Technical Programme of 6th CHINA INDIA JAPAN KOREA Mathematical Biology Colloquium Cum Conference
(August 23-26, 2017)
Venue: PBCEC, VH
Indian Institute of Technology, Kanpur

August 23, 2017 (Day 1)

➢ 7:30 - 8:45  Breakfast-cum-Registration

➢ 9:00 - 9:30  Inauguration [Seminar Room A]

   • 9:00  Lamp Lighting
   • 9:02  Invocation Prayer
   • 9:05  Welcome Address by Prof. B.V. Rathish Kumar, CIJKMBCC Coordinator
   • 9:08  Address by Prof. Manindra Agrawal, Deputy Director, IIT Kanpur
   • 9:15  Address by Prof. J.B. Shukla, Conference Chair
   • 9:20  Address by Prof. Yasuhiro Takeuchi, Foreign Dignitary
   • 9:25  Address by Prof. A.K. Lal, HoD, Dept. Math & Stat, IIT Kanpur
   • 9:27  Vote of Thanks by Prof. S. Ghorai, CIJKMBCC Co-Coordinator
   • 9:30  Hi-Tea

➢ 10:00-11:00  Plenary Talk-1 (Chair: Prof. Yasuhiro Takeuchi, Japan) [Seminar Room A]

   Prof. G. Rangarajan  (Department of Mathematics, IISc, Bangalore) TBA

➢ 11:00-13:00  Parallel Technical Sessions P1, P2

➢ Technical Session P1: Mini symposium on Dynamical Systems with application in Biology (Organizers: Prof. Ryusuke Kon, University of Miyazaki, Japan and Prof. Mansoor Saburov, IIUM, Malaysia) [Seminar Room A]

   • 11:00-11:30  Dr. Ryo Oizumi (National Institute of Population and Social Security Research, Japan)  Structure population models for two fold stochasticity: heterogenenitty and variable environment

   • 11:30-12:00  Prof. G Rangarajan (Department of Mathematics, IISc, Bangalore) TBA

   • 12:00-12:30  Dr. Dinesh Kumar (Department of Computational and Data Sciences, IISc Bangalore)  Additional Food and Predator-Prey Dynamics

   • 12:30-13:00  Prof. Ryusuke Kon (Faculty of Engineering, University of Miyazaki, Japan)  A dynamic dichotomy in semelparous Leslie matrix models
Technical Session P2: Mini symposium on Computational Biology - 1
(Organizers: Prof. B V R Kumar & Prof. A.K.Sharm, IITK) [Seminar Room B]

- 11:00-11:30 Prof. Pranay Goel (IISER Pune) The redox state in type 2 diabetes
- 11:30-12:00 Prashant K Srivastava (Department of Mathematics, IIT Patna) Impact of Information and Treatment on a Disease Dynamics: Modeling and Control
- 12:00-12:30 N. Patil (IIT Kanpur) Fluorescence based optical tomography

13:00 – 14:15 Lunch Break

14:15 - 15:30 Parallel Technical Sessions P3, P4

Technical Session P3: Mini symposium on Modeling of Epidemiological Systems-1 (Organizers: Prof. A K Mishra, BHU Varanasi & Prof. Ram Naresh HBTI Kanpur) [Seminar Room A]

- 14:15-14:45 Dr. Shikha Singh (PPN College Kanpur) Effect of Global Warming on the spread of carrier dependent infectious diseases: A mathematical model
- 14:45-15:00 Dr. Agraj Tripathi (BGI Kanpur) Optimal Control of HIV infection with media alert in the population
- 15:00-15:15 Mr. Alok Gupta (BHU Varanasi) A mathematical model for biological control of carrier-dependent infectious diseases

Technical Session P4: Computational Biology-2 (Organizers: Prof. Paradasani, MNIT Bhopal & Prashant Srivastava, IIT Patna) [Seminar Room B]

- 14:15-14:30 Dr. Sourav Kumar Samal (ISI Kolkata) Cancer Model for angiogenic switch with both chemotherapy and anti-angiogenic treatment.
- 14:30-14:45 Mr. Mukthar Khanday (Univ of Kashmir) Modeling diffusion process in human physiological systems.
- 14:45-15:00 Dr. Uma Arora (Noida) Mathematical Model to study the effect of non-ionizing EM radiation of mobile phone on human head in presence of cell tower radiation.
- 15:00-15:15 Mr. Shivam Saxena (BHU) Reaction Diffusion equations and their applications
- 15:15-15:30 J. P. Chaudhary (Department of mathematical Sciences, IIT BHU) Study of Blast Wave Problem in a non ideal Dusty Gas

15:30 – 15:45 Tea Break
15:45 -17:00  Parallel Technical Sessions P5, P6

Technical Session P5: Mini symposium on Modeling of Epidemiological Systems – 2 (Chairs: Prof. T Kuniya, Kobe university, Japan & Prof. K N Rai, IIT BHU) [Seminar Room A]

- 15:45-16:15  Prof. A K Mishra  (BHU) *Epidemic and media campaigns: Understanding the interplay from mathematical standpoint*

- 16:15-16:45  Prof. Ram Naresh  (HBTI) *Modeling the effect of sanitation on the spread of bacterial disease in a human population*

- 16:45-17:00  Mr. Rajanish Rai  (BHU Varanasi) *Modelling the effect of logistically growing awareness programs on the spread of infectious diseases with isolation.*

Technical Session P6: Mini symposium on Computational Biology – 3 (Organizers: Prof. S Ghorai, IIT Kanpur & Prof. A.K.Sharma, IIT Knapur) [Seminar Room B]

- 15:45-16:15  Prof. P. Muthu  (NIT Warangal) *Hydromagnetic Squeeze Film between anisotropic porous rough plates*

- 16:15-16:30  Priyanka Singh  (NIT Patna) *Stokes flow past a membrane built by non-homogenous porous cylindrical particle*

- 16:30-16:45  Mr. Ajay Kumar  (IIT BHU) *Numerical solution of the moving boundary problem in drug release devices by Chebyshev wavelets method*

- 16:45-17:00  Koushik Ghosh  (Department of Mathematics, University Institute of Technology, University of Burdwan) *Investigation of Self Similar, Periodic, Nonlinear and Complex Phenomena in ECG Signal*

17:00 -18:00  Plenary Talk-2 (Chair: Prof. J.B.Shukla, Presider IAMMS) [Seminar Room A]

Prof. Yasuhiro Takeuchi (Aoyama Gakuin University, Japan) *Rosenzweig-MacArthur model and Lotka-Volterra prey-predator model.*
August 24, 2017 (Day 2)

- **10:00-11:00** Plenary Talk-3 (Chair: Prof. Yasuhiro Takeuchi (Aoyama Gakuin University, Japan)) [Seminar Room A]
  
  Prof. Cheol-Min Ghim (Ulsan National Institute of Science and Technology, South Korea)  
  *Facilitated Altruism in Structured Populations*

- **11:00 -11:15** Tea Break

- **11:15-13:00** Parallel Technical Sessions P7, P8

  - **Technical Session P7:** Mini symposium on Computational Biology-4  
    (Organizers Prof. B.V. Rathish Kumar & Prof. G.P. Rajasekhar IITKgp) [Seminar Room A]
    
    - 11:15-11:45  Prof. Bujurke (Dharwad University)  
      *Stability of flows in a compliant channels using interactive boundary layer theory*
    
    - 11:45-12:15  Prof. Karmeshu K (JNU)  
      *TBA*
    
    - 12:15-12:45  Prof. Paradasani (MNIT Bhopal)  
      *Mathematical models for analysis of thermal changes in human body organs*

  - **Technical Session P8** (Chair: Prof. Cheol-Min Ghim, Ulsan National Institute of Science and Technology, South Korea & Prof. Prawal Sinha, IITK) [Seminar Room B]
    
    - 11:15-11:45  Prof. Kei Tokita (Graduate School of Informatics, Nagoya University, Japan)  
      *Diversity, stability and the relative species abundance of replicator dynamics with complex interspecies interactions*
    
    - 11:45-12:15  Yoichi Enatsu (Department of Applied Mathematics, Tokyo University of Science)  
      *Dynamics of epidemic models with a latent period*
    
    - 12:15-12:45  Toshikazu Kuniya (Kobe university, Japan)  
      *Numerical approximation of the basic reproduction number R₀ for age-structured epidemic models*
    
    - 12:45-13:00  Motohide Seki (Faculty of Science, Kyushu University, Japan)  
      *Population Genetic Model on Three Alleles at the Same Locus on X-chromosome for the Colour Vision Polymorphism in the New World Monkeys*

- **13:00 -14:15** Lunch Break

- **14:15 - 15:30** Parallel Sessions P9, P10

  - **Technical Session P9:**  
    (Chair Prof. P. Muthu, NIT Warangal & Prof. Bujurke, Dharwad University) [Seminar Room A]
    
    - 14:15-14:30  Sneha Jaiswal (MNIT Allahabad)  
      *Effect of Inclined Magnetic Field on the flow of Two-Phase fluids through horizontal Porous Channel*
14:30-14:45  Dr. Shweta Raturi (IITK) *Hydrodynamics of the Motion of Non-Newtonian Spherical particles, droplets and bubbles with surfactant*

14:45-15:00  Ms. Meena P (IITK) *Monodomain Vs Bidomain Vs Tridomain Models in CEA – A Numerical Study*

15:00-15:15  Shashi Kant (Indian Institute of Technology BHU) *An investigation on a two dimensional problem of Mode-I crack under a heat conduction with a delay*

15:15-15:30  Neeraj Kumar Tripathi (Department of Mathematical Sciences, IIT BHU) *Shifted Legendre operational matrix method for solving fractional order Lane-Emden equation*

**Technical Session P10: Session on Ecology-1 (Chairs: Prof. Ryusuke Kon, University of Miyazaki, Japan & Prof. A K Mishra, BHU) [Seminar Room B]**

14:15-14:30  Anupam Priyadarshi (Department of Mathematics, BHU) *Impact of Environmental Variability on Biodiversity and Existence of Top Predator: A Clear Evidence from Phytoplankton Data at Tokyo Bay*

14:30-14:45  P. Mishra (Department of Mathematics, NIT Raipur) *Dynamics induced by defensive ability in a predator-prey system*

14:45-15:00  Nayana Mukherjee (IITK) *Approximated spiral and target patterns in Bazykin’s prey-predator model: multiscale perturbation analysis*

15:00-15:15  P. K. Tiwari (Agricultural and Ecological Research Unit, ISI, Kolkata) *Effects of fertilizers used in agricultural fields on algal blooms*

15:15-15:30  M. Chaudhary (ABV-Indian Institute of Information Technology and Management, Gwalior) *Study of a Non-linear Dynamical Model for the Exploitation and Conservation of Natural Populations*

**15:30 – 15:45  Tea Break**

**15:45 - 17:00  Technical Parallel Sessions P11, P12**

**Technical Session P11: Computational Biology - 5 (Chair: Prof. G.P. Rajasekhar, IIT Kgp & Prof. S Ghorai, IITK) [Seminar Room A]**

15:45-16:00  Sumit Kumar (NIT Silchar) *Newtonian and non-Newtonian blood flow analysis of human abdominal artery: Computational study*

16:00-16:15  Prachi D Dwidmuthe (ICT Mumbai) *Steady state and transient CFD simulation of blood flow through Human Aorta*

16:15-16:30  Manishaa (IITK) *A numerical study of blood flow dynamics in a constricted TCPC system*

16:30-16:45  Dr. Vijayakumar Shukla (IIT BHU) *Study of transport of particle-fluid suspension with dilating peristaltic waves*
16:45-17:00  Ms. Ankita Dubey (MNNIT, Allahabad)  *One dimensional modeling of Blood Flow through compliant artery using FEM.*

**Technical Session P12: Ecology-2 (Chairs: Prof. Kei Tokita, Nagoya University, Japan & Dr. Shikha Singh, PPN College, Kanpur) [Seminar Room B]**

- 15:45-16:00  R. P. Gupta  (Institute of Science, BHU)  *Period Doubling Routes to Chaos in a Predator-Prey Model with a Scavenger*
- 16:00-16:15  Jyoti Gupta  (Jiwaji University, Gwalior)  *Eco-epidemic Prey-Predator Dynamics with Different Rate of Predation*
- 16:15-16:30  Divya Chaturvedi  (School of Mathematics and Allied Sciences, Jiwaji University, Gwalior)  *Modelling the effect of increased salinity due to pollution on the dynamics of a stage-structured Crowley-Martin type prey-predator system*
- 16:30-16:45  Anuraj Singh  (ABV-Indian Institute of Information Technology and Management Gwalior, M.P.)  *Global Stability in a System Using Graph Theoretical Approach*
- 16:45-17:00  Amita Tripathi  (BHU)  *Effects of aerosols in making artificial rain: A mathematical study*

**17:00 - 18:00  Plenary Talk - 4 (Chair: Prof. J.B.Shukla, IAMMS) [Seminar Room A]**

Prof. V. P. Saxena  (Jiwaji University, Gwalior)  *Mathematical Study of Transdermal Drug Distribution in Human Body*
August 25, 2017 (Day 3)

- **10:00-10:55** Plenary Talk-5 (Chair: Prof. Cheol-Min Ghim, Ulsan National Institute of Science and Technology, South Korea) [Seminar Room A]
  
  Prof. Amit Huppert (Bio-statistical Unit, The Gertner Institute for Epidemiology and Health Policy Research, Tel-Aviv University) TBA

- **11:00-11:15** Tea Break

- **11:15 -13:00** Parallel Technical Sessions P13, P14,P15

  Technical Session P13: (Chair: Dr. Ryo Oizumi, National Institute of Population and Social Security Research, Japan & Prof. B V Rathish Kumar, IITK) [Seminar Room A]
  
  - 11:15-11:45 Hiroshi Nishiura (Hokkaido University, Japan) *Modelling the transmission dynamics of Middle East respiratory syndrome*
  - 11:45-12:15 Ryusuke Kon (Faculty of Engineering, University of Miyazaki, Japan) *Permanence of Lotka-Volterra equations with cyclic symmetry*
  - 12:15-12:30 Kwang Su Kim (Department of Mathematics, Pusan National University, Busan, South Korea) *ODE and SDE model of tumor virotherapy*
  - 12:30-12:45 Chunyoung Oh (Chonnam National University, Korea) *Optimal Intervention Strategies for the Spread of Obesity in Korea*

  Technical Session P14: Session on Computational Biology-6 (Chair: Prof. Prawal Sinha, IITK & Prof. Pranay Goel, IISER Pune) [Seminar Room B]
  
  - 11:15-11:45 Prof. Sunita Gakkhar (IIT Roorkee) *Dynamic Complexities in a Integrated Pest Control Models*
  - 11:45-12:15 Prof. G. P. Rajasekhar (IIT KGP) *TBA*
  - 12:15-12:45 Prof. K.N. Rai (IIT BHU) *Mathematical Modeling of Heat Transfer in Biological Tissues*

  Technical Session P15: Mini symposium on natural resource modeling (Orgnaizer: Prof. Manju Agarwal) [Seminar Room C]
  
  - 11:15-11:30 Alok Agarwal (Amity University, Lucknow) *The effect of primary and secondary toxicants on a subclass of biological species: A model*
  - 11:30-11:45 Rachana Pathak (Department of Mathematics & astronomy, University of Lucknow) *Modeling the Depletion of Forest Resources due to Population and Industrialization and Its Effect on Survival of Wildlife Species*
• 11:45-12:00  Shyam Sunder  (PSIT Kanpur)  *Modeling and analysis of the control of toxic air pollutants from the atmosphere*

• 12:00-12:15  Kusum Lata  (BHU)  *A mathematical model to control population pressure and conserve forestry resources by applying economic efforts*

• 12:15-12:25  Ms Preeti  (Department of Mathematics & astronomy, University of Lucknow)  *Dynamical behavior of prey-predator system having Beddington-DeAngelis functional response with impulsive control*

• 12:25-12:35  Ms Niharika  (Department of Mathematics & astronomy, University of Lucknow)  *Control of Atmospheric Carbon Dioxide by Imposing Environmental Tax: A Mathematical Model*

💡 **13:00 – 14:15 Lunch Break**

💡 **14:15 – 15:30 Parallel Sessions P15, P16**

💡 **Technical Session P16:  (Chairs: Prof. Yoichi Enatsu, Tokyo University of Science, Japan & Prof. Ram Naresh, HBTI Kanpur ) [Seminar Room A]**

• 14:15-14:30  Matri Verma  (Department of Mathematics, BHU)  *Modeling the effects of rising levels of carbon dioxide and temperature on crop production*

• 14:30-14:45  Ritesh Pandey  (Shambhunath Institute of Engineering and Technology, Allahabad)  *A Delay Mathematical Model for Malaria Transmission and Chemical Control*

• 14:45-15:00  Omprakash Singh Sisodiya  (Jiwaji University, Gwalior)  *The Role of Seasonality and Sanitation in Cholera Epidemics and its Control by Continuous Disinfectant*

• 15:00-15:15  Ashish Kumar Mishra  (Pranveer Singh Institute of Technology, Kanpur)  *Modeling the abatement of global warming gas CO₂ from the atmosphere: Effect of seaweed cultivation*

• 15:15-15:30  Avinita Gautam  (DST CIMS, BHU)  *Epilepsy-its chaotic behaviour and mathematical modeling*

💡 **Technical Session P17:  (Chairs: Prof. Hiroshi Nishiura, Hokkaido University, Japan & Prof. Sunita Gakkhar, IIT Roorkee) [Seminar Room B]**

• 14:15-14:30  Anuradha Yadav  (Department of Mathematics, IIT Patna)  *Infectious Diseases Control through Vaccination and Treatment with Delay Effect*

• 14:30-14:45  Kunwer Singh Mathur  (Dr. Harisingh Gour Vishwavidyalaya, Sagar, M.P.)  *An SVIHRS stage-structured model with isolation and media induced vaccination*

• 14:45-15:00  Anuj Kumar  (School of Mathematics, Thapar University, Patiala)  *Nonlinear Dynamics of Infectious Diseases via Information-induced Vaccination and Saturated Treatment*
15:00-15:15  Dig Vijay Tanwar (MNNIT Allahabad) *New exact solutions of (2+1)-dimensional Bogoyavlenskii equation using similarity transformations method*

15:15-15:30  Atul Kumar Tiwari (Department of Mathematics, MNNIT Allahabad) *Invariant solutions of potential Kedomtsev-Petviashvili equation by similarity transformation method*

15:30 – 15:45  Tea Break

15:45 – 17:00 Technical Parallel Sessions P18, P19

**Technical Session P18:  (Chair: Prof. Prawal Sinha, IITK)  [Seminar Room A]**

- 15:45-16:00  S. N. Mishra (Department of Mathematics, Brahmanand P.G. College Kanpur) *Can media reduce the spread of HIV/AIDS?: A nonlinear model*

- 16:00-16:15  Jitendra Singh (PPN College, CSJM University, Kanpur) *Study and analysis of an SIS Mathematical Model with density dependent migration*

- 16:15-16:30  Prakash Narayan (Department of Mathematics & Statistics, Dr. Harisingh Gour Vishwavidyalaya, Sagar, M.P.) *Dynamics of an SVEIRS epidemic model with vaccination and saturation incidence rate*

**Technical Session P19:  (Chair: Prof. S Ghorai, IITK)  [Seminar Room B]**

- 15:45-16:00  Nivedita Gupta (HBTI, Kanpur) *Dispersion characteristics of K-L model during transportation of nanoparticles in stenosed microvessel*

- 16:00-16:15  Shailendra Kumar Tiwari (Department of Mathematical Sciences, IIT BHU) *Study of variation of pressure from cervical to distal end of oesophagus during swallowing*

- 16:15-16:30  Surabhi Pandey (Public Health Foundation of India, New Delhi, India) *Estimating tuberculosis incidence from primary survey data: a mathematical modelling approach*

16:30-18:00 **Technical Session P20: (Chairs: Prof. J B Shukla, IAMMS)  [Seminar Room A]**

- 16:30-17:00  Prof. A. K. Sharma (IIT Kanpur) *Models in Population Studies*

- 17:00-17:30  Dr. Rajiv Sharma (Head, Technology Missions Division & Secretary, SERB, DST, New Delhi) *Funding Opportunities for Mathematical Sciences in DST*
August 26, 2017 (Day 4)

- **10:00 -11:00**  Plenary Talk 5 (Chair: Prof. Amit Huppert ) [Seminar Room A]
  
  Prof. J.B. Shukla (IAMMS) *TBA*

- **11:00-12:00**  Valedictory function [Seminar Room A]