

## **Complex Dynamical Systems and Applications (CDSA2026)**

**23-26 January, 2026**

**Date : 23<sup>rd</sup> January, 2026 (Day-I)**

**Registration: 8:30 AM**

**Inaugural Session and High Tea: 8:45 AM**

General Session - I (Venue: LT-1)

Session Chair: Ulrike Feudel

<b>Time</b>	<b>Title Talk</b>	<b>Speakers</b>
9:45 - 10:15	Navigating network dynamics	Baruch Barzel
10:15 - 10:45	Synchronization and navigation of active droplets	Punit Parmananda
10:45 - 11:15	Nonlinear dynamics of large-scale human brain networks -- insights from epilepsy	Klaus Lehnertz
	<b>Tea Break 11:15-11:45 AM</b>	

Parallel Session - I (Networks-I)

Session Chair: Sangeeta Ujjwal (Venue: CEP-209)

<b>Time</b>	<b>Title</b>	<b>Speakers</b>
11:45 - 12:15	Network architecture and dynamical control of the plant circadian clock	Ashutosh Srivastava
12:15 - 12:35	Stability classifiers of complex systems	Chandrakala Meena
12:35 - 12:50	Spectral fluctuations and crossovers in multilayer network	Himanshu Shekhar

Parallel Session - II (Neuroscience-I)

Session Chair: Reik Donner (Venue: CEP-206)

<b>Time</b>	<b>Title</b>	<b>Speakers</b>
11:45 - 12:15	Multiscale connectivity and dynamic coupling: The informational grammar of bio-social systems	Dipanjan Ray
12:15 - 12:35	Reliability of energy landscape analysis of resting-state functional MRI data	Pitambar Khanra
12:35 - 12:50	Edge-centric functional network organization reveals seizure pathways in mesial-temporal lobe epilepsy	Aditi Bose

Parallel Session - III (Dynamical Systems-I)

Session Chair: Thounaojam Umeshkanta Singh (Venue: CEP-212)

Time	Title	Speakers
11:45 - 12:00	Turbulent dynamics in Gross-Pitaevskii model of neutron Star interiors	Anirudh Sivakumar
12:00 - 12:15	Chaotic dynamics and bifurcation analysis of the Hindmarsh–Rose neuron model with blue sky catastrophe under magnetic field influence	Ram Pravesh Yadav
12:15 - 12:30	Dynamics of pulsating swarmalators on a ring	Samali Ghosh
12:30 - 12:45	Exploring the impact of parameter mismatch on dynamics in coupled lorenz oscillators	Swaati Saandhya
12:45 - 13:00	Disorder–order transitions and explosive synchronization in heterogeneous Ginzburg–Landau oscillators on directed networks	Kumar Sourav

**Lunch Break 13:05 PM-14:30 AM**

General Session - II (Venue: LT-1)

Session Chair: Punit Parmananda

Time	Title	Speakers
14:30 - 15:00	Recurrence-based local dimension estimates from time series: multi-scale variability and transient patterns in chaotic dynamical systems	Reik Donner
15:00 - 15:30	Complete synchronization and pattern selection through amplitude dynamics and diffusion in heterogeneous oscillatory media	Katharina Krischer
15:30 - 16:00	The synchronized dance of waves	Sumana Dutta
	<b>Tea Break 16:00-16:30 PM</b>	

Parallel Session - IV (ML and Dynamics)

Session Chair: Michael Small (Venue: CEP-212)

Time	Title	Speakers
16:30 - 17:00	Reservoir Computing for the Prediction and Control of Complex Dynamics	Manish Shrimali
17:00 - 17:15	Enhanced multifunctionality in reservoir Computing	Swarnendu Mandal
17:15 - 17:30	Adaptive ML estimator for transient chaos and predictability horizons in non-stationary time Series	S. V. Manivelan
17:30 - 17:45	Dynamical analysis of a parameter-aware reservoir computer	Dishant Sisodia
17:45 - 18:00	Inferring network dynamics using parallel reservoir computing	Swati Chauhan

Parallel Session - V (Neuroscience-II)

Session Chair: Dipanjan Ray (Venue: CEP-206)

Time	Title	Speakers
16:30 - 16:50	Robust oscillatory dynamics in a mixed population of excitable and self-oscillatory Izhikevich neurons: Influence of second-order linear and nonlinear interactions	Biswambhar Rakshit
16:50 - 17:05	Blink it to sync it: Experimental evidence of synchronization of human brainwaves subjected to common photic forcing	Aarsh Chotalia
17:05 - 17:20	Analysis of spiral wave in a hopfield neural network under electromagnetic induction and control with external magnetic induction	Sajal Debnath
17:20 - 17:35	Spatiotemporal dynamics of neuron-astrocyte interactions in Alzheimer's disease: Insights from a mathematical model	Debasish Pradhan
17:35 - 17:50	Hopf bifurcation in delay-induced Alzheimer's disease model	Sevak Ram Sahu

Parallel Session - VI (Stochastic Processes -I)

Session Chair: Luca Guigiolli (Venue: CEP-209)

Time	Title	Speakers
16:30 - 17:00	Transitions to absorbing state: Non-DP transitions	Prashant M. Gade
17:00 - 17:20	Impact of noise on the dynamics of surface acoustic wave delay line feedback oscillator	Shashank Shekhar Jha
17:20 - 17:35	State-dependence in diffusion-controlled transport and stochastic resonance	Samudro Ghosh
17:35 - 17:50	Nonequilibrium steady states in bead-spring models: Entropy production and probability distributions	Jetin Elsamma Thomas
17:50 - 18:05	Brownian yet non-gaussian heat engine	I. Iyyappan

**Date : 24<sup>th</sup> January, 2026 (Day-II)**

General Session - III (Venue: LT-1)

Session Chair: Klaus Lehnertz

Time	Title	Speakers
9:15 - 9:45	Identifying dyssynchronous states in neuronal network excited by local levy noise using reservoir computing	Tomasz Kapitaniak
9:45 - 10:15	Infrasonic acoustic amplification in driven architected granular chains	Surajit Sen
10:15 - 10:45	Brevity is best: Reservoir computing and the minimum description length principle	Michael Small
	<b>Tea Break 10:45-11:30 AM</b>	

Parallel Session - VII (Biological System - I)

Session Chair: Nandadulal Bairagi (CEP-105)

Time	Title	Speakers
11:30 - 12:00	Spatiotemporal dynamics of cell shape oscillations	Rumi De
12:00 - 12:20	Dendritic learning as a measure of intervention in atrial fibrillation	Jyoti Prasad Deka
12:20 - 12:40	A coarse-grained model for unfolding-driven fibrin mechanics	Poulomi Sadhukhan
12:40 - 12:55	On investigation of complexity in extracellular matrix-induced cancer dynamics under deterministic and stochastic framework.	Amit Kumar Barman

Parallel Session - VIII (Dynamical Systems - II)

Session Chair: Prasant Gade (CEP-106)

Time	Title	Speakers
11:30 - 12:00	Chaos, Ergodicity, and K-mixing in high-quality pseudo-random generators	Vinod Patidar
12:00 - 12:20	Projective synchronization in nonlinear electrical circuits	Thounaojam Umeshkanta Singh
12:20 - 12:35	Dynamical stability of complex systems using gershgorin disc theorem	Yuvrajsingh Pravinsingh Patil
12:35 - 12:50	Collective dynamics of Stuart Landau oscillators due to the competition between asymmetric and symmetric couplings	Naveen Mendola
12:50 - 13:05	Vaccination dilemmas in mitigating monkeypox outbreaks: An imitation dynamics game model approach	Susanta Kumar Das

**Lunch Break 1:05 PM-2:30 AM**

General Session - IV (Venue: LT-1)

Session Chair: Sudeshna Sinha

Time	Title	Speakers
14:30 - 15:00	Elections as complex system : Turnouts drive key election statistics	M S Santhanam
15:00 - 15:30	Recurrences in the climate dynamics of India	G. Ambika
15:30 - 16:00	Multi-modal first-passage dynamics of a random searcher in a spatially disordered environment	Luca Giuggioli
	<b>Poster Session with Tea 16:00 PM onwards</b>	

**Conference Dinner: 19:00 onwards**

**Date : 25<sup>th</sup> January, 2026 (Day-III)**

Technical Session - V (Venue: LT-1)

Session Chair: Baruch Barzel

Time	Title	Speakers
9:15 - 9:45	Metastability, transient dynamics and the role of different timescales	Ulrike Feudel
9:45 - 10:15	The analysis of tropical cyclones	N. Gupte
10:15 - 10:45	Before the collapse: Critical slowing down in abrupt desynchronization	Sarika Jalan
	<b>Tea Break 10:45-11:30 AM</b>	

Parallel Session - IX (Dynamical Systems III)

Session Chair: Chandrakala Meena (CEP-106)

Time	Title	Speakers
11:30-12:00	From coexistence to collapse: Dynamical outcomes of species introduction	Nandadulal Bairagi
12:00 - 12:20	Emergent market states and phase transitions in financial systems	Suchetana Sadhukhan
12:20 - 12:35	Collaboration-driven phase transitions in the prisoner's dilemma	Joy Das Bairagya
12:35 - 12:50	Overcoming unfairness via repeated interactions: Evolutionary dynamics of mini-ultimatum game	Prosanta Mandal
12:50 - 13:05	Controlling extreme events in excitable networks: A single driving signal approach	R Shashangan

Parallel Session - X (Biological Systems II)

Session Chair: Rumi De (CEP-105)

Time	Title	Speakers
11:30 - 12:00	Modeling the dynamics of leptospirosis in India	Sandip Banerjee
12:00 - 12:20	Co-mutation based genetic networks to infer temporal	Rahul Kumar Verma
12:20 - 12:40	Dynamical complexity induced by prevalence-dependent mobility in a disease transmission model.	Pijush Panday
12:40 - 12:55	Deciphering breast cancer organotropism using complex metabolic network dynamics	Garhima Arora
12:50 - 13:05	A survival-theoretic interpretation of change point detection under autocorrelation and transient deviations	Agniva Das

Parallel Session - XI (Networks-II)

Session Chair: G Ambika (CEP-104)

Time	Title	Speakers
11:30 - 12:00	The evolution and formation of Indian political debate networks	Satyam Mukherjee
12:00 - 12:20	Mitigating polarisation and consensus in opinions through diversity	Sangeeta Ujjwal
12:20 - 12:35	Analysis and control of rumor spread model with strategic behavioral dynamics	Arijit Malakar
12:35 - 12:50	Bayesian tit-for-tat fosters cooperation	Arunava Patra
12:50 - 13:05	Universal patterns in the blockchain: Analysis of EOAs and smart contracts in ERC20 token networks	Kundan Mukhia

**Lunch Break 13:05 PM-13:30 AM**

General Session - VI (Venue: LT-1)

Session Chair: Ram Ramaswamy

Time	Title	Speakers
14:30 - 15:00	The inverse problem for periodic travelling waves of the linear 1D shallow-water equations	Robert Hakl
15:00 - 15:30	Everything is connected: Space-Time, and geometric deep learning	Tanujit Chakraborty
15:30 - 16:00	Bunching of extreme events on complex network	R. Amritkar

Parallel Session - XII (Dynamical Systems and Neuroscience )

Session Chair: Katharina Krischer (CEP-106)

Time	Title	Speakers
16:30 - 17:00	Cell signalling, bistability and drug targets	Samrat Chatterjee
17:00 - 17:15	Experimental observation of aging transition in locally, globally coupled network	Aryan Nagpal
17:15 - 17:30	Coexistence of tonic spiking and bursting with synchronization in coupled leech-heart inter neuron through chemical and electrical coupling	Debadri Bera
17:30 - 17:45	Asynchronous evolution induces regularity in coupled neuronal systems	Anupama Roy
17:45 - 18:00	Tuning competitive first-passage outcomes in anomalous diffusion via resetting	Suvam Pal

Parallel Session - XIII (Ecology)

Session Chair: Sandip Banerjee (CEP-105)

Time	Title	Speakers
16:30 - 17:00	Adaptive diversification: speciation, fitness, predictability and the speed of evolution.	Vaibhav Madhok
17:00 - 17:20	When growth meets division: Conditions for self-reproduction in growing-dividing autocatalytic dynamical systems	Parth Pratim Pandey
17:20 - 17:35	Spatio-temporal eco-evolutionary dynamics of prey-predator systems with defended and undefended prey	Sagarika Dutta
17:35 - 17:50	Structural sensitivity of a tri-trophic food chain model in a parameter plane	Ruma Kumbhakar
17:50 - 18:05	Parameter-driven species preference and stability transitions in a hierarchical multi-species May–Leonard model	Shraosi Dawn

**Date : 26<sup>th</sup> January, 2026 (Day-III)**

General Session - VII (Venue: LT-1)

Session Chair: Tomasz Kapitaniak

Time	Title	Speakers
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9:00 - 9:30	Collective dynamics of higher dimensional Stuart Landau models	Ram Ramaswamy
9:30 - 10:00	Disorder in aid of order	Sudeshna Sinha
	<b>Tea Break 10:00-10:30 AM</b>	

Parallel Session – XIV (Quantum)

Session Chair: Vinod Patidar (Venue: CEP-106)

Time	Title	Speakers
10:30 - 10:50	Distribution of lowest eigenvalue in k-body bosonic random matrix ensembles	N. D. Chavda
10:50 - 11:05	Extreme value statistics of localised quantum states	J. Bharathi Kannan
11:05 - 11:20	Designing logic gate using active particles	Sapna
11:20 - 11:35	Dynamics of marangoni-driven elliptical janus particles	Ratan Sarkar

Parallel Session – XV (Networks-III)

Session Chair: Satyam Mukherjee (Venue: CEP-105)

Time	Title	Speakers
10:30 - 11:00	Heterogeneous nucleation in adaptive dynamical networks	D. V. Senthilkumar
11:00 - 11:20	Spectral and network-based classification of complex financial markets	Hirdesh Kumar Pharasi
11:20 - 11:35	Effect of the similarity measure in event synchrony based multi-scale complex network analysis of strong rainfall	Guruprem Bishnoi

General Session - VIII (Venue: LT-1)

Session Chair: M S Santhanam

Time	Title	Speakers
11:45 - 12:15	Multi-agent target search optimization by threshold resetting	Arnab Pal

**12:15 PM Valedictory and prize distribution Session followed by Lunch**