ANNUAL REPORT OF THE CALCUTTA MATHEMATICAL SOCIETY
FOR THE PERIOD FROM 1st APRIL 2022 TO 31st MARCH 2023

INTRODUCTION

Founded	: September 6, 1908 at the Senate House of the University of Calcutta.
Founder President	: Sir Asutosh Mookerjee.
Type of the Society	: Registered Society (Reg. no.6832/85) with an objective for promotion of education and research in Mathematics and Mathematical Sciences.
Postal Address	: AE-374, Sector-I, Salt Lake City, Kolkata-700064.
Status	: Internationally recognized academic Society.
Telephone	: +91 98753 40610, 03340647875
Email	: cms.office2010@gmail.com
Website	: **www.calmathsociety.co.in**

Administrative Complex : "ASUTOSH BHAVAN"
AE-374, Sector-I,
Salt Lake City,
Kolkata-700064.

Academic Complex : "ASUTOSH BHAVAN"
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ANNUAL REPORT

The annual report of the Calcutta Mathematical Society is a record of its broad academic and administrative programs and performances during the period from 1st April , 2022 to 31st March 2023. This annual report also reflects the progress achieved by the Society during this period.

The Council Members (2022-2023)

President	: Dr. Rasajit Kumar Bera
Vice-Presidents	: Dr. Debidas Chattoraj, Dr. T.Som , Dr. Joydeb Chattopadhay, Dr. Kajal De, Dr. Sanjib Kumar Datta.
Secretary	: Dr. Arindam Bhattacharyya
Treasurer	: Dr. Koushik Ghosh
Editorial Secretary	: Dr. Indrajit Lahiri
Assistant Secretary	: Dr. Partha Karmakar

Other Members of Council : Dr. Rajat Kumar Banerjee , Dr. Malay Banerjee , Dr. Krishnapada Das , Dr. Dilip Kumar Ganguly, Dr. Kalyan Halder , Dr. Bablu Biswas, Dr. Nurul Islam , Dr. Aloke Pal , Dr. Rajkumar Roychoudhury , Dr. Seema Sarkar , Dr.Gopal Chanda Shit , Dr. Gokul Saha , Dr. Kalishankar Tewari.

ACTIVITIES OF THE CALCUTTA MATHEMATICAL SOCIETY (2022 - 2023)

Administrative and academic activities of the Calcutta Mathematical Society during the period from 1st April 2022 to 31st March 2023 are presented in brief....

1. Administrative activities:

There are i) Ten (10) Council Meetings and ii) Seven (7) Ordinary General Meetings and one Annual General Meeting were held during this period.

2. Advanced Mathematical Ability Test for Class IX& X:

Calcutta Mathematical Society conducted an Advanced Mathematical Ability Test for the students of class IX and X to celebrate its115-th Foundation Day on 6-th September. The test will be held online on 6th September, 2022 between 2:00 p.m – 3:00 p.m. All the participating students received E- certificate for participation after duly submission of feedback form. Students from Kolkata and other districts of West Bengal participated in the Test. Shortlisted candidates called for interview and best students were rewarded.

3. NET Training Program for the postgraduate students in Mathematics:

It is observed that to improve the level of Ph.D aspirants, an academic preparation of the students for Ph.D. program in Mathematics in various Universities and Institutes in the country is needed. Calcutta Mathematical Society had started a training program for the postgraduate students in Mathematics to facilitate preparation for NET/SET by renowned resource persons from the different Universities /Institutes. Four months training program is conducted by the Society two times per year. Total fifteen (15) students were trained during this period.



SEMINER

- **Prof. M.R. Gupta Memorial Seminar on Nonlinear and Complex Phenomena**
  Calcutta Mathematical Society (CMS)organized a seminar in collaboration with Centre for Plasma Studies(CPS) , Jadavpur University (JU) , Kolkata &Advanced Centre for Nonlinear and Complex Phenomena (ACNCP), Kolkata was held in 4th August 22 the premises of the Calcutta Mathematical Society. The mode of the conference over offline mode.

- **Foundation Day Celebration**
  Calcutta Mathematical Society, Kolkata, India organized a Webinar on History of Science on 06 September, 2022 to celebrate its 115th birthday. The speaker is Prof. Ashish Kumar Lahiri, Adjunct Professor, Indian Institute of Science Education and Research, Kolkata, India. Time: 11:30 AM - 01: 00 PM (Indian Standard Time).

- **International Conference on Algebra ,Mathematical Analysis & Simulation (ICAMAS-2022)**
  The International Conference on Algebra, Mathematical Analysis & Simulation(ICAMAS-2022) organized during December 8 to 10 at the premises of the Calcutta Mathematical Society. The mode of the conference over offline and online (hybrid)mode. Students, Faculty members and Research Scholar from various disciplines of Mathematical Science are able to join the seminar.
  Hard Copy of Certificate will be provided to offline participants and Soft copy of certificate will be provided to the online participant.

Brief Report on "International Conference on Algebra , Mathematical Analysis & Simulation (ICAMAS-2022):

Calcutta Mathematical Society (CMS) organized three days International Conference on Algebra, Mathematical Analysis & Simulation (ICAMAS-2022) during 8th-10th December, 2022 . Distinguished eminent speakers delivered their lectures on different aspects of solving a Class of Non-Standard Real Estate Options , eigen polygon , solitary solutions, curvature inheriting symmetry on Finsler Space , Banach Contraction , fixed point theorem, higher non linear Boolean functions etc.On the first day of the program i.e., on 8th December, 2022 the conference started with the inaugural program. In the beginning of the program, Prof. Arindam Bhattacharyya, Secretary, CMS welcome the eminent speakers, respected dignitaries, all the Vice Presidents, Editorial Secretary, Assistant Secretary, Treasurer, council members, ordinary members and office staffs of Calcutta Mathematical Society and participants from and outside the country. Nextly, Prof. Sanjib Kumar Datta, Joint Convener, ICAMAS-2022 &Vice-President, CMS gave the outline of theprogram highlighting the main theme of theconference. The presidential address was delivered by Prof. Rasajit Kumar Bera, President, CMS. Dr. Koushik Ghosh, Coordinator, ICAMAS 2022 & Treasurer, CMS delivered the vote of thanks. during 11.10-11.15 a.m.

At the end of the inaugural program of the conference a photo session was shoot covering the participants and dignitaries.

On the first day of the program i.e., on 8th December, 2022, Prof. Kailash Patidar, Professor, University of the Western Cape, South Africa talked on the Non-Standard Finite Difference Method to Solve a Class of Non-Standard Real Estate Options during 11.30 a.m.-12.00 Noon

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Offline). The session was chaired by Prof. Rasajit Kumar Bera, President, Calcutta Mathematical Society (CMS).

On the same day, at 12.00 Noon -12.30 p.m. (Online), due to some technical difficulties Prof. Ameeya Kumar Nayak, IIT Roorkee could not be able to deliver his lecture .The session was scheduled to be chaired byProf. (Dr.) Subir Das, IIT, BHU. During 12.30 – 1.00 p.m. (Offline), Dr. Md. NurAlam, Pabna University of Science and Technology, Bangladesh spoke on an Eigen polygon and its application to the non-uniform approximating subdivision surface under the chairmanship of Prof. (Dr.) Sushanta Kumar Mohanta, West Bengal State University.

In the Pre-Lunch session i.e. at 1.00 -1.30 p.m. (Offline),Dr. Rajat Banerjee, Council Member, CMS was the chairperson and Prof. Harun-Or-Roshid, Pabna University of Science and Technology, Bangladesh was the speaker. Hedelivered the lecture on Solitary solutions and chaotic behaviors to the Telecommunication modelusing bifurcation analysis. Prof. Chayan Kumar Mishra, Dr. Rammanohar Lohia Avadh University, U.P. could not be able to deliver his lecture during 2.30–3.00 p.m.(Online) due to some technical difficulties. The session was scheduled to be chaired by Prof.Malay Banerjee, Council Member, CMS. In the session (3.00-3.30 p.m., offline), Prof. (Dr.) Sushanta Kumar Mohanta, West Bengal State University delivered the lecture on the Generalization of Banach Contraction Theorem in Different Spaces under the chairmanship of Prof. (Dr.) Subir Das, IIT, BHU.

In the parallel Session 1A & 1B during 3.45-5.30 p.m. 7 papers have been presented under the chairmanship of Dr. Bablu Biswas, Co-ordinator, ICAMAS-2022 , Council Member, CMS and Dr. Koushik Ghosh, Coordinator, ICAMAS-2022 & Treasurer, CMS respectively in each sessions.

On the second day of the program i.e., on 9th December, 2022, Prof. Ismat Beg, Professor, Lahore School of Economics, Lahore, Pakistan talked (Cullis Memorial Lecture) on the Fixed Point Theory of Multivalued Mappings during 10.00-10.45 a.m. (Online). The main theme was three fundamental fixed point theorems, some recent developments in fixed points of multivalued mappings and Open problems for future work. The session was chaired by Prof. B. S. Chowdhury, IIEST, Shibpur. This session was dedicated for 100-year completion of "Banach Contraction Principle".In the Session(10.45-11.30 a.m.), under the chairmanship of Dr. Krishnapada Das, Council Member, CMS papers have been presented. On the same day, at 11.30 a.m. -12.15 p.m. (Online), Prof. Sugata Gangopadhyay, IIT Roorkee delivered a speech(Saha & Saha Memorial Lecture) on Construction of Higher Non-linear Boolean Functions . The main theme was the idea of nonlinearity of Boolean functions, bent functions, two primary classes of bent function namely, the Maiorana-McFarland class and the Partial Spreads class and the notion of Z-bent functions as an effort to put the bent functions in a recursive framework. The session was chaired by Dr. Hemangi Shah, Harish-Chandra Research Institute, Allahabad.

During 12.15-1.00 p.m.(Offline), under the chairmanship of Prof. D. K. Ganguly, Ex-Vice President & Council Members, CMS, Dr. Hemangi Shah, Harish-Chandra Research Institute, Allahabad gave a lecture (Suddhodan Ghosh Memorial Lecture) on the generalization of the Hopf Conjecture.

Further, Prof. Manoranjan Mishra, IIT Ropar delivered an illuminating talk (S.N. Bose Memorial Lecture) on the Reaction Induced Kelvin-Helmholtz Instabilityat 1.00-1.45 p.m.(Online). The main focus was on the occurrence of chemo-hydrodynamic instabilities such as fingering instability, Rayleigh-Taylor and the Kelvin-Helmholtz (K-H) instability as a

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hydrodynamic instability. The session was chaired by Prof. Rajkumar Roychoudhury, Ex-President & Council Member , CMS.

After Lunch Break, during 2.30-3.00 p.m. (Offline), Dr. Anuj Bhowmik, ISI, Kolkata spoke on Mathematics in The Disguise of Economics under the chairmanship of Prof. Kajal De, Vice President, CMS.

Nextly, Prof. Andrew Rees, University of Bath, UK gave a lecture (N. R. Sen Memorial Lecture) on the Sutton problem : the transition from Darcy-Benard to Wooding at 3.00-3.45 p.m. (Online). The main theme was the Sutton problem consists of a uniform porous layer which is heated from below but where aconstant, uniform vertical through flow passes through the porous bounding surfaces, when Pe is large, all the convective dynamics took place within a thermal boundary near the hot surface; this is the Wooding problem which is well-known to be subject to subcritical instabilities and a nonlinear stability curve to complement the linear stability curve .The session was chaired by Prof. Debidas Chattoraj, Vice President, Calcutta Mathematical Society.

In the parallel Session 2A & 2B (3.45-5.30 p.m.) 7 papers in each Session have been presented. Dr. Prabir Gharami was the chairman in the parallel Session 2A & Dr. Gokul Ch. Saha, Council Member, CMS was the chairman in the parallel session 2B.
On the last day i.e. 10th December, 2022, Prof. Malay Banerjee, Council member of CMS was the chairman and Prof. Binod Chandra Tripathy, was the speaker. He spoke on n-Normed Sequence Spaces during 10.00-10.30 a.m. (Online). The main theme was about n-Normed Sequence Spaces.

Further, Dr. Anirban Banerjee, IISER Kolkata delivered a lecture on spectral study of hypergraphs using matrices at 10.30-11.00 a.m. (Online). The main theme was a hypergraph by different connectivity matrices, such as adjacency matrix, Laplacian matrix, normalized Laplacian matrix, eigenvalues of these matrices reveal different features of hypergraph, various structural characteristics of the hypergraph, like diameter, vertex strong-chromatic number, Cheeger constant, etc., the spectral properties of these matrices and random walk and (Ricci) curvature on the hypergraph using a matrix representation of that hypergraph. The session was chaired by, Prof. Arindam Bhattacharya, Secretary, CMS.

In the parallel Session 3A & 3B i.e. during 11.00-1.30 p.m.8 papers have been presented under the chairmanship of Dr. Md. Zulfikar Ali, Professor, Rajshahi University, Bangladesh and Prof. Kailash Patidar respectively in each Session. After launch break i.e. at 2.30-3.30 p.m. in the Session 4, 6 papers have been presented and Dr. Kalyan Halder Council Member, CMS was the chairman.

The Valedictory Session was started on 10th December, 2022. Prof. Gopal Chandra Shit, Joint Convener, ICAMAS-2022 & Council Member, CMS highlighted the summary of the Conference. Dr. Koushik Ghosh ,Coordinator, ICAMAS-2022 & Treasurer, CMS took the feedback from the participants. Prof. Arindam Bhattacharyya , Secretary, CMS took the suggestions from the Council Members of CMS. The prize distribution session was conducted by Dr. Koushik Ghosh , Co-ordinator, ICAMAS-2022. At the fag end of the session, Prof. Sanjib Kumar Datta, Joint Convener, ICAMAS-2022 &Vice-President, CMS delivered the vote of thanks . In his talk Prof. Datta highlighted that during the moment all dignitaries become enriched with illuminating lectures and far-reaching talks delivered by distinguished and renowned speakers on their chosen research fields. In a word, the International Conference on Algebra, Mathematical Analysis & Simulation (ICAMAS-2022) has been organized during the last three days has given a new dimension to the existing

knowledge of the stake holders. Also, the organizing committee deeply acknowledges the technical and other support like refreshment by the supporting staff of Calcutta Mathematical Society. Once again, Prof. Datta took the opportunity to express his heartfelt respect to all the stake holders and shared his good feelings with all of his learned friends on this Blended (Offline and Online both) platform.

AWARDS

I. Rs. 3000/- were given to Nilarka Pahari, the 1st. rank holder and also to Arindrajit Das, the 2nd. rank holder of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022 from the Society's own fund.

II. "Professor Sanjay Sen Memorial Award", of Rs.3000/- ,donated by Prof. Rajkumar Roychoudhury, Ex-President, Calcutta Mathematical Society was given to Rayan Das, a rank holder of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022 .

III. "Anita Bose Majumdar Award" of Rs. 2000/-, was given to Diya Ghosh, another rank holder of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022.

IV. A "Special Award" of Rs. 1000 provided by Prof. Rajkumar Roychoudhury, Ex-President, Calcutta Mathematical Society was given to Kirutika Gopikrishnan and Aaditya.V another rank holders of the online Advanced Mathematical Ability Test for the students of Class IX and X , held during 6th. September, 2022.

PUBLICATION

Publication of Journals :

The Calcutta Mathematical Society published all of its three internationally recognized series of journals namely, 1) Bulletin of the Calcutta Mathematical Society, 2) Journal of the Calcutta Mathematical Society , and 3) News Bulletin of Calcutta Mathematical Society in time.

1)Bulletin of the Calcutta Mathematical Society : During the period a total number of 118 research papers were received, 34 papers were accepted, 50 papers are under review, 08 papers are under revision and 20 papers were rejected. The number of published papers is 71. The rejection rate is about 16 %. Volume 114, No. 3-6 (2022) and Volume 115, No. 1 & 2 (2023) of the Bulletin of the Calcutta Mathematical Society were published during this period.

2) Journal of the Calcutta Mathematical Society : During the period the total number of research papers were received 96, 16 papers were accepted, 58 papers are under review and 08 papers are under revision and 17 papers were rejected. The number of published papers is 19. The rejection rate is about 18 % . Volume 18, No. 1 & 2(2022) of the Journal of the Calcutta Mathematical Society were published during this period.

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3) News Bulletin of Calcutta Mathematical Society : During the period the total number of 05 papers were received, of which 02 were published and 03 were rejected. Volume 45, No .4-12(2022) and Volume 46, No. 1-3(2023) of the News Bulletin of Calcutta Mathematical Society were published during this period.

LIBRARY OF THE CALCUTTA MATHEMATICAL SOCIETY

Over the years, the library of the Society has attained the distinction of being one of the richest libraries in the country particularly in the field of Mathematics. Library has now 18933 volumes of books and journals altogether. The Society has exchange relation with different Universities, Institutions and learned Societies all over the world under "Journal exchange program". Society now receives 64 foreign journals from USA, UK, Japan, Korea, Yugoslavia, France, Australia, Germany, Spain, Czech Republic, Italy, Poland, Canada, Turkey, Bulgaria, China, Hungary, Malaysia, Finland, Egypt, Denmark and12 journals from different states of India. Library also maintains manuscripts and letters of Professor S. N. Bose, Life History of Professor Bibhuti Bhusan Dutta (Later known Swami Vidyaranya). Several valuable papers of the eminent scientists like Meghnad Saha, C. V. Raman, K. Chandrasekhar, S. N. Bose, Ganesh Prasad and many others had been published in the Bulletin of the Calcutta Mathematical Society, which were kept in the library as hard copy and as soft copy too. During the period under report total no. of books were 6853 and total number of bound volumes of journals were 12,188. Library book entry in Excel database was going on during this period.

Due to pandemic situation during this period library services were given to the research scholars, teachers and students of mathematics and mathematical sciences from India and abroad through e-mail. Soft copy of the research papers were sent to them through e-mail.

FUTURE PLANS AND PROGRAMS

- Prof. M.R. Gupta Memorial Seminar on Nonlinear and Complex Phenomena will be jointly organized by Advanced Centre for Nonlinear and Complex Phenomena (ACNCP), Kolkata and Calcutta Mathematical Society (CMS), Kolkata in collaboration with the Centre for Plasma Studies, Jadavpur University, Kolkata to be held on 18th August, 2023 (Friday) in offline mode.

- Calcutta Mathematical Society will conduct Advanced Mathematical Workshop on Mathematical Analysis, Applied Probability and Astrophysics(WMAAPA - 2023) on 8 - 15 September 2023 in online mode.

- Calcutta Mathematical Society will conduct Advanced Mathematical Ability Test 2023 for students of class XI and XII to celebrate its 116-th Foundation Day on 6-th September 2023.

- Calcutta Mathematical Society will conduct an Advanced Mathematical Workshop for school students class VII to X on Geometry & Number system on 30th September 2023.

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- Calcutta Mathematical Society will conduct an International seminar in 5 - 7 December 2023.
- An International Seminar will be held in the month of February 2024 in the premises of Calcutta Mathematical Society to celebrate the 131st Birthday of Prof. Satyendranath Bose .

DONATION

1. Society received Rs.5,000/- for society's welfare, from Ajay Chatterjee.
2. Prof. Arindam Bhattacharyya , Secretary of the Society, donated Rs.1000/ - for the development of the Society.
3. Society received Rs. 1000/- for society's welfare, Tapan Maiti.

Rasajit Kumar Bera

(Prof. Dr. Rasajit Kumar Bera)
President
Calcutta Mathematical Society

(Prof. Dr. Arindam Bhattacharyya)
Secretary
Calcutta Mathematical Society

Date : 16/09/2023

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