

**Department of
ELECTRONICS AND COMMUNICATION ENGINEERING**

A Report on
**5 Days FDP on “Antennas and Applications: A Research
Perspective”**
(13 July 2021 to 17 July 2021)

Department of Electronics & Communication Engineering
Faculty Development Program
on
Antennas & Applications: A Research Perspective



From 13th to 17th July, 2021

Coordinator
Mr. A. Gopal
Asst. Prof. ECE, NNRG



The Department of Electronics and Communication Engineering successfully conducted a Five-Day Faculty Development Program (FDP) on 'Antennas & Applications: A Research Perspective' from 13th to 17th July 2021. The FDP was organized to strengthen participants' understanding of modern antenna technologies, antenna design methodologies, electromagnetic wave propagation, measurement techniques, wireless communication systems, and current research trends. The sessions

emphasized both theoretical concepts and research-oriented applications relevant to academia and industry.

Day-1&2:

The inaugural session introduced participants to the fundamentals of antenna engineering and electromagnetic wave propagation. The resource person explained the basic operating principles of antennas, radiation mechanisms, antenna classifications, radiation patterns, gain, directivity, efficiency, bandwidth, polarization, and impedance matching. The session also highlighted the importance of antennas in wireless communication, satellite communication, radar systems, broadcasting, and navigation applications. Participants developed a strong conceptual understanding of antenna characteristics and their practical significance in communication engineering.

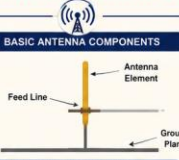
D Dr.Jadgadesh (Presenting)

ANTENNAS & APPLICATIONS: A RESEARCH PERSPECTIVE

WHAT IS AN ANTENNA?

An antenna is a transducer that converts electrical energy into electromagnetic waves (radiation) and vice versa.

BASIC ANTENNA COMPONENTS



TYPES OF ANTENNAS

- Wire Antennas
- Microstrip Patch Antennas
- Array Antennas
- Reflector Antennas
- Slot Antennas
- Frequency Selective Surface (FSS) Based Antennas

KEY ANTENNA PARAMETERS

- Radiation Pattern
- Gain
- Bandwidth
- Input Impedance
- Polarization
- Efficiency
- VSWR

APPLICATIONS OF ANTENNAS



RESEARCH TRENDS

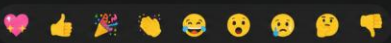
- Miniaturization
- Wideband & Multiband
- MIMO Antennas
- Metamaterial Based Antennas
- FSS & EBG Structures
- Smart / Reconfigurable Antennas

Better Antenna Performance → Efficient Communication → Connected Future

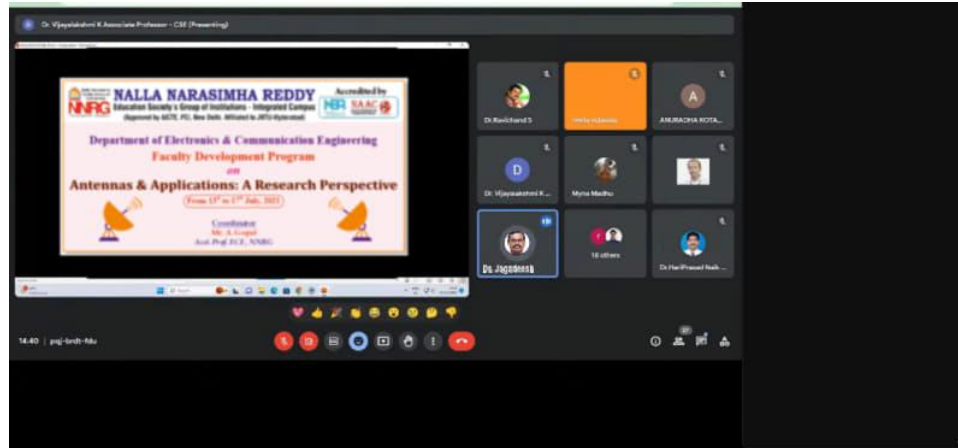


Dr.Jadgadesh

14:40 | pnq-krxh-rku







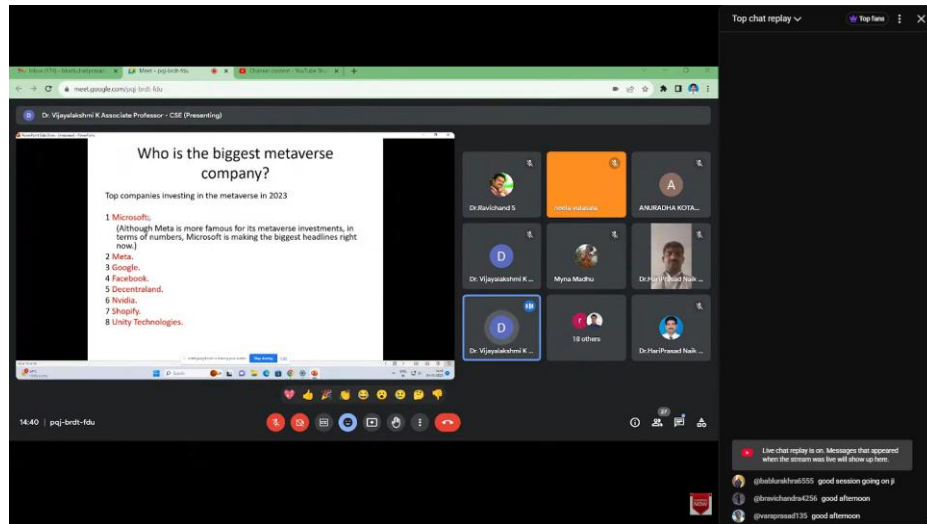
Session by Dr.Jagadeesh Babu Kamili

The second day's sessions focused on the design and analysis of microstrip patch antennas. The speaker discussed various feeding techniques, substrate materials, design equations, bandwidth enhancement methods, and performance optimization techniques. The importance of computer-aided antenna design using simulation tools such as HFSS and CST Microwave Studio was also explained. Practical examples demonstrated how antenna parameters influence radiation performance, efficiency, and return loss. The interactive discussions helped participants understand the complete antenna design process from theoretical analysis to practical implementation.

Day-3&4:

The third day concentrated on advanced antenna technologies used in modern wireless communication systems. The resource person explained antenna arrays, smart antennas, beamforming techniques, multiple-input multiple-output (MIMO) antenna systems, and mutual coupling reduction techniques. The session also covered the role of antennas in 5G communication, Internet of Things (IoT), satellite systems, and high-speed wireless networks. Participants gained valuable insights into contemporary

antenna research and the challenges involved in designing compact, high-performance antenna systems.

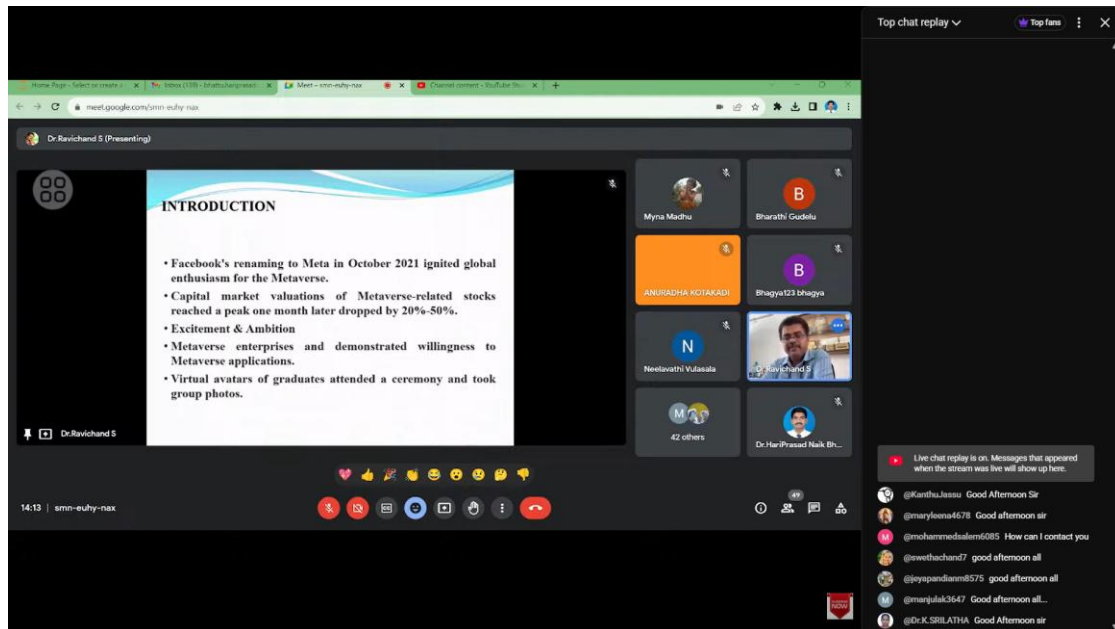


Session by Dr.B.Hari Prasad Naik

The fourth day's sessions emphasized emerging research trends in antenna engineering. Topics such as Frequency Selective Surfaces (FSS), metamaterials, wearable antennas, reconfigurable antennas, millimeter-wave antennas, and dielectric resonator antennas were discussed in detail. The speaker explained how these advanced technologies improve antenna gain, bandwidth, efficiency, and isolation while supporting next-generation communication systems. Recent research developments and industrial applications in aerospace, defense, healthcare, automotive communication, and wireless sensor networks were also highlighted. Participants actively interacted during the discussion session and clarified their research-related queries.

Day-5

The The valedictory session summarized the major concepts covered throughout the Faculty Development Program. The expert discussed future research opportunities in antenna engineering, recent innovations in wireless communication, publication strategies, funded research projects, and interdisciplinary collaboration. The session emphasized the growing importance of antenna research in 5G, 6G, IoT, satellite communication, radar, and intelligent communication systems. The FDP concluded with participant feedback, certificate distribution, and a vote of thanks. Participants appreciated the comprehensive coverage of antenna technologies and the research-oriented approach adopted throughout the program



Session by Dr.S.Ravi Chand

Outcomes

- Enhanced understanding of antenna fundamentals and electromagnetic wave propagation.
- Improved knowledge of antenna design methodologies, simulation, and measurement techniques.
- Awareness of advanced antenna technologies including MIMO, smart antennas, Frequency Selective Surfaces (FSS), and metamaterials.
- Exposure to emerging research trends and industrial applications in wireless communication systems.
- Increased motivation for research, innovation, publication, and interdisciplinary collaboration in antenna engineering.


Coordinator


HOD-ECE