



**MANAV RACHNA UNIVERSITY**  
 Declared as State Private University vide Haryana Act 26 of 2014



**One Day National Workshop on  
 "Multiple Facets of Quantum Mechanics:  
 Quantum Computing, Quantum Optics & Quantum Communication" (MFQM)  
 (September 2, 2022)**

**ABOUT THE UNIVERSITY**

Manav Rachna University: Manav Rachna University (MRU) is a leading State Private University (established by Haryana State Legislature Act No 26 of 2014 & under section 2(f) of UGC Act 1956), offering globally relevant education. The University has evolved from Manav Rachna College of Engineering (MRCE), established in 2004, a NAAC Accredited 'A' Grade Institution).

**ABOUT THE WORKSHOP**

Department of Physics is organising One Day Workshop on "Multiple facets of Quantum Mechanics: Quantum Computing, Quantum Optics & Quantum Communication" (MFQM) on (September 2, 2022). The workshop aims to provide and spread awareness among the young budding minds about the upcoming era of quantum computation. This workshop will provide a platform for young minds to interact with the eminent speakers to discuss recent research contributions, breakthroughs and the concepts of quantum computation. Further the workshop is focused on addressing the future trends, challenges and needs along with the basics and experimental aspects of quantum computing, quantum optics and quantum communication. We look forward to an excellent interaction among the young budding minds and pioneer people in the arena of quantum computation, quantum optics and quantum communication.

**Chief Patron:**  
**Prof. (Dr.) I. K. Bhatt**  
 Vice Chancellor, Manav Rachna University

**Patron:**  
**Prof. (Dr.) D.S. Sengar**  
 Pro-Vice Chancellor  
 Manav Rachna University

**Prof. (Dr.) Sangita Banga**  
 Dean Academics,  
 Manav Rachna University

**Prof. (Dr.) Pradeep K. Varshney**  
 Dean Research & Applied sciences, Manav Rachna University

**Chair Person:**  
**Prof. (Dr.) D. K. Sharma**

**Convener:**  
**Dr. Deepti Maikhuri & Dr. Anshuman Sahai**  
 Department of Physics,  
 School of Applied Sciences  
 MRU

**Contact details:**  
**deepti@mru.edu.in, anshuman@mru.edu.in**  
**+91-9211912300**

**Members:**  
 All the Faculty members, Department of Physics,  
 School of Applied Sciences, MRU

**RESOURCE PERSONS:**

**Prof. AJOY GHATAK** (Emeritus Professor) (Indian Institute of Technology, Delhi)



Prof. Ajoy Ghatak is currently President of the National Academy of Sciences, India - the oldest Science Academy in India and Honorary Professor at Optics & Photonics Center, IIT Delhi. He has research interests in Fiber Optics & Quantum Mechanics. He has authored several books including his undergraduate text on OPTICS which has been translated to Chinese and Persian. He is recipient of several awards including the 2003 OSA Esther Hoffmann Beller Award and the 2008 SPIE Educator award which was in recognition of "his unparalleled global contributions to the field of fiber optics research, and his tireless dedication to optics education worldwide." and also the CSIR 1979 Shanti Swarup Bhatnagar award. Also he is the recipient of the Optical Society Sang Soo Lee Award (2020) in recognition of outstanding leadership in founding or growing an optics and photonics community.

**Prof. ANIRBAN PATHAK** (Jaypee Institute of Information Technology, JIIT Noida)



Prof. Anirban Pathak (FNASc, FIETE) is currently HOD Physics at JIIT Noida. He is a theoretical physicist. Earlier he was a post-doctoral fellow in the Freie University, Berlin. At present he is actively involved in teaching and research related to several aspects of quantum optics and quantum information with a focus on quantum cryptography. He is a visiting scientist at Palacky University, Czech Republic. At present he leads a research group focused on quantum optics and quantum information with specific interest on quantum cryptography. He is a recipient of 2017 Shri O. P. Bhasin Award in the field of Electronics and Information Technology.

**Dr. BHASKAR KANSERI** (Indian Institute of Technology, Delhi)



Dr. Bhaskar Kanseri is an Associate Professor at Department of Physics, IIT Delhi. Prior to that he was IUGS and CNRS Postdoc at Laboratoire Charles Fabry, Institut d'Optique, Palaiseau France, from 2012-2015. Earlier to that he earned his post doc from Max Planck Institute for the Science of Light, Erlangen Germany. Before joining Max Planck Institute he served as Research Associate at National Physical Laboratory, after earning his Ph.D in Physics from Delhi University. At present, his work deal in basic and experimental aspects of quantum optics and quantum communication.

**WHO CAN PARTICIPATE?**  
 All Science, Engineering graduates & Post graduates/Ph.D. Students/Faculty

**REGISTRATION LAST DATE:** 30 August 2022

**REGISTRATION FEE:** Rs 250

**BANK DETAILS FOR NEFT:**  
 Name of Beneficiary: Manav Rachna University  
 A/C No: 50200045814055  
 Nature of Bank Account: Current  
 MICR No.: 190240247  
 IFSC: HDFC0002549  
 Bank: HDFC Bank, Palam Vihar, Gurugram, Haryana

**Or PAYTM**



**REGISTRATION LINK:**  
 After the payment of registration, fill the below mentioned google form to complete the registration process. <https://forms.gle/vdFVrkHZVwaZdvq7>

Note: Lunch/Certificate will be provided to all the participants.

\*\*Wearing mask is mandatory for all the participants.

Organized by  
 Department of Physics, School of Applied Sciences (SAS), Manav Rachna University, Faridabad, India  
 Website: (www.mru.edu.in)  
 in association with National Academy of Sciences, India, NASI - Delhi Chapter  
 Venue: IG 07

## Workshop on “Multiple Facets of Quantum Mechanics: Quantum Computing, Quantum Optics & Quantum Communication”

**Date:** 2<sup>nd</sup> September, 2022

**Venue:** I Block Auditorium

**Time:** 09:00 AM to 04:00 PM

**Resource Persons:**

- (i) Prof. Ajoy Ghatak, Former Professor, Department of Physics, IIT Delhi
- (ii) Prof. Anirban Pathak, Professor and HoD, Department of Physics and Materials Science and Engineering, Jaypee Institute of Information Technology
- (iii) Dr. Bhaskar Kanseri, Associate Professor, Department of Physics, IIT Delhi





Department of Physics, Manav Rachna University organized a workshop on “Multiple Facets of Quantum Mechanics: Quantum Computing, Quantum Optics & Quantum Communication” on 2<sup>nd</sup> September, 2022

The workshop was co-sponsored by National Academy of Sciences India (NASI-Delhi chapter) and Manav Rachna University.

The conveners of the workshop, Dr. Deepti and Dr. Anshuman, begins the session with welcoming address which was followed by the traditional lamp lightning ceremony by Honourable Vice chancellor Prof. Dr. I. K Bhatt, the guests of honors Prof. Ajoy Ghatak, Prof. Anirban Pathak and Dr. Bhaskar Kanseri with all the other senior dignitaries PVC Prof. D. S. Sengar, Registrar Dr. Kameshwar Singh, Dean Academics Prof (Dr.) Sangeeta Banga, Dean school of applied sciences Prof (Dr.) Pradeep Varshney, HOD Prof. (Dr.) D. K. Sharma. Next, Shreya offered saraswati vandana to seek the blessings of Maa Saraswati the “Goddess of Knowledge”. Further our Honourable Vice Chancellor, Prof. Dr. I. K. Bhatt welcomed all the eminent speakers and declared the workshop open by highlighting the present and future aspects of Quantum Mechanics and its applications in real life.

Further, a brief introduction about National Academy of Sciences (NASI) -India and its Delhi Chapter was given by Dr. Ananna. Thereafter, the technical session started with the discussion about the evolution of various theories of light which eventually led to quantum theory by Prof. Ajoy Ghatak. Next speaker of the session Prof. Anirban Pathak discussed the basic ideas of quantum computing and quantum communication with specific focus on quantum cryptography emphasizing upon how principles of quantum mechanics help us in computing and secure communication, where we stand now and what are the challenges we need to solve in the near future. Further he focussed on what kind of experiments related to quantum computing and communication can be performed in undergraduate and postgraduate laboratories. Last speaker of the session Dr. Bhaskar Kanseri throws light on quantum optics which is a framework to test fundamental aspects of quantum mechanics such as coherence, entanglement, and non-classical properties of light which led to the development of quantum technologies which aim to harness quantum principles for promising applications in computing and communication. The session introduces the quantum properties of light which

do not have classical counterparts. Moreover, some of the experimental approaches were discussed to prepare, control, and measure such properties for developing photonic quantum communication technologies.

At last, conveners express the vote of thanks to all the eminent speakers by presenting them mementos as a token of gratitude for gracing the workshop, invigorating the spirits of all the participants and making everyone feel to keep on learning and thinking about different aspects of science. Further, the contribution of all the participants from various universities was acknowledged by the conveners to make the workshop worthwhile.