



International Conference on Nonlinear Dynamics and Applications 2022
(ICNDA 2022)

Organized by:

Department of Mathematics
Sikkim Manipal Institute of Technology, Sikkim, India

Date: March 09-11, 2022



Brief Report about International Conference on Nonlinear Dynamics and Applications (ICNDA 2022)

1	TITLE OF EVENT:	International Conference on Nonlinear Dynamics and Applications (ICNDA 2022)
2	ORGANIZED BY (DEPT/(CLUB/BODY ETC):	Department of Mathematics, SMIT
3	UNDER THE BANNER OF(DEPT./OFFICE/CELL ETC):	Department of Mathematics, SMIT
4	COLLABORATION WITH:	NA
5	STUDENT EVENT: YES / NO	No
6	EXTERNALLY FUNDED: YES / NO	Yes
7	IF EXTERNALLY FUNDED, THEN NAME OF FUNDING AGENCY	Science & Engineering Research Board (SERB)
8	NATURE: INTERNAL PARTICIPANTS / EXTERNAL PARTICIPANTS / BOTH	Both internal and external participants
9	NO. OF PARTICIPANTS:	207
9A	INTERNAL:	37
9B	EXTERNAL	170
10	MODE: ONLINE / OFFLINE	Both online and offline (Hybrid)
11A	DATE FROM	9 th March 2022
11B	DATE TO:	11 th March 2022
12	COORDINATOR/ Organizing Secretaries	Dr. Asit Saha Department of Mathematics Sikkim Manipal Institute of Technology, SMU, East Sikkim, India Prof. Santo Banerjee Department of Mathematical Sciences Politecnico di Torino, Italy





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RESOURCE PERSON(S):

SL. NO.	NAME	AFFILIATION
1	Prof. M. Lakshmanan F.N.A., FTWAS, Professor of Eminence & DST-SERB National Session Chair	Department of Nonlinear Dynamics, School of Physics, Bharathidasan University, Tiruchirapalli-620024, India
2	Prof. Lamberto Rondoni	Department of Mathematical Sciences, Politecnico di Torino, Italy
3	Prof. Kamrul Hassan	Department of Physics, Dhaka University, Bangladesh
4	Prof. Prasanta Chatterjee	Department of Mathematics, Siksha-Bhavana, Visva-Bharati, Santiniketan, India
5	Prof. Nareshpal Singh Saini	Department of Physics, Guru Nanak Dev University, Amritsar, India
6	Prof. Addepalli V N Krishna	CSE Department, Christ University, Bengaluru, India
7	Dr. Amit Chakraborty	Department of Mathematics, Sikkim University, Sikkim, India
8	Dr. Barun Pratiher	Department of Mechanical Engineering, Indian Institute of Technology Jodhpur, India
9	Dr. Rajendra Kr. Ray	School of Basic Sciences, Indian Institute of Technology Mandi, Mandi-175005, Himachal Pradesh, India
10	Dr. Kajal Kumar Mondal	Department of Mathematics, Cooch Behar Panchanan Barma University, West Bengal, India
11	Dr. Amar Prasad Misra	Department of Mathematics, Siksha Bhavana, Visva-Bharati University, Santiniketan, India
12	Dr. R. Rakkiyappan	Department of Mathematics, Bharathiar University, Coimbatore, India
13	Dr. Nur Aisyah Binti Abdul Fataf	National Defence University of Malaysia, Malaysia
14	Dr. M. Muthtamilselvan	Department of Mathematics, Bharathiar University, Coimbatore, India
15	Dr. R. Sivaraj	Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, India
16	Dr. Debaldev Jana	Department of Mathematics, RKMVERI, West Bengal, India
17	Dr. Amiya Das	Department of Mathematics, University of Kalyani, India
18	Dr. A. Gowrisankar	Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, India





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The Department of Mathematics, Sikkim Manipal Institute of Technology (SMIT), Sikkim Manipal University, organized an International Conference on Nonlinear Dynamics and Applications (ICNDA 2022) [<http://icnda.in/>] in hybrid mode from 9th to 11th March, 2022 at the institute premises in Majitar, Sikkim. The conference has seen a gathering of scientists, engineers and academicians discussing on various topics ranging from Dynamical Systems, Mathematical Modelling, Chaos, Complexity and Fractals, The Dynamics of COVID-19 Pandemic, Graphs and Applications, Plasma Dynamics and Applications, Fluid Dynamics and Nonlinear Flows, Fractional Systems and Applications, Communication and its Applications, Cryptography and Networks, Deep Learning and Machine Learning, Chaos and Complexity in Social Structures, Ecological, Biological and Biomedical Models and Applications, Signal Processing and Signal Analysis, Bifurcation Analysis and its Applications, Quantum Systems and Quantum Chaos, Financial Data and Applications, Genetic Algorithm, Optimization and Artificial Intelligence, Semiconductor Devices and Materials, Internet of Things and Smart Applications, and Nonlinear Effects on Climate Change. About 207 participants (74 in physical mode and 133 in virtual mode) joined the conference from different countries like Turkey, Iran, Egypt, Mexico, Vietnam, Spain, Italy, Latvia, Indonesia, Serbia, Philippines, and India.

The conference was sponsored by the Science & Engineering Research Board (SERB) and Sikkim Manipal Institute of Technology and supported by Sikkim State Council of Science & Technology. A total of 154 papers were selected for the presentation in the conference from which 124 research papers were chosen to be published in "Springer proceedings in Complexity" (Scopus indexed). Details of the proceedings are available in <https://link.springer.com/book/9783030997915>. The articles were presented over 26 technical sessions (8 Physical and 18 virtual) over a stretch of three days from 9th to 11th March 2022. The sessions were chaired by notable academicians from India and abroad. The conference also facilitated a special session on "The Dynamics of Covid-19 Pandemic". Some authors of the selected papers from special session were given an option to publish their work in the topical issue "The Dynamics of Covid-19 – Pandemic: Nonlinear approaches on the modelling, prediction and control" of the Springer journal "The European Physical Journal Special Topics (EPJST)" [Q2, SCI, Multidisciplinary Physics Journal, I.F. = 2.707 (2020)].

Delegates from various reputed National and International Institutes were invited to share their scientific knowledge, experiences and research results on various aspects of nonlinear science and its applications in different fields. This provided an opportunity to academicians, researchers, the members of the faculty of the institute and research scholars to explore and discuss the latest innovations and trends in the field of Engineering, Physics and Applied Mathematics. The notable speakers who delivered the keynote address include Prof. (Dr.) M. Lakshmanan, F.N.A., FTWAS, Professor of Eminence & DST-SERB National Session Chair, Department of Nonlinear Dynamics, School of Physics, Bharathidasan University, Tiruchirapalli, India, Prof. (Dr.) Lamberto Rondoni, Department of Mathematical Sciences, Politecnico di Torino, Italy, Prof. (Dr.) Kamrul Hassan, Physics Department, Dhaka University, Bangladesh, and Prof. (Dr.) Prasanta Chatterjee, Professor In Charge, Centre for Mathematics Education, Visva-Bharati University, Santiniketan, India. In addition to the four keynote speakers, fourteen eminent researchers who also delivered the invited talk on various field of nonlinear dynamics are Prof. Nareshpal Singh Saini, Department of Physics, Guru Nanak Dev University, Amritsar, India, Prof. Addepalli V N Krishna, CSE Department, Christ University, Bengaluru, India, Dr. Amit Chakraborty, Department of Mathematics, Sikkim University, Sikkim, India, Dr. Barun Pratiher, Department of Mechanical Engineering, Indian Institute of Technology Jodhpur, India, Dr. Rajendra Kr. Ray, School of Basic Sciences, Indian Institute of Technology Mandi, Mandi, Himachal Pradesh, India, Dr. Kajal Kumar Mondal, Department of Mathematics, Cooch Behar Panchanan Barma University, West Bengal, India, Dr. Amar Prasad Misra, Department of Mathematics, Siksha Bhavana, Visva-Bharati University, Santiniketan, India, Dr. R. Rakkiyappan, Department of Mathematics, Bharathiar University, Coimbatore, India, Dr. Nur Aisyah Binti Abdul Fataf, National Defence University of Malaysia, Malaysia, Dr. M. Muthtamilselvan, Department of Mathematics, Bharathiar University, Coimbatore, India, Dr. R. Sivaraj, Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, India, Dr. Debaldev Jana, Department of Mathematics, RKMVERI, West Bengal, India, Dr. Amiya Das, Department of Mathematics, University of Kalyani, India, and Dr. A. Gowrisankar, Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, India.





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Details of organizing secretaries:

Dr. Asit Saha

Department of Mathematics

Sikkim Manipal Institute of Technology, SMU, India

Prof. Santo Banerjee

Department of Mathematical Sciences

Politecnico di Torino, Italy

Details of Keynote Speakers and their talks:

Prof. M. Lakshmanan

F.N.A., FTWAS, Professor of Eminence & DST-SERB National Session Chair

Department of Nonlinear Dynamics, School of Physics, Bharathidasan University, Tiruchirapalli-620024, India

Title: Integrability and Chaos in Simple and Complex Systems

Prof. Lamberto Rondoni

Professor

Department of Mathematical Sciences, Politecnico di Torino, Italy.

Title: Reality and Probability: From Atoms to Global Climate

Prof. Kamrul Hassan

Professor

Department of Physics, Dhaka University, Bangladesh.

Title: Understanding scale-free, small-world and multifractal weighted planar stochastic lattice

Prof. Prasanta Chatterjee

Professor

Department of Mathematics, Siksha-Bhavana, Visva-Bharati, Santiniketan, India.

Title: Solitons and Soliton Interactions in Plasmas

Details of Invited Speakers and their talks:

Prof. Nareshpal Singh Saini

Professor

Department of Physics, Guru Nanak Dev University, Amritsar, India.

Title: Nonlinear Excitations in Degenerate Quantum Plasma

Prof. Addepalli V N Krishna

Professor

CSE Department, Christ University, Bengaluru, India

Title: Newer Research Directions in Cryptographic Study

Dr. Amit Chakraborty

Associate Professor

Department of Mathematics, Sikkim University, Sikkim, India

Title: Bio-Complexity: Limiting Resource-Diversity-the Functioning of Systems (R-D-FS) framework





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Dr. Barun Pratiher

Associate Professor

Department of Mechanical Engineering, Indian Institute of Technology Jodhpur, India.

Title: Nonlinear dynamics and bifurcation analysis of vibration-based energy-harvesting device

Dr. Rajendra Kr. Ray

Associate Professor

School of Basic Sciences, Indian Institute of Technology Mandi, Mandi-175005, Himachal Pradesh, India.

Title: The Role of Entropy Index on the Tsallis Entropy Theory to Study the Velocity Distribution in Open Channels

Dr. Kajal Kumar Mondal

Associate Professor

Department of Mathematics, Cooch Behar Panchanan Barma University, West Bengal, India.

Title: Mass Transport Phenomena of Solute in Wetland Flows: A Numerical Approach

Dr. Amar Prasad Misra

Associate Professor

Department of Mathematics, Siksha Bhavana, Visva-Bharati University, Santiniketan-731 235, India

Title: Nonlinear Dynamics of Gravity Waves in the Earth's Ionosphere

Dr. R. Rakkiyappan

Assistant Professor

Department of Mathematics, Bharathiar University, Coimbatore, India.

Title: Finite Time Stability of Nonlinear Impulsive Systems

Dr. Nur Aisyah Binti Abdul Fataf

Senior Lecturer

National Defence University of Malaysia, Malaysia

Title: A chaos based communication scheme for IoT

Dr. M. Muthtamilselvan

Assistant Professor

Department of Mathematics, Bharathiar University, Coimbatore, India.

Title: Nonlinear Convection in Open Cavities

Dr. R. Sivaraj

Senior Assistant Professor

Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, India.

Title: Heat Transfer Studies on Cavities and Applications

Dr. Debaldev Jana

Research Assistant Professor and Graded Bharatanatyam artist of Doordarshan

Broadcasting Ministry of India Empaneled Bharatanatyam artist of ICCR (Indian Council for Cultural Relation, Ministry of External Affairs, Govt. of India).

Department of Mathematics, RKMVERI, West Bengal, India.

Title: Explosive Tritrophic Food Chain models with Interference: A comparative study





Dr. Amiya Das

Assistant Professor

Department of Mathematics, University of Kalyani, India

Title: Stability analysis of solutions of nonlinear Schrödinger equation in presence of PT-symmetric potentials.

Dr. A. Gowrisankar

Assistant Professor

Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, India

Title: Fractal perspective on the dynamics of SARS-CoV 2

Inaugural Photos:



Lighting of auspicious diya by honourable Director, SMIT, Organiser and Keynote Speakers



Lighting of auspicious diya by honourable Director, SMIT, Organiser and Keynote Speakers

General Photos:



Participants and organising committee with delegates

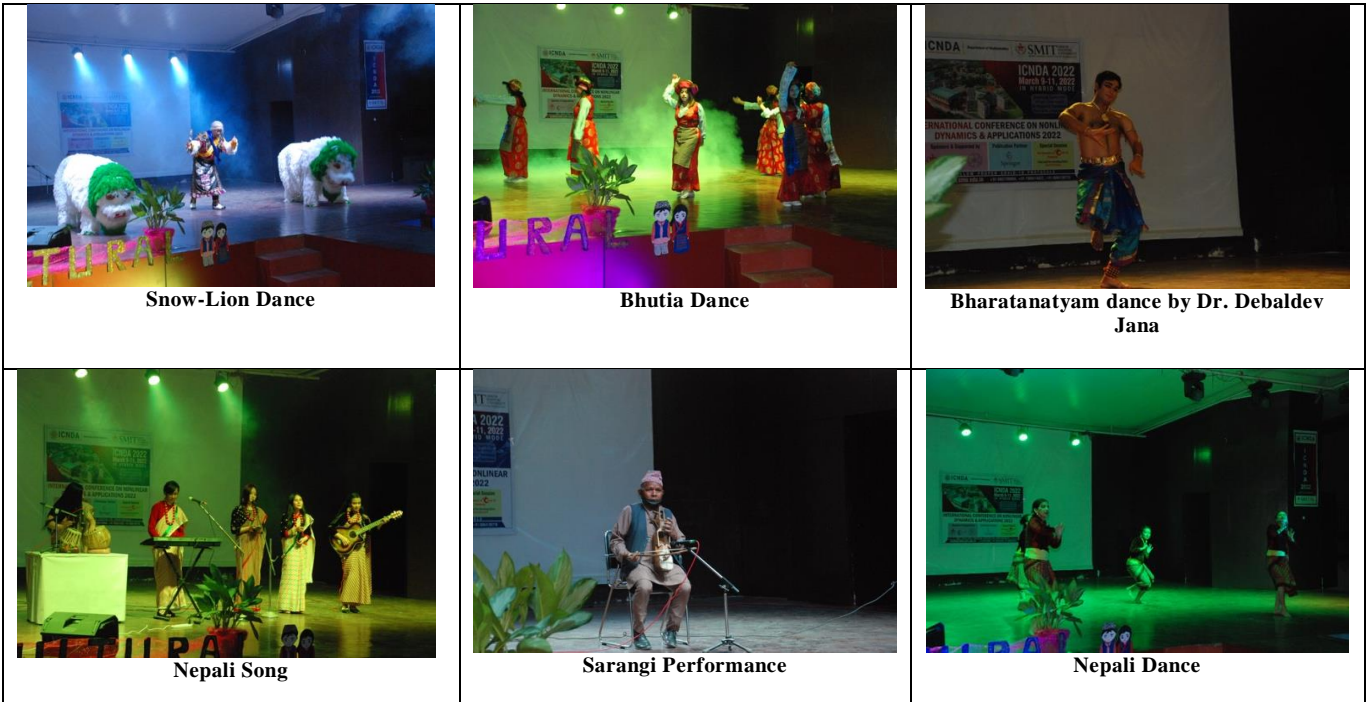


Participants with delegates





Cultural Events:



Technical Sessions:





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Valedictory Function:



Certificate distribution to invited speaker



Certificate distribution to participant



Closing of the event with National Anthem

For more details you may explore the ICNDA-2022 website: <http://icnda.in/>. Hope your support, contribution and association will continue in future as well. We shall always remain obliged for your support.

Asit Saha
07-06-2022

Dr. Asit Saha
Organizing Secretary

Dr. Asit Saha
Organising Secretary, ICNDA 2022
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