

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

1.	Synthesis and characterization of nano piezoelectric material for vibrations sensor applications
2.	Understanding and Characterization of Systematic Errors in the WRF-ARW Boundary layer parameterization over the Bhubaneswar and its neighbourhood regions
3.	Development of thermal barrier coatings by electron beam physical deposition
4.	Development of high performance super-capacitors based on Lithium Titanate/Carbon nanostructures
5.	Design and synthesis of IPN based polymer electrolyte membranes embedded with Nano-additives for fuel cell applications
6.	Ultra wide band dielectric resonators antenna
7.	Antipodal Linear Tapered Slot Antenna (AL TSA) array design and development for inter-satellite communication at 60 GHz
8.	Study on the effect of Very High Energy (VHE) Emission in Universe
9.	Design of Ultra Low Power FHSS Transceiver for Wireless Communication Applications.
10.	Shoreline changes and its impact on coastal ecosystem in Chidiatapu and Wandur of South Andaman Islands using Remote Sensing and GIS
11.	Design and Simulation of L-Band Phased-FS MIMO Radar for increased system flexibility
12.	Studies on Vanadium oxide band thin film developed by dip/spin coating techniques
13.	Enhancement of Boiling Heat Transfer via the Suppression of Coalescence in Microgravity
14.	Process development for minimization of spring back deformation and enhancement of Profile accuracy for Carbon Fiber Reinforced Polymers (CFRP) reflectors
15.	Gated photodiodes for single photon detection in CMOS technology
16.	Design and Development of Proof-of-Concept Model of an Adaptive Membrane
17.	Development of Carbon Nano-Tube (CNT) based strain sensor
18.	Characterization of Aerosols, Black Carbon and Radiative forcing over Urban environment of Ahmedabad and Gandhinagar City, Gujarat, India
19.	Modelling and Controller design for Active Clamp Forward Converter with Multiple Outputs used as Electronic Power Conditioner (EPC)
20.	Research Projects by Advanced Centre for Atmospheric Sciences

21.	Design of Ultra Low Power CMOS (Complementary Metal Oxide Semi-Conductor) temperature sensor for aerospace applications
22.	Improvement in size uniformity of self assembled InAs Quantum Dots on GaAs substrate by rapid thermal annealing
23.	Erosion Behavior of ZrB ₂ -SiC Composites
24.	Development of a Catalyst for reduction of Carbon Dioxide to Methane and Water
25.	Synthesis of Tantalium Pentoxide-Reduced Graphene Oxide Hybrid Nanomaterials: Ionic Liquid based Electrolytes for Lithium Battery
26.	High temperature X-ray diffraction studies on precipitation behavior of Ni and Fe based alloys
27.	Synthesis and concentration of propellant Hydroxylamine Nitrate (HAN) from aqueous solution by polymer mediated pervaporation techniques
28.	Astrophysical S-factor from nuclear reactions with a rare isotope beam of Be
29.	A local short term model for forecasting ionospheric scintillations for GNSS applications over Indian region
30.	Friction Stir Welding (FSW) of Aluminium alloys for Aerospace Applications
31.	Development of Ba _x Sr _{1-x} TiO ₃ (BST) tunable dielectric thin films prepared by pulsed laser deposition
32.	Formation of Prebiotic Molecules and Amino acids in Astrophysical ices: Ad initio Molecular Cluster and Spectroscopic studies
33.	Solar wind turbulence, viscosity and implications for the propagation of solar coronal mass ejection
34.	Seasonal and inter-annual variability of Relative Heat Content (RHC) in the Indian Ocean
35.	MHD Waves in the Solar Atmosphere and Refined Magneto-seismology
36.	Dynamics of solar prominences and initiation of CMEs
37.	Effect of different types of land use patterns on local scale meteorological phenomena with an emphasis on future projected scenario
38.	Influence of Particle Irradiation on Photo Absorption and Charge Separation Kinetics in Organic Solar Cells
39.	Development of multi-layered functionally gradient Thermal Barrier Coating (TBC) technology for Aerospace Applications
40.	Development of Aluminium Nitride Tapes (AlN) for space electronic packaging applications

41.	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
42.	Development of Flexible Photovoltaic Devices using photo anode/active layer systems-Phase-II Activity
43.	Development of Inversion algorithms for retrieval of atmospheric parameters from lidar atmospheric data
44.	Open Cavity Studies at Supersonic Speed
45.	Design and analysis of Collapsible Mandrel System, for Solid Propellant casting of 1m Diameter Test Motor-A near subscale of S200 Motor
46.	Study and implementation of advanced low bit rate audio encoding and decoding algorithms
47.	Design and implementation of dual blind detection robust watermarking for multimedia security
48.	Development of III - Nitrides thin film(s) for high frequency SAW device applications
49.	Non-contact Multidirectional Vibration Sensor using 2D position Sensitive Detector(PSD)
50.	On-orbit characterization of space-borne synthetic Aperture Radar (SAR) performance using ground deployed corner reflectors
51.	Feasibility studies on Synthesis and Characterization of Carbon on various substrates using PECVD techniques
52.	Development of hydrogen sensors for extended range of temperatures from 100K to 300K using 2D nano cluster assembled films of Palladium
53.	Experimental Characterization of Rocket exhaust flow over Launch Pad Configuration
54.	Hybrid nano gas sensor arrays for detection of atmospheric and green house gases
55.	Synthesis and Characterization of Microwave Materials based on $\text{Li}_2\text{O-MgO-SiO}_2$ doped with Zn, Ti, W for Space Applications
56.	Optimisation of the Cryogenic Treatment parameters for stabilization of martensitic stainless steels used in indigenous satellite launch vehicles
57.	Interstellar Chemistry as a powerful tool to investigate the physical conditions around the star forming regions and protoplanetary disks
58.	Synthesis and evaluation of efficient burn rate catalysts for composite solid propellants
59.	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
60.	Design and Development of Scalable Data Mining Algorithms for Big Earth Data

61.	Development of green polymer systems as adhesive & coating for space applications
62.	Study of variations in Total Electron Content (TEC)/Scintillations and IWV (Integrated Water Vapor) using GNSS (Global Navigation Satellite System) Receiver
63.	Development and evaluation of algorithms for automated tree delineation and tree parameters (height and crown diameter) estimation for forestry applications
64.	Scintillation Effect on Navigation receivers and alleviation techniques using Kalman filter based PLL (Phase Locked Loop)
65.	Development of ESD I/O Pads for CCD Image Sensor for 0.18 μ m SCL Foundry
66.	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
67.	Integrated Remote Sensing and Geophysical approach for mineral mapping over parts of Dharwar Craton
68.	Development of Web based Tools for online/offline inclusion of value added services and analysis on BHUVAN for High Resolution Satellite Imagery
69.	Secured Data Transmission for Space Communication over Elliptical Curve Cryptography
70.	Ionospheric studies using IRNSS receivers and Comparison with other GNSS
71.	Development of Ultra Low Power and Low Voltage Time to Digital Converter (TDC) for Space Applications
72.	Development of High Voltage (HV) devices for CCD (Charge Coupled Device)
73.	Optical flow based prediction of visual storms from satellite image sequences
74.	Integration of NAVIC receiver with mapping services
75.	Design, modeling and simulation of GaAs based III-V semiconductor multi junction solar structures for space applications
76.	Design and development of Registration & Super Resolution Reconstruction (SRR) techniques for remotely sensed images
77.	Strength enhancement of AA2219 Aluminium Alloy Sheets/plates by Cryorolling for usage in tankage applications
78.	Simulations on Differential IRNSS and RTK
79.	Detecting Convective Clouds over India using multi-spectral satellite observations and quantifying their variability in changing climate
80.	Development of Software Defined Radio (SDR) based GNSS receiver

81.	Nanostructures (Carbon Nano Tube) Reinforced Nanocomposite based Heat Shield System for Space Craft Application
82.	Development of Nanostructured Multilayer Coating by Electro-deposition for Aerospace Application at elevated temperature and its corrosion studies
83.	Design, Analysis and Development of Metallic Liners for Spherical Gas Bottle for Aerospace Applications
84.	Interpulse TIG (Tungsten Inert Gas) Welding of Aerospace Alloys
85.	Energetic Propellant Binders based on Polyphosphazenes
86.	Design and Fabrication of Large Deflection MEMS Biomorph Elements for Tunable Filters
87.	Reliability based Soft Decision Decoding of Turbo Codes for Satellite Communication
88.	The feasibility of bandwidth enhancement of reflectarray antenna at Ku band for conventional and shaped beams
89.	Radiative Impact of Clouds: Assessment of the intraseasonal and interannual variability during Indian Summer monsoon season
90.	Investigation of Hydrogen Storage in Carbon: Nanoporous Carbon and Carbon Aerogels
91.	Plasma Sprayed Carbon Nanotube and Graphene Reinforced Alumina Hybrid Nanocomposite Coating with Enhanced Properties for Light Metal Alloys
92.	Situating Scientific Environment and Institution Building in India: Vikram Sarabhai & his Times
93.	Crack growth direction in amorphous Silica under extreme temperature using molecular mechanics
94.	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)
95.	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
96.	A Compact Low Volume Dielectric Resonator Antenna Loaded with Metamaterial Structure for Small Satellite Applications
97.	Classification of Satellite Images using Cellular Automata
98.	Wireless optical Signaling based Inter-satellite tracking and monitoring for high data rate communication
99.	Ion Source Facility for Calibration of Ion Mass and Energy Analysers for Space Missions

100.	Study of structure of our Galaxy using Ultraviolet Star Counts of GALEX and UVIT-ASTROSAT surveys
101.	Electron Induced Chemistry of Molecules Relevant to Space Applications
102.	Modeling and Simulation of Hall Effect Thruster (HET)
103.	Study on heat transfer characteristics of low melt alloy encapsulated PCM(Phase Change Material) for Satellite avionics thermal management
104.	Development of a Real-time Image Super-resolution System using Parallel Processing Hardware for Remote Sensing Applications
105.	Capacity, bit error rate and performance evaluation of MIMO based communication system on minimized multipath environment
106.	Development of microwave absorber (Carbonyl Iron filled Silicon Rubber Sheets) in 1 to 8 GHz range
107.	Control Oriented air-breathing scramjet engine propulsion system model for TSTO(Two-stage-to-Orbit) mission
108.	Design and development of X-band dual polarised waveguide slotted array antenna
109.	Ontology Driven Meteorology Conceptual Data Dissemination through Open Geo-Spatial Consortium (OGC) Web services
110.	Ionic liquids and deep eutectic solvents as electrolytes for energy efficient electrochemical double layer capacitor
111.	Prediction of process induced deformations and residual stresses in fibre reinforced composite laminates
112.	X-ray Study of Galaxy Clusters
113.	Study of electronic and magnetic structure of high-performance Lithium Ion Battery materials
114.	Development of novel Nanomaterials for space based radiation detection
115.	Development of engineered mount for single element dielectric resonator antenna and arrays for space borne applications
116.	Synthesis of algorithm from multiple orbiting satellites towards operational high resolution soil moisture estimation- HighRes-SM
117.	Design and development of key exchange mechanism for High security applications
118.	Design and Analysis of an Integrated Optic Microring Resonator Array based Sensor system for Detection of Multiple Gases
119.	Study on Mechanism of Self-sustained cavity oscillation for subsonic, transonic and supersonic flows

120.	Compressible Flow Solver with Immersed Boundary Approach
121.	Development of S/X/Ka multiband Feed
122.	Multi-Temporal Interferometric SAR (MT-InSAR) studies for near real time landslide monitoring
123.	Design and Implementation of High Performance Hyperspectral target detection system using FPGA
124.	SIRMI-Strengthening IRNSS Receiver by Mitigation of Interference
125.	Design and development of substrate integrated waveguide based circular polarized high gain slot array antenna for satellite communication
126.	Design and development of Optimized Miniature Antenna modules with duality function for inflatable satellite antenna setup
127.	A High-Speed SAR Analog to Digital Converter (ADC) with low distortion sample-hold front end
128.	Analysis and Performance Enhancement of Graphene Plasmonic Antennas
129.	Predicting Reliability and Optimal Release Time of various categories Software Systems
130.	Development of Braze Joint between Carbon-Carbon (C-C) composites and Titanium Alloy Ti6Al4V
131.	Synthesis of nano sized Aluminium Nitride (AlN) ceramic powder by Transferred Arc Plasma Reactor (TAPR) for electronic packaging applications
132.	Development of solid state hybrid hydrogen storage using Palladium and Magnesium nanoclusters
133.	Investigation of non-assisted low temperature start up of PEM (Proton Exchange Membrane) fuel cell
134.	Design and study of Nano and micro displacement sensor based on Photonic Crystal Fiber model Interferometer
135.	Development of Magneto-Dielectric Materials for Miniaturized Microstrip Patch Antenna
136.	Variability of the UV sky using UVIT onboard ASTROSAT
137.	Design and development of a miniaturized low cost Graphene based radiation detector for space applications
138.	Bhuvan-R an open source development Platform for Geospatial data analysis
139.	Modeling and Performance prediction of Lithium Ion cell
140.	Impacts of land use changes on human-primate conflict in India

141.	Design of urban storm water drainage system for Jorhat Town (Assam) and its suburb using GIS and Remote Sensing
142.	Influence of microphysical and boundary layer processes on stable isotopic ratios of monsoon rainfall
143.	Nonlinear Waves and Turbulence with Implication on the Magnetic Reconnection
144.	Investigation on thermally assisted friction stir welding of Nickel based superalloy for gas ducts in Cryogenic and Semi Cryogenic Engines
145.	Multi-Wavelength studies of Rich and Poor Galaxy Clusters in an expanding Universe
146.	Development of electrically conducting & Atomic Oxygen resistant CNT reinforced Polyimides for space applications
147.	Nanofabricated dielectric mirrors for non-mechanical beam steering
148.	Semi-supervised Sequence classification for voice activation and voice to text in hand-held/IoT devices
149.	High Speed Modular using LiNbO ₃
150.	Fabrication of Micro-Optical Components for Space Applications
151.	High Sensitive IR detector using nano-materials heterojunctions
152.	Aerial Image Understanding
153.	Data Assimilation to Space Dynamical Systems with Application to High Accuracy Orbital Estimation for the IRNSS Satellites
154.	S-band Transmitter for Nanosatellite Applications
155.	Structure and Mechanical Properties of Ultra-Fine Grained Cu-Cr/Cu-Cr-Ti alloy processed by Equal Channel Angular Processing
156.	Weldability Studies on Inconel 718
157.	A Novel Mach Zehnder Modulator based integrated Photonic highly steerable Beam-forming system for Broad band satellite communication link
158.	Ku-band Tx/Rx Transportable Reflect Array Antenna for satellite communication
159.	A low noise subharmonic mixer for millimeter wave Space borne applications
160.	Visible - IR and XRF spectroscopic studies of Lunar Analogues
161.	Modeling Spatio-temporal forest growth dynamics using Dendroclimatological and Remote Sensing observations in North East India

162.	Investigation of Ionospheric Irregularities using Coherent Radar Imaging
163.	Performance enhancement of circularly polarized planar/dielectric resonator antennas using defected ground structure
164.	Automated structural evolution and performance optimization of RF bandpass filters- An evolutionary Algorithmic Design Approach
165.	A big data processing framework to model vector borne disease dynamics based on the seasonal changes
166.	Automation of Transport and Building Feature Extraction using deep learning with Super-Resolution Enhancement of Satellite Imagery
167.	Design of 0.18 μ m CMOS Dual band Low Noise Amplifier (LNA) for IRNSS applications
168.	Synthesis of aqueous Polychlorotrifluoro Ethylene (PCTFE) Dispersion for Cryogenic Applications (Phase-1)
169.	Simulations Aging and Corrosion Inhibition Process of Maraging Steel used in Satellite Launch Vehicles
170.	Nanoparticle-enhanced gel propellant
171.	Study of few Persistent and Transient Black Holes using ASTROSAT and other satellite data
172.	Effect of shot peening and laser shock peening on Fatigue behaviour of Ti-15V-3Al-3Sn-3Cr
173.	Design and Development of Wideband Circularly Polarized Antenna using 2D Metamaterial Structures
174.	Design, Fabrication and Characterization of Uncooled Microbolometer for IR Imaging Applications
175.	Development of Time Weighted Dynamic Time Warping (TWDTW) Algorithm for Analysis of Vegetation Dynamics using Time-Series Vegetation Index Data from Earth Observation Satellites
176.	Synthesis and characterization of Epoxy- based Inorganic-Organic hybrid polymers and their evaluation as adhesives and Matrix Resins for composites for Space Applications
177.	Development of Automated Web based Online Feature Tracking system using Shape Adaptive Curvelet with PCA and Haralick Texture Feature