with Fluctuating Nutrient Input*, IJCA, Proceedings of The National Workshop-Cum-Conference on Recent Trends in Mathematics & Computing 2011, The Technical Institute of Textile & Sciences, Bhiwani, Haryana May 21, 2011, ISSN No.819039523X.

[4] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *Complexity to order: Protection in a tri-trophic Food Chain Dynamics*, **Annual International conference on Computational Mathematics, Computational Geometry & Statistics (CMCGS 2012), Singapore**, Jan 30-31, 2012, ISSN: 2251-1911, pp 55-59. Received “**Best Research Paper Award**” <http://dl4.globalstf.org/?wpsc-product=complexity-to-order-protection-in-a-tri-trophic-food-chain-dynamics>

(d). Papers presented in Conference but not published

[1] A. Priyadarshi, “Closure modelling: Biodiversity and Heterogeneity” International Academic meet, **23 September-07 October 2017**, Tokyo University of Marine Science and Technology, **Shinagawa, Tokyo**

[2] **Closure Modeling approach in plankton dynamics: Impact of spatial heterogeneity and biodiversity**, International Conference on Mathematical Modeling and Simulation (ICMMS-2016), 29-31 August 2016, Banaras Hindu University, Varanasi

[3] A. Priyadarshi, “Variability and Intermittency in NPZ Closure model: Biodiversity and Heterogeneity” Graduate Seminar Lab, 08-17 March 2017, Tokyo University of Marine Science and Technology, Shinagawa, Tokyo

- [4] A. Priyadarshi, *Chaos in a four species food web system*, CMPD4, May 29-June 2, 2013, North University of China, Taiyuan, China
- [5] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *Complex Behavior of Plankton Systems with Hyperbolic and Sigmoidal Mortality of Zooplankton*, National Conference on Theoretical Biology and Biomathematics (NCTBB-2010) , Dec. 15-16, 2010, Department of Mathematics, Jadavpur University, Kolkata, India.
- [6] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *Complex Behavior of Plankton Systems with Hyperbolic and Sigmoidal Mortality*, International Conference on Recent Development in Mathematical Sciences and their applications (ICRDMSA-2010) , Dec. 09-11, 2010, Calcutta Mathematical Society, Kolkata, India.
- [7] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *Chaotic behaviour in a three species food web*, National Conference on “Mathematical Modelling and Simulation” (NCMMAS-2009), Jan 9-11, 2009, Jiwaji University, Gwalior and ABV-IITM, Gwalior, India,
- [8] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *Role of density dependent protection in a food chain systems*, 1st International Conference on Mathematical Sciences and applications, Dec.17-18, 2011, New Delhi, India.
- [9] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *The effects of protection in Food-chain system in nature*, Proceeding of National Conference on Environment and Biodiversity of India, page no. 60, 30-31 Dec, 2011, JamiaMiliaIslamia, New Delhi, India.
- [10] A. Priyadarshi, S. Gakkhar and Sandip Banerjee, *Chaos Control in a Four-species Food web Model*, International Conference on Advances in Modeling, Optimization and Computing (AMOC-2011), 05-07 Dec, 2011, IIT Roorkee, India.

(e). Research Colloboration:

- [1] **Prof.Hidekatsu Yamazaki**, Lab of Ocean Ecosystem Dyanmics, Tokyo Univeristy of Marine Science and Technology, Shinagawa, Tokyo
- [2] **Prof.S Lan Smith, JAMSTEC, Tokyo, Japan**

[3] **Dr. Sandip Mandal, PHFI, New Delhi**

[4] **Dr. Jiang Jinag, NIMBioS, USA**

[5] **Prof. Vlastimil Krivan, Ceske Budejovice, Czech Republic**

(f). Invited Talks:

[1] **“Closure Modeling: Variability effect on Biodiversity”** Graduate Seminar, Lab of Ocean Ecosystem Dynamics, Tokyo University of Marine Science and Technology, **Tokyo Japan 23 Sept -07 October 2017**

[2] **“Impact of Heterogeneity and Biodiversity through Modeling”** Graduate Seminar, Lab of Ocean Ecosystem Dynamics, Tokyo University of Marine Science and Technology, **Tokyo Japan 08-17 March 2017**

[3] **“NPZ Closure Modeling and Biodiversity”** Lab of Ocean Ecosystem Dynamics, Tokyo University of Marine Science and Technology, **Tokyo Japan 23-29 October 2016**

[4] **“Parameter Estimation and L-shaped Isocline”**, National Workshop on Mathematical Modeling and Simulations, Department of Mathematics, Banaras Hindu University, Varanasi-221005, **20-28 August 2016**

[5] **“Coefficient of Variation and NPZ Closure Modeling”** Lab of Ocean Ecosystem Dynamics, Tokyo University of Marine Science and Technology, **Tokyo Japan 28 May-04 June 2016**

[6] Invited talk, “plankton modeling and variability’s role”, 28 August 2015, **JAMSTEC Tokyo, Japan**

[7] Invited Talk, *“Role of Variability in Plankton Dynamics: Closure Modelling Approach”*, Ecosystem Modeling Symposium, March 4-5, 2015, **Atmosphere and Ocean Research Institute, University of Tokyo, Japan**

[8] Invited Talk, Small-scale Microstructured Plankton Dynamics, Institute of Oceanography, **National Taiwan University Taipei, 14-16 January 2015**

[9] Invited for a talk (short communication) “Role of protection in tri-trophic food chain model” at **Tenth JISD 28 May to 1 June 2012 at Barcelona, Spain**

(f). Workshops:

Convener & Organizing secretary:

- [1] A National Workshop entitled “*Differential Equation, Bifurcation and Chaos with Numerical Simulation in MATLAB*” during October 27-28, 2018 is organized at BHU Varanasi.

Delivered Talk/Participations:

- [2] National Workshop on Mathematical Modeling and Simulations, 20-28 August 2016. Department of Mathematics, Banaras Hindu University, Varanasi
- [3] Workshop on Plant Vector Viruses, March 17-19, 2014, NIMBioS, UTK, Knoxville
- [4] Tenth JISD 28 May to 1 June 2012 at Barcelona, Spain
- [5] Workshop and Symposium on Mathematical Ecology Organized by IISER-Kolkata, (Indian Institute of Science and Research, Kolkata) during 07-14 December 2010.
- [6] SERC SCHOOL ON NON-LINEAR DYNAMICS’ held at Department of Physics and Astrophysics, Delhi University during December 8-24, 2009.
- [7] Study Group Meeting On Industrial Problems- Organized by IIT Roorkee, March 16-21, 2009
- [8] Summer Program in Mathematics (SPIM - 2007)”- organized by Harish Chandra Research Institute, Allahabad, U.P.
- [9] National conference on Modern Analysis and Allied Areas – held at BHU, Varanasi, Feb. 23-24, 2007.

List of Referees:

1. Prof. Sunita Gakkhar

Department of Mathematics
Indian Institute of Technology
Roorkee-247667, India
Email: sungkfma@iitr.ac.in
Mobile: +919719242545

2. Dr. Sandip Banerjee

Associate Professor
Department of Mathematics
Indian Institute of Technology
Roorkee-247667, India
Email: sandofma@iitr.ac.in
Mobile: +919410511782

3. Prof. Vlastimil Krivan

Chair of Laboratory of Theoretical Ecology

Biology Center, Academy of Sciences of the Czech republic
Chair of Department of Mathematics and Biomathematics
University of South Bohemia, Czech republic
Phone: [+420] 38 777 5365
E-mail: vlastimil.krivan@gmail.com

4. Prof.Hidekatsu Yamazaki

Lab. of Ocean Ecosystem Dynamics
Tokyo University of Marine Science and Technology
4-5-7 Konan, Minato-ku, Tokyo 108-8477 Japan
TEL:81-(0)3-5463-0728
Email: hide@kaiyodai.ac.jp