



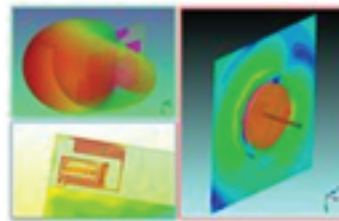
# Department of Electronics & Communication Engineering

## CONSULTANCY SERVICES

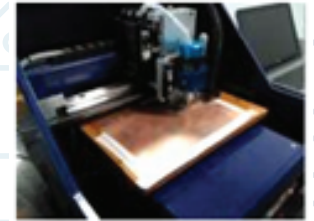
### Name of the Research Center: Antennas & Liquid Crystals Research Center

#### About the research center

1.The Antenna & Liquid Crystals Research Centre (ALRC) was established in 2008. The main objective of this state-of-the-art facility, directed by Dr. B T P Madhav, is to support research, analysis, modelling, test and development efforts related to antennas and liquid crystal-based systems. This Lab is equipped with the latest antenna and microwave design tools like ANSYS Electronics Desktop, CST Microwave Studio. The test facilities also include Vector Network Analyzers, Spectrum Analyzers, PCB Prototype Machine, Differential Scanning Calorimeter, Liquid Crystal Analysis System, Polarizing Microscope, Computer facilities available for research in the ALRC R&D include a network of several high-performance workstations with high speed RAM's.



Design/Modelling /Simulations



Prototyping Service



Measurement & Testing Facility



Skill Development /Training Programmes & Workshop

#### Consultancy (Will provide on)

1.Fabrication of Microstrip patch antennas of various kinds

2.Functional verification of antennas and other microwave devices (filter, couplers etc)

Details of the Equipment

1.Name

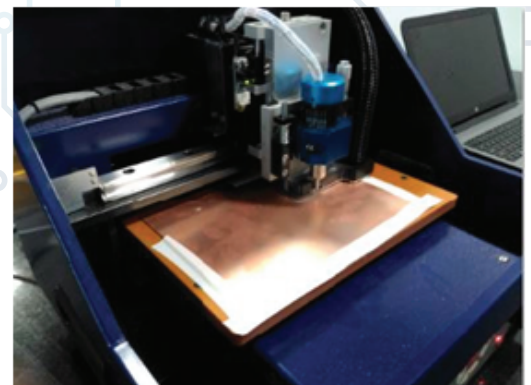
2.Technical details at glance

3.Applications (Where it can be used?)

4.HD Images

Equipment 1: PCB Prototype Machine Model No: Scientech-71 (Nvis)

Applications: Prototyping of Printed circuit antennas, filters, PCB circuits etc



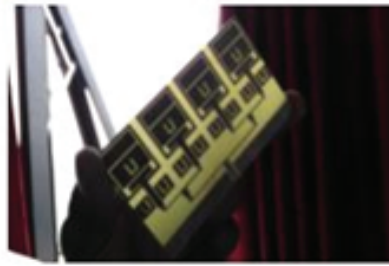
## Fabricated Prototypes



Metamaterial based Filtenna



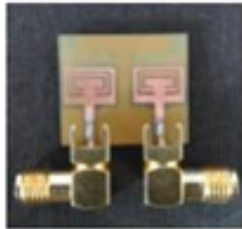
Sierpinski Fractal Antenna



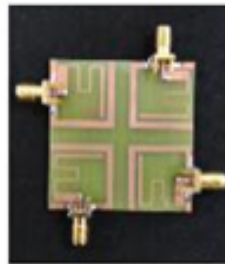
1x4 Element High Gain Array Antenna



1-to-2 Power Divider



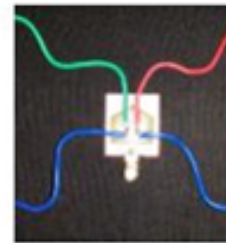
2-Port UWB MIMO Antenna



4-Port Diversity Antenna



Band switchable Reconfigurable Antennas



Liquid Crystal Polymer Antenna

**Equipment 2:** ANRITSU Combination Analyzer

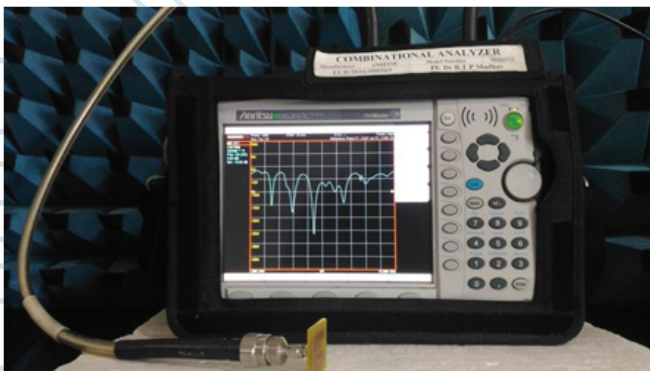
**Model No:** MS2037C

**Specs:** Vector Network Analyzer

Mode-(5kHz-15GHz)

Spectrum Analyzer Mode-(9kHz-15 GHz)

**Applications:** Characterization of antennas & microwave devices



**Equipment 3:** KEYSIGHT's EXG Analog Signal Generator,

**Specs:** 9kHz-15 GHz

**Applications:** Signal source for RF & microwave signals, as a transmitter



**Equipment 4:**

AARONIA-AG High Power Horn Antenna

**Model:**

PowerLOG70180

**Specs:**

Frequency of

**operation:**

700MHz-18GHz



**Equipment 5:** Differential Scanning Calorimeter (Perkin Elmer's Diamond DSC)

**Applications:** Liquid crystal compounds characterization & analysis



**Equipment 6:** Polarizing Microscope  
**Applications:** microscopic imaging of various phases of liquid crystal compounds/specimen



### Details of the software

- 1.Name
  - 2.Version/Technical details
  - 3.Applications (Where it can be used?)
- Software 1:  
ANSYS Electronics Desktop 17
- Software 2:  
CST Microwave Studio 2019
- Applications: Design, simulation of various kind of RF & Microwave Antennas and other devices

### Completed consultancy works (If any)

1.Consultancy provided to M/s Lakshmi Engineering Services India (P) Ltd., for the project "Design and development of Planar Printed Antenna Prototypes for Wireless Applications" Submitted on Mar-2018.

2.Consultancy provided to M/s Maharshi Research Consultancy, for the project "Development of Planar Antenna Modules for Industrial Wireless Communications" on Submitted on Mar-2019

Clients (If any)

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Clients from various academic engineering institutions in AP & Telangana states  
Collaborations with Industries, Universities, etc. (If any)

1.etc

### Few Publication details

(By using the mentioned equipment)

- ✓ Madhav, B.T.P., Venkateswara Rao, M., Anilkumar, T. "Conformal Band Notched Circular Monopole Antenna Loaded with Split Ring Resonator", 2018, Wireless Personal Communications, 103(3), pp. 1965-1976.
- ✓ Venkateswara Rao, M., Madhav, B.T.P., Krishna, J. "CSRR-loaded T-shaped MIMO antenna for 5G cellular networks and vehicular communications", 2019, International Journal of RF and Microwave Computer-Aided Engineering, 29(8),e21799
- ✓ Nadh, B.P., Madhav, B.T.P., Kumar, M.S. "Design and analysis of dual band implantable DGS antenna for medical applications", 2019, Sadhana - Academy Proceedings in Engineering Sciences, 44(6),131.
- ✓ Venkateswara Rao, M., Madhav, B.T.P., Anilkumar, T., Prudhvi Nadh, B. "Metamaterial inspired quad band circularly polarized antenna for WLAN/ISM/Bluetooth/WiMAX and satellite communication applications", 2018, AEU - International Journal of Electronics and Communications, 97, pp. 229-241.

- ✓ Nadh, B.P., Madhav, B.T.P., Kumar, M.S., Rao, M.V., Anilkumar, T. "Asymmetric ground structured circularly polarized antenna for ISM and WLAN band applications", 2018 Progress In Electromagnetics Research M, 76, pp. 167-175.
- ✓ Pokkunuri, P., Madhav, B.T.P., Sai, G.K., "Metamaterial inspired reconfigurable fractal monopole antenna for multiband applications," 2019, International Journal of Intelligent Engineering and Systems, 12(2), pp. 53-61
- ✓ Venkateswara Rao, M., Madhav, B.T.P., Naveen, T., Sai Prashanth, N., Niharika, B. "Metamaterial loaded rectangular monopole antenna with ultra-wideband applications", 2019, International Journal of Recent Technology and Engineering, 8(1), pp. 1573-1576.
- ✓ Deepak, B.S., Madhav, B.T.P., Prabhakar, V.S.V. "Design and analysis of hetero triangle linked hybrid web fractal antenna for wide band applications", 2018 Progress In Electromagnetics Research C, 83, pp. 147-159.
- ✓ Saravanan, R.A., Madhav, B.T.P., Venkateswararao, M., (...), Priyanka, V.K., Anand, P.S. "Frequency and pattern reconfigured multi band cpw antenna for wimax and x-band applications", 2019, International Journal of Innovative Technology and Exploring Engineering, 8(6), pp. 1202-1208.

And many more..

### Contact details

**Mobile Number: +91-8008940999**

**Extension Number: 1793**

**Mail ID: [btpmadhav@kluniversity.in](mailto:btpmadhav@kluniversity.in)**

Any relevant Information

We can provide consultancy in the RF, Microwave and Antennas design, prototyping and testing. Liquid crystals and other nano dispersed compounds analysis with POM, DSC and LCAS also will be provided.