ANNUAL REPORT OF THE CALCUTTA MATHEMATICAL SOCIETY FOR THE PERIOD FROM 1st APRIL 2021 TO 31st MARCH 2022

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(033)2337-8882; (033)4064-7875
Email	: cms.office2010@gmail.com
Website	: **www.calmathsociety.co.in**

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

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

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,2021 to 31st March 2022. This annual report also reflects the progress achieved by the Society during this period.

The Council Members (2021-2022):

President	: Dr. Rasajit Kumar Bera
Vice-Presidents	: Dr. Debidas Chattoraj, Dr. Joydeb Chattopadhay, Dr. Kajal De, Dr. Sanjib Kumar Datta, Dr. T. Som
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 (2021-2022):

Administrative and academic activities of the Calcutta Mathematical Society during the period from 1st April 2021 to 31st March 2022 are presented in brief....

Administrative activities:

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

Academic Activities:

A popular lecture on "History of Mathematics" was delivered on Foundation Day, 6th September, 2021 by Dr. Debiprasad Duari, Director of M. P. Birla Planetarium. Title of the talk was: "From Number to Analysis: A Historical Journey". More than 500 participants were registered for the talk. It was done in Google Meet platform and YouTube also, from 11:30am-12:30pm. All the participants received E-Certificate.

Advanced Mathematical Ability Test for Class XI & XII:

Calcutta Mathematical Society conducted an Online Advanced Mathematical Ability Test for the students of class XI and XII to celebrate 114th Foundation Day on 6th September 2021, from 1:00p.m.-2:00p.m. All the participants received E-Certificate for participation after duly submission of feedback from. Students from Kolkata, other districts of West Bengal and other States participated in the test. Shortlisted candidates called for interview and 4 students were awarded.

Seminar & Symposia:

An Online Workshop on Emerging Areas in Mathematics (WEAM-2021).

The Calcutta Mathematical Society organized an Online workshop on "Emerging Areas in Mathematics" (WEAM-2021) during 10th-17th July, 2021. It was a one-week faculty development programme to provide an excellent platform to promote young research scholars and faculty members to build contact and collaborations with senior scientists. WEAM-2021, was focused on Algebraic Geometry, Discrete Dynamical System, Stochastic Process, Stochastic Differential Equation and Information Theory. In the workshop, experts from their respective fields delivered speech and that served as a motivation for the researchers in the area to get a better direction for further research on these topics and to explore something new. Participants had also gotten a clear view on the computational aspects of the focus domains from this workshop. Thrust areas of the workshop were mentioned above.

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International Conference on Recent Developments in Mathematics and Mathematical Sciences (ICRDMMS 2021) (Annual Conference of Calcutta Mathematical Society)

The "International Conference on Recent Developments in Mathematics and Mathematical Sciences" (ICRDMMS 2021) was held over online platform (Google Meet) during 9th – 11th December, 2021. Total 112 participants contributed web presentation during the conference. As a whole total 138 delegates participated in this conference apart from Council Members of Calcutta Mathematical Society. Eight (8) eminent speakers delivered invited talks in this conference out of them Three (3) were from foreign institutes. The main objective of this conference is to highlight and promote mathematical research focusing the Recent Advances in the field of Mathematical Sciences. The conference aims to provide ideal virtual platform for the young researchers to initiate possible scientific collaboration in different domains. The programme consisted of invited talks as well as presentations by contributors from various technical disciplines.

CIMPA RESEARCH SCHOOLPROGRAMME 2022:

Calcutta Mathematical Society (CMS) has organized a Nine (9) day CIMPA Research School-2022 from 18th January, 2022 to 27th January, 2022 in collaboration with and under active guidance of CIMPA (CENTRE INTERNATIONAL DE MATHÉMATIQUES PURES ET APPLIQUÉES) on Groups and Geometry. Local organizing Coordinator was Prof Dr. Arindam Bhattacharyya, Department of Mathematics Jadavpur University & Secretary of Calcutta Mathematical Society and External Coordinator Prof. Dr. Peter Haissinsky, Professor, Aix-Marseille University, France. Distinguish eminent speakers delivered their lectures on different aspects of Riemannian Geometry, Hyperbolic Geometry, Boundary of a Hyperbolic Group, Geometry of Higher rank non compact symmetric spaces, etc.

The meeting held in ZOOM platform provided by CIMPA in hybrid mode where in the first and last day, some of the local participants council members of the society were present at the premises for the inauguration and valedictory programme.

On the first day of the programme i.e., on 18th January, 2022, after the Inauguration, Prof. Arindam Bhattacharyya from Jadavpur University, talked on the basic Geometric objects of Riemannian to provide some background such as definition of a Riemannian manifold, it's associated distance and group of isometries with their elementary properties. On the same day, Prof. Peter Haissinsky from Aix-Marseille University, France started his lecture on Quasi-Isometry in variants to present some standard examples of in variants, such as ends, Volume Growth, Finite Presentability etc. After his lecture Dr. Krishnendeu Gangopadhay from IISER, Mohali, gave a gentle introduction to Hyperbolic Geometry, Hyperbolic Plane.

On 19th January, 2022 in the pre-lunch session, Prof. Peter Haissinsky and Dr. Krishnendu Gangopadhay continued their previous day lectures respectively on Quasi-Isometry and Hyperbolic geometry. On the same day, in the after-lunch session Prof. Indira Chatterji from

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University De Nice, France gave her speech on word Hyperbolic Groups to discuss Cayley Graphs, then Growth and Hyperbolicity in Metric Spaces and Groups.

On 20th January, 2022 Prof. Indira Chatterji again talked on word Hyperbolic groups and then Prof. Peter Haissinsky delivered his lecture. On the same day, Dr. Krishnendu Gangopadhay again gave his lecture on Hyperbolic Geometry.

On 21st January 2022, Prof Indira Chatterji further gave a lecture on word hyperbolic groups and then Dr. Krishnendu Gangopadhay delivered his lecture on Hyperbolic Geometry.

On 22nd January 2022, in the pre-lunch session Dr. Krishnendu Gangopadhay continued his previous day lecture on Hyperbolic Geometry. On the same day after-lunch session Prof Indira Chatterji again gave a speech on word Hyperbolic Groups and then Prof. Peter Haissinsky talked on Quasi-Isometry invariants.

They and the tutors engaged the participants in several tutorial classes to do the exercises given by them in Zulip platform provided by CIMPA.

On 24th January 2022, in the pre-lunch session the video lecture of Prof. Tullia Dymarz from University of Wisconsin, USA has been started as she was affected by COVID, on amenability of arose from the Banach Tarski paradox that a sphere can be decomposed into finitely many pieces that can then be used to construct two spheres by only moving the pieces around by rotations.

On the same day in the after-lunch session Prof. Christopher Pittet from Aix-Marseille University, France begun first speech on Ergodic Theorems that can be deduced from operator norm estimates and unitary representations of Lie Groups and their Lattices and then Prof. Kingshook Biswas from ISI Kolkata, and Prof. Genevieve Walsh from Tufts University, USA commenced their first lecture respectively on Mostow Rigidity and Boundaries of Hyperbolic & Relatively Hyperbolic Groups respectively.

On each 25th & 26th January 2022, in the pre-lunch session the video lecture of Prof. Tullia Dymarz continued. On the same day in the after-lunch session Prof. Christopher Pittet again gave a speech on Ergodic Theorems and Unitary representations of Lie Groups and Prof. Genevieve Walsh delivered lectures on Boundaries of Hyperbolic & Relatively Hyperbolic Groups with the tutorial.

On the last day of the programme i.e., on 27th January 2022, un the pre-lunch session Prof. Kingshook Biswas continued previous day speech on Hyperbolic Geometry and Mostow Rigidity. On the same day after-lunch session after the tutorial of Prof Walsh, Prof. Christopher Pittet again gave a speech on Ergodic Theorems and Unitary representations of Lie Groups.

Several tutorials have been taken by the eminent speakers and the efficient tutors and participants actively enjoyed and replied their feedback very positively. Apart from the tutors like Swathi Krishna, Sagar Kalane, Ravi Tomar, Soumya Dey, Ashani Dasgupta, Sushil Bhunia and Rakesh Halder some of the active participants are Arkajit Pal Choudhury of ISI, Kolkata,

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Sreejani Choudhury from Hyderabad University, Supriti Laha from NIT, Durgapur, Paritosh Ghosh, Sumanjit Sarkar and Dipen Ganguly from Jadavpur University, Anjali Srivastava and Ranadeep Ganguly from Banaras Hindu University, Arghya Mondal, CMI, and Biswajit Nag from TIFR, Mumbai.

During the School we are enriched with illuminating lectures and far-reaching talks delivered by distinguished and renowned speakers on their chosen research fields. In a word, the CIMPA Research School-2022, organized during those nine days has given a new dimension to the existing knowledge of the stake holders. We are also thankful to those who have rendered financial assistance namely CIMPA, International Mathematical Union (IMU) & Institute de MATHEMATIQUES de MARSEILLE, which actually help us to share a new platform with the modern aspects of Groups and Geometry. Also, the organizing committee deeply acknowledges the technical and other support by the supporting staffs of Calcutta Mathematical Society. Once again, we take the opportunity to express our heartfelt respect and gratitude to all eminent speakers and tutors to complete this research school very successfully and sharing their knowledge to enrich the participants in Groups and Geometry on this virtual platform.

Scientific content:

Course 1: "Prerequisites on Riemannian Geometry", Arindam Bhattacharyya (Jadavpur University, India)

Course 2: "Hyperbolic Geometry", Krishnendu Gongopadhyay (Indian Institutes of Science Education and Research, India)

Course 3: "Quasi-Isometry Invariants", Peter Haïssinsky (Université d'Aix-Marseille, France)

Course 4: "Word Hyperbolic Groups", Indira Chatterji (Université Côte d'Azur, France)

Course 5: "Boundaries of Hyperbolic Groups", Genevieve Walsh (Tufts University, USA)

Course 6: "Ergodic Theorems and Unitary Representations of Lie Groups and their Lattices", Christophe Pittet (Université d'Aix-Marseille, France)

Course 7: " Mostow Rigidity", Kingshook Biswas (Indian Statistical Institute, India)

Course 8: "Large scale geometry of nilpotent and solvable Lie groups", Tullia Dymarz (University of Wisconsin, USA).



International Webinar on Recent Trends in Mathematical Sciences (With Special Emphasis on Mathematical Physics and Number Theory) (IWRTMS):

To Commemorate the 129th Birthday of Prof. Satyendranath Bose and 135th Birthday of Srinivasa Ramanujan, Calcutta Mathematical Society organized a Two-day web-based seminar during 25th to 26th February, 2022. The main objective of IWRTMS-2022 is to promote research and to focus on the recent trends in Mathematical Sciences (With Special Emphasis on Mathematical Physics and Number Theory). This programme conducted to commemorate the phenomenal contributions of the two legends Prof. Satyendranath Bose on his 129th birthday 1st January and Srinivasa Ramanujan on his 135th birthday on 22nd December. The seminar aims to provide ideal virtual platform for the young researchers to interact with senior scientists, to exchange their views and ideas and to initiate possible scientific collaboration in the focused domains. The programme will consist of invited talks as well as contributed presentations in different technical sessions.

Memorial Lecture:

1. Prof. N. R. Sen Memorial Lecture-2021was given by Prof. B. V. Rathish Kumar, IIT Kanpur, India.
   Title of the talk: Stabilized Variational Multiscale-Finite Element Analysis of Coupled Brinkman-Stokes-Transport Model.

2. Prof. S. N. Bose Memorial Lecture-2021was given by Prof. Vitaly Volpert, CNRS, Institute Camille Jordan, University Lyon 1, France
   Title of the Talk: Theory and Applications of Reaction-Diffusion Waves.

3. C. E. Cullis Memorial Lecture-2021 was given by Prof. Maira Aguiar, Basque Center for Applied Mathematics, Bilbao, Spain
   Title of the Talk: On the Origin of Complex Dynamics in Multi-Strain Dengue Models.

4. Suddhodan Ghosh Memorial Lecture-2021 was given by Prof. Shamik Ghosh, Jadavpur University, Kolkata, West Bengal.
   Title of the Talk: Interval Catch Digraphs.

5. Saha and Saha Memorial Lecture-2021 was given by Prof. Luis Manuel Sanchez Ruiz, Polytechnic University of Valencia, Spain
   Title of the Talk: Recent Approaches to Continuous Assessment of Mathematical Competencies.

6. Prof. B.K. Datta Memorial Lecture-2021 was given by Prof. Nandini Trivedi, Professor, Ohio State University, Fellow of the American Physical Society and Fellow of the American Association for Advancement of Science.

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Title of the Talk: Quantum Phase Transition from Bose-Einstein condensates to Mott Insulators.

Awards:

1. Rs. 3000/- each were given to Sri Aditya Kishore, the 1st rank holder and also to Ms. Siyona Jena, the 2nd rank holder, of the online Advanced Mathematical Ability Test for the students of class XI & XII, held during 6th September, 2021 from the society's own fund.

2. Prof. Sanjay Sen, Memorial Award of Rs. 3000/- was given to Mr. Souraj Samaddar another rank holder of the online Advanced Mathematical Ability Test for the students of class XI & XII, held during 6th September, 2021.

3. Anita Bose Majumdar Award of Rs. 3000/-, was given to Ms. Ayantika Basu another rank holder of the online Advanced Mathematical Ability Test for the students of Class XI & XII, held during 6th. September, 2021.

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. programme in Mathematics in various Universities and Institution in the country is needed. Calcutta Mathematical Society had started a training programme for the postgraduate students in Mathematics to facilitate preparation for NET/SET by resources persons from the different universities/Institutes. Four months online training programme was conducted by the society two time per year. This programme was started from August 2021 to June 2022. Thirteen (13) students joined in the August, 2021 session, and Seven (7) students joined on March, 2022 session respectively.

Council Election 2021-2024:

The following candidates are declared unopposed as elected to the Management Committee of the Society for the year 2021-2024

President	: Dr. Rasajit Kumar Bera
Vice-Presidents	: Dr. Debidas Chattoraj, Dr. Joydeb Chattopadhay, Dr. Kajal De, Dr. Sanjib Kumar Datta, Dr. T. Som
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.

Publications:

Publication of Journals:

The Calcutta Mathematical Society published in time its two internationally recognized series of journals, namely, i) Bulletin of the Calcutta Mathematical Society, and ii) Journal of the Calcutta Mathematical Society. However, due to some unavoidable circumstances any regular issue of News Bulletin of Calcutta Mathematical Society could not be published.

1. Bulletin of the Calcutta Mathematical Society:

   During the period, (i) 42 (forty-one) research papers were published, (ii) 35 (thirty-five) papers were received, (iii) 14 (fourteen) papers were accepted, (iv) 16 (sixteen) papers are under review (v) 4 (four) papers are under revision (as advised by the referees) and (vi) 8 (eight) papers were rejected.

   Bulletin of the Calcutta Mathematical Society, Volume 113, No. 2 – 6 (2021) and Volume 114, No. 1 & 2 (2022) were published during this period.

2. Journal of the Calcutta Mathematical Society:

   During the period (i) 12 (twelve) research papers were published, (ii) 39 (thirty-nine) papers were received, (iii) 8 (eight) papers were accepted, (iv) 19 (nineteen) papers are under review, (v) 4 (four) papers are under revision (as advised by the referees), and (vi) 10 (ten) papers were rejected.

   Journal of the Calcutta Mathematical Society, Volume 17, No. 1 & 2 (2021) were published during this period.

3. News Bulletin of Calcutta Mathematical Society:

   Volume 45, No. 1-6 (2022) and Volume 43, Nos. 4-12 (2020) and Volume 44, Nos. 1-12 (2021) of News Bulletin of Calcutta Mathematical Society could not be published due to Covid- 19 situation.

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

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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 was sent to them through e-mail.

Future plans and programs:

1. A Workshop on Discrete Mathematics, Mathematical Modelling and Probability & Statistics (WDMMMPS-2022) will be held during 14th to 20th June.

2. Calcutta Mathematical Society will conduct a popular lecture and an Advanced Mathematical Ability Test 2022 for students of class IX and X to celebrate its 115-th Foundation Day on 6thSeptember 2022.

3. A School teachers' training may be organized in collaboration with DST BT Govt. of West Bengal in November 2022.

4. An International Conference will be organized during 8th to10th December 2022.

5. A seminar may be organized in February 2023 to mark the 130th birth anniversary of Satyendranath Bose and 136th birth anniversary of Srinivas Ramanujan.

Donation:

Society received Rs.20,000/- for society's welfare, from Hare Krishna Tamil, a School teacher from Contai, Purba Medinipur, West Bengal.

Prof. Rasajit Kumar Bera
(President)
Calcutta Mathematical Society

Prof. Arindam Bhattacharyya
(Secretary)
Calcutta Mathematical Society

Date: 10/09/2022

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