

## **RF & MICROWAVE RESEARCH LABORATORY**

**(developed by Dr. S Suganthi under MRP funding)**

The RF and Microwave is a Research Laboratory which caters researchers to explore the field of wireless communication with respect to conventional & planar antennas and RF systems including investigations on the effect of metamaterials and ambient RF energy harvestment.

The explosive growth in the demand for information transfer using handsets and personal communications devices has created the need for major advancements of antennas. One type of antenna that fulfills most of the wireless system requirements is the planar antenna. It finds increasingly wide range of wireless applications in handheld mobile devices, satellite communication systems and biomedical applications.

This Research Laboratory provides a complete platform for simulation and experimental validation of antennas & RF system designs upto 40 GHz. This lab is equipped with HFSS EM simulation software and the state-of-the-art kind of measuring instruments Vector Network Analyzer, Spectrum Analyzer, PCB Printing Machine, RF modules and an Anechoic Chamber measuring a size of 7m x 4m x 3m. The long term goal is to develop this laboratory as a center of excellence for microwaves.

### **Research work in this domain**

<b>S.No</b>	<b>Working Topic</b>	<b>Faculty</b>	<b>Project</b>	<b>Funded by</b>	<b>Status</b>
1	Design and Development of Metamaterial Inspired Planar Antenna and Investigation on the Performance for Wireless Applications and Energy Harvesting Rectenna with an "Establishment of Research Environment in the Area of <b>RF and Microwave</b>	PI: Dr S Suganthi Co-PI:- Mr.DShashi kumar Mr. R Vivek	MRP Project	Christ Funded 1.16 Crores Period:3 years	On-going

## Facilities available

**Software:** Ansys Electronics Desktop HFSS 18.2 (High Frequency Structure Simulator Software), Total Users: 26 , Teaching License: 25 , Research License: 1

**Equipment:** PCB Prototyping machine, Spectrum Analyzer, Vector Network Analyzer, Anechoic Chamber

### **Nvis 72 PCB Prototype:**

It is a new electro-mechanical utility which can be used for making all MIC passive components such as filters, directional couplers and antennas and so on.



**Spectrum Master (MS2720T) - High Performance Handheld Spectrum Analyzer, 9kHz to 43 GHz**



**Handheld Vector Network Analyzer - Microwave Site Master S820E, 1 MHz to 40 GHz**

Anritsu's Site Master S820E is the highest performance, rugged, hand-held microwave cable/antenna analyser.



### **Anechoic Chamber, 800 MHz - 40 GHz Rectangular Chamber of size 7m x 4m x 3m**

The anechoic chamber is a room designed to completely absorb reflections of either sound or electromagnetic waves. The chamber is also often isolated from waves entering from their surroundings. It is integrated with an Automatic Antenna Measurement with Positioning System. This is used for measuring both primary and secondary antenna radiation patterns in the 2D as well as 3D formats.

#### **Shielding effectiveness**

- Frequency range of interest : 800 MHz to 40 GHz
- Overall Shielding effectiveness: - 80 dB
- Test zone quietness: -40dB around 1m<sup>3</sup>area
- Test procedure: As per STD-IEEE-299

