



Report on Online “Seventh Srinivasa Ramanujan Memorial Lecture, 2021” held on 27.11.2021

Date: 27-11-2021

Time: 03.00 pm to 04.30 pm [IST]

Title: The Games That Mathematicians Play

Target Audience:-The “Seventh Srinivasa Ramanujan Memorial Lecture” was a special lecture organised by the School of Sciences, Netaji Subhas Open University. The lecture was meant primarily for UG/PG Students of the Department of Mathematics, NSOU. However, the learned as well as Common audiences including faculties, learners of the University, research Scholars, students of other Universities and institutes were welcome to attend the lectures.

Technical Platform: -The webinar was conducted using Zoom through LMS platform of NSOU.

Committee formation and Programme Schedule:-At the outset, in a departmental meeting organized by Prof. Kajal De, Director, School of Sciences & HOD, Mathematics with the faculty members discussions were held on the possible speaker, topic, date and time of the lecture. Then with approval from the competent authority, the program was finalized and keeping Prof. S. S. Sarkar, Vice-Chancellor as Chief Patron, an Organizing Committee was formed whose Chairperson was Prof. Kajal De and members were Mr. Chandan Kr. Mondal, Dr. Usnish Sarkar, Mr. Ratanesh Misra, Dr. Nema Chand Dawn.

The programme schedule:-

Welcome Address: CA kishore Sengupta, Registrar, NSOU.

Introduction:- Prof. Kajal De, Director, School of Sciences, NSOU

Seventh Srinivasa Ramanujan Memorial lecture:- Prof. Gadadhar Misra, ISI, Bangalore, J. C. Bose National Fellow.

Presidential Address: - Prof. S.S. Sarkar, vice- Chancellor, NSOU.

Vote of Thanks: Mr. Chandan Kr. Mondal, Asst. Prof. of Mathematics, NSOU.

About the Speaker:- Prof. Gadadhar Misra, an eminent Indian Mathematician who specializes in Operator theory was born at Bhubaneswar, in the state of Odisha in 1956. He obtained B.Sc. (1997) from Utkal University, M.Sc. (1979) from Sambalpur University and PhD (1982) from the state of University of Newyork in USA.

He was the assistant Professor of Mathematics of the University of Georgia, Athens (1982- 84), at the University of California, Irvine (1984-85), ISI, Bangalore (1986-89). He became Associate Professor (1989- 93) and then professor (1993-2007) at ISI, Bangalore. He joined Indian Institute of Science, Bangalore as professor in 2007.

He was awarded the Shanti Swarup Bhatnagar Prize for Science & Technology in 2001, the highest Science award in India, in the mathematical Science Category. He was awarded the Biju Patnaik Award for Scientific Excellence by Odisha Bigyan Academy in 2013. He became the



NETAJI SUBHAS OPEN UNIVERSITY

SCHOOL OF SCIENCES

H.Q.: DD-26, Salt Lake, Sector-I, Kolkata - 700 064

City Campus: K-2, Bidhannagar Fire Station, Sector- V, Salt Lake, Kolkata -700 091

Kalyani Campus: First Floor, Academic Building, KalyaniGhoshpara, Kalyani-741235

Website: www.wbnsou.ac.in

fellow of Indian Academy of Sciences, Bangalore in 1999. Also he is the J.C. Bose National Fellow.

He was the editor of the Journal Proceeding (Math.Sci.) Indian Academy from 2005 - 2012 and he became the editor of Indian Journal of Pure and Applied Maths in 2015.

Abstract of the Lecture: The 15- Puzzle: A sliding puzzle having 15 square files numbered 1 through 15 in a 4 times 4 array. This leaves one slot in the array blank. The legal moves are sliding one of the tiles next to the blank slot by moving it to the right, left, up or down. Suppose all the numbers are in order and only the two numbers 14 and 15 are switched leaving the slot (4,4) blank. How do you switch the position of 14 and 15 back using only legal moves? This is the first game.

A second game is to unstack two piles consisting of n blocks each. This is a two player game. Each of the players is asked to split her stack into two, say one Consisting of P blocks and the other consisting of K blocks. For this move, she earns p times q points. The second player similarly splits the stack to two consisting of J and K blocks earning j times k points. The game continues until each stack is split into n piles each consisting of just one block. The player, who has the larger number of points, wins. The question is to determine if one of the two players can come up with a strategy to win. The answer will be obtained using the principle of strong induction.

A brief Proceedings / Overview :-

The Memorial Lecture was held in virtual mode.

The webinar was commenced with the prior permission from Prof. S.S. Sarkar, Vice-Chancellor, NSOU and President of the program. The whole programme was conducted by **Dr. Ushnish Sarkar**, Asst. Prof. of Mathematics, NSOU. At first he gave his warm reception to all the dignitaries and audiences. He explained in short the utility of the education of NSOU to society. In the welcome Address, **Mr. Kishore Sengupta**, Registrar described briefly about the University from the opening year 1997. He mentioned that NSOU is the first Open University in India awarded grade A by NAAC. He also mentioned the number of regional centres, study centres, registered students and different types of courses and three new PG programmes approved by UGC. **Prof. Kajal De**, Director, School of Sciences in her Introductory lecture described briefly the life history of Srinivasa Ramanujan. She mentioned that how Srinivasa Ramanujan became a self-taught renowned mathematician in India and next in world overcoming the tremendous poverty in the family and his deteriorating health. Though Ramanujan had almost no formal training in pure mathematics, he made substantial contributions to mathematical analysis, number theory, infinite series and continued fractions. During short span of life of 32 yrs., Ramanujan independently compiled nearly 3900 results. Prof. De also mentioned about Ramanujan's education awards, scientific career, thesis, academic advisors G.H. Hardy, J. E. Little wood and their influences in the scientific career of Ramanujan. Prof. Kajal De finished her introductory lecture introducing the speaker Prof. Gadadhar Misra.

The speaker **Prof. Gadadhar Misra, ISI Bangalore** started his lecture mentioning the abstract of the lecture. He told that 15 puzzle game is a permutation puzzle. He showed that with every state of the puzzle there is an association with permutation and every legal move is a transposition. He mentioned that at first two American mathematicians showed that 15 puzzle



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can not be solved. Prof. Misra proved it by permutation theory. For the second game, he solved the problem taking the different particular values of n .

The programme ended with the Presidential address of **Prof. S.S.Sarkar**, Hon'ble Vice Chancellor, NSOU, in which he expressed his gratitude to the speaker Prof. Misra for delivering the Lecture. He mentioned the names of the dignitaries who delivered the earlier Ramanujan Memorial Lectures at NSOU. He also praised Prof. De and the faculties of the department of Mathematics for organizing the programme successfully. It was followed by the vote of thanks by **Mr. Chandan Kumar Mondal**, Assistant Professor of Mathematics. Nearly 50 participants joined the programme.