

School of Computational & Integrative Sciences Jawaharlal Nehru University, New Delhi.





DBT-Bioinformatics Center (DBT-BIC) WORKSHOP Enabling Technology Training

## Quantum Computing essentials using

**JISkit** 

#### 

① 10:00 am -1:00 pm Organisers

- Prof. Shandar Ahmad

- Prof. Ashok Kumar - Dr. Shruti Gupta
- Dr. Murali Subrahmanyam

#### Distinguished Lecture Hybrid Mode Aspects of quantum computing: relevance for biological and chemical problems

This talk will discuss the potential of pristine quantum computational frameworks as well as hybrid approaches that may be of relevance to chemical and biological systems.

#### 🕓 03:00 pm



#### Speaker

Dr. Arunangshu Debnath Ph.D. Founder CEO @stealth Microsoft startup, Hamburg, Germany Founder, Episteme99 & Visiting researcher, DESY, Germany.

#### Abstract

https://www.researchgate.net/profile/Arunangshu-Debnath

Quantum computing is a fascinating paradigm that is pushing us to redesign the unified computational stack. With its promise comes the challenge of designing suitable algorithms and ensuring their scalable implementation. This talk will discuss the potential of pristine quantum computational frameworks and associated hybrid approaches that may be of relevance to chemical and biological systems.

http://ccbb.jnu.ac.in/bic/index.php/events or Scan QR



https://jnu.ac.in/scis

Know Details &

Registration



#### School of Computational & Integrative Sciences Jawaharlal Nehru University, New Delhi.







#### DBT-Bioinformatics Center (DBT-BIC) WORKSHOP ETT

Enabling Technology Training

### Quantum Computing essentials using **QIS**

Speaker

#### Dr. Arunangshu Debnath Ph.D.-

Founder, Episteme99 & Visiting researcher, DESY, Germany. Founder, Episteme99 & Visiting researcher, DESY, Germany. https://www.researchgate.net/profile/Arunangshu-Debnath



Arunangshu completed his M.Sc. from IIT Guwahati and obtained his PhD from CNRS, France as an EU Marie Curie Fellow. Thereafter, he worked as a post-doctoral research associate at the University of California, Max Planck Institute, Germany, and the Center for Free-Electron Laser Science, Deutsches Elektronen-Synchrotron, Germany. His research work involves the broad areas of theoretical quantum dynamics with a focus on algorithms, control, spectroscopy, and imaging. In 2024, he founded his deep-tech startup in Germany The startup is developing quantum-classical algorithms and workflows among other verticals.

#### Resource Person(s)

#### Prof. Ashok Kumar Ph.D.-

Head. Center for Artificial Intelligence in Medicine. Imaging & Forensics

Professor, Dept of Physics, School of Basic Sciences & Research (SBSR) Sharda University, Greater Noida.

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https://www.sharda.ac.in/faculty/details/ashok-kumar/

He has obtained his Masters (Integrated) in Physics from IIT Kanpur and Ph.D. from Johns Hopkins University, USA. He has post-doctoral experience at Stanford University in microfluidics and from Massachusetts General Hospital Jointly with Harvard Medical School in Medical Imaging. Dr. Kumar was awarded with the "U.S National Science Foundation's Antarctica service medal of USA". He has also worked in biomedical instrumentation industry. Currently, his research involves applications of artificial intelligence in medicine, medical imaging, musical acoustics, speech and hand-writing forensics, space physics, molecular dynamics and Quantum Machine Learning.

#### Dr. Murali Subrahmanyam Ph.D.-



Managing Director and Group Head Data & Analytics Operations London Stock Exchange Group (LSEG)

Shttps://www.lseg.com/en

Dr. Murali Subrahmanyam is a seasoned executive and expert in AI, augmented intelligence, and autonomous systems, currently serving as the Managing Director and Group Head of Data & Analytics Operations at the London Stock Exchange Group (LSEG). With over eight years in this role, he is dedicated to transforming operations to meet client needs through the adoption of emerging technologies, enhancing data quality, and improving service delivery. Prior to LSEG, Murali held senior leadership positions at MSCI Inc., Nomura, AllianceBernstein and Quintegra Solutions, where he made significant impact in each organisations. His contributions have consistently driven operational efficiency and innovation. Murali holds a Ph.D. in Theoretical Physics from Jamia Millia Islamia, where he also earned his M.Sc. and B.Sc. (Hons.) in Physics. He has been recognized as an Honorary Visiting Professor at Jawaharlal Nehru University, New Delhi.

#### Prof. Shandar Ahmad Ph.D.-

Professor

School of Computational & Integrative Sciences Jawaharlal Nehru University, New Delhi shandar@jnu.ac.in

Attp://sciwhylab.org

Prof. Shandar Ahmad is a professor at Jawaharlal Nehru University, New Delhi, with a doctoral degree in Physics. He specializes in Bioinformatics, data science, and machine learning, leading the research group SciWhyLab (www.sciwhylab.org). Previously, he held academic and research positions at Jamia Millia Islamia, New Delhi, the National Institute of Biomedical Innovation in Osaka, Kyushu Institute of Technology, RIKEN, Japan and Universiti Putra Malaysia, and was honorary professor at Universiti Kebangsaan Malaysia. His research focuses on developing data-driven algorithms and applications for biological data, utilizing machine learning, big data analytics, and innovative architectures and training methods for deep learning through neural networks.

#### Dr. Shruti Gupta Ph.D.-

Postdoctoral Research Scientist at SciWhyLab

School of Computational & Integrative Sciences Jawaharlal Nehru University, New Delhi

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Shttp://sciwhylab.org

Dr. Shruti Gupta holds a Master's and Ph.D. in Computational Biology and Bioinformatics from Jawaharlal Nehru University. Her research employs an integrative approach combining biology and computational science, focusing on Artificial Intelligence, pattern mining and the repurposing of gene expression data to address critical questions in systems biology. Currently, she is a Postdoctoral Research Scientist at SciWhyLab, also at Jawaharlal Nehru University, New Delhi.



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# DBT-Bioinformatics Center (DBT-BIC) WORKSHOP Enabling Technology Training Quantum Computing essentials using Qiskit



C) Schedule

#### 10:00 AM - 10:15 AM

Inaugural message and opening remarks by Dr. Murali Subrahmanyam

#### ) 10:30 AM - 11:30 AM

Quantum computing promise and essential concepts by Prof. Shandar Ahamad

#### ) 11:30 AM - 12.00 Noon

Installation of Qiskit and basic programming with circuits by Dr. Shruti Gupta

#### ) 12:00 AM - 01.00 PM

Quantum machine learning by Prof. Ashok Kumar

#### ) 03:00 PM onwards

**Distinguished lecture** 

Aspects of quantum computing: relevance for biological and chemical problems by Dr. Arunangshu Debnath