

Celebration of 130th Birth Anniversary of Professor Meghnad Saha

Indian Science News Association (ISNA) paid homage to Professor Meghnad Saha, a pivotal founder Secretary of ISNA, and Editor of the Journal *Science and Culture*, on the 6th October, 2023 in the N.R. Sen Auditorium, University of Calcutta, Rashbehari Siksha Prangan, Rajabazar Campus. It was organized as a part of the XXXVI Training Programme on Science Communication and Media Practice (TPSCMP) 2023-2024.

At the outset, Dr. Amit Krishna De, an Honorary Secretary of ISNA, informed the audience about the main reason for holding the programme. Dr. De, being the Convener of the XXXVI TPSCMP 2023-'24, stated about the activities of the Training Programme in every year since 1983. In a brief speech, Shri Prasanta K Bose, the Chairman of the Organizing Committee of the TPSCMP, delivered welcome address and talked about Professor Saha's contribution towards the development of free India. His short but valuable speech impressed the audience.

The next speaker was Professor Manas Chakrabarty, another Honorary Secretary of ISNA. In a very emotional way he narrated how Professor M.N. Saha became a member of India's intelligentsia. Professor Chakrabarty also spoke about the creation of ISNA and *Science and Culture* by M.N. Saha, along with Acharya P.C. Ray and others, his writings on river management, railway construction, India's need for power development, etc. in *Science and Culture*, his criticisms of the science policies of the Indian Government, and his role to create the National Planning Committee. He also mentioned briefly on Saha's accomplishments in thermodynamics, spectroscopy and quantum theory.

Professor Anirban Kundu, Department of Physics, University of Calcutta, was the next speaker. He mentioned that M.N. Saha joined Calcutta University as a Professor in 1916. Sir Taraknath Palit contributed a huge amount of money for the construction of a laboratory within Rajabazar Science College Campus. In that laboratory, Professor Saha prepared a cyclotron machine, which opened a new path in the field of research of Science. He

was the pioneer in the field of Astrophysics in India and was the first to inform the world that the stars of the sky always follow the rules of Physics. Professor Saha was instrumental in the formation of Allahabad University which became a centre of excellence in scientific research. Professor Kundu also explained Saha's original theory on Sun's atomic structure.

Chief-Guest Professor Anupam Basu, Raja Ramanna Chair Professor of Jadavpur University and Professor of Sister Nibedita University, very humbly told that Saha and other scientists were involved in research and education and dedicated freedom fighters too. He mentioned that Professor Saha was a diligent scientist and wholeheartedly worked for his country with his head held high to make important contributions to Science and Technology. In a very depressing mood, he told that the shadow of these great scientists is becoming hazy amongst the new generation. He encouraged students in the audience to know and follow Professor Saha's footsteps and work laboriously for the betterment of science. He gave emphasis on the hands-on experiments for the students. Then Dr. Basu released volume 3, issue 1 of the e-paper *Scientific Communica*.

Indian Science News Association humbly felicitated Professor S.K. Talapatra and Dr. Balaram Majumder, the two most senior members of ISNA, with 'Uttariyo, Felicitation Certificate Memento and a sapling' for their long association with and fruitful contribution to ISNA and its activities.

The successful students of the XXXVI TPSCMP were given Certificates on this occasion.

The main attraction was the extempore speech competition for the school students. 'Amar Chokhe Meghnad Saha' was selected as the topic of extempore speech in memoriam of Professor Saha. The students of Haryana Vidyamandir and Dumdum Ananda Ashram Sarada Vidyapith participated in the competition. Deparpon Ghosh from the former school and Samadrita Nayak and Moumita Acharya from the latter school made their mark in the speech and grabbed the first three positions. At last Professor Bikash K. Chakrabarti, Vice-President of ISNA and Ex-Director and Professor of Saha Institute of Nuclear



(L to R) Dr. Amit Krishna De, Prof. Manas Chakrabarty, Prof. Anupam Basu, Prof. Anirban Kundu, Shri Prasanta K Bose and Prof. Bikash K. Chakrabarti



(L to R) Dr. Amit Krishna De, Prof. Manas Chakrabarty, Prof. Sunil Kumar Talapatra, Prof. Anupam Basu, Shri Prasanta K Bose and Prof. Bikash K. Chakrabarti



(L to R) Prof. Bikash K. Chakrabarti, Dr. Amit Krishna De, Dr. Baram Majumder, Prof. Sudhendu Mandal, Prof. Manas Chakrabarty and Shri Prasanta K Bose

Physics, delivered a speech on SINP. The whole programme was anchored by Tithi Roy and Dr. Saikat Kumar Basu, ex-students of TPSCMP. □

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The Ninth Professor Asima Chatterjee Foundation Oration; 22nd September 2023

The Professor Asima Chatterjee Foundation organised its Ninth Oration Lecture in a function held on 22nd September 2023. It was held in dual mode at the Meghnad Saha Auditorium, Rashbehari Siksha Prangan of the University of Calcutta, 92 Acharya Prafulla Chandra Road, from 2 P.M. onwards. Professor Uday Maitra, Retired Professor, Department of Organic Chemistry, Indian Institute of Science, Bangalore, delivered the Ninth Oration Lecture. Dr. G. Babu, Director – Central Ayurveda Research Institute, Kolkata under the Central Council of Research in Ayurveda, Ministry of Ayush, graced the function as the Chief Guest. The function was presided over by Professor Avijit Banerji, Working President PACFK.

At the outset, floral tributes were offered to the portrait of Professor (Mrs.) Asima Chatterjee. The programme started with an invocation sung by (Mrs.) Jaya Bandyopadhyay. Then the Chief Guest was felicitated by Professor S.K. Talapatra, and the Oration speaker Professor Uday Maitra by Professor Avijit Banerji.

Dr. (Mrs.) Sumitra Chaudhuri, Secretary, PACFK delivered the Welcome Address. She briefly recounted the life and contributions of Professor (Mrs.) Asima Chatterjee - revered 'Master' as she was called. Professor Chatterjee was an outstanding scientist, academician and scientific policy maker of our country. She



Dr. G. Babu



Prof. Uday Maitra

is internationally renowned for her contributions to research and teaching in Organic Chemistry and associated disciplines. Several of her students rose to positions of eminence in the scientific community.

Professor Chatterjee worked with Dr. Prafulla Kumar Bose, one of the pioneering researchers in Natural Products Chemistry in India at the University of Calcutta. She received the Nagarjuna Prize and Gold Medal in 1940, Premchand Roychand Studentship in 1942 and Moutat Medal in 1944. She was awarded the D.Sc. degree of the University of Calcutta in 1944 on her thesis entitled 'Naturally Occurring Indole Alkaloids and Coumarins' as the first lady recipient of D.Sc. degree of any Indian University. She worked abroad in the USA and Switzerland in the later 1940s and 1950s - working with Professor L.M. Parks, Professor L. Zechmeister, Professor Paul Karrer, NL. During her stay at the Californian Institute of Technology, she came into close contact with Professor Linus Pauling, NL. She had her life-long association with Professor Linus Pauling and Mrs. Ava Pauling.

Professor Asima Chatterjee made significant contributions on the chemistry of diverse classes of Natural Products from Indian medicinal plants, particularly in the fields of indole, isoquinoline and steroidal alkaloids and also on terpenoids



(L to R) Prof. Avijit Banerji, Prof. Uday Maitra and Prof. S.K. Talapatra



Audience

and polyphenolics. She also contributed to the study of Organic Reaction Mechanisms and Synthetic Organic Chemistry. She devoted considerable attention to the development of drugs based on the practice of Indian Traditional Medicine. She was the inspiration for the development of two Ayurvedic combination drugs – these are landmarks in the use of herbal medicines without any side effects. These were Ayush-56, a highly successful rehabilitation drug in the treatment of epilepsy and behavioural epileptic disorders, and Ayush-64, a highly potent antimalarial drug which is now being used as an adjunct to standard care in mild to moderate COVID-19.

Among the many awards and recognitions she received, particular mention may be made of the following – Elected Fellow of the Indian National Science Academy (FNA) in 1960 and subsequently admitted as a Fellow to all the major Academies of India; Shantiswarup Bhatnagar Award (1961); C.V. Raman Award (1985/1982); Asutosh Mookerjee Award (ISCA, 1989), Award of the Hari Om Ashram Trust (1982) of the University Grants Commission. She received several other medals, prizes and prestigious lectureships. She was elected General President of the Indian Science Congress Association (1975 Session) – the first woman scientist to hold this prestigious position. She was honoured with ‘Padma Bhushan’ by the Government of India (1975). She was nominated by the President of India to be a Member of the Rajya Sabha (February 1982 - April 1984; May 1984 - May 1990) as a scientist-academician. She contributed to science policy formulations during her tenure at the Rajya Sabha. She was also deeply involved in the Popularisation of Science. She had worked together with Professor Satyendranath Bose in the Bangiya Bijnan Parishad, and succeeded the latter as its President in 1974, on Professor Bose’s demise.

She was the Founder of a multi-disciplinary Research Institute on Ayurvedic Sciences, which is now named the Central Ayurveda Research Institute, situated at Bidhannagar, Kolkata. Professor Asima Chatterjee created a school of Research on Natural Products. She was the Chief Editor of the six-volume series, *The Treatise of Indian Medicinal Plants* published by CSIR, India. She also edited and revised the six-volume *Bharatiya Bonousudhi* published by the University of Calcutta.

She was a great devotee of Sri Ramakrishna Paramhamsadev, Holy Mother Sarada and Swami Vivekananda, and was closely associated with Ramakrishna Math and Mission, Belur, throughout her life. Swami Abhayanandaji Maharaj (popularly known as Bharat Maharaj), Swami Ranganthanandaji Maharaj, Swami Nikhalanandaji Maharaj and Swami Prabhakaranandaji

Maharaj played a prominent role in her life in providing inspiration and courage.

Dr. G. Babu, Director of the Central Ayurveda Research Institute, Kolkata under the Central Council of Research in Ayurveda, Ministry of Ayush graced the function as Chief Guest. Dr. Babu, a renowned authority on the traditional school of medicine Ayurveda, headed the CCRAS Institute at Jhansi before taking up his present assignment. Dr. Babu began his address by mentioning that he felt proud and privileged to be a part of the function being held on the occasion of the Professor Asima Chatterjee Foundation Ninth Oration Lecture. He greeted Professor Uday Maitra, the Oration speaker and the dignitaries on and off the dais. He mentioned that the Central Ayurveda Research Institute, Kolkata is one of the premier Research Institutes on Ayurveda in the country. He mentioned that she was a role model for all women who wanted to pursue a career in Science, particularly Chemistry, and also as a role model for all mothers. Her life provided a ray of hope for all women scientists. He mentioned that in addition to basic research, Professor Chatterjee was also interested in Ayurvedic Science and the development of drugs from Indian Medicinal Plants. Dr. Babu informed that she developed two drugs from Indian Medicinal plants, in collaboration with Indian Council of Medical Research and Central Council of Research in Ayurveda and Siddha: Anti-epilepsy drug Ayush 56 – a formulation of *Marsilia minuta* and *Nardostachys jatamansi*, and the Anti-malarial drug Ayush 64 – a formulation of *Alstonia scholaris*, *Swertia chirayata*, *Caesalpinia indica*, *Picrorhiza kurroa*. These have been commercialised by many companies. Late Professor Chatterjee was one of the founders of the Central Ayurveda Research Institute, Kolkata, and arranged for procurement of the land. Dr. G. Babu said that he had studied the life and struggles of Professor Chatterjee. He felt that an extraordinary woman like her become more extraordinary when they survive under the most trying circumstances. He felt happy to mention that a statue of late Professor (Mrs.) Asima Chatterjee is proposed to be constructed and will be placed in the new eight story building of the Institute which will be inaugurated in February 2024. In concluding, Dr. G. Babu paid his tributes to late Professor (Mrs.) Asima Chatterjee on behalf of all the staff of CARI, Kolkata.

Professor Avijit Banerji, Working President PACFK, delivered his Presidential address. He mentioned that after a lapse of four years, PACFK was organising the Oration lecture - the Ninth in the series – off-line. The last three Oration lectures had been delivered on-line. The venue

this time was different from earlier years. The choice of venue - the Rashbehari Siksha Prangan, of University of Calcutta - was made in recognition of the life-long association of Professor (Mrs.) Chatterjee with this campus. The genesis of the Professor Asima Chatterjee Foundation goes back to 1997, when a Committee was formed for the observance of her 80th Birthday in September 1997. A three-day Conference was organised at Science City in which participants came from Academia, Industry, and Public Life. Professor Chatterjee was also felicitated at this campus, in this very auditorium later in the same month in a function organised by the Chemistry Department, University of Calcutta. This Committee, with Dr. S.C. Pakrashi as President, continued its activities after 1997.

After the sad demise of Professor Chatterjee in 2006, the students and admirers of Professor Chatterjee gave shape to this Committee as a registered Foundation – the Professor Asima Chatterjee Foundation, Kolkata was established with a view to perpetuate her memory and to inspire future generations for the upliftment of the status of chemical research and education in India. Dr. Pakrashi was the first President of PACFK, with Prof. Biswapati Mukherjee as its Honorary Secretary. From 2015, the PACFK has been arranging the Professor Asima Chatterjee Oration Lecture on her Birth Anniversary on 23rd September, or on another convenient date if 23rd was a holiday.

The Foundation organised two International Conferences on Chemistry for Human Development (ICCHD) with the collaboration of The University of Calcutta and Heritage Foundation in January 2018, and January 2020. Professor Dilip Maiti was the Organising Secretary of these Conferences, where many famous scientists drawn from Academia and Industry in India, and several Asian, European and American countries participated. Due to the COVID pandemic the next one could not be held so far. The third ICCHD has now been scheduled to be December 2024/ January 2025.

It would be relevant to mention certain other accolades given to Professor Chatterjee in recent years. On 23rd September 2017, Google celebrated her 100th birthday with a special doodle tribute to her. In a book brought out by Vigyan Prasar entitled ‘Indian Scientists: The Saga of Inspired Minds’ a Chapter has been devoted to her. A plenary Session entitled ‘Investigations of Indian Medicinal Plants - A Post-Centenary Tribute to Professor (Mrs.) Asima Chatterjee - was organised at the 107th Session of the Indian Science Congress Association at Bangalore in 2020. In recent years the Asiatic Society, Lady Brabourne College and Scottish Church College have

organised Seminars on the life and work of Professor Chatterjee. The Indian Chemical Society organised an on-line Session on Professor Chatterjee at their Annual Convention in 2021. Two lectures were given by Professor Julie Banerji in Seminars organised by the IIT, Indore and WIEE. A Chemistry Building in IIT, Jodhpur has been named after Professor Chatterjee. Very recently, information was received that an Auditorium at DST Headquarters has been named after her.

The Foundation suffered the grievous loss of Dr. S.C. Pakrashi in 2020 and Prof. Biswapati Mukherjee in 2021, during the COVID-19 pandemic. Professor S. K. Talapatra, took over as President in 2020. Dr. Sumitra Chaudhuri, presently President of Bangiya Bijnan Parishad, took over as Honorary Secretary in 2021. Professor Banerji mentioned that he has been discharging duties of PACFK as Working President, due to the continuing illness of Professor Talapatra, with his blessings. He expressed happiness that Professor Talapatra could be able to participate in today’s function, in spite of his illness.

Professor Banerji then introduced the Oration speaker Professor Uday Maitra, of the Indian Institute of Science, Bangalore. He graduated from Presidency College, Calcutta, and obtained his MSc from IIT Kanpur in 1981. He received M Phil and PhD from Columbia University, New York, in 1986, working with Professor Ronald Breslow. Following a postdoctoral stay at the University of California at Berkeley in Professor Paul A. Bartlett’s group, he returned to India, and after a year at IIT Kanpur moved to IISc Bangalore in 1989. He continues there as Retired Professor - an Emeritus position. His research interests are in the broad area of Supramolecular Chemistry, though he has contributed significantly to other fields as well. He has about 180 publications. Professor Banerji mentioned just two. *Supramolecular gels: Functions and Uses* published in Chemical Society Reviews has received over 2200 citations. In the 1980s, attention was drawn to his pioneering work on Selective Diels-Alder reactions in aqueous solutions and suspensions published in 1983, when he was with Professor Breslow. Prof. Uday Maitra is also greatly interested in Chemistry Education and is a regular participant in a variety of outreach programmes for high school and undergraduate students. He frequently runs a ‘Chemistry is Fun!’ show in various locations in India and abroad. He has received several awards and honours including the S.S. Bhatnagar Award in Chemical Sciences in 2001 and has been elected Fellow of the Indian Academy of Sciences and the Indian National Science Academy. Professor Banerji then invited Professor Uday Maitra to deliver his lecture.

Professor Uday Maitra then delivered his Oration Lecture, entitled 'A simple, inexpensive, and general photoluminescent sensor platform for multiple analytes'. About a decade ago, Professor Maitra's group discovered a facile method to enhance the luminescence from lanthanides through the self-assembly of multiple components in a metallohydrogel. Using this strategy, they developed a *pro*-sensitizer ('masked sensitizer') based protocol for sensing enzymes and a few small molecules. They also found that some Natural Products and clinically used drugs can sensitize lanthanides. The gel-based platform, therefore, provides opportunities to detect and quantify such species as well. Lanthanum cholate, ytterium cholate and hydrogels have been investigated. The sodium salts of biphenyl-4, 4'-dicarboxylic acid and naphthalene-2,6-dicarboxylic acid were found to be effective sensitizers for lanthanides in their respective lanthanide cholate (LnCh) hydrogels. Among these chromophores, the former exhibited high sensitization efficiency towards both Tb^{3+} and Eu^{3+} when doped in micromolar concentrations. The latter showed a high selectivity towards Eu^{3+} . Lifetime and quantum yield of sensitized Tb^{3+} and Eu^{3+} emissions were calculated, and the lifetimes were found to be in the millisecond to sub-millisecond ranges. The advantage of this technique is that the output (green photoluminescence from Tb^{3+} , red photoluminescence Eu^{3+}) is *independent* of the analyte being sensed, and in many cases pre-processing of the sample is not required. For several enzymes present in blood serum and Natural Product extracts, the *presence* of the analyte can be readily inferred using an inexpensive, hand-held long-wave UV lamp. To simplify the assay, Professor Maitra's group have developed a low-cost, paper-based method, and a portable device, to further develop this technique for useful, real-life applications. The first-generation prototype of a novel low-cost multiparametric, stand-alone imaging instrument for lanthanide detection has been designed and tested. This compact device consists of excitation LEDs, a camera and image processing software to control the operation of the equipment from a touchscreen. A choice of three LEDs (275 nm, 310 nm, and 340 nm) focuses the excitation beam on the gel-coated paper discs. A digital image sensor captures the emitted light (620 nm) and the images are processed by the App. the intensity enhancement can be quantified using image processing software, or for multiple samples using a commercial plate reader. The results have confirmed the usefulness of the imaging device for several small and biomolecular detection, or fast *in loco* preliminary analyses without the aid of a specialized laboratory.

The memento was presented to Professor Uday

Maitra by Professor Avijit Banerji. Then Professor S.K. Talapatra, President of PACFK, enriched the proceedings by his valuable comments and observations. He paid homage to the memory of Professor Chatterjee, and highlighted her inspirational role. He expressed his admiration reminding everyone that to Professor Chatterjee, teaching and research combined together, was the most exalted profession. She was a woman of advanced view, not of limited horizon, and a possessor of iconic quality. She thus is a source of inspiration to not only her own students, but to all students, researchers and teachers in Science.

About 160 participants attended in person. Particularly noteworthy was the presence of many PhD scholars and MSc students of the Chemistry Department, University of Calcutta. Over 60 participants attended on-line from all over India and also from the USA. Professor Dilip Maiti of the University of Calcutta, Chemistry Department, and member of the Governing body of PACFK took a leading role in organising the function, with the Faculty and Research scholars of the Department of Chemistry, and ISNA personnel lending valuable support. Dr. Amit De, former Executive Secretary ISCA and now Secretary ISNA, and member of PACFK Governing body, acted as rapporteur. The audio-visual and dual mode arrangements was made professionally by Shri Biplab Basu and his team.

It will be befitting to mention that Professor Chatterjee was nominated by the President of India (Visitor) to the Executive Council and Court (Samsad) of Visva-Bharati as Visitor's nominee when Professor Nemai Sadhan Bose was the Vice-Chancellor. Professor Chatterjee also contributed a lot for the proper development of science faculty at Visva-Bharati. Professor Chatterjee was also closely associated with ISNA for about 50 years (1956-2006) and served in different positions and finally became the Vice-President of ISNA (1985-2006). As a world class Scientist she said at the last phase of her life "*I wish to work as long as I live*".

The Vote of Thanks was moved by Professor Manas Chakrabarty, Assistant Secretary, PACFK to conclude the function. □

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