

STATE LEVEL WEBINAR ON QUANTUM INFORMATION

A REPORT

A one day State Level Webinar on “**Quantum Information**” was organized by the Department of **Physics** in association with Internal Quality Assurance Cell of our College MMK & SDM Mahila Maha Vidyalaya, Krishna Murthypuram, Mysore on **24th December 2020**.

Earlier Prof. N. Bharathi HOD of Physics and Convener of the Webinar welcomed the delegates and outlined the theme of the workshop. She while welcoming said that Quantum mechanics, the subfield of Physics that describes the behavior of very small particles provides the basis for a new paradigm of computing. She opined that in recent years research into the very foundation of quantum Mechanics has also led to a new field quantum information Technology. She further said that the use of quantum physics could revolutionize the way we communicate and process the information.

. Smt. G.R. Sumithra, HOD of Electronics and also IQAC Co ordinator speaking on the occasion said that quantum Information Science and Engineering is a rapidly developing interdisciplinary field of science and Technology, drawing from various subfields of Physical Science, Computer Science, Mathematics and Engineering which addresses how the fundamental laws of quantum physics can be exploited to achieve dramatic improvements in how information is acquired, transmitted and processed.

Principal Prof. Sainath Malligemadu in his presidential address said that MMK & SDM College is making pioneer efforts to popularize basic Sciences among the colleges in Karnataka. This workshop is one such important initiative which provides an opportunity for participants to view the subject from different perspectives. He further opined that this workshop will provide motivation for faculty to take up research in this emerging areas.

The Resource Person for the webinar was Dr. A.R. Ushadevi, Professor, Bangalore University, Bangalore. She started with the history of quantum mechanics. She started the session with transformation brought by electromagnetism in generating and distributing electric power and communicating words and pictures across the world at the speed of light can be seen as application of Maxwell’s equation.

Ever since its invention in the 1920s, quantum physics has given rise to countless discussions about its meaning and about how to interpret the theory correctly.

She discussed the **Einstein-Podolsky-Rosen paradox in Quantum Theory**(EPR theory) –

and spoke about the thought experiment meant to demonstrate the innate conceptual difficulties of quantum theory which the result of a measurement on one particle of an entangled quantum system can have an instantaneous effect on another particle, regardless of the distance of the two parts. She highlighted Bell's theorem which rules out the possibility that beneath all the apparent quantum — the randomness and the spooky action at a distance — is a hidden deterministic reality that obeys the laws of relativity.

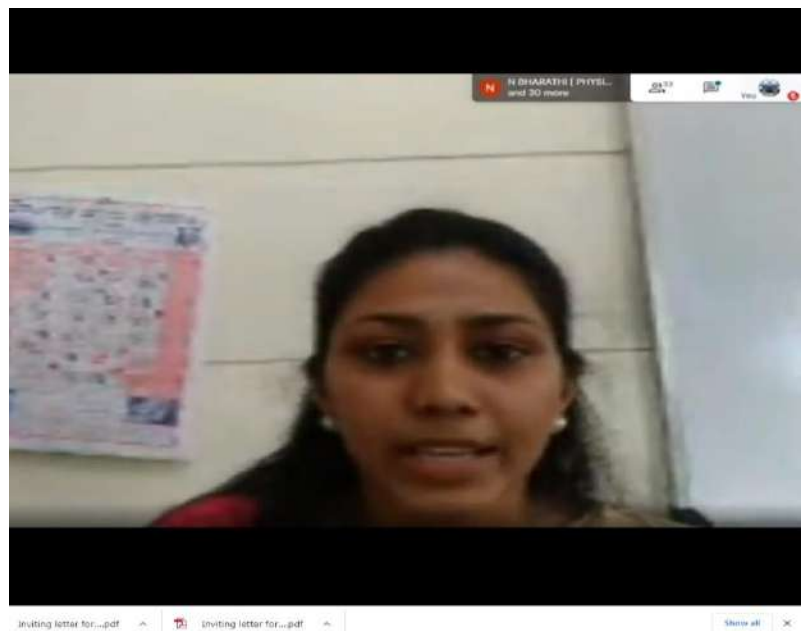
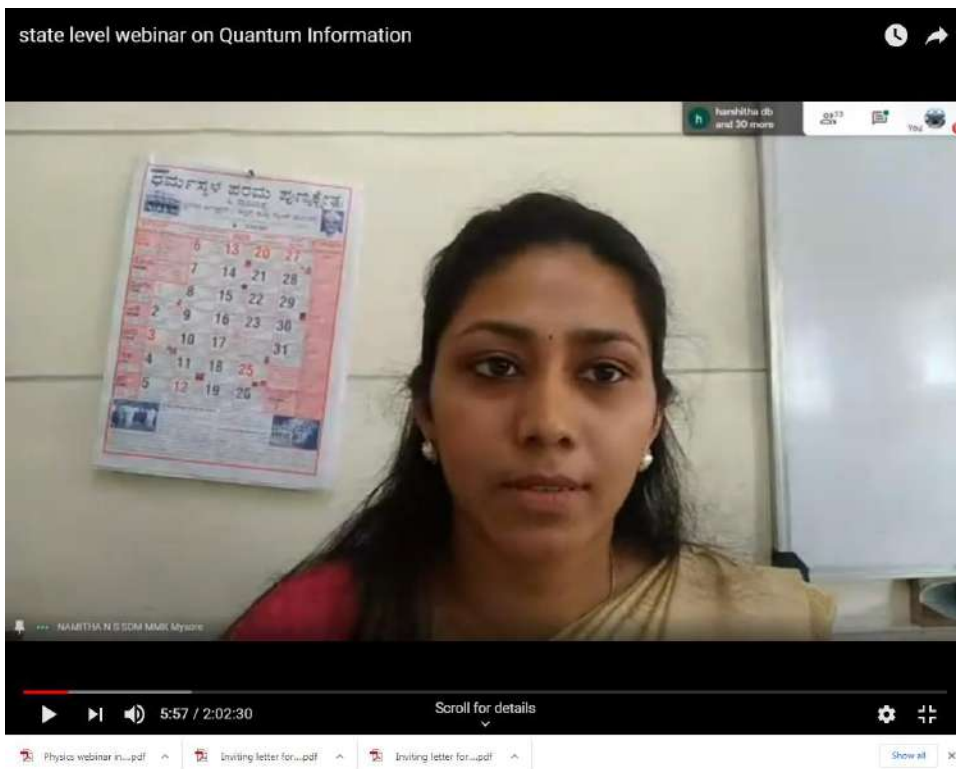
Discussed Quantum entanglement a quantum mechanical phenomenon in which the quantum states of two or more objects have to be described with reference to each other, even though the individual objects may be spatially separated. She highlighted on Quantum entanglement which has applications in the emerging technologies of quantum computing and quantum cryptography, that has been used to realize quantum teleportation experimentally.

The programme was concluded by proposing vote of thanks by Smt. N.S. Namitha, Assistant Professor in the Department of Physics and the programme was compeered by Miss. K.M. Chandini. Assistant professor, Department of Physics.

The programme was attended by 74 participants.

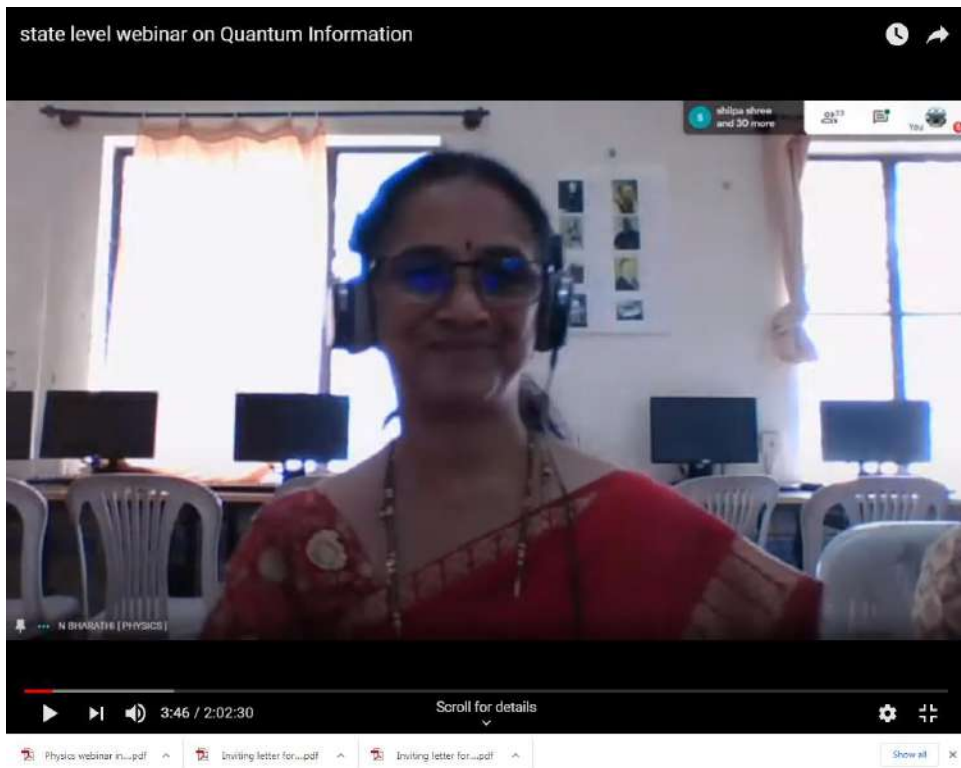
Feed back from the delegates were received by providing them with feedback forms.

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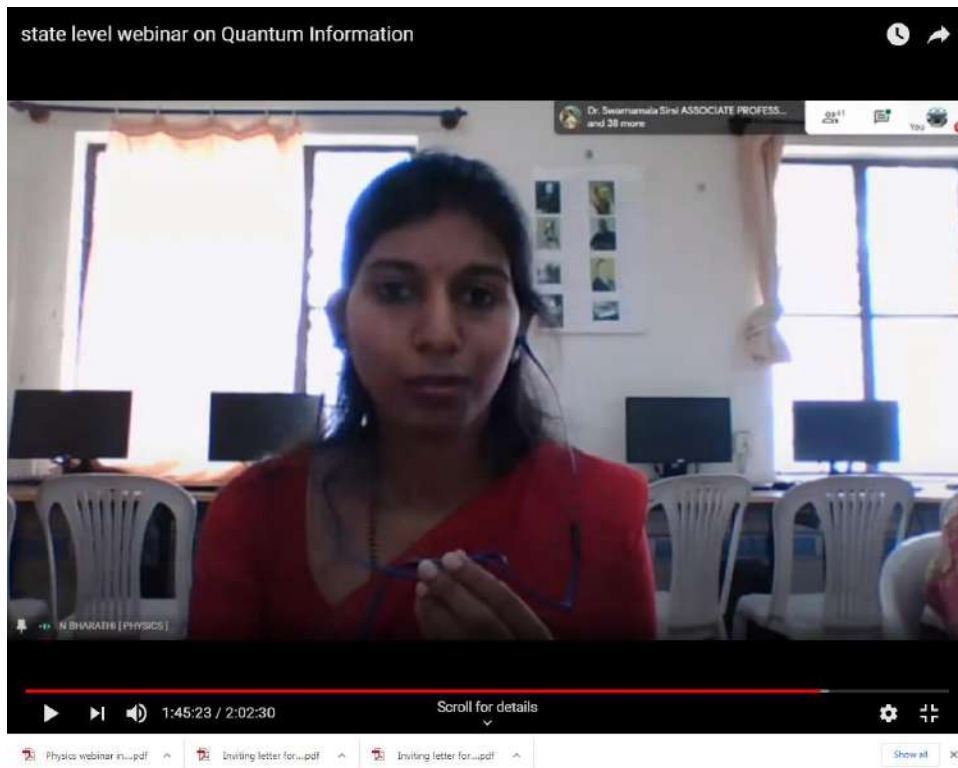
MISS. K.M. CHANDINI, ASSISTANT PROFESSOR, DEPARTMENT OF PHYSICS- COMPERING THE PROGRAMME

DEPARTMENT OF PHYSICS



Smt. N. Bharathi, HOD of Physics, welcoming the Resource person and Participants.

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**Smt.N.S Namitha, Assistant Professor, Department of Physics
proposing vote of thanks**

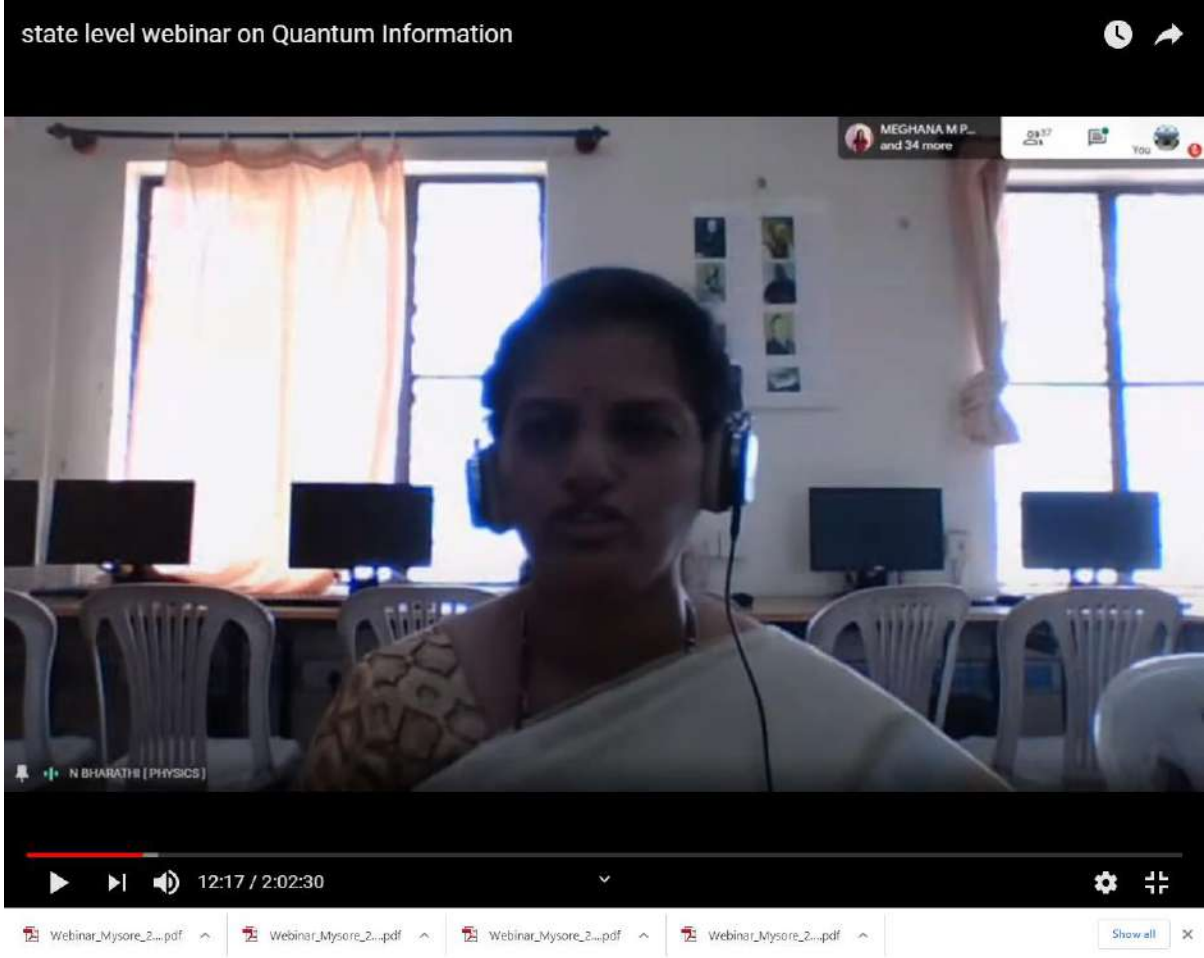
DEPARTMENT OF PHYSICS

STATE LEVEL WEBINAR ON QUANTUM INFORMATION

The image is a screenshot of a Zoom webinar. At the top, the title 'state level webinar on Quantum Information' is displayed in white text on a black background. Below the title is a large video feed of a man with glasses and a mustache, wearing a white shirt and a brown tie. In the top right corner of the video area, there are icons for a clock, a share icon, and a list of participants including 'MEGHANA M P...' and 'and 31 more'. At the bottom left of the video area, there is a small icon and the text 'SDM MMK Mahila Maha Vidyalaya'. Below the video feed is a black control bar with a red progress indicator, play/pause buttons, a volume icon, and the text '6:51 / 2:02:30'. To the right of the progress bar are icons for settings and full screen. Below the control bar, there is a row of document thumbnails with titles like 'Physics webinar in...pdf' and 'Inviting letter for...pdf'. A 'Show all' button is located at the bottom right of this row.

**PRESIDENTIAL REMARKS BY PROF. SAINATH MALLIGEMADU-
PRINCIPAL, MMK & SDM MAHILA MAHAVIDYALAYA, MYSORE**

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REMARKS BY SMT. G.R. SUMITHRA, IQAC CO ORDINATOR AND HEAD OF THE DEPARTMENT OF ELECTRONICS

DURING THE SESSION

The screenshot displays a Google Meet interface during an active session. The top browser tabs include 'Inbox (543) - bharathimysore5@...', 'Inbox (391) - bharathi@sdmm...', 'My Drive - Google Drive', 'Feedback form-new - G...', '(no subject) - chandini@...', and 'Meet - kjo-fsdc-abk'. The address bar shows 'meet.google.com/kjo-fsdc-abk'. The main meeting area features a grid of participants: a large video of Usha Devi AR, and several smaller video thumbnails for N BHARATHI [PHYSICS], SDM MMK Mahila Maha Vidyalaya, Bhagalakshmi Mysore Shivanna, Nisarga K S, Dr. Lokesh R Physics, Dr Doreswamy S, and Varun Varu. A chat window on the right contains the following messages:

- Dr. Kiran KS 11:59 AM: very informative session
- You 12:16 PM: participants please mute your audio
- NBHARATHI [PHYSICS] 12:17 PM: please mute your audio
- Dr. Swarnamala Sirsi ASSOCIATE PROFESSORS 12:18 PM: Organisers can mute everyone
- Dr VINDU VAHINI M 12:32 PM: Session was informative, interesting and educative. Thank you madam
- Bhagalakshmi Mysore Shivanna 12:32 PM: Very informative session thank you mam

The bottom taskbar shows open applications: 'copy of mon...', 'NAMITHA N S SDM MMK', 'Result sheet 2020 passouts & cover page of annual report 2020 - Regards, Namitha NS As...', and 'Annual report ti...'. The date 'Mar 19' is visible in the bottom right corner.

DURING THE SESSION

The screenshot shows a Google Meet interface during a session. At the top, there is a Windows Photo Viewer window and a browser window with the URL `meet.google.com/kjo-fsdc-abk`. The main area displays a 3x3 grid of video thumbnails for participants:

- Top-left: N BHARATHI [PHYSICS]
- Top-middle: Usha Devi A R
- Top-right: Dr. Kiran KS (represented by a pink circle with 'D')
- Middle-left: SDM MMK Mahila Maha Vidyalaya
- Middle-middle: venkataramana shas tri
- Middle-right: Karthik kumar MB
- Bottom-left: Dr. Neetha S
- Bottom-middle: Dr. Sankarshan B M
- Bottom-right: Javaregowda s (represented by an orange circle with 'J')

On the right side, the 'Meeting details' sidebar is visible, showing:

- Meeting title: Meeting details
- Participants: People (42)
- Chat icon
- Add people button
- IN CALL list:

Name	Microphone	Video
KM CHANDINI [P... (You)	On	On
Akhileshwan P	Off	Off
anurag bengrodi	Off	Off
Aswathi Vengalat	Off	Off
Belaku belaku	Off	Off
Bhagyalakshmi Mysore ...	Off	Off
Dr. Doreswamy S	Off	Off
Dr. Kiran KS	Off	Off

At the bottom, the meeting control bar includes icons for zoom, mute, video, back, forward, refresh, and close.

w8.png Search mail Open with

Compose 1 at 7:47

Hemalatha D.L. and 30 more

N BHARATHI [PHYSICS]

Usha Devi A R

Tejaswini M Hegde

Javaregowda s

SDMMMK Mahila Maha Vidyalaya

Dr. Lokesh R Physics

Bhagyalakshmi Mysore Shivanna

Mithun Hosakote

NAMITHA N S SDM MMK Mysore

41 You

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DURING THE SESSION

The screenshot shows a Google Meet interface during a session. The main window displays a presentation slide titled "EPR-Bohm thought experiment:" with the following content:

EPR:
We can precisely infer (without disturbing the particle B) epr for two non-commuting observables S_{Bz} and S_{Bx} .

Note: "an epr has a counterpart in theory" seems to imply definite numerical value for a physical quantity i.e., the state of the system is an eigenstate of the observable.

EPR-Bohm thought experiment:

Consider the following situation:

Alice	Source	Bob
$\times \leftarrow$	\circ	$\rightarrow \times$
A	(ψ_{AB})	B

1. Measure z -component of spin S_{Az} on A

$(\psi_{AB}) \rightarrow |\psi_{Bz}\rangle$, an eigenstate of S_{Bz}

2. Measure S_{Ax} on A

$(\psi_{AB}) \rightarrow |\psi_{Bx}\rangle$, an eigenstate of S_{Bx} .

System B is NOT DISTURBED physically.

ARU
Bangalore University

The interface also shows a "Meeting details" sidebar on the right with "People (69)" and "Chat" options. At the bottom, a participant list includes Usha Devi A R, Rakshith Raj, Nisarga K S, and Shoban Appu. The top of the browser shows the Gmail interface and the meeting URL: meet.google.com/kjo-fsdc-abk.