



# Announcement

International Conference

On

Nonlinear Dynamics and its Applications in  
Physical and Biological Sciences

(NDAPBS-23)

**March 16-18, 2023**

Sponsored by

DBT STAR COLLEGE SCHEME

Jointly Organized by

The Department of Physics & Department of  
Mathematics

Durgapur Govt. College

**J. N. Avenue, Durgapur, Pin- 713214, WB, INDIA**

(DST-FIST Sponsored & NAAC Accredited College with A Grade  
in 2017 (2<sup>nd</sup> Cycle) with UGC 12 (B) and 2 (f) status)

## About the Conference

Of late the study of nonlinear dynamics has emerged as a major area of interdisciplinary research. The past three decades have seen an explosion of ideas in the general field of nonlinear dynamics including geology, mathematical sciences, biology, microbiology, computer science, engineering, economics, meteorology, philosophy, population dynamics, medical science, telecommunications, sensors and laser. The study of nonlinear dynamics is one of the most exciting and fastest growing branches of mathematical sciences including the study of mathematical modelling, chaos, computation and analysis, turbulence behaviour of weather and climate and the analysis of biological and economical phenomena.

Nonlinear optics has been a rapidly growing field in recent decades. Physics of nonlinear optics describes various major nonlinear optical effects including physical principles, experimental techniques and up to date research achievements. Nonlinear optical phenomena have led to numerous scientific and technological advances not only in photonics but also in the wider fields of knowledge in physics, chemistry, biology, engineering and medicine. Many areas of research and innovation from laser technology to high energy physics, photo chemistry, and quantum information science have been made possible through the exploitation of nonlinear optical effects. Relatively recently, researchers have successfully used artificial intelligence to predict nonlinear dynamics that take place when ultrashort light pulses interact with matter. This novel technique can be used for efficient and fast numerical modeling such as in the case of imaging, manufacturing and surgery etc.

The biologists are not far behind in using the boon of solitons. Solitons may occur in protein and DNA. Solitons are related to the low-frequency collective motion in protein and DNA. In biology, soliton theory has been applied to explain signal and energy propagation in bio-membranes and the nervous system.

The chaos theory has an immense impact in many scientific disciplines including biology, chemistry, microbiology, computer science and its applications, engineering, economics, meteorology, philosophy, population dynamics, medical science, telecommunications, sensors, laser and even on the dynamics of satellite in the solar system. The chaos theory is currently being applied to medical studies of epilepsy. The nonlinear dynamics and chaos are applied for prediction of weather and climate changes. Turbulence, namely irregular fluctuations in space and time characterise fluid flows in general and atmospheric flows in particular which contribute to the unpredictable nature of both short-term weather and long-term climate. Techniques based on nonlinear dynamics are widely used in remote sensing to suggest that some ocean and atmospheric phenomena may be chaotic rather than random.

Nonlinear dynamics and stochastic dynamics can be applied to the variety of currently open questions in physics and biophysics including cell regulations at multiple scale, brain dynamics and laser dynamics.

This conference will give an opportunity to learn more about the recent developments from the experts in the concerned fields. The conference will be used as a platform to initiate the

collaborative research programme among different people working in various academic institutions in India and abroad.

## Subthemes

<ol style="list-style-type: none"><li>1. Integrable Systems and Solitons</li><li>2. Bifurcation Theory</li><li>3. Nonlinear Optics</li><li>4. Dynamics of Conservative Systems, Patterns, Complex Fluids</li><li>5. Hamiltonian and Quantum Chaos</li><li>6. Classical Deterministic Chaos</li><li>7. Dynamics of Weather and Climate System</li><li>8. Nonlinearity in Plasma and Magneto Hydrodynamics</li><li>9. Chemical Dynamics and Kinetics</li><li>10. Nonlinear phenomena in Engineering, Medical and Biological Sciences</li><li>11. Fractals, Multi fractals, Order and Time-Series Analysis</li><li>12. Synchronization and Coupled Systems</li></ol>	<ol style="list-style-type: none"><li>13. Nonlinear phenomena in Social Science and Management</li><li>14. Nonlinearity in Programming and Soft-Computing Techniques</li><li>15. Clustering</li><li>16. Bio-molecular phenomena for Cell and Tissue Engineering</li><li>17. Biophysical and Micro Scale Analyses of Molecular and Cellular Function</li><li>18. Metabolic Pathway Engineering</li><li>19. Protein Engineering</li><li>20. Nano-materials and Nano-composites</li><li>21. Synthetic Biology</li><li>22. Diversity and Dynamics of Plant Animal Interaction</li><li>23. Eco System Biology</li><li>24. Eco Monitoring</li><li>25. Diversity and Dynamics in Plant, Water and Soil Systems</li><li>26. Interface of Aero allergen, Bio pollution and Bio-Nanotechnology</li></ol>
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## Call for Abstract

Organizing committee invites delegates/participants to submit abstract for presentation (oral or poster) in different technical sessions. Abstracts must be in English with the title of the paper, name of Author(s), Designation, and institutional affiliations and corresponding email address; in MS Word (150 words; Times New Roman; 12 sizes; 1.0 space). All abstracts must be sent as email attachment to: [trinil2003@gmail.com](mailto:trinil2003@gmail.com) addressing Convener. Only the presenter will be provided the certificate of presentation and the rest others will be issued the certificate of participation, provided they physically attend the conference. **The paper may be presented in hybrid mode (off line or online).**

All abstracts must be sent by email attachment to: The Convener, by **28<sup>th</sup> February, 2023.** Only selected abstracts will be published in the book of abstract, whose registration amounts are received. Abstract, without registration fee, will not be entertained. On spot, papers will not be accepted in any case. For further details contact E-mail: [trinil2003@gmail.com](mailto:trinil2003@gmail.com) or visit web site: [www.durgapurgovtcollege.ac.in](http://www.durgapurgovtcollege.ac.in)

**Publication of Proceedings: Conference Proceedings will be published in any International/National Journal as a special issue if fund permits.**

## **Important Dates**

<b>Important Events</b>	<b>Closing dates</b>
<b>Abstract Submission</b>	<b>25<sup>th</sup> February, 2023</b>
<b>Acceptance Notification</b>	<b>27<sup>th</sup> February, 2023</b>
<b>Early Bird Registration</b>	<b>28<sup>th</sup> February, 2023</b>
<b>Full Paper Submission</b>	<b>10<sup>th</sup> March, 2023</b>

## **About Durgapur Govt. College**



## **DURGAPUR GOVT. COLLEGE**

Government of West Bengal established Durgapur Government College during the time of the genesis of Durgapur itself, an industrial town that was being built around a host of large and medium scale industries in the public and private sector and the ancillaries thereof. With the settlement of many thousands of industrial workers of all ranks in Durgapur, the need was felt for an institution offering higher education that would nurture prospective students a quality education and it was to meet this demand that the college was established on the 22<sup>nd</sup> day of January, 1969. As being the oldest institution of its kind to come up in the steel city of Durgapur, Durgapur Government College has moved from its initial modest intake capacity of 150 students to that of about 2500 students out of which fifty percent are girl students. The college offers 3-year undergraduate courses in Arts, Science and Commerce, as well as Post Graduate Ph.D. courses in Geology, Chemistry and Conservation Biology, along with M. Phil course in Geology and M.Sc. course in Zoology under the Netaji Subhash Open University (NSOU).

Durgapur Government College as it stands today since in 1969, has traversed a long way in serving the community. Durgapur is very fortunate to have a government college of this stature and potentiality. It has already earned fame for encouraging academic intercourse through organizing national and international seminars and workshops on specific disciplines and interdisciplinary subjects. Research projects sponsored by UGC, DST and other funding bodies are being carried out at the Doctoral levels. The college aims to become an affiliate of many other similar projects and has a vision to upgrade this institution to Zenith. The full-time Government College teachers are appointed by the Government under the West Bengal Education Service (W.B.E.S.) on the basis of the recommendation of the Public Service Commission, West Bengal, following the eligibility criteria framed by the University Grants

Commission (UGC). The college is a full-fledged Government college and is totally under the administrative control of the Higher Education Department (headed by the Principal Secretary, Government of West Bengal) that frames all the policies and modalities regarding the functioning of the college for the principal to execute. The college was affiliated to University of Burdwan till academic session 2014-15. From the academic session 2015-16, it is affiliated to Kazi Nazrul University. CBCS curriculum for undergraduate programmes has been introduced from the academic session 2016-2017. The institution was accredited by NAAC (National Assessment and Accreditation Council), Bangalore in September 2017 and obtained the grade A (83.5 points out of 100).

### **The Department of Physics:**

Durgapur Government College was established in 1969. Just four years after the college was established, in 1973, the Department of Physics starts its journey to fulfil the growing demands of the students of surrounding locality to learn physics. For almost a four decade, the Department has distinguished itself as the best place to study Physics in Asansol-Durgapur industrial belt. Over the years, the Department has produced successful outstanding graduates who held the positions of leadership in various professions. The Department hopes that students will develop a keen interest in the subject and contribute to the educational life of the nation.

Students after passing out generally pursue higher education in different IITs, Research Institutes, Central Universities and State Universities. Students, those who have passed from this department, are doing job in research institutes in India as well as in abroad, Government sectors, Colleges, Schools, Banks, IT industries, private industries etc.

Our vision is to impart a thorough knowledge of the fundamental principles of the several branches of physics through mathematical and experimental demonstration and to conduct the more strictly practical instruction under the guidance of these primary truths.

Our mission is to provide the students with a broad understanding of the physical principles of the universe, to help them develop critical thinking and quantitative reasoning skills, to empower them to think creatively and critically about scientific problems and experiments and to provide training for students planning careers in physics. Our goal is to be recognized as a leading institute of national standard for study of physics.

The college is offering both Honours and General courses at undergraduate level. It is equally making efforts by communicating to begin Post Graduate Course in Physics. The present composition of the faculty members includes four Assistant Professors, two Associate Professors and two non-teaching staffs. The Department provides ample Laboratory facilities. Students also enjoy an additional facility of using the extremely rich departmental library.

### **The Department of Mathematics:**

The Department of Mathematics has become its integral part and has always shared the vision of the university in striving for excellence in teaching and research activities. Over the years, the department has produced many outstanding graduate students, who have taken their career in further studies including research and also hold reputed positions in different fields. This department comprising 5 faculty members is actively involved in research besides teaching. The frontier areas of research of the department include: Fixed-point Theory, Combinatorial Optimization, Bio-Mathematics, etc.

The offered BSc course (Honours and Program) covers the core areas of mathematics. Apart from the curriculum, assignments are given on regular basis to each student of each semester

for continuous assessment. Students are trained in computer programming languages like C and FORTRAN

### **Durgapur at a Glance:**

Durgapur is a city in the Burdwan District, in the state of West Bengal, India. It was the dream child of Dr. Bidhan Chandra Roy, the second chief minister of West Bengal. It is the third largest city in West Bengal in terms of both area and population. Durgapur is the second planned city of India after Chandigarh. Distance from Kolkata: By road 170 km via NH-2 by Rail 158 km and by Flight 163 km. The nearest airport is Kazi Nazrul Islam International Airport. The airport is roughly 15 km from Durgapur's City Centre. It is India's first private-sector Greenfield airport.

### **Climate and Clothing in March:**

Durgapur has a moderate climate with all distinct seasons in a year. Weather condition in March in Durgapur is mild, dry weather and temperature fluctuates between 20° and 36°C, however it occasionally may be colder. So, participants are advised to bring warm cloths.

### **How to reach Durgapur:**

Durgapur is the second planned city of India after Chandigarh. Distance from Kolkata: By Road 170 km via NH-2 by Rail 158 km and by Flight 163 km. The nearest airport is Kazi Nazrul Islam International Airport. The airport is roughly 15 km from Durgapur's City Centre. It is India's first private-sector Greenfield airport. The airport is connected to important cities of India through domestic airlines. There are regular buses including Rocket and Volvo services from Kolkata (Calcutta) to Durgapur.

### **Registration**

Participants/Delegates are requested to submit the google form for registration whose link is given at the bottom of the page on and before **28<sup>th</sup> February, 2023. Registration will be considered only after receipt of the registration fees, which will include admission to all sessions, abstract book, conference kit, daily lunch, tea/coffee/snacks, and shuttle service between Durgapur Govt. College, selected hotels and conference venue and a special lunch on March 16, 2023.**

Registration Category	Dates of Registration	
	Early bird Registration (within 28 <sup>th</sup> February 2023) (Without Accommodation)	After 28 <sup>th</sup> February 2023) (Without Accommodation)
Faculty members	Rs. 2000/-	Rs. 3000/-
Outside India	50 USD	80 USD

Research students (non-fellowships) *	Rs. 1000/-	Rs. 2000/-
Outside India	20 USD	30 USD
Research students (With fellowships) *	Rs.1500/-	Rs. 2500/-
Outside India	25 USD	40 USD
PG / UG Students*	Rs. 500/-	Rs. 1200/-
Outside India	10 USD	20 USD
Others	Rs. 2000/-	Rs. 3000/-
Outside India	50 USD	80 USD

\*Research scholars (both categories) and the students have to produce a certificate from the Head of the concerned department without which they will be asked to pay full Registration fee (equal to faculty members).

### **Mode of Payment of Registration Fees:**

Registration fees may be paid preferably through online Bank transfer (NEFT/IMPS/UPI) to the following beneficiary

**BANK NAME** : **CENTRAL BANK OF INDIA**  
**BRANCH NAME** : **MICHAEL MADHUSUDAN MEMORIAL COLLEGE**  
**A/C NAME** : **PRINCIPAL, DURGAPUR GOVERNMENT COLLEGE**  
**A/C NO** : **1402801791**  
**A/C TYPE** : **CURRENT**  
**IFSC CODE** : **CBIN0283919**  
**MICR** : **713016203.**

Delegates/Participants are requested to send the Scan copy of the Money Transfer Receipt to the Organizing Committee through email: ID [trinil2003@gmail.com](mailto:trinil2003@gmail.com) on and **before 28<sup>th</sup> February, 2023.**

### **Accommodation & TA/DA:**

Accommodation will be the responsibility of the participants themselves. Participants/Speakers can book their own accommodation.

**Due to scarcity of funds No TA/DA will be provided.**

## **The organising Committee**

### **Patron:**

Dr. Debnath Palit

### **Principal, Durgapur Govt. College**

### **Convener:**

Dr. Swapan Kr. Ghosh

### **Joint Organising Secretaries:**

Dr. Somnath Bhattacharya & Dr. Pratikshan Mondal

### **Treasurers**

Dr. Nupur Bhakta & Dr. Amiya Biswas

<b>International Organising Committee (IOC)</b>	<b>Local Organising Committee (LOC)</b>
1. Prof. A. Khare (IISER, Pune)	1. Prof. A. Samanta (Math, DGC, Durgapur)
2. Prof. B.K. Talukdar (Physics, VB, Santiniketan)	2. Prof. S. Chandra (Chemistry, DGC, Durgapur)
3. Prof. Fred Cooper (Physics, Santa Fe Institute, Baston, USA)	3. Prof. P. Dasgupta (Geology, DGC, Durgapur)
4. Prof. Katsuhiko Nakamura (Emeritus Professor of Osaka city University, Japan)	4. Dr. A. Bhattacharya (Botany, DGC, Durgapur)
5. Dr. T. Pal (Computer Science, NIT Durgapur)	5. Dr. M. Chakraborty (Conservation Biology, DGC, Durgapur)
6. Prof. Moshe M. Chaichian (Physics, Univ. of Helsinki, Finland)	6. Dr. D. Ghosh (Physics, MMM College, Durgapur)
7. Prof. S. Mandal (Botany, Visva-Bharati)	7. Dr. P. K. Pal (Agriculture, UBKV, Cooch Bihar)
8. Prof. B. Maity (Physics, Moulana Azad College, Kolkata)	8. Dr. A. Koley (Women's College, Durgapur)
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13. Prof. M.K. Mondal (Physics, NIT, Durgapur)	13. Dr. H. Mondal (Physics, DGC, Durgapur)
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15. Prof. B. Dey (Physics, University of Pune, Pune)	15. Prof. S. Nandy (Math, DGC, Durgapur)
16. Prof. A. Banerjee (Biosciences & Bioengineering, IIT Bombay)	
17. Dr. L.K. Dey (Mathematics, NIT Durgapur)	
18. Prof. A. Pathak (Physics, IIIT, NOIDA)	
19. Dr. D. Banerjee (Physics, TM Univ. Moradabad UP)	

### **CONTACT FOR FURTHER DETAILS**

**Dr. Swapan Kr. Ghosh, Convener**

**E-mail: [trinil2003@gmail.com](mailto:trinil2003@gmail.com) (+91 8250517326/9434948490)**

**Dr. Pratikshan Mondal, Joint Organising Secretary**

**E-mail: [real.analysis77@gmail.com](mailto:real.analysis77@gmail.com) (+91 9434198620)**

**Registration Link: <https://forms.gle/X6YJsBu7N8tz3Kqs7>**