

# R.Karunanithi

## Associate Professor



### Details of Academic Qualifications

- B.Sc and M.Sc degrees from Madras University.
- Ph.D from Indian Institute of Science, Bangalore. Ph.D. Thesis Title: "Studies in cold Electronics": Components, Design and Fabrication of Analog Circuits".

### Professional Experiences

- 28 years experience as Cryogenic Scientist in the Indian Institute of Science, Bangalore
- More than 90 publications in journals and conferences on different fields of Cryogenics

### Research Abroad

Dr.Karunanithi was invited by the Low Temperature Division of University of Twente, the Netherlands & Forschungszentrum, Germany to work as Visiting Scientist for a period of 6 months at each place and worked in frontier areas of cryogenics during 1995-96. During this period, Dr. Karunanithi visited Giessen in Germany and had an opportunity to have discussions at the Institute for Angewandte physik on the most advanced Pulse Tube Refrigerators and related topics.

### Research Undertaken

- Dr. R. Karunanithi joined the Centre in 1983. He has been a key person in the installation, maintenance trouble-shooting and operation of liquid helium & liquid nitrogen plants and the accessory units in the centre. In addition to the above primary responsibilities at the centre to ensure continuous and reliable supply of liquid nitrogen & liquid to all the users in the institute.
- Dr.Karunanithi has initiated and actively participated in a number of cryogenic research and development activities in the center and has made valuable contributions towards successful completion of the objectives. The areas in which he has worked are Cryo-and Cold electronics, Cryocoolers, Development of Cryogenic systems, Cryogenic Instrumentation etc.

### **Sponsored Projects(Research Schemes) for the period 1997- Till date**

- Development of Stirling type Pulse tube refrigerators for space application
- Design and development of twin pulse tube refrigerator and the moving magnet type linear compressor to drive the pulse tubes
- Design and development of zero loss liquid helium system using high frequency Pulse tube refrigerators and J-T cooling
- Calibration of capacitance type cryo-liquid level sensors of the cryostat of GSLV
- Cryogenic treatment of metals and pressure transducers for space applications
- Liquid Helium cryostat for operation of SQUIDs for NDT studies.
- Development of a Double inlet Single Stage Pulse tube Cryocooler and numerical modeling.
- Studies on Vortex tube air separator (Phase I).
- Studies on Vortex tube air separator (Phase II).
- Cryo grinding of Spices.
- Development and studies of a convection free single stage pulse tube cry cooler operating at 77K.
- 100 litre capacity Super insulated LHe dewar and Remote Deliver Tube.
- SQUID detection of low frequency NMR and NQR.
- Development of an Electro-acoustic type Helium purity monitor for gas recovery systems.
- Development of electro acoustic type hydrogen gas monitor.

### **Some of the major Consultancy Projects undertaken have been the following**

- Design and Development of Discrete array type Liquid Level Indicator for Liquid Oxygen system.
- Calibration of Temperature Sensors for Cryogenic Upper stage Project-Phases I to V
- Upgradation of the performance of CCD Cryostat.
- Advice on LOX breather Converter :Restoration of Performance (Phase II).
- Cryogenic Pulverizer for PVC Scrap Processing.
- Up-grating of performance of LOX Dispenser Assembly.
- Technical advice on ambient pressure thermal cycling facility.

## Patent

1. Cryogrinding of Waste Plastics and Other Materials
2. Optical cryocooler with thermal shields cooled by waste fluorescence energy driven thermo-electric cooler
3. Cryogenic bending technique for thin walled metallic tubes.
4. A remote delivery tube with integral Joule-Thompson value for Helium Liquefier.
5. Formulation of low temperature adhesive and bonding technique for cryogenic containers.
6. Concentric Tubular Support Design for Cryogenic Tanks

## Awards

Indian Cryogenic Counsel -" M.C. Joshi Memorial Award" (1995).

## Appreciation of R&D Work

Bharat Heavy Electrical Ltd.,Hyderabad had communicated to Director, IISc,their appreciation for the successful project by the team at CCF on the Design and Development a Rotating Helium Transfer coupling, which was satisfactorily tested on the first Super conducting generator made in the country during 1995. The Director, IISc has conveyed his congratulations and has appreciated the success of the team in this prestigious project.

**E-mail:** [karun@ccf.iisc.ernet.in](mailto:karun@ccf.iisc.ernet.in)