Faculty Development Program

Title : Quantum Mechanics and Computation: Building the Bridge to the Quantum Era

Date : 2025-05-05 - 2025-05-09
Time : 10:00 - 17:30
Venue : TT513

Event Outcome

- Explain key principles of quantum mechanics relevant to quantum computing.
- Utilize quantum computing simulators (IBM Qiskit, Cirq) for programming and experimentation.
- Bridge classical and quantum computing concepts for an interdisciplinary teaching approach.
- Identify research opportunities at the intersection of quantum mechanics and quantum computing.
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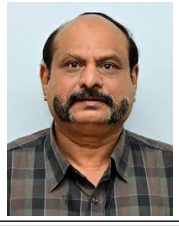
	**Resource Person 1 - Details** **Name :** Samir Ranjan Meher **Designation :** Associate Professor Grade 2, School of Advanced Sciences **University/ Company :** VIT, Vellore **Address :** India, 632014.
	**Resource Person 2 - Details** **Name :** Balakrishnan S **Designation :** Associate Professor Grade 2, School of Advanced Sciences **University/ Company :** VIT, Vellore **Address :** India, 632014.
	**Resource Person 3 - Details** **Name :** Vishwa Bandhu Pathak **Designation :** Associate Professor Sr., School of Advanced Sciences **University/ Company :** VIT, Vellore **Address :** India, 632014.
	**Resource Person 4 - Details** **Name :** S Aravinda **Designation :** Assistant Professor, Department of Physics **University/ Company :** IIT Tirupati, Tirupati **Address :** India, 517619.
	**Resource Person 5 - Details** **Name :** B R K Nanda **Designation :** Professor, Department of Physics **University/ Company :** IIT Madras, Chennai **Address :** India, 600036.
	**Resource Person 6 - Details** **Name :** T Subha **Designation :** Associate Professor, Department of Educational Media and Technology **University/ Company :** National Institute of Technical Teachers Training and research Chennai, Chennai **Address :** India, 600113.
	**Resource Person 7 - Details** **Name :** M Senthilvelan **Designation :** Professor, Department of Nonlinear Dynamics **University/ Company :** Bharathidasan University, Tiruchirappalli **Address :** India, 620024.

Resource Person's Profile :

1. Profile of Samir Ranjan Meher

Dr. Samir Ranjan Meher is working as an Associate Professor in the Department of Physics, School of Advanced Sciences, VIT Vellore. Dr. Samir has published more than 60 research articles in peer reviewed journals of international repute with a SCOPUS h-index of 19. His research interest is in thin film based photovoltaics together with first principle calculations on the optoelectronic properties of solar cell absorber layers.

2. Profile of Balakrishnan S

Dr. S. Balakrishnan is working as an Associate Professor and currently serving as the Head of the Department of Physics, VIT Vellore. He has sepecialized in quantum communication and quantum game theory with more than 50 articles in peer reviewed journals of international repute.

3. Profile of Vishwa Bandhu Pathak

Dr Vishwa Bandhu Pathak is an Associate Professor in the Physics Department, SAS, VIT Vellore. Before joining VIT in 2022, he was at the Center for Relativistic Laser Science, Institute for Basic Science (IBS) in the Republic of Korea on a tenure-track position.

4. Profile of S Aravinda

Dr. Aravinda S is an Assistant Professor in the Department of Physics, Indian Institute of Technology, Tirupati. His research interests include Quantum information and computation. He has published more than 25 articles in the field of quantum communications in various peer-reviewed journals of international repute. He is currently guiding 2 Ph.D. students and 6 M.Sc. projects.

5. Profile of B R K Nanda

Dr. B. R. K. Nanda is a Professor in the Department of Physics, Indian Institute of Technology, Madras. His primary focus is on the electronic structure of solids. He specializes in strongly correlated electron systems and emerging quantum materials, particularly exploring non-trivial topological quantum phases in recent work. In addition to fundamental research, his team is dedicated to applied materials science, including energy storage.

6. Profile of T Subha

Dr. Subha T is working as an Associate Professor in the Department of Educational Media and Technology in National Institute of Technical Teachers Training and research, Chennai. She has received the BE Computer science and Engineering from Bharathidasan University, MTech Information Technology from Sathyabama University, Chennai and completed doctorate degree in Anna University, Chennai I am having 22 years of experience in teaching and published around 40 papers in international journals.

7. Profile of M Senthilvelan

Prof. M. Senthilvelan is a Professor in the Department of Non-linear Dynamics in Bharathidasan University. He is having more than 25 years of research experience in the field of non-linear dynamics. He has guided 10 Ph.D. students 99 P.G. projects. He has published more than 150 research articles in the field of non-linear dynamics in peer-reviewed journals of international repute. He has successfully completed 9 funded projcets sponsored by the GoI.

Quantum computation is a rapidly evolving field that integrates principles of quantum mechanics with computational paradigms, offering transformative potential across various scientific and technological domains. This 5-day Faculty Development Programme (FDP) is designed to provide faculty members with a balanced understanding of both
quantum mechanics and quantum computation. The sessions will cover fundamental quantum mechanics concepts essential for quantum computing, followed by an introduction to quantum algorithms, quantum gates and hands-on quantum programming using tools like IBM Qiskit. By the end of this FDP, participants will develop the necessary knowledge to introduce quantum computing concepts into their teaching and research.

IBM Qiskit

Coordinator's: **Prof. SAMIR RANJAN MEHER 13684 - Associate Professor Grade 2 - SAS**
Prof. BALAKRISHNAN S 13680 - Associate Professor Grade 2 - SAS