

Conference on Nonlinear Systems & Dynamics

Technical Programme

Day 1, 16 December 2016

Inauguration: 9AM

Plenary talk 1: 9.30-10.15 AM, Venue: Lecture Hall 107

Chair: Sudeshna Sinha

Speaker: Arnd Bäcker, Technical University Dresden, Germany, “*Visualizing higher-dimensional systems — classical and quantum*”

Tea break: 10.15AM-10.30AM

Mini-symposium on complex networks: 10.30AM-1.00PM, Venue: G05

Chair: G. Ambika

1. Niloy Ganguly, *Threshold-based epidemic dynamics in distributed Systems* (10.30-11)
2. Dibakar Ghosh, *Collective behavior of moving oscillators in three dimensional space* (11-11.30)
3. Anirban Banerjee, *Structural similarity of metabolic networks by graph spectra* (11.30-12)
4. K P Harikrishnan, *A complex network based measure for the analysis of time series data* (12-12.30)
5. G. Ambika, *Heterogeneity measure for recurrence networks from chaotic and noisy time series* (12.30-1.00)

Mini-symposium on quantum chaos. 10.30AM-1.00PM, Venue: G06

Chair: Pragya Shukla

1. M. Santhanam, *Sub-diffusion, localisation and decoherence in kicked rotor* (10.30-11)
2. Arul Laxminarayan, *Entanglement transitions in eigenstates of interacting chaotic systems* (11-11.30)
3. Santosh Kumar: *Smallest eigenvalue density for Wishart-Laguerre ensemble and entanglement in coupled kicked tops* (11.30-12)
4. Yang Chen: *Single-User MIMO System, Painleve Transcendents and Double scaling* (12-12.30)
5. Pragya Shukla. *Curl force dynamics* (12.30-1.00)

Lunch: 1.00PM-2.00PM

Interactive session 1: 2.00PM-4.00PM

Parallel session 1: 4PM-5.20PM, Venue: G05

Chair: Arul Lakshminarayan

1. S. S. Ghosh: *Classical “Supersolitons” in Two Electron Temperature Warm Multi-ion Plasmas* (4-4.20)
2. Fakir Chand: *Fractional soliton solutions in a purely nonlinear complex Ginzburg-Landau equation through a nonlinear discrete transmission Line* (4.20-4.40)
3. Sakkaravarthi Karuppaiya: *Resonant Solitons and Breathers in Higher Dimension: A Study on Long-wave--Short-wave System* (4.40-5.00)
4. K. Tamilselvan: *Solitary waves in multicomponent nonlinear Helmholtz equations* (5.00-5.20)

Parallel session 2: 4PM-5.00PM, Venue: G06

Chair: Jayendra Bandyopadhyay

1. S. Bilal: *The generalized Lozi map: bifurcation and dynamics* (4-4.20)
2. Manish Agrawal: *Quasiperiodic forcing of coupled chaotic systems* (4.20-4.40)
3. Murugan Senthil Mani Rajan: *Design of twisted dual core photonic crystal fiber for sensing application* (4.40-5.00)
4. Chetan Pahlajani: *A Randomly Perturbed DC/DC Converter* (5.00-5.20)

Plenary talk 2: 5.30PM-6.15PM, Venue: Lecture Hall 107

Chair: Arnd Bäcker

Prof. Tetsuro Endo, Meiji University, Japan, *Classification of Quasi-Periodic Bifurcations of 2- and Higher-Dimensional Tori Using Lyapunov Bundles and Its Demonstration Via a Practical Electronic Circuit*

Tea break: 6.15PM—6.45PM

Cultural programme: 7PM-8.30PM, Venue: Lecture Hall 107

Dinner: 8.30PM

Day 2, 17 December 2016

Plenary talk 3: 9AM-9.45AM, Venue: Lecture Hall 107

Chair: Neelima Gupte

Prof. Leon Glass, McGill University, Canada: *Tipping points, critical transitions, and bifurcations: Can we predict the future?*

Tea: 9.45AM-10AM

Mini-symposium on synchronization. 10AM-12.30PM, Venue: G05

Chair: Shashi Srivastava

1. Syamal K. Dana: *Dragon-king-like extreme events in bursting neurons under excitatory and inhibitory synaptic coupling* (10-10.30)
2. K. Murali: *Synchronizable chaotic orbits* (10.30-11)
3. Shakti N. Menon: *Chemical computation in arrays of relaxation oscillators coupled via mutual inhibition* (11-11.30)
4. Arindam Saha: *Extreme Events in Delay-Coupled FitzHugh-Nagumo Oscillators* (11.30-12)
5. Sarika Jalan, *Cluster Synchronization in Multiplex Networks* (12-12.30)

Mini-symposium on data assimilation and algorithms: 10AM-12.00PM, Venue: G06

Chair: Amit Apte

1. Amit Apte, *Data assimilation in chaotic Chua circuit* (10-10.30)
2. Suman Acharyya: *State estimation using gradient descent method* (10.30-11)
3. Mitaxi Mehta: *A Variant of the Mid-point Monodromy Algorithm* (11-11.30)
4. Md Nurujjaman : *A study of nonlinear dependence between Oil Price and Stock Returns in India* (11.30-12)

Lunch: 12.30PM-1.30PM

Interactive session 2: 1.30PM-3.30PM

Parallel session 3: 3.30-5.30PM, Venue: G05

Chair: Pankaj Wahi

1. Nithin Nagaraj: *Separating a Heterogeneous Mixture of Chaotic Signals using Compressed Sensing* (3.30-3.50)
2. R. Sarmah: *Strain dynamics in a driven magnetostrictive ribbon* (3.50-4.10)
3. Shashi C. L. Srivastava: *Random Reverse Cyclic Matrices* (4.10-4.30)
4. Suddhasattwa Das: *Unfolding quasiperiodic trajectories* (4.30-4.50)
5. Rajarshi Roy: *Experiments on Optical Networks: Symmetry, Synchrony and Chimeras* (4.50-5.20)

Parallel session 4: 3.30PM-5.30PM, Venue: G06

Chair: M Santhanam

1. Arnd Bäcker: *What is the mechanism of power-law distributed Poincaré recurrences in higher-dimensional systems?* (3.30-4.00)
2. Ghosh Koushik : *Analysis of Memory and Governing Process and Exploration of Chaos and Self Organized Criticality in Solar Radio Flux Data* (4.00-4.20)
3. Pabel Shahrear : *Chaotic Dynamics and Diffusion in a Piecewise Linear Equation* (4.20-4.40)
4. S. S. Chaurasia: *Dynamical effects of switching coupling forms* (4.40-5.00)
5. Jagadish Kumar: *Power law distributions and multifractality of acoustic emission spectra during intermittent plastic deformation* (5.00-5.20)

Tea break: 5.20PM—6PM

Plenary talk 4: 6PM-6.45PM, Venue: Lecture Hall 107

Chair: Pranay Goel

Speaker: Ram Ramaswamy, Jawaharlal Nehru University, India. *Memoryless nonlinear response as an explanation of 1/f noise*

Discussion session on the format of the CNSD conferences and the venue/dates of the next conference: 6.45PM-7.30PM, Venue: Lecture Hall 107

Panel discussion on “Women in Science”: 7.30PM-8.30PM. Venue: Lecture Hall 107. Panelists: Somdatta Sinha, Rumi De, Ram Ramaswamy, and Sarika Jalan. Conducted by Neelima Gupte.

Dinner: 8.30PM

Day 3, 18 December 2016

Plenary talk 5: 9AM-9.45AM, Venue: Lecture Hall 107

Chair: Yang Chen

Speaker: Prof. Rajarshi Roy, University of Maryland, College Park, USA: *Chaos, Noise and Random Number Generation*

Tea: 9.45AM-10AM

Mini-symposium on Collective Dynamics in Biological Systems: 10AM-12.30PM, Venue: G05

Chair: Somdatta Sinha

1. Leon Glass: *Spatial symmetry breaking determines spiral wave chirality (10-10.30)*
2. Sudeshna Sinha: *Balance of interactions determines optimal survival in multi-species communities (10.30-11)*
3. Pranay Goel: *The organization of cellular activity in the pancreatic islets of Langerhans (11-11.30)*
4. Tanmoy Banerjee: *Chimera patterns in ecological networks (11.30-12)*
5. Ulrike Feudel : *Networks of networks: biodiversity in connected habitats (12-12.30)*

Parallel session 5: 10AM-12.30PM, Venue: G06

Chair: Shyamal Dana

1. N.D.Chavda: *Entanglement in two-body random ensembles (10-10.20)*
2. Nilanjan Bandyopadhyaya: *Exact partition function and spectral properties of supersymmetric BC N type rational integrable models with polarized spin reversal Operators (10.20-10.40)*
3. A. P. Misra: *Landau damping of Langmuir waves in a semiclassical plasma (10.40-11)*
4. Jayendra N Bandyopadhyay: *Self-similar fractal spectrum in quantum mechanical systems (11-11.20)*
5. H. N. Deota: *Spectral properties of bosonic and fermionic random matrix ensembles (11.20-11.40)*
6. Nivedita Bhadra: *Effect of noise and quantum fluctuation on Josephson junction model with second harmonic (11.40-12)*
7. S. Balsamy: *Synchronization of an array of point contact spin transfer torque driven nano-oscillators (12-12.20)*

Lunch: 12.30PM-1.30PM

Interactive Session 3: 1.30PM-3.30PM

Panel discussion on “Science in India: Research Students' Perspective”, 3.30PM-4.30PM, Venue: Lecture Hall 107. Panelists: Aasifa Rounak, Arnab Chakrabarti, Sourabh Singh, Ananya Mondal

Closing / valedictory session: 4.30PM-4.45PM. Venue: Lecture Hall 107

INTERACTIVE SESSIONS (POSTER AND DEMONSTRATION)

Day 1, 16 December 2016

1. A Ramesh : *Environmental coupling in ecosystems: From oscillation quenching to rhythmogenesis*
2. Anantharam Shashank : *Dynamics of Real Verhulst Networks*
3. Biswas Animesh : *Extensive Study of Mercury Drop Oscillations in Non-Autonomous MBH System*
4. Biswas Debabrata : *Controlling birhythmicity via conjugate self-feedback: Theory and Experiment*
5. Chakraborty Abhijit : *Dynamical systems analysis of tracking and thawing models*
6. Chakraborty Dipanjan : *Dynamics of Collective Cell Migration*
7. Chutani Malayaja : *A Study of Time Series-Networks*
8. D Premraj : *An experimental study on control of bifurcation-delay in slow passage effect*
9. Das Santanu : *Controlling the Basin of Attraction of Period-1 Rotation of a Horizontally Excited Parametric Pendulum*
10. Deshpande Amey : *Local stable manifold theorem for fractional systems*
11. Ghosh Anupam : *Occasional coupling synchronization: Transient uncoupling and On-off coupling schemes*
12. Ghosh Debarati : *Effect of parameter mismatch in mean-field-diffusion-induced oscillation suppression*
13. Ghosh Saptarshi : *Synchronization in delayed multiplex networks*
14. Gianchandani Kaushal : *Binary logic using spatially patterned deaths in chemical oscillators*
15. Gupta Kajari : *Dynamics of slow and fast systems on complex networks*
16. K Premlatha : *Chimera states in two interacting populations of nonlocally coupled Stuart-Landau oscillators*
17. K Sathiyadevi : *Interesting multistabilities in coupled oscillators with attractive and repulsive coupling*
18. Pal Ritu : *Bright soliton of nonautonomous cubic-quintic nonlinear Schrödinger equation model with repulsive nonlinearity*
19. Varshney Vaibhav : *Targeting periodic solutions in chaotic systems*
20. K Subramanian: *Soliton Management in an Erbium Doped Tapered Nonlinear Fiber*
21. Arnab Acharya: *Complex Network Analysis of the Indian Power Grid*
22. G. Ambika : *Topology of power transmission network of India*
23. Arabinda Ghosh: *Modeling and Stability of a Smart Grid as a Coupled Oscillator*
24. Singh R K : *Complexity enhances stability in evolving networks*
25. Singha Joydeep : *Spatial splay states and chimera states in coupled sine circle map Lattice*
26. Sinha Nitish : *Chaotic behaviour of the three-state variable rate and state friction model*
27. Subramaniyan Sabari : *Dynamics of vortices in a dipolar Bose-Einstein condensate with an oscillating potential*
28. Roy Ujjal : *Microwave effect on the dynamics of oscillatory Bray–Liebhafsky Reaction*
29. Kanchwala Husain : *Modeling and characterization of suspension bushings using fractional derivatives*

Day 2, 17 December 2016

30. Karmarkar Vivek : *Speed fluctuations in a limit cycle*
31. Karthiga S : *On the nonreciprocal nature of PT symmetrically coupled systems*
32. Kashyap Ananth : *Generation of directed scale-free networks with tunable clustering and degree Correlations*
33. Konwar Rupam : *Nonautonomous Dark Solitons and Soliton Collisions in a Nonlinear Medium with Linear Potential*

34. Kumar Anil : *Interplay of degree degree correlation and driven mechanism for cluster synchronization*
35. Kumar Aravind : *The Duffing-Holmes Oscillator: A Theoretical Analysis of the Magneto-elastic Interactions*
36. Kumar Pawan : *Partially synchronized states in an ensemble of chemo-mechanical oscillators*
37. Kumar Rahul : *Harvesting Energy through the Chaotic Motion of Double Pendulum*
38. Lahiri Sudeshna : *Effect of Temperature on Long Range Correlation*
39. Rupsagar Chatterjee: *Nonlinear fluid-structure interaction dynamics of an elastically mounted flapping airfoil in an inviscid fluid*
40. Kaur Harleen : *Controlling optical similaritons in tapered graded-index waveguide in presence of PT symmetric potential*
41. Mandal Dhruvajyoti : *Invariant Density of Piecewise Smooth Maps in Presence of Noise*
42. Mondal Ananya : *Interaction of Neimark-Sacker and period doubling bifurcations in a vibro-impact system*
43. Mondal Sirshendu : *Chimera-like states observed during the transition to thermoacoustic instability in turbulent combustor*
44. Mukhopadhyay Debangana : *Formation of tissue aggregation of biological cell*
45. Patra Mahashweta : *Quasiperiodic Bifurcation in 3D Piece-wise Linear maps*
46. Paul Sanku : *Classical subdiffusion and quantum localisation in chaotic Hamiltonian system*
47. Pawar Samadhan : *Mutual synchronization of coupled oscillators of a thermoacoustic system*
48. Pradhan Priodyuti : *Degeneracies in network spectra*
49. Raj Sudhir : *Decoupled Terminal Sliding Mode Control for Stabilization of Double Inverted Pendulum*
50. Ranjani S Sree : *Construction of new rational potentials and their solutions using Darboux transformations*
51. Raunak Aasifa : *Bifurcation analysis of systems with intermittent contact with a filtered Time-varying switching surface*
52. Roy Animesh : *Image encryption and decryption using vertical-cavity surface-emitting lasers (VCSEL)*
53. Roy Anupama : *Microtransitions in 2-D Load Bearing Hierarchical Networks*
54. Roy Diptanil : *Dissipation dynamics with two finite chaotic environments*
55. Roy Subhamoy Singha : *DNA Spin Dynamics and Thermodynamic Entropy*
56. V Vinod : *An Initial Condition Dependent Oscillation Control in an Odd and Even Number Van der Pol Ring.*
57. Debapriya Pal: *Periodic observation of a quantum system*
58. George Sandip : *Detecting Dynamical States Using Bicoherence Function*
59. S. Krishna Kumar : *Effect of Noise Correlation on Multiplicative Noise induced Intermittency*
60. De Partho Sakha : *Dynamics of single cell crawling: stick-slip movement*

Day 3, 18 December 2016

61. Saha Ritabrata : *Recurrence Analysis of Dynamics of a Square Natural Circulation Loop*
62. Saminathan Bhuvaneshwari : *Modulational instability in spin-orbit coupled Bose- Einstein Condensates*
63. Achintya Mukhopadhyay : *Intermittent and Periodic Behavior in Ducted Inverse Diffusion Flames*
64. Seth Soumyajit : *Study of an Inductorless Chaos Generator*
65. Sharma Anupama : *Coevolutionary dynamics of incentives and actions in spatial games*
66. Shaw Pankaj Kumar : *Canard and mixed mode oscillations in an excitable glow discharge plasma in the presence of inhomogeneous magnetic field*
67. Singh Ajit Kumar : *Dual combination synchronization of the fractional order complex chaotic systems*
68. Singh Ram Mehar : *Solitary Wave-Type Solutions of Nonlinear Diffusion Reaction Equation Using Auxiliary Equation Method*

69. Suda Narasimha Rao : *A New Python based Toolbox for Stability and Bifurcation Analysis of Hybrid Dynamical Systems*
70. T Shreecharan : *Leibniz algebroid axiomatics and their role in mechanical systems*
71. T.P. Suneera : *The stationary states of a nonlinear coupler in a PT symmetric periodic potential*
72. Tanajirao Udaysinh : *Effect of bifurcation on quantum correlations*
73. Tekur Sai Harshini : *Spacing distribution of localized states and their nearest neighbours in quantum chaos*
74. Tiwari Sankalp : *Equilibrium and Stability of a Buckled Elastica in an Asymmetric Force Field*
75. Priodyuti Pradhan: *Degeneracies in network spectra*
76. Swetamber Das: *Transport, Diffusion, and Energy in a volume preserving map*
77. M.S. Mani Rajan : *Novel sensor for diluted glucose using PCF based surface plasmon resonance*
78. Promit Moitra: *Emergence of Persistent Infection due to Heterogeneity*
79. Susmita Kundu : *Bifurcation analysis of single phase half controlled rectifier fed DC series motor drive system.*
80. Bandyopadhyay Aranya : *Analysis of Dynamics and Stability of an Autonomous Voltage Source Inverter*
81. Bagchi Subhayu : *On the Effect of Nonlinear Perturbations on the Precession of Mercury's Orbital Perihelion*
82. Balasubramanian Sudharsan : *Stable multiple vortices in collisionally inhomogeneous attractive Bose-Einstein Condensates*
83. Bera Bidesh : *Emergence of imperfect travelling chimera states in a network of locally Coupled Oscillators*
84. Rakshit Sarbendu: *Characterizing Stable Steady State Of Coupled Limit Cycle Oscillators*
85. Somnath De : *Recurrence Analysis of Dynamics of Premixed and Partially Premixed Flames near Lean Blowout*
86. Chandan Bose: *Recurrence quantification analysis of the low Reynolds number flow dynamics past a flapping wing*