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आज़ादी का
अमृत महोत्सव



DIRECTORY

SAC Annual Sponsored reseArch Review (सैक-असर / SAC-ASAR) 2022

November 2022

FOREWORD

In pursuit of ISRO's Vision '*Harness Space Technology for National Development, while Pursuing Space Science Research and Planetary Exploration*', Space Applications Centre (SAC), Ahmedabad is one of the major Research & Development (R&D) center of ISRO. SAC excels in its core competence in the development of space and airborne instruments/payloads for use in various societal applications as well as strategic purposes for national development. Besides, SAC is actively contributing towards space exploration through interplanetary science missions and India's ambitious Human Space Programme '*Gaganyaan*' as well as Advanced R&D for Space Quantum Frontiers and futuristic technologies.

This year is momentous, as we are celebrating 50th year of SAC establishment. '*Sponsored Research at SAC*' with academia across the country is an integral part in its *Golden journey* of Space Research. Sponsored Research which was initiated as RESPOND program way back in 1970s, has grown manifold under several Capacity Building initiatives by ISRO. These include RESPOND, RESPOND Basket, Space Technology Cell (STC) at premier Indian Institutes of Technology (IITs), IISc Bengaluru and Savitribai Phule Pune University (SPPU), ISRO's Regional Academic Centre for Space (RAC-S), Space Technology Incubation Centres (S-TIC), Centre for Nanoscience and Engineering (CeNSE), IISc Bangalore, Advanced Space Group at Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram. In addition, SAC is also contributing in R&D projects being pursued under Ministry of Education, Govt. of India Uchchar Avishkar Yojna (UAY).

The 23rd SAC Annual Sponsored ReseArch Review (SAC-ASAR/ **सैक-असर** 2022 is being organised during '**आज़ादी का अमृत महोत्सव** , celebrating **75** years of Independent India with its Scientific & Technological achievements. All Sponsored Research projects under various avenues will be reviewed during this annual review. This SAC-Annual Sponsored reseArch Review (**सैक-असर / SAC-ASAR**) **Directory 2022** is our humble effort to provide contact details of Principal/Co Investigators from academia as well as focal Scientist/Engineer of SAC for Centre's new, ongoing and in-completion projects under various avenues of Capacity Building. The directory is expected to serve as a handy reference for all project team members and academia/ISRO officials. In addition, *theme wise index* of projects is also included for enhanced focused research domain-wise interactions.


I sincerely hope this humble effort would facilitate active interactions and innovative ideas, approach, solutions among the project team members to yield outcome and deliverables with utilization in SAC/ISRO's ongoing and future programmes & missions.

अभ्रा

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DOCUMENT CONTROL SHEET

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7. **Abstract** : The SAC-Annual Sponsored reseArch Review (सैक-असर/ SAC-ASAR) Directory 2022 contains the contact details of Principal Investigators and team along with SAC Focal Persons/SAC Co-PIs of ongoing RESPOND/ RESPOND Basket/ Space Technology Cell (STC)/ Regional Academic Centres for Space (RAC-S)/ Space Technology Incubation Centre (S-TIC)/ Uchhtar Avishkar Yojna (UAY) projects. It also contains contact details of CBPO, ISRO HQ, Academia coordinators/ convenors, SAC review committee members. Theme wise index of ongoing projects is also included towards the end of the directory.
8. **Security Classification** : Unrestricted
9. **Distribution** : General

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OGP133

Project Title: Design of Ultra Low Power CMOS (Complementary Metal Oxide Semi-Conductor) temperature sensor for aerospace applications

(Project Category:Electro-Optic Technology, ISRO Code: ISRO/RES/3/679)

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OGP158

Project Title: 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

(Project Category:RS-Applications, ISRO Code: ISRO/RES/4/636)

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OGP160

Project Title: A Compact Low-volume Dielectric Resonator Antenna Loaded with Metamaterial Structure for Small Satellite Application

(Project Category:Antenna, ISRO Code: ISRO/RES/3/736)

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OGP167

Project Title: Development of Microwave Absorber (Carbonyl Iron Filled Silicon Rubber Sheets) in 1 to 8 GHz range

(Project Category:Reliability Testing, ISRO Code: ISRO/RES/3/742)

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OGP170

Project Title: Design and analysis of an Integrated optic microring resonator array based sensor system for detection of multiple gases

(Project Category: Electro-Optic Technology, ISRO Code: ISRO/RES/3/754)

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OGP172

Project Title: Design and Development of Optimized Miniature Antenna Modules with duality function for Inflatable Satellite Antenna Setup

(Project Category:Antenna, ISRO Code: ISRO/RES/3/758)

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OGP173

Project Title: Design and development of Substrate Integrated Waveguide (SIW) based circular polarized high gain slot array antenna for satellite communication

(Project Category: Antenna, ISRO Code: ISRO/RES/3/759)

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OGP174

Project Title: A High-Speed SAR Analog to Digital Converter (ADC) with low distortion sample-and-hold front-end

(Project Category: Microwave Technology, ISRO Code: ISRO/RES/3/749)

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OGP175

Project Title: Predicting Reliability and Optimal release time of various categories software systems

(Project Category: Reliability Testing, ISRO Code: ISRO/RES/4/646)

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OGP176

Project Title: Analysis and Performance Enhancement of Graphene Plasmonic Antennas

(Project Category: Antenna, ISRO Code: ISRO/RES/3/760)

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OGP177

Project Title: Design and study of Nano and micro displacement sensor based on Photonic Crystal Fiber modal interferometer

(Project Category: Electro-Optic Technology, ISRO Code: ISRO/RES/3/757)

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OGP179

Project Title: Design of urban storm water drainage system for Jorhat Town (Assam) and its suburb using GIS and Remote Sensing

(Project Category: RS-Applications, ISRO Code: ISRO/RES/4/645)

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OGP180

Project Title: A Novel Mach zehnder Modulator based integrated Photonic highly Steerable Beam-forming system for Broadband Satellite Communication Link

(Project Category: Satcom-Technology, ISRO Code: ISRO/RES/3/775/18-19)

Principal Investigator:

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OGP182

Project Title: Visible-IR and XRF spectroscopic studies of Lunar Analogues

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/772/18-19)

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OGP183

Project Title: Ku-band Tx/Rx transportable reflect array Antenna for satellite communication
(*Project Category: Antenna, ISRO Code: ISRO/RES/3/773/18-19*)

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OGP185

Project Title: Design of 0.18 μ m CMOS Dual band Low Noise Amplifier (LNA) for IRNSS Applications
(*Project Category: Microwave Technology, ISRO Code: ISRO/RES/4/654/18-19*)

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OGP186

Project Title: Design and Development of Wideband Circularly Polarized Antenna using 2D Metamaterial Structures

(Project Category: Antenna, ISRO Code: ISRO/RES/3/788/18-19)

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OGP187

Project Title: Design, Fabrication and Characterization of Uncooled Microbolometer for IR Imaging Applications

(Project Category: Electro-Optic Technology, ISRO Code: ISRO/RES/3/779/18-19)

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OGP188

Project Title: Development of Time Weighted Dynamic Time Warping (TWDTW) Algorithm for Analysis of Vegetation Dynamics using Time-Series Vegetation Index Data from Earth Observation Satellites

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/780/18-19)

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OGP189

Project Title: Development of Automated Web Based Online Feature Tracking system using Shape Adaptive Curvelet with PCA and Haralick Texture Feature

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/789/18-19)

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OGP190

Project Title: Experimental Studies on tropospheric scintillation and associated rain attenuation for SATCOM links over North Eastern India (Sikkim) at Ku/Ka-Band

(Project Category: Satcom-Applications, ISRO Code: ISRO/RES/3/790/18-19)

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OGP191

Project Title: Design and Development of a Proof-of-Concept Model of a Packaging Methodology & Rigidization for Gossamer Space Antenna Structures

(Project Category: Mechanical Systems, ISRO Code: ISRO/RES/3/791/18-19)

Principal Investigator:

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OGP192

Project Title: Development, Testing and Characterization of 1m Dia Ku-Band P.E.E.K parabolic reflector with and without Metallization for Spacecraft Applications

(Project Category: Mechanical Systems, ISRO Code: ISRO/RES/3/783/18-19)

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OGP193

Project Title: Speckle noise reduction in SAR images using Neuro-Fuzzy approaches for coastal zone change detection and monitoring

(Project Category: RS-Data Products & IP, ISRO Code: ISRO/RES/4/655/18-19)

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OGP194

Project Title: Design and Simulation of Beamforming Algorithms and Baseband Technologies for SATCOM On the Move (SOTM) Networks

(Project Category: Satcom-Applications, ISRO Code: ISRO/RES/3/804/18-19)

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OGP195

Project Title: Government Agency Initiatives for Scientific Research Management with special reference to Institute/University Interface

(Project Category: Management Research, ISRO Code: ISRO/RES/3/808/18-19)

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OGP196

Project Title: Design and Simulation of Physical Layer and Medium Access Control (MAC) Layer Functionalities of Future Mobile Satellite Systems

(Project Category: Satcom-Applications, ISRO Code: ISRO/RES/3/809/19-20)

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OGP197

Project Title: Development of Fusion Algorithms for Remotely Sensed Satellite Images in Cartographic Applications

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/815/19-20)

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OGP199

Project Title: Elucidation of the deformation signatures and fluvial activity near junction of Noachis Terra with Margaritifer and Arabia Terra

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/819/19-20)

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OGP200

Project Title: Delaying programmed cell death of beneficial gut bacteria in microgravity using oxide and complex nanoparticles

(Project Category: Human Spaceflight and Advanced Technology, ISRO Code: ISRO/RES/3/827/19-20)

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OGP201

Project Title: System design for Ground based Beam Former

(Project Category: Satcom-Technology, ISRO Code: ISRO/RES/3/830/19-20)

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OGP202

Project Title: Neuro-Fuzzy Synergism based POLSAR Image Classification

(Project Category: RS-Data Products & IP, ISRO Code: ISRO/RES/4/673/19-20)

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OGP203

Project Title: Vision guided Auto-Lander for Planetary missions

(Project Category: RS-Data Products & IP, ISRO Code: ISRO/RES/3/834/19-20)

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OGP204

Project Title: Integrated Post cyclone impacts on the chlorophyll biomass in the central and Western Bay of Bengal

(Project Category: RS-Applications, ISRO Code: ISRO/RES/4/674/19-20)

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OGP205

Project Title: Estimation of Crop Water Productivity (CWP) in the major River basins of Tamilnadu using Geospatial technology

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/823/19-20)

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OGP206

Project Title: Prediction of ground-level particulate matter concentrations from Multi-Satellite Aerosol Optical Depth (AOD) over the Indian Subcontinent

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/806/19-20)

Principal Investigator:

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OGP207

Project Title: Design and development of a Scalable Framework for Geospatial/Geoscience Data Ingestion, Ad-hoc Queries and analysis on Big Data Environment

(Project Category: RS-Data Products & IP, ISRO Code: ISRO/RES/3/835/19-20)

Principal Investigator:

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OGP208

Project Title: Thermal Management of Space Electronics using Multi-turn Pulsating Heat Pipes (PHP)

(Project Category : Mechanical Systems, ISRO Code: ISRO/RES/3/836/19-20)

Principal Investigator:

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OGP209

Project Title: Combining Hyperbolic and NavIC navigation algorithms for attitude control of ship in floating dry dock

(Project Category: Satcom-Applications, ISRO Code: ISRO/RES/3/847/19-20)

Principal Investigator:

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OGP211

Project Title: Satellite Network Simulator (SNS) with ULPC and ACM features

(Project Category: Satcom-Applications, ISRO Code: ISRO/RES/3/850/19-20)

Principal Investigator:

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OGP212

Project Title: **Adaptive Beam Forming for Mitigation of Interference and Jamming at the Ground Terminal of Global Navigational Satellite Systems (GNSS)**

(Project Category: Satcom-Applications, ISRO Code: ISRO/RES/3/854/19-20)

Principal Investigator:

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OGP213

Project Title: **SAR Polarimetric image classification using Wishart Mixture model and Convolution Neural Networks**

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/858/19-20)

Principal Investigator:

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OGP214

Project Title: Orbit parameter refinement using GNSS carrier phase data in post facto scenario for Interferometric SAR and Pol InSAR applications

(Project Category: RS-Data Products & IP, ISRO Code: ISRO/RES/3/866/19-20)

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OGP215

Project Title: Modeling of Chlorophyll-a (Chl-a) Dynamics of the Eastern Arabian Sea : Biophysical coupling in the Context of change in climate

(Project Category: RS-Applications, ISRO Code: ISRO/RES/3/826/19-20)

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OGP216

Project Title: Design and development of X-band prime focal reflectarray antenna
(*Project Category: Antenna, ISRO Code: ISRO/RES/3/874/20-21*)

Principal Investigator: Dr. Yogeshwar Prasad Kosta
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OGP217

Project Title: Development and Testing of NavICSuite: Processing Software Tool for NavIC Receiver
(*Project Category: Satcom-Applications, ISRO Code: ISRO/RES/3/870/20-21*)

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OGP218

Project Title: Design, Analysis and Development of Fabry Perot Cavity based Feed Cluster
(*Project Category: Antenna, ISRO Code: ISRO/RES/3/900/21-22*)

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OGP219

Project Title: Development of LTCC tapes and compatible gold pastes for space applications
(*Project Category: Electronic Systems, ISRO Code: ISRO/RES/3/884/21-22*)

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OGP220

Project Title: 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

(Project Category: RS-Applications, ISRO Code: ISRO/RES/4/686/21-22)

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OGP221

Project Title: Spatio-spectral Deconvolution of Hyperspectral Images

(Project Category: RS-Data Products & IP, ISRO Code: ISRO/RES/4/692/21-22)

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OGP222

Project Title: Study, design and development of electronic nose for fire detection system

(Project Category: Human Spaceflight and Advanced Technology, ISRO Code: ISRO/RES/3/896/21-22)

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OGP223

Project Title: Multi-channel stackable input perfectreconstruction transmultiplexer for satellite communication

(Project Category: Satcom-Technology, ISRO Code: ISRO/RES/3/903/21-22)

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OGP224

Project Title: Appraisal of lake water dynamics and security through high resolution satellite imageries

(Project Category: RS-Applications, ISRO Code: ISRO/RES/4/693/21-22)

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OGP225

Project Title: Ultra-high sensitivity tunable laser-based spectroscopic gas selection system for the Human Spaceflight Programme

(Project Category: Human Spaceflight and Advanced Technology, ISRO Code: ISRO/RES/3/911/21-22)

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OGP226

Project Title: An Empirical Analysis on Deriving Test Cases from Natural Language Text using MBT Approach

(Project Category: Reliability Testing, ISRO Code: ISRO/RES/3/897/21-22)

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OGP227

Project Title: The Design and analysis of a Silicon Particle Detector Array using High Voltage CMOS process for Space Application

(Project Category: Electro-Optic Technology, ISRO Code: ISRO/RES/3/908/21-22)

Principal Investigator:

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OGP228

Project Title: To study potential protocols for satellite-based secure quantum communication under ambient atmospheric conditions

(Project Category: Satcom-Technology, ISRO Code: ISRO/RES/3/906/22-23)

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❖ IISc Bangalore ❖

STC0316

Project Title: Super resolution of Hyperspectral Remote Sensing Images
(*Project Category: RS-Data Products & IP*)

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STC0343

Project Title: Quality Assessment of Pansharpened Images
(*Project Category: RS-Data Products & IP*)

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❖ IISc Bangalore ❖

STC0344

Project Title: **Estimation of vulnerable soil-carbon and hotspots of carbon-efflux across different land-use in India**
(*Project RS-Applications*)

Principal Investigator:

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STC0346

Project Title: **Edge-Aware Interpolation for Terrestrial 3-D Maps**
(*Project Category: RS-Data Products & IP*)

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STC0347

Project Title: **High Precision Satellite Image Denoising in Hardware**

(Project Category: RS-Data Products & IP)

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STC0384

Project Title: **Large Area flexible metasurface based photonic devices**

(Project Category: Electronic Systems)

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STC0385

Project Title: **Research and development of MoS₂ Quantum Dots based non-contact temperature sensor for applications in Indian Space Research programs**

(Project Category : Electro-Optic Technology)

Principal Investigator:

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STC0386

Project Title: **Highly sensitive IR detection using photo-gating by electrically defined quantum dot**

(Project Category: Electronic Systems)

Principal Investigator:

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❖ IISc Bangalore ❖

STC0387

Project Title: Graphene van der Waals heterostructure based field effect transistor for gas emission monitoring

(Project Category : Human Spaceflight and Advanced Technology)

Principal Investigator:

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STC0437

Project Title: Improving the spatial resolution of GRACE TWS for India using remote sensing datasets and modeling approach

(Project Category: RS-Applications)

Principal Investigator:

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STC0439

Project Title: **"Super-compatible shape memory alloy slender structures for space applications"**

(Project Category: Mechanical Systems)

Principal Investigator:

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STC0440

Project Title: **Near-Future Forecasting of Transient Weather Phenomena Using Dynamic Mode Decomposition**

(Project Category: RS-Applications)

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STC0441

Project Title: **Unsupervised Semantic Segmentation of High Resolution Satellite Images**
(*Project Category: Electro-Optic Technology*)

Principal Investigator:

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STC0442

Project Title: **Vibration Isolation using Bandgap Metamaterials**
(*Project Category: Mechanical Systems*)

Principal Investigator:

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STC0444

Project Title: **Generation and Characterisation of Entangled Microwave Photon states using a Josephson Parametric Convertor**

(Project Category: Human Spaceflight and Advanced Technology)

Principal Investigator:

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❖ IIT, Bombay ❖

STC0067

Project Title: **Visible-NIR Electromagnetic Wave Concentration using Metallic Aperture for Photodetectors**

(Project Category: Electro-Optic Technology)

Principal Investigator:

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❖ IIT, Bombay ❖

STC0070

Project Title: **Fractional NPLL and ADC for IRNSS User Receiver**

(Project Category: *Electronic Systems*)

Principal Investigator:

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STC0215

Project Title: **Growth and Characterization of AlGaIn/GaN Heterostructure by Plasma Assisted Molecular Beam Epitaxy (PA-MBE) Technique for High Mobility Electron Transistor**

(Project Category: *Electronic Systems*)

Principal Investigator:

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STC0241

Project Title: Development of a NIR laser based platform for emulating single event effects on integrated circuits due to radiation strikes

(Project Category: Human Spaceflight and Advanced Technology)

Principal Investigator:

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STC0253

Project Title: Modelling of Water Quality Parameters for Coastal and Inland Water Bodies using Data from Multispectral and Hyperspectral Imaging Systems

(Project Category: RS-Applications)

Principal Investigator:

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STC0254

Project Title: **Physico-chemical conditions of formation of bole beds within Deccan basalt for Martian analogue**

(Project Category: RS-Applications)

Principal Investigator:

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STC0267

Project Title: **A flood warning system for entire India-optimal utilization for satellite based data and development of a computationally efficient flood inundation model**

(Project Category: RS-Applications)

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❖ IIT, Bombay ❖

STC0269

Project Title: **Modelling and validation of evapotranspiration from India Space borne thermal sensors**

(Project Category: RS-Applications)

Principal Investigator:

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STC0270

Project Title: **Modelling and Mapping of Supraglacial Debris Cover Thickness using UAS and Satellite Remote Sensing Data in selected Glaciers of Western Himalayas**

(Project Category: RS-Applications)

Principal Investigator:

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❖ IIT, Bombay ❖

STC0272

Project Title: **Comprehensive Simulation Engine for Type-II Superlattice based Barrier Infrared Photodetectors**

(Project Category: Electro-Optic Technology)

Principal Investigator:

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STC0426

Project Title: **Advancing technology CAD simulations on superlattice structures for MWIR and SWIR sensors**

(Project Category: Electro-Optic Technology)

Principal Investigator:

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STC0427

Project Title: A multivariate data assimilation framework to improve drought predictions

(Project Category: RS-Applications)

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STC0428

Project Title: Serpennoid robots for unmanned exploration of Moon and Mars

(Project Category: Mechanical Systems)

Principal Investigator:

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STC0429

Project Title: **GaN-Based CMOS Digital Circuits GaN-Based CMOS Digital Circuits**
(Project Category: *Electronic Systems*)

Principal Investigator:

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STC0459

Project Title: **A Machine Learning Approach to Estimate Atomic and Molecular Properties Accurately for Space Applications**

(Project Category: *Human Spaceflight and Advanced Technology*)

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STC0368

Project Title: Impact of Satellite observations in a coupled system for predicting storm tides and its coastal inundation.

(Project Category:RS-Applications)

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STC0372

Project Title: Real-Time Flood Risk Warning Smart System Integrating Information from Satellite and Sensor Products

(Project Category:RS-Applications)

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STC0374

Project Title: **Establishing a coupled Indian Land Data Assimilation System (ILDAS) for identifying hydrologic extremes**
(*Project Category: RS-Applications*)

Principal Investigator:

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STC0377

Project Title: **Analysis of variable stiffness composite honeycomb sandwich structures with embedded delamination**
(*Project Category : Mechanical Systems*)

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STC0379

Project Title: Low-Pressure Systems (LPSs) and their nonlinear interaction with other scales in atmosphere through the lens of Scale Energetics

(Project Category: RS-Applications)

Principal Investigator:

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STC0405

Project Title: Microwave photonic devices for Space Applications

(Project Category: Human Spaceflight and Advanced Technology)

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STC0410

Project Title: **Development of Signal Processing Chip for GNSS Anti-jamming functionality**
(*Project Category : Satcom-Applications*)

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STC0363

Project Title: **Plasmonic metamaterials based filters for photonic applications in space**
(*Project Category : Human Spaceflight and Advanced Technology*)

Principal Investigator:

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STC0364

Project Title: **Development of low loss Ni-Zn ferrite for S band Circulator**
(*Project Category : Satcom-Technology*)

Principal Investigator: Dr T Tiwari

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STC0452

Project Title: **Design and development of efficient tool-path strategies of precision high-speed machining of monolithic thin-walled structures for construction of light-weight satellites and spacecrafts**

(*Project Category : Mechanical Systems*)

Principal Investigator: Prof. Arghya Deb

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STC0229

Project Title: PDK Development and modeling support for ISRO's GaN HEMT Technology

(Project Category : Electronic Systems)

Principal Investigator: **Co-PI:**

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STC0231

Project Title: Impact Melt Cover on Central Peaks of Lunar Impact Craters: Evaluating its Implications for Deriving Sub-surface Mineralogy using data from Chandrayaan-1 & other recent lunar missions

(Project Category : RS-Applications)

Principal Investigator: **Co-PI:**

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STC0235

Project Title: **Stabilization of a 3D Platform for Space Applications Against Rolling and Pitching Excitations**

(Project Category : Mechanical Systems)

Principal Investigator:

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STC0236

Project Title: **Parallel Electro-Magnetic Solver for Microwave, Infrared, and Optical applications (MIO-PEMS)**

(Project Category : Microwave Technology)

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STC0239

Project Title: **Molecular Size and Mass Sensitive Ultrasensitive Thermal Spectrometer Applications**

(Project Category : Electro-Optic Technology)

Principal Investigator:

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STC0259

Project Title: **Development and Evaluation of Multiscale CNT/polymer composites**

(Project Category : Antenna)

Principal Investigator:

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STC0271

Project Title: **Development of Reconfigurable Flat-Panel Metasurface Antenna**
(*Project Category : Antenna*)

Principal Investigator:

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STC0308

Project Title: **Biomechanical Aspects of Plant and Root Growth in Microgravity Environments**
(*Project Category : RS-Applications*)

Principal Investigator:

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STC0309

Project Title: **SPIRIT: A Post-Processing System for NavIC Signals for High-Precision Applications**

(Project Category : Satcom-Applications)

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STC0311

Project Title: **Forward Error Control (FEC) Schemes for High Data Rate Optical Communications**

(Project Category : Satcom-Technology)

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STC0312

Project Title: **Effect of lensing phenomenon on doped fiber for high power lasers**
(*Project Category : Human Spaceflight and Advanced Technology*)

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STC0319

Project Title: **RTE-optical-tomography based mixed-phase cloud parameter retrieval**
(*Project Category : RS-Applications*)

Principal Investigator:

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STC0412

Project Title: Integrating satellite and UAV remote sensing for Land Surface Temperature (LST) and soil moisture estimations to map crop water stress in an agriculture-dominated Critical Zone Observatory (CZO)

(Project Category : RS-Applications)

Principal Investigator:

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STC0413

Project Title: Determining the origin of the Simlipal Volcanics: meteoritic Impact vs effusive volcanis geological terrain invisible and thermal region,J4.2- Catastrophic events across the Indian geological records

(Project Category : RS-Applications)

Principal Investigator:

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STC0414

Project Title: **Smart Metasurface-based Reconfigurable Partially Reflecting Surface for 2-40 GHz**
(*Project Category : Microwave Technology*)

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STC0416

Project Title: **Development of ISRO Calibration/Validation facility using corner reflectors co-located with low-cost GNSS receivers**
(*Project Category : RS-Applications*)

Principal Investigator:

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STC0418

Project Title: **Investigation of color centers in atomically thin hexagonal boron nitride as a source of quantum emitters**

(Project Category : Human Spaceflight and Advanced Technology)

Principal Investigator:

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STC0164

Project Title: **Development of forest health monitoring model based on Hyperion data for Geo-Environmental Impact management in the Iron Ore mining belts of Saranda Forest, Jharkhand**

(Project Category : RS-Applications)

Principal Investigator:

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STC0167

Project Title: **Shoreline Change Analysis along Andaman and Nicobar Islands: Implication for Coral Conservation (AAC)**

(Project Category : RS-Applications)

Principal Investigator:

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STC0178

Project Title: **Design of SET Tolerant High-Speed Transceiver for Chip to Chip Backplane Interconnect (HBI)**

(Project Category : Microwave Technology)

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STC0214

Project Title: Hands-free Gesture Control for 3D Data Visualization by Immersive Image Navigation (Phase-II_STC0038)

(Project Category : Management & Information Systems Research)

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STC0225

Project Title: A Kalman Filter-Based Multi-Constellation GNSS Integrity Monitor (KFM)

(Project Category : Satcom-Applications)

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STC0232

Project Title: **Establishment of Quantum Communication Link for Space Application (EQS)**
(*Project Category : Satcom-Technology*)

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STC0247

Project Title: **Improved Protocols, Techniques and Algorithms for Inter-Planetary Networks (TAN)**
(*Project Category : Satcom-Applications*)

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STC0248

Project Title: **Accuracy estimation of INSAT-3D and INSAT-3DR ozone, temperature and water vapor measurements : Application for AIR-Sea Interaction studies**

(Project Category : RS-Applications)

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STC0250

Project Title: **Hyperspectral Data Processing using Deep Learning Neural network and Graph cut method for mineral identification and Mapping (TIM)**

(Project Category : RS-Applications)

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STC0293

Project Title: **Radiation Tolerant All Digital Wide-Tuning Range Fractional-N Phase-Locked Loop (PLL)**

(Project Category : Satcom-Applications)

Principal Investigator:

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STC0296

Project Title: **Design and Development of Substrate Integrated Waveguide (SIW) based Bandpass Filters**

(Project Category : Electronic Systems)

Principal Investigator:

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STC0313

Project Title: **Design and Implementation of an efficient power management IC in sub-micron Technology for Space Application**

(Project Category : Microwave Technology)

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STC0322

Project Title: **Quantum Resistant Cryptographic Protocols for Cloud computing**

(Project Category : Management & Information Systems Research)

Principal Investigator:

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STC0333

Project Title: Improvement of temporal resolution (~weekly to daily) of Sentinel-1 based high spatial resolution surface soil moisture estimates

(Project Category : RS-Applications)

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STC0337

Project Title: Development of Nano-polishing Technology for Metal Mirror

(Project Category : Mechanical Systems)

Principal Investigator:

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STC0433

Project Title: Mixed signal ASIC for NavIC receiver

(Project Category : Satcom-Applications)

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STC0434

Project Title: Identification of reusable economic indicators using enhanced satellite imagery and multimodal multi-tasking deep learning method

(Project Category : RS-Applications)

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STC0435

Project Title: Development of High Performance GNSS-INS Integration Scheme for Accurate Navigation and it's Implementation in Embedded Platform
(Project Category : Satcom-Applications)

Principal Investigator:

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STC0447

Project Title: Fabrication and modelling of a Hybrid composite antenna reflector
(Project Category : Mechanical Systems)

Principal Investigator:

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STC0072

Project Title: **16 bit 5MS/s analog to digital converter**
(*Project Category : Human Spaceflight and Advanced Technology*)

Principal Investigator: Co-PI (1) : Prof. Shanthi Pavan,
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STC0251

Project Title: **Energy efficient & wide-range 15Mb/s-1.5Gb/s SERDES**
(*Project Human Spaceflight and Advanced Technology*)

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STC0264

Project Title: Relation between atmospheric aerosols and plant productivity: A missing link between agricultural production and pathogenic bio aerosols

(Project Category : RS-Applications)

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STC0265

Project Title: Design and Development of an Advanced Carbon Fiber 3D Printable Printer

(Project Category : Mechanical Systems)

Principal Investigator:

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STC0382

Project Title: A Lagrangian framework to define the spatio-temporal requirements of measurement of ocean surface currents from space-borne sensors

(Project Category : RS-Applications)

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STC0389

Project Title: Experimental Study of Flame Spread Under Convection In Micro-Gravity

(Project Category : Human Space Programme)

Principal Investigator:

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STC0390

Project Title: **Feasibility study of smoke characterization of flaming and smouldering materials in micro-gravity**

(Project Category : Human Spaceflight and Advanced Technology)

Principal Investigator:

Co-PI (1) : Prof. Amit Kumar

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STC0392

Project Title: **Wind and Sea-swell spectral data assimilation to improve wind and wave prediction using satellite data**

(Project Category : RS-Applications)

Principal Investigator:

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❖ IIT Madras ❖

STC0432

Project Title: **Physics-based AI-ML models for predicting crop yield at different space-time scales**

(Project Category : RS-Applications)

Principal Investigator:

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❖ IIT Roorkee ❖

STC0297

Project Title: **Deployment Mechanisms for 12m Diameter Spacecraft Antennas**

(Project Category : Mechanical Systems)

Principal Investigator:

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STC0299

Project Title: Affordable Sub-millimeter/THz Components Using 3D Printed Dielectric Integrated Guides

(Project Category : Microwave Technology)

Principal Investigator:

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STC0317

Project Title: Landslide monitoring, forecasting and mitigation system

(Project Category : RS-Applications)

Principal Investigator:

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STC0349

Project Title: RF front-end of Tri-band for the IRNSS using CMOS/BiCMOS process.

(Project Category : Satcom-Applications)

Principal Investigator:

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STC0350

Project Title: Computer Tomography (CT) Based Algorithm for Non-Destructive Quality Assessment of Joints of the components used in Space applications

(Project Category : Reliability Testing)

Principal Investigator:

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❖ IIT Roorkee ❖

STC0404

Project Title: **Interlinked seasonal evolution of supraglacial lakes and ice velocity changes of glaciers in Greenland**

(Project Category : RS-Applications)

Principal Investigator:

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❖ SPPU, Pune ❖

STC0263

Project Title: **Effects of simulated microgravity on expression profile of micro RNA in human cardiomyocytes**

(Project Category : Human Spaceflight and Advanced Technology)

Principal Investigator:

Co-Pi: Dr. Indranil Banerjee

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❖ SPPU, PUNE ❖

STC0282

Project Title: **Development of Nano-polishing technology for metal mirror**
(*Project Category : Mechanical Systems*)

Principal Investigator:

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STC0286

Project Title : **Data driven modeling of morphology and formation of impact craters in Basalt: A case study of Lonar**
(*Project Category : RS-Applications*)

Principal Investigator:

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❖ SPPU, PUNE ❖

STC0301

Project Title : Effect of altered gravity on gene expression of Human Blood Mononuclear Cells and bone cell with special reference Immunity and differentiation

(Project Category : RS-Applications)

Principal Investigator:

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STC0401

Project Title : Trends in the Glacier Recessions from Kanchenjunga National Park (India and Nepal): Studies based on Spatio-temporal variability and Paleoclimate signatures

(Project Category : RS-Applications)

Principal Investigator:

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Regional Academic Centres for Space (RAC-S)

RAC-S_038

Project Title: Development of Variable data rate CCSDS compliant Direct Digital Demodulator
(*Project Category : Satcom-Technology*)

Principal Investigator:

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RAC-S_040

Project Title: Autonomic Neural Performance Index estimation using Cardiovascular, Respiratory and Behavioral Recordings

(*Project Category : Human Spaceflight and Advanced Technology*)

Principal Investigator:

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RAC-S_043

Project Title: Metasurface-based various components for applications in microwave and beyond

(Project Category : Microwave Technology, Satcom Technology)

Principal Investigator:

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RAC-S_044

Project Title: Development of graphene/CNT FET based sensors for space applications

(Project Category : Electro-Optic Technology)

Principal Investigator:

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RAC-S_045

Project Title: Development of Wearable Internet of Medical Things for Continuous Health Monitoring of Astronauts

(Project Category : Human Spaceflight and Advanced Technology)

Principal Investigator:

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RAC-S_046

Project Title: Flat Panel Beam Steerable Array Antenna System for SATCOM On-The-Move (SOTM) Terminals

(Project Category : Antenna)

Principal Investigator:

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RAC-S_047

Project Title: Development of Algorithms for water quality monitoring using ground instrumentation and optical sensors onboard Unmanned Airborne Vehicle

(Project Category : RS-Applications)

Principal Investigator:

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RAC-S_027

Project Title: Graphene based conductive ink for flexible and wearable printable electronics

(Project Category : RS-Data Products & IP)

Principal Investigator:

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RAC-S_028

Project Title: **Synthesis of spinel structured lithium based soft ferrimagnets for application in satellite communication**

(Project Category : Satcom-Technology)

Principal Investigator:

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RAC-S_032

Project Title: **Key management for secure multicast applications in Space Terrestrial Integrated Network (D15.3) (Long term R & D projects of more than oneyear duration, preferably leading to Ph.D.)**

(Project Category : Satcom-Applications)

Principal Investigator:

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RAC-S_037

Project Title: Development of a deep learning enabled algorithm for automatic modulation recognition in blind RF environment

(Project Category : Satcom-Technology)

Principal Investigator:

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RAC-S_023

Project Title: Design, Development of Multi-Harmonics Tuned GaN HEMT Power Amplifier over Broadband

(Project Category : Electronic Systems)

Principal Investigator:

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RAC-S_024

Project Title: Programmable photonic microwave signal generation using on-chip spectral shaper for satellite communication

(Project Category : Human Spaceflight and Advanced Technology)

Principal Investigator: Co-PI (1) : Pankaj Verma,
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RAC-S_025

Project Title: Design and Development of Multi Input/Multi Output Power Converter

(Project Category : Satcom-Technology)

Principal Investigator: Co-PI (1): Dr. B. Dastagiri Reddy,
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RAC-S_029

Project Title: **Customized Reconfigurable Platform for Image/Video Compression based on Deep Learning Algorithms for Hyperspectral Images**

(Project Category : RS-Data Products & IP)

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RAC-S_010

Project Title: **Synthesis and characterization study of CuNiFeCrMo- Graphene oxide Nano composites to enhance thermal and mechanical properties of material Proposal has been revised and resubmitted in consultation with SAC Co-PI.**

(Project Category : Mechanical Systems)

Principal Investigator:

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RAC-S_017

Project Title : Development of novel CoFe₂O₄/CaCu₃Ti₄O₁₂/polymer composites for EMI attenuation

(Project Category : Reliability Testing)

Principal Investigator:

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RAC-S_052

Project Title: Knowledgebase creation and Information extraction

(Project Category : Management & Information Systems Research)

Principal Investigator:

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RAC-S_057

Project Title : Simulation Analysis and Implementation of Soft Decision Forward Error Correction Codes for High Speed Free-Space/Satellite Optical Communication.

(Project Category : Human Spaceflight and Advanced Technology)

Principal Investigator:

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RAC-S_059

Project Title: Development of space qualified vapor chamber

(Project Category : Mechanical Systems)

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RAC-S_060

Project Title: **Onboard spectral preprocessing for multispectral image compression using FPGA**

(Project Category : Electro-Optic Technology)

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Space Technology Incubation Centre (S-TIC)

SAC S-TIC_0006

Project Title: Improving the Conductive Heat Transfer Efficiency of Thermal Base Plate inside a Thermal Vacuum Chamber

(Project Category : Electronic Systems)

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SAC S-TIC_0007

Project Title: FPGA based High Speed CCSDS Processor for Baseband Receiver

(Project Category:Electro-Optic Technology)

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SAC_S-TIC_0013

Project Title: Single Object Tracking in a video/Image Sequence using Machine/Deep Learning Techniques

(Project Category : RS-Data Products & IP, ISRO)

Principal Investigator:

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SAC_S-TIC_0015_1

Project Title: Design & Development of RF and Microwave Components (Passive Components)

(Project Category : Satcom-Technology)

Principal Investigator:

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SAC_S-TIC_0016

Project Title: Development of NavIC based Asset Tracking system

(Project Category : Satcom-Applications)

Principal Investigator:

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YS/PD-IP/2021/408

Project Title: Development of a UV-assisted 3D Printing System for PCB Manufacturing

(Project Category : Management & Information Systems Research)

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YS/PD-IP/2021/338

Project Title: Design & Development of active RF, microwave and mm-wave circuits
(*Project Category : Microwave Technology*)

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YS/PD-IP/2021/343

Project Title: Integrated Information System for Agriculture Monitoring and Crop Insurance
(*Project Category : RS-Applications*)

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YS_PD-IP_2021_310

Project Title: Development of multi-arm Toothed Log-periodic Antenna for Geodetic grade Multi GNSS

(Project Category : Satcom-Applications)

Principal Investigator:

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YS_PD-IP_2021_364

Project Title: Design and development of Magneto Resistive Heat Switch

(Project Category : Mechanical Systems)

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SAC_S-TIC_0017

Project Title: Design and development of X –band & Ka-band passive devices
(*Project Category : Microwave Technology*)

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YS_PD-IP_2021_344

Project Title: Development of Ammonia based Flexible Heat Pipe for Space Applications
(*Project Category : Mechanical Systems*)

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YS/PD-IP/2021/342

Project Title: Safe Ship Navigation

(Project Category : RS-Applications)

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YS_PD-IP_2021_333

Project Title: Development of Photodetector for low intensity light levels in UV/VIS/IR wavelength regions

(Project Category : Electro-Optic Technology)

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YS_PD-IP_2021_396

Project Title: Design and development of Thermal Ribbon Temperature Sensor
(*Project Category : Electronic Systems*)

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UAY0013

Project Title: Deep learning based ecosystem for aircraft health management using visual and sensor data

(Project Category:RS-Applications)

Principal Investigator:

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UAY0009

Project Title: Hybrid Additive-Subtractive Manufacturing technology development

(Project Category : Mechanical Systems)

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UAY0001

Project Title: Wide-area field of view CMOS image sensors for aerial surveillance for defense applications

(Project Category:Electro-Optic Technology)

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**Centre for Nanoscience and
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CeNSE SAC001

Project Title: Development of AIN based Film Bulk Acoustic Resonator (FBAR) based RF filters for space use

(Project Category : Electronic Systems)

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IIST- Thiruvananthapuram

IIST/SAC/11/2021/22

Project Title: Machine learning driven Augmented Reality based Campus walkthrough
(*Project Category : Management & Information Systems Research*)

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Project Title: Interference analysis and co-existence studies between GSO and NGSO satellite systems

(*Project Category : Satcom-Technology*)

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6	OGP186	Design and Development of Wideband Circularly Polarized Antenna using 2D Metamaterial Structures	Shri K. Krishnamoorthy, National Institute of Technology Karnataka, Mangalore	47
7	OGP216	Design and development of X-band prime focal reflectarray antenna	Dr. Yogeshwar Prasad Kosta, CHARUSAT Space Research & Technology Center, Changa	61

8	OGP218	Design, Analysis and Development of Fabry Perot Cavity based Feed Cluster	Dr. Piyush Bhatasana, Nirma University, Ahmedabad	62
9	STC0259	Development and Evaluation of Multiscale CNT/polymer composites	Dr. Sumit Basu, IIT Kanpur	91
10	STC0271	Development of Reconfigurable Flat-Panel Metasurface Antenna	Dr. Deepak Gupta, IIT Kanpur	92
11	RAC-S_046	Design and development of Reconfigurable Reflectarray Antenna at X-band	Dr. Manoj Kumar Meshram, IIT BHU, Varanasi	120
12	YS_PD-IP_2021_310	Development of multi-arm Toothed Log-periodic Antenna for Geodetic grade Multi GNSS	Dr. Situ Rani Patre, NIT Rourkela	134
Electronic Systems (13)				
13	OGP219	Development of LTCC tapes and compatible gold pastes for space applications	Dr. K. P. Surendran, CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram	62
14	STC0070	Fractional NPLL and ADC for IRNSS User Receiver	Dr. Jayanta Mukherjee, IIT Bombay	77
15	STC0215	Growth and Characterization of AlGaN/ GaN Heterostructure by Plasma Assisted Molecular Beam Epitaxy (PA-MBE) Technique for High Mobility Electron Transistor	Dr. Apurba Laha, IIT Bombay	77
16	STC0229	PDK Development and modeling support for ISRO's GaN HEMT Technology	Dr. Yogesh Singh Chauhan, IIT Kanpur	89

17	STC0296	Design and Development of Substrate Integrated Waveguide (SIW) based Bandpass Filters	Prof. M.K. Mandal, IIT Kharagpur	102
18	STC0384	Large Area flexible metasurface based photonic devices	Dr. Tapajyoti Das Gupta, IISc Bangalore	71
19	STC0386	Highly sensitive IR detection using photo-gating by electrically defined quantum dot	Prof. Kausik Majumdar, IISc Bangalore	72
20	STC0429	GaN-Based CMOS Digital Circuits	Prof. Dipankar Saha, IIT Bombay	83
21	RAC-S_023	Design, Development of Multi-Harmonics Tuned GaN HEMT Power Amplifier over Broadband	Dr. Sandeep Kumar, NIT Karnataka, Surathkal	123
22	RAC-S_027	Graphene based conductive ink for flexible and wearable printable electronics	Dr. Hemen Kumar Kalita, Gauhati Uni.	121
23	SAC_S-TIC_0006	Improving the Conductive Heat Transfer Efficiency of Thermal Base Plate inside a Thermal Vacuum Chamber	Dr Subhas Chander, Dr. B.R. Ambedkar NIT Jalandhar	130
24	YS_PD-IP_2021_396	Design and development of Thermal Ribbon Temperature Sensor	Dr. Rahul Prajesh, CSIR-CEERI, Pilani, Rajasthan,	137
25	CeNSE_SAC 001	Development of AlN based Film Bulk Acoustic Resonator (FBAR) based RF filters for space use	Dr. Vijayaraghavan Madakisara, IISc Bangalore	141
Electro-Optic Technology (15)				
26	OGP133	Design of Ultra Low Power CMOS (Complementary Metal Oxide Semiconductor) temperature sensor for aerospace applications	Dr. Vijay Nath, Birla Institute of Technology Mesra, Ranchi	39
27	OGP170	Design and analysis of an Integrated optic microring resonator array based sensor system for detection of multiple gases	Dr. S. Malathi, M.S Ramaiah Uni of Applied Sciences, Bengaluru	41

28	OGP177	Design and study of Nano and micro displacement sensor based on Photonic Crystal Fiber modal interferometer	Dr. Rajan Jha, IIT Bhubaneswar	44
29	OGP187	Design, Fabrication and Characterization of Uncooled Microbolometer for IR Imaging Applications	Dr. Shiv Govind Singh, IIT Hyderabad	47
30	OGP227	The Design and analysis of a Silicon Particle Detector Array using High Voltage CMOS process for Space Application	Dr. Hitesh Shrimali, IIT Mandi	66
31	STC0067	Visible-NIR Electromagnetic Wave Concentration using Metallic Aperture for Photodetectors	Dr. Sumit Saxena, IIT Bombay	76
32	STC0239	Molecular Size and Mass Sensitive Ultrasensitive Thermal Spectrometer Applications	Dr. Debabrata Goswami, IIT Kanpur	91
33	STC0272	Comprehensive Simulation Engine for Type-II Superlattice based Barrier Infrared Photodetectors	Dr. Bhaskaran Muralidharan, IIT Bombay	81
34	STC0385	Research and development of MoS ₂ Quantum Dots based non-contact temperature sensor for applications in Indian Space Research programs	Prof. Asha Bhardwaj, IISc Bangalore	72
35	STC0426	Advancing technology CAD simulations on superlattice structures for MWIR and SWIR sensors	Prof. Bhaskaran Muralidharan, IIT Bombay	81
36	RAC-S_044	Development of Graphene/CNT FET based sensors for Space Applications	Dr. Shivam Verma, IIT BHU, Varanasi	119
37	RAC-S_060	Onboard spectral preprocessing for multispectral image compression using FPGA	Dr. Anand Darji, Malaviya NIT Jaipur	128
38	SAC_S-TIC_0007	FPGA based High Speed CCSDS Processor for Baseband Receiver	Dr Ashish Raman, Dr. B.R. Ambedkar NIT Jalandhar	130

39	YS_PD-IP_2021_333	Development of Photodetector for low intensity light levels in UV/VIS/IR wavelength regions	Dr. Nikhil Deep Gupta, VNIT, Nagpur	136
40	UAY0001	Wide-area field of view CMOS image sensors for aerial surveillance for defense applications	Dr. Mukul Sarkar, IIT Delhi	139
Human Spaceflight and Advanced Technology (24)				
41	OGP180	A Novel Mach zehnder Modulator based integrated Photonic highly Steerable Beam-forming system for Broadband Satellite Communication Link	Dr. Sanjeev Kumar Raghuvanshi, Indian Institute of Technology (ISM), Dhanbad	45
42	OGP200	Delaying programmed cell death of beneficial gut bacteria in microgravity using oxide and complex nanoparticles	Prof. Arunava Goswami, Indian Statistical Institute (ISI), Kolkata	53
43	OGP222	Study, design and development of electronic nose for fire detection system	Dr. J. Manikandan, PES University, Bangalore	64
44	OGP225	Ultra-high sensitivity tunable laser-based spectroscopic gas selection system for the Human Spaceflight Programme	Dr. Arup Lal Chakraborty, IIT Gandhinagar	65
45	OGP228	To study potential protocols for satellite-based secure quantum communication under ambient atmospheric conditions	Dr. Subhashish Banerjee, IIT Jodhpur	67
46	STC0072	16 bit 5MS/s analog to digital converter	Dr. Nagendra Krishnapura, IIT Madras	107
47	STC0232	Establishment of Quantum Communication Link for Space Application	Dr. Shailendra K Varshney, IIT Kharagpur	100
48	STC0241	Development of a NIR laser based platform for emulating single event effects on integrated circuits due to radiation strikes	Dr. Shalabh Gupta, IIT Bombay	78

49	STC0251	Energy efficient & wide-range 15Mb/s-1.5Gb/s SERDES	Dr. Saurabh Saxena, IIT Madras	107
50	STC0263	Effects of simulated microgravity on expression profile of micro RNA in human cardiomyocytes	Dr. Varsha W Wankhade, SPPU Pune	114
51	STC0301	Effect of altered gravity on gene expression of Human Blood Mononuclear Cells and bone cell with special reference Immunity and differentiation	Ms. Kalpana Pai, SPPU Pune	116
52	STC0312	Effect of lensing phenomenon on doped fiber for high power lasers	Prof. Debabrata Goswami, IIT Kanpur	94
53	STC0363	Plasmonic metamaterials based filters for photonic applications in space	Dr. Gagan Kumar, IIT Guwahati	87
54	STC0387	Graphene van der Waals heterostructure based field effect transistor for gas emission monitoring	Prof. Abha Misra, IISc Bangalore	73
55	STC0389	Experimental Study of Flame Spread Under Convection In Micro-Gravity	Prof. Amit Kumar, IIT Madras	109
56	STC0390	Feasibility study of smoke characterization of flaming and smouldering materials in micro-gravity	Prof. T M Muruganandam, IIT Madras	110
57	STC0405	Microwave photonic devices for Space Applications	Prof. Amol Choudhary, IIT Delhi	86
58	STC0418	Investigation of color centers in atomically thin hexagonal boron nitride as a source of quantum emitters	Prof. Sudipta Dubey, IIT Kanpur	97
59	STC0444	Generation and Characterisation of Entangled Microwave Photon states using a Josephson Parametric Convertor	Dr. Baladitya Suri, IISc Bangalore	76

60	STC0459	A Machine Learning Approach to Estimate Atomic and Molecular Properties Accurately for Space Applications	Prof. Achintya Kumar Dutta, IIT Bombay	83
61	RAC-S_024	Programmable photonic microwave signal generation using on-chip spectral shaper for satellite communication	Dr. Mandeep Singh, NIT Karnataka, Surathkal	124
62	RAC-S_040	Autonomic Neural Performance Index estimation using Cardiovascular, Respiratory and Behavioral Recordings	Prof. Prasun K. Roy, Shiv Nadar University, Greater Noida	118
63	RAC-S_045	Development of Wearable Internet of Medical Things for Continuous Health Monitoring of Astronauts	Dr. Priya Ranjan Muduli, IIT BHU, Varanasi	120
64	RAC-S_057	Simulation Analysis and Implementation of Soft Decision Forward Error Correction Codes for High Speed Free-Space/Satellite Optical Communication.	Dr. Amit Kumar Garg, Indian Institute of Information Technology, Kota	127
Management & Information Systems Research (06)				
65	OGP195	Government Agency Initiatives for Scientific Research Management with special reference to Institute/University Interface	Dr. Nityesh Bhatt, Nirma University, Ahmedabad	51
66	STC0214	Hands-free Gesture Control for 3D Data Visualization by Immersive Image Navigation (Phase-II_STC0038)	Dr. Partha Pratim Das, IIT Kharagpur	99
67	STC0322	Quantum Resistant Cryptographic Protocols for Cloud computing	Dr. Ratna Dutta, IIT Kharagpur	103
68	RAC-S_052	Knowledgebase creation and Information extraction	Dr. Namita Mittal, Malaviya NIT Jaipur	126
69	YS/PD-IP/2021/408	Development of a UV-assisted 3D Printing System for PCB Manufacturing	Dr. Narendra Kumar, NIT, Jalandhar	132
70	IIST/SAC/11/2021/22	Machine learning driven Augmented Reality based Campus walkthrough.	Dr. Deepak Mishra, IIST Trivandrum	143

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71	OGP191	Design and Development of a Proof-of-Concept Model of a Packaging Methodology & Rigidization for Gossamer Space Antenna Structures	Dr. Sanjay H Upadhyay, IIT Roorkee	49
72	OGP192	Development, Testing and Characterization of 1m Dia Ku-Band P.E.E.K parabolic reflector with and without Metallization for Spacecraft Applications	Dr. M Abdul Kader, Central Institute of Plastics Engineering & Technology, Ahmedabad	50
73	OGP208	Thermal Management of Space Electronics using Multi-turn Pulsating Heat Pipes (PHP)	Dr. M. Narendra Kumar, Jyothy Institute of Technology, Bengaluru	57
74	STC0235	Stabilization of a 3D Platform for Space Applications Against Rolling and Pitching Excitations	Dr. Nachiketa Tiwari, IIT Kanpur	90
75	STC0265	Design and Development of an Advanced Carbon Fiber 3D Printable Printer	Late. Dr. S. Soundarapandian (Dr. N Arunachalam), IIT Madras	108
76	STC0282	Development of Nano-polishing technology for metal mirror	Dr. Girish N. Kotwal, SPPU Pune	115
77	STC0297	Deployment Mechanisms for 12m Diameter Spacecraft Antennas	Dr. S. H. Upadhyay, IIT Roorkee	111
78	STC0337	Development of Nano-polishing Technology for Metal Mirror	Prof. Ajay Muljibhai Sidpara, IIT Kharagpur	104
79	STC0377	Analysis of variable stiffness composite honeycomb sandwich structures with embedded delamination	Dr. S. Pradyumna, IIT Delhi	85

80	STC0428	Serpenoid robots for unmanned exploration of Moon and Mars	Prof. Harish K. Pillai, IIT Bombay	82
81	STC0439	Super-compatible shape memory alloy slender structures for space applications	Dr. Vivekanand Dabade, IISc Bangalore	74
82	STC0442	Vibration Isolation using Bandgap Metamaterials	Dr. Rajesh Chaunsali, IISc Bangalore	75
83	STC0447	Fabrication and modelling of a Hybrid composite antenna reflector	Dr. Nilanjan Das Chakladar, IIT Kharagpur	106
84	STC0452	Design and development of efficient tool-path strategies of precision high-speed machining of monolithic thin-walled structures for construction of light-weight satellites and spacecrafts	Dr. Shrikrishna Nandkishor Joshi, IIT Guwahati	88
85	RAC-S_010	Synthesis and characterization study of CuNiFeCrMo- Graphene oxide Nano composites to enhance thermal and mechanical properties of material	Prof. Upender Pandel, Malaviya NIT Jaipur	125
86	RAC-S_059	Development of space qualified vapor chamber	Md. Qaisar Raza, Malaviya NIT Jaipur	127
87	YS_PD-IP_2021_344	Development of Ammonia based Flexible Heat Pipe for Space Applications	Dr. Suresh S, NIT Trichy	135
88	YS_PD-IP_2021_364	Design and development of Magneto Resistive Heat Switch	Dr. Bukke Kiran Naik, NIT Rourkela	134
89	UAY0009	Hybrid Additive-Subtractive Manufacturing technology development	Prof. Asim Tewari, IIT Bombay	139
Microwave Technology (10)				
90	OGP174	A High-Speed SAR Analog to Digital Converter (ADC) with low distortion sample-hold front-end	Prof. Subhajit Sen, IIIT, Bengaluru	42

91	OGP185	Design of 0.18 μ m CMOS Dual band Low Noise Amplifier (LNA) for IRNSS Applications	Dr. G Kavya, S. A. Engineering College, Chennai	46
92	STC0178	Design of SET Tolerant High-Speed Transceiver for Chip to Chip Backplane Interconnect	Dr. Mrigank Sharad, IIT Kharagpur	98
93	STC0236	Parallel Electro-Magnetic Solver for Microwave, Infrared, and Optical applications (MIO-PEMS)	Dr. Mahendra Verma, IIT Kanpur	90
94	STC0299	Affordable Sub-millimeter/THz Components Using 3D Printed Dielectric Integrated Guides	Dr. Nagendra Prasad Pathak, IIT Roorkee	112
95	STC0313	Design and Implementation of an efficient power management IC in sub-micron Technology for Space Application	Prof. Pradip Mandal, IIT Kharagpur	103
96	STC0414	Smart Metasurface-based Reconfigurable Partially Reflecting Surface for 2-40 GHz	Prof. R. Vijaya, IIT Kanpur	96
97	SAC_S-TIC_0017	Design and development of X –band & Ka-band passive devices	Dr. R. Pandeewari, NIT Trichy	135
98	YS/PD-IP/2021/338	Design & Development of active RF, microwave and mm-wave circuits	Dr. Prasun Chongder, NIT, Rourkela	133
99	RAC-S_043	Metasurface-based various components for applications in microwave and beyond	Dr. Somak Bhattacharyya, IIT BHU, Varanasi	119
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100	OGP167	Development of Microwave Absorber (Carbonyl Iron Filled Silicon Rubber Sheets) in 1 to 8 GHz range	Prof. Deepak Ghodgaonkar, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar	40

101	OGP175	Predicting Reliability and Optimal release time of various categories software systems	Dr. Subhashis Chatterjee, Indian Institute of Technology (ISM), Dhanbad	43
102	OGP226	An Empirical Analysis on Deriving Test Cases from Natural Language Text using MBT Approach	Dr. Saurabh Tiwari, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar	66
103	STC0350	Computer Tomography (CT) Based Algorithm for Non-Destructive Quality Assessment of Joints of the components used in Space applications	Prof. Mayank Goswami, IIT Roorkee	113
104	RAC-S_017	Development of novel CoFe ₂ O ₄ / CaCu ₃ Ti ₄ O ₁₂ /polymer composites for EMI attenuation	Dr. Rahul Singhal, Malaviya NIT Jaipur	126
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105	OGP158	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	Dr. Venkatraman Seetaram Hegde, S.D.M. College of Engineering and Technology, Dharwar	39
106	OGP179	Design of urban storm water drainage system for Jorhat Town (Assam) and its suburb using GIS and Remote Sensing	Dr. Nandita Goswami, K.S. School of Business Management, Gujarat University, Ahmedabad	44

107	OGP182	Visible-IR and XRF spectroscopic studies of Lunar Analogues	Dr. K.N. Kusuma, Pondicherry University, Puducherry	45
108	OGP188	Development of Time Weighted Dynamic Time Warping (TWDTW) Algorithm for Analysis of Vegetation Dynamics using Time-Series Vegetation Index Data from Earth Observation Satellites	Dr. Arti Khaparde, Dr. Vishwanath Karad MIT World Peace University (MIT-WPU), Pune	48
109	OGP189	Development of Automated Web Based Online Feature Tracking system using Shape Adaptive Curvelet with PCA and Haralick Texture Feature	Dr. K. Rajakumar, VIT University, Vellore	48
110	OGP197	Development of Fusion Algorithms for Remotely Sensed Satellite Images in Cartographic Applications	Dr. N. Venkateswaran, Sri Sivasubramaniya Nadar (SSN) College of Engineering, Chennai	52
111	OGP199	Elucidation of the deformation signatures and fluvial activity near junction of Noachis Terra with Margaritifer and Arabia Terra	Dr. Abhik Kundu, Asutosh College, Kolkata	53
112	OGP204	Integrated Post cyclone impacts on the chlorophyll biomass in the central and Western Bay of Bengal	Dr. K. Maneesha, National Institute of Oceanography - RC, Visakhapatnam	55
113	OGP205	Estimation of Crop Water Productivity (CWP) in the major River basins of Tamilnadu using Geospatial technology	Prof. N. Vaani, VIT University, Vellore	56

114	OGP206	Prediction of ground-level particulate matter concentrations from Multi-Satellite Aerosol Optical Depth (AOD) over the Indian Subcontinent	Dr. Sunita Verma, Banaras Hindu University, Varanasi	56
115	OGP213	SAR Polarimetric image classification using Wishart Mixture model and Convolution Neural Networks	Dr. Srimanta Mandal, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar	59
116	OGP215	Modeling of Chlorophyll-a (Chl-a) Dynamics of the Eastern Arabian Sea : Biophysical coupling in the Context of change in climate	Dr. A A Mohamed Hatha, School of Marine Sciences, Cochin University of Science and Technology, Cochin	60
117	OGP220	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	Prof. M G Thakkar, Krantiguru Shyamji Krishna Verma Kachchh University, Bhuj-Kachchh	63
118	OGP224	Appraisal of lake water dynamics and security through high resolution satellite imageries	Dr. (Er.). Kishan Singh Rawat, Graphic Era, Dehradun	65
119	STC0164	Development of forest health monitoring model based on Hyperion data for Geo-Environmental Impact management in the Iron Ore mining belts of Saranda Forest, Jharkhand	Dr. K Pathak, IIT Kharagpur	97

120	STC0167	Shoreline Change Analysis along Andaman and Nicobar Islands: Implication for Coral Conservation	Dr. Sabyasachi Maiti, IIT Kharagpur	98
121	STC0231	Impact Melt Cover on Central Peaks of Lunar Impact Craters: Evaluating its Implications for Deriving Sub-surface Mineralogy using data from Chandrayaan-1 & other recent lunar missions	Dr. Deepak Dhingra, IIT Kanpur	89
122	STC0248	Accuracy estimation of INSAT-3D and INSAT-3DR ozone, temperature and water vapor measurements : Application for AIR-Sea Interaction studies	Dr. Jayanarayanan Kuttippurath, IIT Kharagpur	101
123	STC0250	Hyperspectral Data Processing using Deep Learning Neural network and Graph cut method for mineral identification and Mapping	Dr. Biswajit Samanta, IIT Kharagpur	101
124	STC0253	Modelling of Water Quality Parameters for Coastal and Inland Water Bodies using Data from Multispectral and Hyperspectral Imaging Systems	Dr. Shirishkumar S Gedam, IIT Bombay	78
125	STC0254	Physico-chemical conditions of formation of bole beds within Deccan basalt for Martian analogue	Dr. Santanu Banerjee, IIT Bombay	79
126	STC0264	Relation between atmospheric aerosols and plant productivity: A missing link between agricultural production and pathogenic bio aerosols	Dr. Sachin S Gunthe, IIT Madras	108
127	STC0267	A flood warning system for entire India-optimal utilization for satellite based data and development of a computationally efficient flood inundation model	Dr. Basudev Biswal, IIT Bombay	79
128	STC0269	Modelling and validation of evapotranspiration from India Space borne thermal sensors	Dr. Eswar Rajasekaran, IIT Bombay	80

129	STC0270	Modelling and Mapping of Supraglacial Debris Cover Thickness using UAS and Satellite Remote Sensing Data in selected Glaciers of Western Himalayas	Dr. Raaj Ramsankaran, IIT Bombay	80
130	STC0286	Data driven modeling of morphology and formation of impact craters in Basalt: A case study of Lonar	Dr. Bhalchandra Pujari, SPPU Pune	115
131	STC0308	Biomechanical Aspects of Plant and Root Growth in Microgravity Environments	Prof. Anurag Gupta, IIT Kanpur	92
132	STC0317	Landslide monitoring, forecasting and mitigation system	Dr. R. Balasubramanian, IIT Roorkee	112
133	STC0319	RTE-optical-tomography based mixed-phase cloud parameter retrieval	Prof. Naren Naik, IIT Kanpur	94
134	STC0333	Improvement of temporal resolution (~weekly to daily) of Sentinel-1 based high spatial resolution surface soil moisture estimates	Dr. Rajib Maity, IIT Kharagpur	104
135	STC0344	Estimation of vulnerable soil-carbon and hotspots of carbon-efflux across different land-use in India	Dr. Sumanta Bagchi, IISc Bangalore	70
136	STC0368	Impact of Satellite observations in a coupled system for predicting storm tides and its coastal inundation.	Prof A D Rao, IIT Delhi	84
137	STC0372	Real-Time Flood Risk Warning Smart System Integrating Information from Satellite and Sensor Products	Dr. Dhanya C. T., IIT Delhi	84
138	STC0374	Establishing a coupled Indian Land Data Assimilation System (ILDAS) for identifying hydrologic extremes	Dr. Manabendra Saharia, IIT Delhi	85
139	STC0379	Low Pressure Systems (LPSs) and their nonlinear interaction with other scales in atmosphere through the lens of Scale Energetics	Dr. Sarvesh Kumar Dubey, IIT Delhi	86
140	STC0382	A Lagrangian framework to define the spatio-temporal requirements of measurement of ocean surface currents from space-borne sensors	Dr. Manikandan Mathur, IIT Madras	109

141	STC0392	Wind and Sea-swell spectral data assimilation to improve wind and wave prediction using satellite data	Dr. S. A. Sannasiraj, IIT Madras	110
142	STC0401	Trends in the Glacier Recessions from Kanchenjunga National Park (India and Nepal): Studies based on Spatio-temporal variability and Paleoclimate signatures	Dr. Swapnil S. Vyas, SPPU Pune	116
143	STC0404	Interlinked seasonal evolution of supraglacial lakes and ice velocity changes of glaciers in Greenland	Dr. Saurabh Vijay, IIT Roorkee	114
144	STC0412	Integrating satellite and UAV remote sensing for Land Surface Temperature (LST) and soil moisture estimations to map crop water stress in an agriculture-dominated Critical Zone Observatory (CZO)	Prof. Rajiv Sinha, IIT Kanpur	95
145	STC0413	Determining the origin of the Simlipal Volcanics: meteoritic Impact vs effusive volcanism	Prof. Amar Agarwal, IIT Kanpur	95
146	STC0416	Development of ISRO Calibration / Validation facility using corner reflectors co-located with low-cost GNSS receivers	Prof. Onkar Dikshit, IIT Kanpur	96
147	STC0427	A multivariate data assimilation framework to improve drought predictions	Prof. Riddhi Singh, IIT Bombay	82
148	STC0432	Physics-based AI-ML models for predicting crop yield at different space-time scales	Prof. Arun K. Tangirala, IIT Madras	111
149	STC0434	Identification of reusable economic indicators using enhanced satellite imagery and multimodal multi-tasking deep learning method	Prof. Tutan Ahmed, IIT Kharagpur	105
150	STC0437	Improving the spatial resolution of GRACE TWS for India using remote sensing datasets and modeling approach	Dr. Bramha Dutt Vishwakarma, IISc Bangalore	73

151	STC0440	Near-Future Forecasting of Transient Weather Phenomena Using Dynamic Mode Decomposition	Dr. Balachandra Suri, IISc Bangalore	74
152	RAC-S_047	Development of Algorithms for water quality monitoring using ground instrumentation and optical sensors onboard Unmanned Airborne Vehicle	Dr. Shishir Gaur, IIT BHU, Varanasi	121
153	YS/PD-IP/2021/34 2	Safe Ship Navigation	Pratikumar Parimal Shah, Indian Institute of Information Technology, Vadodara	136
154	YS/PD-IP/2021/34 3	Integrated Information System for Agriculture Monitoring and Crop Insurance	Dr Dushyant Mahadik, NIT Rourkela	133
155	UAY0013	Deep learning based ecosystem for aircraft health management using visual and sensor data	Dr. Ambedkar Dukkupati & R. Venkatesh Babu, IISc Bangalore	139
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156	OGP193	Speckle noise reduction in SAR images using Neuro-Fuzzy approaches for coastal zone change detection and monitoring	Dr. V. Santhi, Vellore Institute of Technology, Vellore	50
157	OGP202	Neuro-Fuzzy Synergism based POLSAR Image Classification	Prof. Sheli Sinha Chaudhuri, Jadavpur University, Kolkata	54
158	OGP203	Vision guided Auto-Lander for Planetary missions	Prof. Dr. Amitava Gupta, Jadavpur University, Kolkata	55
159	OGP207	Design and development of a Scalable Framework for Geospatial/Geoscience Data Ingestion, Ad-hoc Queries and analysis on Big Data Environment	Dr. Jai Prakash Verma, Nirma University, Ahmedabad	57

160	OGP214	Orbit parameter refinement using GNSS carrier phase data in post facto scenario for Interferometric SAR and Pol InSAR applications	Dr. Ratna Ghosh, Jadavpur University, Kolkata	60
161	OGP221	Spatio-spectral Deconvolution of Hyperspectral Images	Dr. Puneet Gupta, IIT Indore	63
162	STC0316	Super resolution of Hyperspectral Remote Sensing Images	Dr. Kunal Narayan Chaudhury, IISc Bangalore	69
163	STC0343	Quality Assessment of Pansharpened Images	Prof. Rajiv Soundararajan, IISc Bangalore	69
164	STC0346	Edge-Aware Interpolation for Terrestrial 3-D Maps	Prof. Chandra Sekhar Seelamantula, IISc Bangalore	70
165	STC0347	High Precision Satellite Image Denoising in Hardware	Dr. Rathna G N, IISc Bangalore	71
166	STC0441	Unsupervised Semantic Segmentation of High Resolution Satellite Images	Dr. Rahul Singh, IISc Bangalore	75
167	RAC-S_029	Customized Reconfigurable Platform for Image/Video Compression based on Deep Learning Algorithms for Hyperspectral Images	Dr. M. Nagabushan, MSRIT Bangalore	125
168	SAC_S-TIC_0013	Single Object Tracking in a video/Image Sequence using Machine/Deep Learning Techniques	Dr Om Prakash Verma, Dr. B.R. Ambedkar NIT Jalandhar	131
Satcom-Applications (18)				
169	OGP190	Experimental Studies on tropospheric scintillation and associated rain attenuation for SATCOM links over North Eastern India (Sikkim) at Ku/Ka-Band	Dr. Swastika Chakraborty, Sikkim Manipal Institute of Technology, East Sikkim	49
170	OGP194	Design and Simulation of Beamforming Algorithms and Baseband Technologies for SATCOM On the Move (SOTM) Networks	Dr. Yash Vasavada, DA-IICT, Gandhinagar	51

171	OGP196	Design and Simulation of Physical Layer and Medium Access Control (MAC) Layer Functionalities of Future Mobile Satellite Systems	Dr. Rajib Lochan Das, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar	52
172	OGP209	Combining Hyperbolic and NavIC navigation algorithms for attitude control of ship in floating dry dock	Dr. Mrinal Sarvagya, Reva University, Bengaluru	58
173	OGP211	Satellite Network Simulator (SNS) with ULPC and ACM features	Dr. Bhaskar Chaudhury, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar	58
174	OGP212	Adaptive Beam Forming for Mitigation of Interference and Jamming at the Ground Terminal of Global Navigational Satellite Systems (GNSS)	Dr. Sanjeev Gupta, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar	59
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182	STC0433	Mixed signal ASIC for NavIC receiver	Dr. Bibhudatta Sahoo, IIT Kharagpur	105
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Celebrating 50 Years



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RESPOND and Research Management Division

अनुसंधान, बाह्यसंपर्क एवं प्रशिक्षण समन्वय समूह

Research, Outreach and Training Coordination Group

प्रबंधन एवं सूचना प्रणाली क्षेत्र/ Management and Information Systems Area

अंतरिक्षउपयोग केंद्र, इसरो/ Space Applications Centre, ISRO