

Annexure-1 : List of Ongoing RESPOND Projects As of April 2018

1.	Conformal array synthesis using evolutionary algorithms for the generation of a shape beam antenna for data transmission
2.	Synthesis and characterization of nano piezoelectric material for vibrations sensor applications
3.	Understanding and Characterization of Systematic Errors in the WRF-ARW Boundary layer parameterization over the Bhubaneswar and its neighbourhood regions
4.	Development of thermal barrier coatings by electron beam physical deposition
5.	Development of high performance super-capacitors based on Lithium Titanate/Carbon nanostructures
6.	Design and synthesis of IPN based polymer electrolyte membranes embedded with Nano-additives for fuel cell applications
7.	Ultra wide band dielectric resonators antenna
8.	Antipodal Linear Tapered Slot Antenna (AL TSA) array design and development for inter-satellite communication at 60 GHz
9.	Study on the effect of Very High Energy (VHE) Emission in Universe
10.	Design of Ultra Low Power FHSS Transceiver for Wireless Communication Applications.
11.	Development of passive damping surface coating for advanced materials based structural system using PZT (Piezo) powder
12.	Habitat suitability and corridor analysis for sloth bear in Gujarat using remote sensing and ecological modeling
13.	Shoreline changes and its impact on coastal ecosystem in Chidiatapu and Wandur of South Andaman Islands using Remote Sensing and GIS
14.	Design and Simulation of L-Band Phased-FS MIMO Radar for increased system flexibility
15.	Studies on Vanadium oxide band thin film developed by dip/spin coating techniques
16.	Enhancement of Boiling Heat Transfer via the Suppression of Coalescence in Microgravity
17.	Process development for minimization of spring back deformation and enhancement of Profile accuracy for Carbon Fiber Reinforced Polymers (CFRP) reflectors
18.	Gated photodiodes for single photon detection in CMOS technology
19.	Design and Development of Proof-of-Concept Model of an Adaptive Membrane

20.	Development of Carbon Nano-Tube (CNT) based strain sensor
21.	Characterization of Aerosols, Black Carbon and Radiative forcing over Urban environment of Ahmedabad and Gandhinagar City, Gujarat, India
22.	Modelling and Controller design for Active Clamp Forward Converter with Multiple Outputs used as Electronic Power Conditioner (EPC)
23.	Research Projects by Advanced Centre for Atmospheric Sciences
24.	Design of Ultra Low Power CMOS (Complementary Metal Oxide Semi-Conductor) temperature sensor for aerospace applications
25.	Improvement in size uniformity of self assembled InAs Quantum Dots on GaAs substrate by rapid thermal annealing
26.	Erosion Behavior of ZrB ₂ -SiC Composites
27.	Development of a Catalyst for reduction of Carbon Dioxide to Methane and Water
28.	Synthesis of Tantalum Pentoxide-Reduced Graphene Oxide Hybrid Nanomaterials: Ionic Liquid based Electrolytes for Lithium Battery
29.	High temperature X-ray diffraction studies on precipitation behavior of Ni and Fe based alloys
30.	Synthesis and concentration of propellant Hydroxylamine Nitrate (HAN) from aqueous solution by polymer mediated pervaporation techniques
31.	Astrophysical S-factor from nuclear reactions with a rare isotope beam of Be
32.	A local short term model for forecasting ionospheric scintillations for GNSS applications over Indian region
33.	Friction Stir Welding (FSW) of Aluminium alloys for Aerospace Applications
34.	Development of Ba _x Sr _{1-x} TiO ₃ (BST) tunable dielectric thin films prepared by pulsed laser deposition
35.	Formation of Prebiotic Molecules and Amino acids in Astrophysical ices: Ad initio Molecular Cluster and Spectroscopic studies
36.	Oceanic pollution and other ocean phenomenon monitoring using feature extraction from multi-polarized SAR data
37.	Solar wind turbulence, viscosity and implications for the propagation of solar coronal mass ejection
38.	Seasonal and inter-annual variability of Relative Heat Content (RHC) in the Indian Ocean
39.	MHD Waves in the Solar Atmosphere and Refined Magneto-seismology
40.	Dynamics of solar prominences and initiation of CMEs

41.	Effect of different types of land use patterns on local scale meteorological phenomena with an emphasis on future projected scenario
42.	Influence of Particle Irradiation on Photo Absorption and Charge Separation Kinetics in Organic Solar Cells
43.	Development of multi-layered functionally gradient Thermal Barrier Coating (TBC) technology for Aerospace Applications
44.	Development of Aluminium Nitride Tapes(AIN) for space electronic packaging applications
45.	Acoustic emission signal analysis to filter the noise during tensile tests on the AA2219 aluminium alloy tensile coupons and generation of signatures corresponding to failure
46.	Development of Flexible Photovoltaic Devices using photo anode/active layer systems-Phase-II Activity
47.	Development of Inversion algorithms for retrieval of atmospheric parameters from lidar atmospheric data
48.	Open Cavity Studies at Supersonic Speed
49.	Design and analysis of Collapsible Mandrel System, for Solid Propellant casting of 1m Diameter Test Motor-A near subscale of S200 Motor
50.	Study and implementation of advanced low bit rate audio encoding and decoding algorithms
51.	Design and implementation of dual blind detection robust watermarking for multimedia security
52.	Development of III - Nitrides thin film(s) for high frequency SAW device applications
53.	Extended Depth of Field imaging using Coded Camera Architecture
54.	Non-contact Multidirectional Vibration Sensor using 2D position Sensitive Detector(PSD)
55.	On-orbit characterization of space-borne synthetic Aperture Radar (SAR) performance using ground deployed corner reflectors
56.	Feasibility studies on Synthesis and Characterization of Carbon on various substrates using PECVD techniques
57.	Development of hydrogen sensors for extended range of temperatures from 100K to 300K using 2D nano cluster assembled films of Palladium
58.	Experimental Characterization of Rocket exhaust flow over Launch Pad Configuration
59.	Hybrid nano gas sensor arrays for detection of atmospheric and green house gases
60.	Synthesis and Characterization of Microwave Materials based on $\text{Li}_2\text{O-MgO-SiO}_2$ doped with Zn, Ti, W for Space Applications

61.	Optimisation of the Cryogenic Treatment parameters for stabilization of martensitic stainless steels used in indigenous satellite launch vehicles
62.	Interstellar Chemistry as a powerful tool to investigate the physical conditions around the star forming regions and protoplanetary disks
63.	Synthesis and evaluation of efficient burn rate catalysts for composite solid propellants
64.	Design of a Multiband and Polarization Sensitive Smart Antenna using Support Vector Machine (SVM) based Direction of Antenna (DOA) estimation techniques and Genetic Algorithm based optimization for Indoor Positioning
65.	Design and Development of Scalable Data Mining Algorithms for Big Earth Data
66.	Development of green polymer systems as adhesive & coating for space applications
67.	Study of variations in Total Electron Content (TEC)/Scintillations and IWV (Integrated Water Vapor) using GNSS (Global Navigation Satellite System) Receiver
68.	Development and evaluation of algorithms for automated tree delineation and tree parameters (height and crown diameter) estimation for forestry applications
69.	Scintillation Effect on Navigation receivers and alleviation techniques using Kalman filter based PLL (Phase Locked Loop)
70.	Development of ESD I/O Pads for CCD Image Sensor for 0.18 μ m SCL Foundry
71.	Investigation of the aerosol high over the South Eastern Arabian sea, its impact on the atmospheric parameters and assessment of the aerosol radiative forcing over the region
72.	Integrated Remote Sensing and Geophysical approach for mineral mapping over parts of Dharwar Craton
73.	Development of Web based Tools for online/offline inclusion of value added services and analysis on BHUVAN for High Resolution Satellite Imagery
74.	Secured Data Transmission for Space Communication over Elliptical Curve Cryptography
75.	Ionospheric studies using IRNSS receivers and Comparison with other GNSS
76.	Development of Ultra Low Power and Low Voltage Time to Digital Converter (TDC) for Space Applications
77.	Development of High Voltage (HV) devices for CCD (Charge Coupled Device)
78.	Optical flow based prediction of visual storms from satellite image sequences
79.	Integration of NAVIC receiver with mapping services
80.	Design, modeling and simulation of GaAs based III-V semiconductor multi junction solar structures for space applications

81.	Design and development of Registration & Super Resolution Reconstruction (SRR) techniques for remotely sensed images
82.	Strength enhancement of AA2219 Aluminium Alloy Sheets/plates by Cryorolling for usage in tankage applications
83.	Simulations on Differential IRNSS and RTK
84.	Detecting Convective Clouds over India using multi-spectral satellite observations and quantifying their variability in changing climate
85.	Development of Software Defined Radio (SDR) based GNSS receiver
86.	Nanostructures (Carbon Nano Tube) Reinforced Nanocomposite based Heat Shield System for Space Craft Application
87.	Development of Nanostructured Multilayer Coating by Electro-deposition for Aerospace Application at elevated temperature and its corrosion studies
88.	Design, Analysis and Development of Metallic Liners for Spherical Gas Bottle for Aerospace Applications
89.	Interpulse TIG (Tungsten Inert Gas) Welding of Aerospace Alloys
90.	Energetic Propellant Binders based on Polyphosphazenes
91.	Design and Fabrication of Large Deflection MEMS Biomorph Elements for Tunable Filters
92.	Reliability based Soft Decision Decoding of Turbo Codes for Satellite Communication
93.	The feasibility of bandwidth enhancement of reflectarray antenna at Ku band for conventional and shaped beams
94.	Radiative Impact of Clouds: Assessment of the intraseasonal and interannual variability during Indian Summer monsoon season
95.	Investigation of Hydrogen Storage in Carbon: Nanoporous Carbon and Carbon Aerogels
96.	Plasma Sprayed Carbon Nanotube and Graphene Reinforced Alumina Hybrid Nanocomposite Coating with Enhanced Properties for Light Metal Alloys
97.	Situating Scientific Environment and Institution Building in India: Vikram Sarabhai & his Times
98.	Crack growth direction in amorphous Silica under extreme temperature using molecular mechanics
99.	Sediment budget and estuarine dynamics along the West Coast of India: Implications for Coastal Hazards Management (A Case study of Gangolli Estuary, Near Kundapur, Karnataka)
100.	Software Framework for hosting API/Modules for Artificial Intelligence, Heterogeneous Parallel Computing and Device Drivers for various scientific equipments in ex-

	planetary vehicles to the end/remote user
101.	A Compact Low Volume Dielectric Resonator Antenna Loaded with Metamaterial Structure for Small Satellite Applications
102.	Classification of Satellite Images using Cellular Automata
103.	Wireless optical Signaling based Inter-satellite tracking and monitoring for high data rate communication
104.	Ion Source Facility for Calibration of Ion Mass and Energy Analysers for Space Missions
105.	Study of structure of our Galaxy using Ultraviolet Star Counts of GALEX and UVIT-ASTROSAT surveys
106.	Electron Induced Chemistry of Molecules Relevant to Space Applications
107.	Modeling and Simulation of Hall Effect Thruster (HET)
108.	Study on heat transfer characteristics of low melt alloy encapsulated PCM(Phase Change Material) for Satellite avionics thermal management
109.	Development of a Real-time Image Super-resolution System using Parallel Processing Hardware for Remote Sensing Applications
110.	Capacity, bit error rate and performance evaluation of MIMO based communication system on minimized multipath environment
111.	Development of microwave absorber (Carbonyl Iron filled Silicon Rubber Sheets) in 1 to 8 GHz range
112.	Control Oriented air-breathing scramjet engine propulsion system model for TSTO(Two-stage-to-Orbit) mission
113.	Design and development of X-band dual polarised waveguide slotted array antenna
114.	Ontology Driven Meteorology Conceptual Data Dissemination through Open Geo-Spatial Consortium (OGC) Web services
115.	Ionic liquids and deep eutectic solvents as electrolytes for energy efficient electrochemical double layer capacitor
116.	Prediction of process induced deformations and residual stresses in fibre reinforced composite laminates
117.	X-ray Study of Galaxy Clusters
118.	Study of electronic and magnetic structure of high-performance Lithium Ion Battery materials
119.	Development of novel Nanomaterials for space based radiation detection
120.	Development of engineered mount for single element dielectric resonator antenna and

	arrays for space borne applications
121.	Synthesis of algorithm from multiple orbiting satellites towards operational high resolution soil moisture estimation- HighRes-SM
122.	Design and development of key exchange mechanism for High security applications
123.	Design and Analysis of an Integrated Optic Microring Resonator Array based Sensor system for Detection of Multiple Gases
124.	Study on Mechanism of Self-sustained cavity oscillation for subsonic, transonic and supersonic flows
125.	Compressible Flow Solver with Immersed Boundary Approach
126.	Development of S/X/Ka multiband Feed
127.	Multi-Temporal Interferometric SAR (MT-InSAR) studies for near real time landslide monitoring
128.	Design and Implementation of High Performance Hyperspectral target detection system using FPGA
129.	SIRMI-Strengthening IRNSS Receiver by Mitigation of Interference
130.	Design and development of substrate integrated waveguide based circular polarized high gain slot array antenna for satellite communication
131.	Design and development of Optimized Miniature Antenna modules with duality function for inflatable satellite antenna setup
132.	A High-Speed SAR Analog to Digital Converter (ADC) with low distortion sample-hold front end
133.	Analysis and Performance Enhancement of Graphene Plasmonic Antennas
134.	Predicting Reliability and Optimal Release Time of various categories Software Systems
135.	Development of Braze Joint between Carbon-Carbon (C-C) composites and Titanium Alloy Ti6Al4V
136.	Synthesis of nano sized Aluminium Nitride (AlN) ceramic powder by Transferred Arc Plasma Reactor (TAPR) for electronic packaging applications
137.	Development of solid state hybrid hydrogen storage using Palladium and Magnesium nanoclusters
138.	Investigation of non-assisted low temperature start up of PEM (Proton Exchange Membrane) fuel cell
139.	Design and study of Nano and micro displacement sensor based on Photonic Crystal Fiber model Interferometer

140.	Development of Magneto-Dielectric Materials for Miniaturized Microstrip Patch Antenna
141.	Variability of the UV sky using UVIT onboard ASTROSAT
142.	Design and development of a miniaturized low cost Graphene based radiation detector for space applications
143.	Bhuvan-R an open source development Platform for Geospatial data analysis
144.	Modeling and Performance prediction of Lithium Ion cell
145.	Impacts of land use changes on human-primate conflict in India
146.	Design of urban storm water drainage system for Jorhat Town (Assam) and its suburb using GIS and Remote Sensing
147.	Influence of microphysical and boundary layer processes on stable isotopic ratios of monsoon rainfall
148.	Nonlinear Waves and Turbulence with Implication on the Magnetic Reconnection
149.	Investigation on thermally assisted friction stir welding of Nickel based superalloy for gas ducts in Cryogenic and Semi Cryogenic Engines
150.	Multi-Wavelength studies of Rich and Poor Galaxy Clusters in an expanding Universe
151.	Development of electrically conducting & Atomic Oxygen resistant CNT reinforced Polyimides for space applications
152.	Nanofabricated dielectric mirrors for non-mechanical beam steering
153.	Semi-supervised Sequence classification for voice activation and voice to text in hand-held/IoT devices
154.	High Speed Modular using LiNbO ₃
155.	Fabrication of Micro-Optical Components for Space Applications
156.	High Sensitive IR detector using nano-materials heterojunctions
157.	Aerial Image Understanding
158.	Data Assimilation to Space Dynamical Systems with Application to High Accuracy Orbital Estimation for the IRNSS Satellites
159.	S-band Transmitter for Nanosatellite Applications

