List of Ongoing RESPOND Projects As of December, 2024

Sr. No	Research Title
1.	AI/ML based mapping of planetary morphology/morphometry
2.	An Empirical Analysis on Deriving Test Cases from Natural Language Text using MBT Approach
3.	Appraisal of lake water dynamics and security through high resolution satellite imageries
4.	Assimilation of Remote Sensing and Hydrogeological data for aquifer zonation vis a` vis determining Structural and Lithological control over Groundwater Quality and Quantity in Central – Southern Kachchh Mainland, Western India
5.	Data Driven Approaches for Dehazing of High-Resolution Multispectral Remote Sensing Images
6.	Delaying programmed cell death of beneficial gut bacteria in microgravity using oxide and complex nanoparticles
7.	Design and development of AI/ ML enabled algorithm for a static code analysis tool and its implementation as a software product
8.	Design and Development of Fabry Perot Cavity based Feed Cluster
9.	Design and development of X-band prime focal reflectarray antenna
10.	Design and fabrication of Phased array antenna with front end system for Ku band with design, simulation and implementation of tracking algorithms for SOTM on microcontroller
11.	Design of transceiver for On Board Wireless interface of distributed control systems
12.	Design, Development & Implementation of Real/Near Real Time Low SNR Target Detection & Tracking System
13.	Development and Characterization of Processed Shape Memory Alloy (SMA) components for Space Applications
14.	Development of active learning algorithm for human in loop Al systems for satellite imagery analysis
15.	Development of LTCC tapes and compatible gold pastes for space applications
16.	Development of Miniaturized Multi-Constellation Weak MBOC signal Real-Time GNSSReceiver
17.	Development of Non-cyanide Autocatalytic Silver Plating Chemistry
18.	Development of Superconductor-Insulator-Superconductor (SIS) thin film stack for THz application
19.	Development of techniques for ground-Based Source Localization using Sparse Antenna Arrays on board LEO Satellite

Sr. No	Research Title
20.	Development of Time domain measurement technique for very low frequency (10 MHz – 50 MHz) antenna radiation pattern measurements
21.	Fabrication and performance optimization of Thin Film Bulk Acoustic Wave (BAW) resonators and filters
22.	Impact of climate change on offshore wind and wave power potential in the India EEZ region
23.	Low Frequency Compact Ultra-wideband Planner Artificial Magnetic Conductor(AMC)
24.	Multi-channel stackable input perfect reconstruction transmultiplexer for satellite communication
25.	PIC based Tx and Rx with multiplexed optical channels employing polarization modulation and homodyne/heterodyne detection
26.	Polarisation Imaging Camera for characterisation of planetary atmosphere and surface
27.	Precise Baseline/Orbit Determination (PBD/POD) Algorithm for Tandem Satellite operations for high precision GNSS receiver
28.	Prediction of ground-level particulate matter concentrations from Multi-Satellite Aerosol Optical Depth (AOD) over the Indian Subcontinent
29.	Quantum memory development
30.	SAR Polarimetric image classification using Wishart Mixture model and Convolution Neural Networks
31.	Spatio-spectral Deconvolution of Hyperspectral Images
32.	Study and realization of low Vpi Mach-Zender for OOK/BPSK/QPSK modulation up to 20 GHz
33.	Study, design and development of electronic nose for fire detection system
34.	Techniques for Coexistence and Integration of Communication Satellites and Terrestrial IMT Systems
35.	The Design and analysis of a Silicon Particle Detector Array using High Voltage CMOS process for Space Application
36.	To study potential protocols for satellite-based secure quantum communication under ambient atmospheric conditions
37.	Ultra-high sensitivity tunable laser-based spectroscopic gas detection system for the Human Spaceflight Programme
38.	Use of Artificial Intelligence based technique for the retrieval of Atmospheric Motion Winds