NIVEDITA MAHESH

Academic Details:

B.E Instrumentation & Control　　● Anna University, India　　　● G.P.A : 9.54/10　　*2008-2012*
  ● Subjects Concentrated: Sensors & Transducers, DSP, Modern Control Systems, Transforms & Complex analysis, Integrated circuits

M.S Electrical Engineering　　● University of California, Los Angeles　　● G.P.A : 3.89/4　　*2014 – 2016*
● Advanced Electrodynamics, Electromagnetic Radiation, Terahertz technology& Applications, Computational Electromagnetics

PhD Astrophysics　　　● Arizona State University　　　● G.P.A : 4/4　　*2016 – Present*
  ● Stars & Interstellar Medium, Distant Universe, Galaxies & Cosmology

Software skills:

　　　　Languages　　　：　C Programming, C++, FORTRAN and Python
　　　　Simulation/Analysis　：　MATLAB, CST, HFSS, WIPL-D, FEKO, Xilinx ISE Design Suite, IRAF

Certification:

- UCLA Extension – Microwave Antenna Measurements　　　*May 2015*
- Raman Research Institute – IISC certified in Signals &Systems in Radio Astronomy　　*Aug 2013 –Sept 2013*
- Analog Devices Inc. and IIT Madras certified in DSP programming & Applications　　*Jun 2011*
- ISA – CIAT certified in Industrial Automation & PLC programming　　*Jun 2010*

Fellowships:

- USNC-URSI Travel Fellowship for NRSM　　　*Jan 2018*
- ASTRON/JIVE summer Fellowship　　　*Jun 2017*

Publications:

- R.A. Monsalve, B. Greig, J.D. Bowman, A. Mesinger, A.E.E. Rogers, T.J. Mozdzen, N.S. Kern, ***N. Mahesh, "Results from EDGES High-band. II. Constraints on Parameters of Early Galaxies",*** ApJ 863:11, August 2018.
- J.D. Bowman, A.E.E. Rogers, R.A. Monsalve, T. J. Mozdzen, ***N. Mahesh, "An absorption profile centered at 78 MHz in the sky-averaged spectrum ",*** Nature 555, 67-70, March 2018.
- ***N.Mahesh***, R.Subrahmanyan, N.U Shankar, A.Raghunathan, **"A Resistive wideband Space Beam Splitter"**, IEEE Transactions on Antenna and Propagations, Volume 11, Issue – 64, November 2015
- N.U Shankar, Subrahmanyan.R, ***Mahesh.N***, Raghunath.A, Patra.N, **"Antennas, space beam splitters and receivers for precision radiometers exploring the reionization and recombination epochs"**, IEEE URSI conference, Aug 2014

Current Project: (Research Assistant, LOCO, ASU)

　Experiment to Detect the Global EoR Signature(EDGES)　　　*Aug 2016 - Present*
- Model and compare the radiation pattern of the EDGES blade dipole using Feko, HFSS and CST
- Study the effects of antenna model, EM solver and ground plane on beam chromaticity
- Understand the effects of beam chromaticity on the sensitivity of EoR detection
- Apply the beam corrections to the data and

　Power Spectrum Analyses of the LOFAR data of the 3C196 Flanking field　　*Jun 2017 - Present*
- Tested the suitability of the field for EoR studies.
- Successfully used a new source removal technique to reduce foreground contribution on data.
- Obtained reasonable upper limits on the Power Spectra compared to the LOFAR data from the main 3C196 field.

Work Experience:

1. **Senior Research Assistant, CalTech**　　　*July 2015 – Mar 2016*
- Develop a Flexure Model for the Near-Infrared Echelette Spectrometer to be in installed on the Keck Telescope
- Perform image analysis (IRAF) for object motion, noise, bad pixel and detector optimization
- Final testing and calibration of the NIRES system prior to installation

2. **Graduate Student Researcher, UCLA**　　　*Jan 2015 – Jun 2015*
- Study of externally polluted UV spectrum of a White Dwarf
- To identify element composition and abundances using IRAF
- To compare the elemental abundances with known crustal abundances and search for existence of Exo Solar terrestrial planets

3. **Research Fellow, Raman Research Institute, Bangalore**　　　*Oct 2013 – Aug 2014*
- Developed a space beam splitter to enable zero baseline interferometry to increase the SNR of the CMBR

- Analytically determined the parameters using Maxwell's equations and boundary conditions
- Tested the constructed prototype (50 – 400 MHz) for its reflection and transmission coefficients
- Simulated the performance of the prototype using Huygens waves using MATLAB

4. DCS Control Engineer, ABB India Ltd, Bangalore   *Oct 2012 – Jun 2013*
- Tested the Control and RTU panels of the Distributed control system for Wanakbhori power station
- Designed the cable scheduling for the DCS panels of Vishakapatnam Steel Plant
- Developed Control Logics for Boiler systems, LP & HP heaters & Carried out stability analysis of Super Heater Systems

Research works:

1. EM Scattering from Dielectric Structures (UCLA Antenna Research & Measurement Lab)   *Sept 2015 – Mar 2016*
- Study of scattering characteristics from complex dielectric structures
- Analysis on effect of multiple internal reflections on scattered fields from low loss dielectric structures

2. Data collection from MWA Array Prototype using FPGA. (Raman Research Institute, RRI)   *Aug 2013 – Sept 2013*
- Programmed the Virtex -6 for real time collection of signals with 330 MHz bandwidth via a 10 bit ADC
- Controlled the FIFO memory with the data rate of the incoming signal
- Sent the collected data to the Ethernet interface via emac library of the FPGA board

3. Design and Development of a Log Periodic Dipole Array. (RRI)   *Dec 2011 – Jun 2012*
- Designed & analyzed an obtuse angled LPDA using WIPL-D
- Developed a FORTRAN code to verify the dependency of impedance values on the antenna parameters
- A prototype was constructed and tested for gain, impedance and return loss in the range of 88-880MHz using a VNA

Academic Projects:

1. Embedded system to implement learning techniques for arrhythmia detection-Design   *Jun 2011 – Nov 2011*
- The acquired real time ECG signals were processed using DB6 wavelets on ARM 9x board
- The signals were classified into normal and abnormal using Bayesian classifier

2. Stress recognition in automobile drivers using physiological signal analysis   *Dec 2010 – Apr 2011*
- Identified the stress levels by analyzing the physiological signals viz ECG, EMG and GSR
- Processed signals from MIT database using filter bank and Db6 wavelet algorithms written in C

Memberships:

- **Student Representative, Facilities Fee Board, University Boards and Committees,** ASU   *Sept 2018 - Present*
- **Secretary, Graduate Student Council of SESE,** ASU   *Aug 2017 – Apr 2018*
- **International Outreach Chair, Engineering Graduate Student Association,** UCLA   *Feb 2015 – Apr 2016*
- **Secretary, International Society of Automation (ISA),** Students' Section, PSG CT   *Jun 2011- Mar 2012*