



(DEEMED TO BE UNIVERSITY)



**CATEGORY 1
UNIVERSITY**
BY MHRD, Govt. of India

**KL ACCREDITED BY
NAAC WITH A++
GRADE**

nirf
2024
NATIONAL
INSTITUTIONAL
RANKING
FRAMEWORK

**RANKED 22
AMONG ALL
UNIVERSITIES**

**45 YEARS OF
EDUCATIONAL
LEADERSHIP**

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING



RF & MICROWAVE ENGINEERING - CENTRE OF EXCELLENCE

RF & MICROWAVE ENGINEERING - CENTRE OF EXCELLENCE



About the Research Centre

1. **Foundational aspects of RF & Microwave Engineering:** Understanding the basic principles and concepts that govern RF and Microwave Engineering.
2. **Significance in modern technology:** The research in RF and Microwave leads to advancements in wireless communication systems, supporting technologies like 5G, satellite systems, and IoT devices, enhancing global connectivity.
3. **KL University's commitment to advancing research:** The RF and Microwave Research Centre at KL University drives innovation in RF and microwave technologies. With a focus on defense, space, and industrial applications, the centre fosters a collaborative environment and utilizes cutting-edge facilities to push the boundaries of RF MWE.



Vision

To be a leading and trusted partner for RF, microwave, and millimeter-wave technologies.



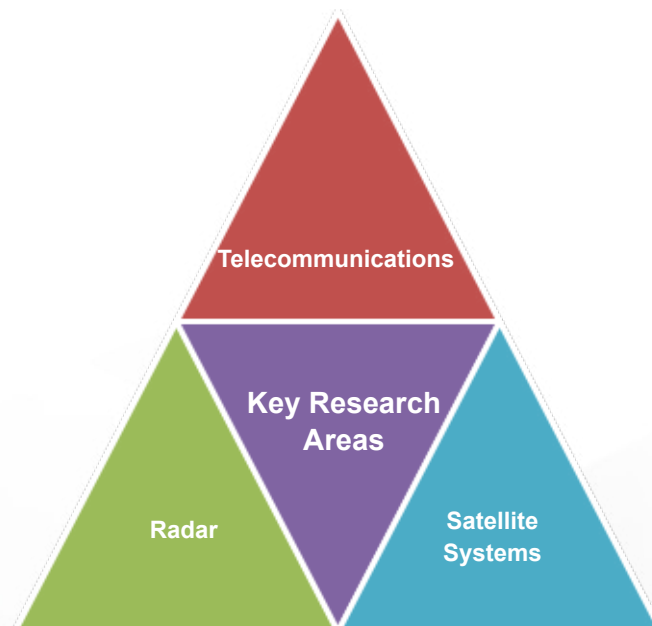
Mission

Enable innovation through expert support, deliver superior RF and microwave solutions, and build long-term partnerships. Foster technological advancement and maintain a commitment to quality and integrity.

OBJECTIVES

1. **Focus on RF & Microwave Engineering:** RF and microwave research is significant due to its broad applications in communication, radar technology, medical devices, and industrial processes.
2. **Research and Innovation Initiatives:** Highlighting key initiatives taken for innovation in research.
3. **Addressing Societal Needs:** RF and Microwave plays a crucial role in areas such as remote sensing and microwave imaging, important in fields like astronomy and healthcare. The ongoing research aims to improve the efficiency and capabilities of these technologies, addressing current challenges and future demands.

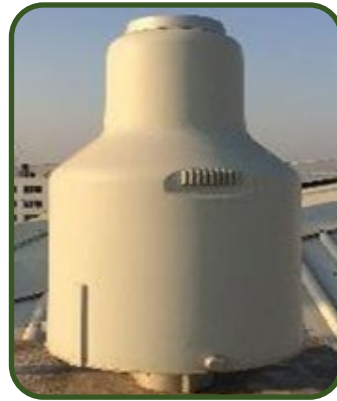
Key Research Areas



EQUIPMENT DETAILS/PHOTOS



90 cms M-90 Offset dish



OTT Pluvio Rain gauge

PROTOTYPES DEVELOPED



Prototyped Antennas on Various Rigid Substrate Materials

EQUIPMENT DETAILS/PHOTOS



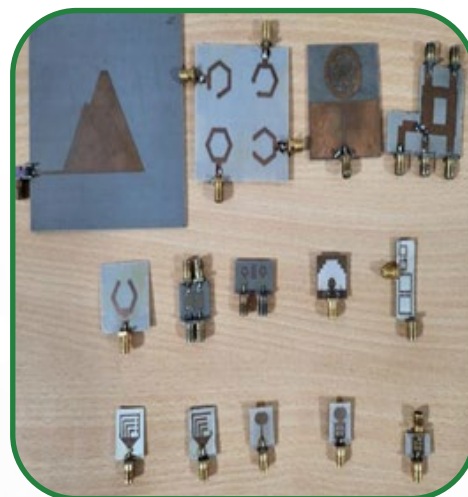
Antennas and Frequency Selective Surfaces on Transparent Materials



Reconfigurable Microwave Devices with PIN and Varactor Diodes



Flexible and Conformal Materials based Microwave and RF Devices



Filters, Couplers and Microwave Devices

OUR TEAM



Dr. K. Sarat Kumar
Director

Applied Electromagnetics and
Satellite communication



Dr. K. Ch. Sri Kavya
Director

Applied Electromagnetics and
Satellite communication



Dr. I. Govardhini
Professor

Applied Electromagnetics and
Satellite communication



Dr. B. T. P. Madhav
Professor

Rf & Microwave



Dr. Sujatha Moorthy
Professor

Rf & Microwave



Dr. N. V. K. Ramesh
Associate Professor

Rf & Microwave



Dr. Abhishek Pahuja
Associate Professor

Rf & Microwave



Dr. Aravind Kilaru
Associate Professor
Data Communications



Dr. Sumit Bhushan
Associate Professor
Rf & Microwave

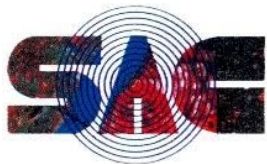


Dr. M. V. D. Prasad
Associate Professor
Rf & Microwave



G. Veerendra Nadh
Assistant Professor
Rf & Microwave

COLLABORATORS



Space Applications Centre, (SAC) Ahmedabad

S V University, Tirupati



ESA, The Netherlands for RAPIDS II Access

University of Calcutta, Kolkata



SCHOLARS INFORMATION

S.No.	Name	Department
1	Mr. S.S.S Kalyan	ECE
2	Mrs. Manjulatha	ECE
3	Mr. Ravi Teja	ECE
4	Mrs.P.Vijaya santhi	ECE
5	Mrs.R.Latha	ECE

S.No	Description	Total Number	Remarks
1	Ph.D's Awarded	14	From 2010 Onwards
2	Submitted by KLU faculty	2	Likely to be awarded in 3 months (AU, IIIT, JNTU etc.,)
3	Research Scholars	10	KLU
4	Faculty registered with other University	02	Registered in JNTU/AU/SVU/NIT etc.,
5	Project Fellows/Research/ Scientists/JRF/SRF	08	KLU

HIGHLIGHTS OF RESEARCH CENTRE WORKS

- * **Sponsored Projects:** Successfully executed multiple funded projects with agencies like DRDO, DST, and ISRO, addressing communication challenges and disaster management
- * **Key Innovations:** Developed low-cost satellite-compatible transceivers, phased array antennas, and radomes for defense, space, and industrial applications.
- * **KLSAT Contributions:** Played a pivotal role in the design and development of first ever satellite of KL University KLSAT, enhancing satellite communications @KL
- * **Advanced Facilities:** Equipped with state-of-the-art labs for Ka-band studies, propagation impairment analysis, OTT Parsivel, Disdrometer and antenna design

PROJECTS - SPONSORED

S.NO	Title of the Project and Duration	Amount (In Lakhs)	Funding Agency	Status
1	Carrying out Theoretical Studies on Simulator (Expendable Active Decoys against Missiles) (15 Months)	4.5	DLRL, DRDO	Completed
2	Theoretical Studies on Phased Arrays for Satellite Links (15 Months)	8.5	DEAL, DRDO	Completed
3	Radome Design (24 Months)	5.82	MHRD-AICTE	Completed
4	Optical Studies on Nano Particles Doped Liquid Crystals (36 Months)	10.91	DST	Completed
5	Design of Feasibility Study for a Single Directional Antenna for L and S Bands (12 Months)	13.44	ISRO, Bangalore	Completed
6	Design of Low-Cost Amateur Radio SATELLITE Compatible Transceiver Setup for Operation during Disaster Situations (36 Months)	9.28	MHRD-AICTE	Completed
7	EW Receivers (15 Months)	8.25	DLRL, DRDO	Completed
8	Prediction of Propagation Impairments for Ku & Ka Band Satellite Links – Real Time Monitoring & Analysis for Communication Applications/Services	11	DST-FTP-YS	Completed
9	Systematic Studies of Phase Stability in Dimeric Liquid Crystals (36 Months)	26	DST-SERC	Completed
10	Communication Platforms using the Low-Cost Transceivers Setup for Quick Establishment and Operation during DISASTER SITUATIONS	25.45	DST-ES-WOS	Completed
11	Experimental Studies on Ku and Ka-Band Satellite Signal Propagation Impairments	25.55	DST-ES	Completed
12	Characterization and Modelling of Ka-Band Earth Space Paths for Prediction of Total Attenuation including Fade Dynamics	53.6	SERB	Completed
13	Systematic Designing of Compact Slot Antennas for Wireless LAN Applications	24.45	DST-ES-SERC-WOS	Completed
14	Development of Attenuation Contours for Ku and Ka Band Propagation Impairments over Indian Region with Low Cost Receiver Setup (36 Months)	36	DST-SERC	Completed

PROJECTS - SPONSORED



ज्ञान - विज्ञानं विमुक्तये



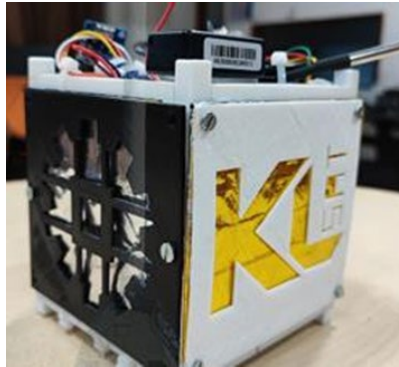
विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY

COLLABORATIVE PUBLICATIONS

1. Kavya, K., Sarat, K. K., D Charan, B. S. S. S., & Phanindra, K. (2017). Statistical Analysis Of Propagation Parameters For Fade Mitigation. Journal of Theoretical and Applied Information Technology, 95(10).
2. Madhav, B. T. P., T. Anilkumar, and Sarat K. Kotamaraju. "Transparent and conformal wheel-shaped fractal antenna for vehicular communication applications." AEU- International Journal of Electronics and Communications 91 (2018): 1-10.
3. Kalyan, S. S. S., K. Ch Sri Kavya, and Sarath K. Kotamaraju. "Performance Analysis Of Synthesized Beamsteering Linear Array Antenna For Ka-Band Satellite Communication Links." Journal of Fundamental and Applied Sciences 10.6S (2018):
4. Madhav, B. T. P., Habibulla Khan, and Sarat K. Kotamaraju. "Circularly polarized slotted aperture antenna with coplanar waveguide fed for broadband applications." Journal of Engineering Science and Technology 11.2 (2016): 267-77.
5. Sundar, P. S., Kotamaraju, S. K., Madhav, B. T. P., Sreehari, M., Rao, K. R., Prathyusha, L., & Pravallika, . (2016). Parasitic Strip Loaded Dual Band Notch Circular Monopole Antenna with Defected Ground Structure. International Journal of Electrical and Computer Engineering (IJECE), 6(4), 1742-1750.
6. Devika, S. V., Kotamaraju, S. K., Kavya, K. C. S., Kumar, V. S., Suhas, K., Vinu, K., & Anudeep, B. (2016). A Circularly Polarized Ka-Band Antenna for Continuous Link Reception from GSAT-14. Indian Journal of Science and Technology, 9(38).

S.No	Title of the Textbook	Author	Year
01	In Search of Research-An Useful survey book for researchers 978-81-203363-0-8	Dr K Sarat Kumar	2011
02	CATR Antennas	Dr T V Rama Krishna	2012

ACHIEVEMENTS



Specifications

Cube sat Dimensions: 10 x 10 x 10 cm

Payload weight: 1200g

Type of Balloon: A Latex Helium Balloon Total weight (Balloon + Module): 2800g Vertical Distance Travelled: 28Km Horizontal Distance Travelled: 70Km Frequencies Operated at: 144MHz, 434MHz, 915MHz

Antennas Used: HF, VHF and UHF Antennas

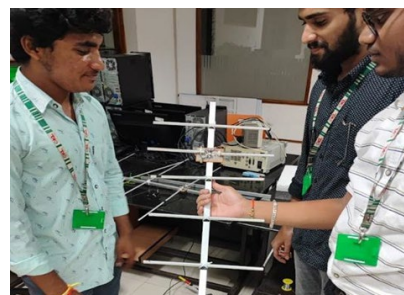
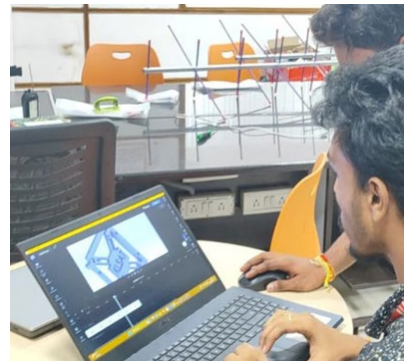
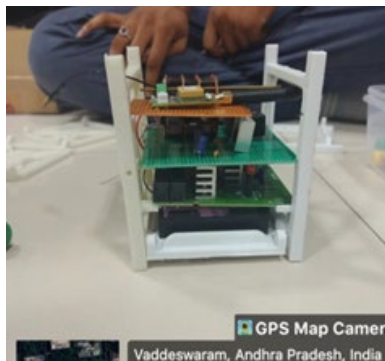
GPS Modules Used: KLAP, SPACE SAT Tracker

Sensors Used: Temp, Humidity, Moisture, Pressure, Ozone

- KLSAT-Miniature satellite, 1U CubeSat with a payload of 1.2 Kg equipped with atmospheric sensors, reached an altitude of 28 kilometers (92,000 feet), gathering valuable data for research purposes.
- The KLSAT project is an endeavor aimed at advancing the understanding of atmospheric measurement technology in a given specific area.

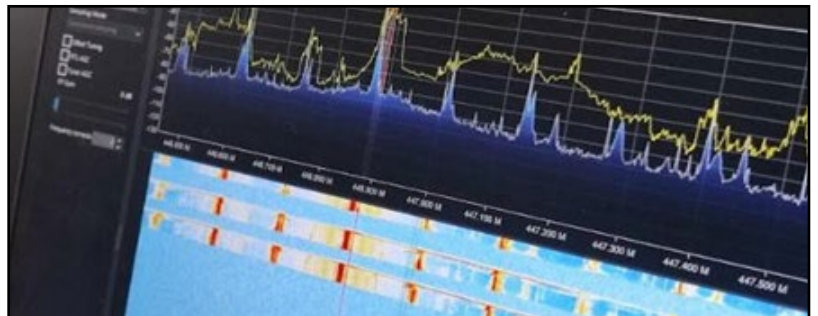
ACHIEVEMENTS

Trail Testing



ACHIEVEMENTS

Launch Preparations



ACHIEVEMENTS

THE BIG DAY 27 September 2023



ACHIEVEMENTS

Retrieval of KLSAT



Celebrations of Successful data recovery



ACHIEVEMENTS

Coverage in National Media



Experimental Studies on Ku & Ka Band Satellite Signal Propagation Impairments

DST - Women Scientist (WOS – A) Scheme (2011-2012)

Principal Investigator : Dr. I. Govardhani

Mentor: D.K Sarat Kumar (SR/FTP/ET-081/2011)

Grant Received: Rs. 25,50,000.00

Objectives

1. To install the experimental setup for Earth-Space path propagation studies
2. To study the seasonal and diurnal effects of the availability of Ku and Ka- band satellite systems operating in tropical regions and their impact on different services like DTH, Wireless, Broadband Communications etc.
3. To study the rain attenuation for different drop size distributions

Deliverables

1. Low-Cost Experimental Studies
2. Long Term Experimental Data
3. Suitable Models for Indian Regions

ACHIEVEMENTS

Design of Low-Cost Amateur Radio SATELLITE Compatible Transceivers Setup for operation and Quick Establishment of Communication Platforms during Disaster Situations

AICTE – RPS SCHEME

FILE NO: 8023/RID/RPS/032/11/12

Principal Investigator : Dr.K.Sarat Kumar

Co-Investigator: BTP Madhav

Grant Received: Rs. 9,28,000.00

Objectives

1. To use existing Satellites in Space effectively for Disaster Communication/Management
2. To develop the low cost Antennas/Equipment for Effective use in Disaster Mitigation/ Management.
3. Knowledge and information exchange with Common Public/HAM operators.
4. To focus on disaster preparedness with emphasis on mitigation measures and Human Resource Development.
5. To increase the level of awareness of the community about disasters, prepare them adequately to face the crisis.

Deliverables

1. Satellite compatible transceivers
2. Testing results of Communication links
3. Communication systems for ease of use for mass installation at remote locations

ACHIEVEMENTS

Propagation Impairment studies over Indian Region to develop the rain attenuation contours and suitable models

File No: SR/S4/AS-82/2011

Principal Investigator: Dr. K. Sarat Kumar

Co-Investigators: Dr. SVB Rao, Dr. DV Ratnam, BTP Madhav.

Grant Received: Rs. 39,81,000.00

Objectives

1. To design, test and install the low-cost experimental setup for Earth-Space path propagation studies at TWO locations in the preliminary stages
2. To develop contour maps for Rain Attenuation which is first of its kind in India for major locations using SIMULATIONS
3. To study the seasonal and diurnal effects of rain and other propagation impairments on Ku propagation links operating in India during rainy situations
4. To develop rain attenuation models based on the experimental data and analysis.

Deliverables

1. Contours & Atlas
2. Suitable Models for Indian Regions

ACHIEVEMENTS

Design of Radome

AICTE-RPS

Principal Investigator: Dr. P.Siddaiah

Grant Received: Rs. 5,82,000.00

Objectives

1. To study the types of radomes
2. To fabricate the A & B Sandwich Radomes
3. To test the fabricated radomes

Deliverables

1. Fabricated A & B Sandwich type radomes

Design for Optimization of Phased Array Antennas

UGC – MAJOR PROJECT

Principal Investigator: Dr. P.Siddaiah

Grant Received: Rs. 10,23,000.00

Objectives

1. To design a phased array antenna with phase shifters
2. To fabricate and test the optimized design of phased array antenna

Deliverables

1. Studies on phased array antennas
2. Simulation of different grid structures within the phased array antenna
3. Simulation of subarray technique
4. Studies and design of phase shifters
5. Complete phased array antenna fabricated and tested along with phase shift

FOR MORE INFORMATION

Dr. K. Ch. Sri Kavya,

Professor

Department of Electronics & Communication Engineering

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Contact Number: 9573943055



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