

List of STC Ongoing Projects

S.No.	Research Title
1	Design and Efficient Implementation of Advanced Encryption and Decryption Techniques for Use in Spacecraft Communications (EEC)
2	Development of Novel Plasmonic Devices for Next Generation Chip-scale Technology based on Nanophotonics
3	Design and Implementation of a 250 MSPS, 8-bit ADC in sub-micron technology for Space Applications (BTA)
4	Deep learning for Automated Feature Discovery in Hyperspectral Images (LDH)
5	Visible-NIR Electromagnetic Wave Concentration using Metallic Aperture for Photodetectors
6	Fractional NPLL and ADC for IRNSS User Receiver
7	Identification of mesoscale eddies in the Bay of Bengal using Lagrangian Coherent Structures
8	16 bit 5MS/s analog to digital converter
9	Studies on Retro-Directive Array for Space Applications (RAA)
10	Ka Band Propagation Experiments over Indian Tropical Region for Improvement of Ka Band Satellite Communication (KPE)
11	Design of Dual/Tri-Band Circularly-Polarized Antennas with Reduced Ground Plane Size
12	Assessment and Implementation of Complex Image Co-registration and Phase Unwrapping Algorithms for Interferometric SAR Processing
13	Characterization and Modeling of Radiation hardened CMOS transistors for space applications
14	High throughput surface characterization using coherent optical imaging
15	RTE-tomography based cloud and ocean monitoring
16	Numerical investigations on surface gravity waves and internal tides
17	Exploration of vertical soil moisture profile by assimilating the surface soil moisture data retrieved from remotely sensed SAR data
18	Indigenous Authenticated Encryption for Satellite Communication (IAE)
19	Development of Pre qual engineering model of "SEAPS" (300 KHz to 30 MHz) RF Front-End Electronics and Data Acquisition System for low frequency space science studies
20	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
21	Shoreline Change Analysis along Andaman and Nicobar Islands: Implication for Coral Conservation (AAC)
22	Gigahertz and Terahertz antenna on photonic crystal substrate
23	Development of a Gas sensor to detect leakage of Helium gas from inflatable space structure
24	Space-Time Trellis Coding (STTC)/Turbo coding based robust satellite image processing and communication
25	Underlay Cognitive Radio based Satellite-Terrestrial Non-Cooperative/Cooperative Communication for Efficient Resource Utilization: Protocol Design and Performance Analysis
26	Polarimetric Analysis of SAR Images for Segmentation, Classification and Recognition of Objects (ARI)

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27	Design of SET Tolerant High-Speed Transceiver for Chip to Chip Backplane Interconnect (HBI)
28	Aerial Image understanding
29	Design and Development of Five Axis Magnetic field Assisted fluid jet polishing for nano-surface generation
30	Petrographic, Geochemical, Isotopic and Remote Sensing study of the Dhala impact crater, India
31	Satellite Image Denoising in Hardware
32	Hands-free Gesture Control for 3D Data Visualization by Immersive Image Navigation (Phase-II_STC0038)
33	Growth and Characterization of AlGaIn/GaN Heterostructure by Plasma Assisted Molecular Beam Epitaxy (PA-MBE) Technique for High Mobility Electron Transistor
34	QPSK Demodulator based on Wideband Acquisition Technique
35	A Kalman Filter-Based Multi-Constellation GNSS Integrity Monitor (KFM)
36	PDK Development and modeling support for ISRO's GaN HEMT Technology
37	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
38	Establishment of Quantum Communication Link for Space Application (EQS)
39	Optical characterization of wetlands from Earth Observations
40	Integration of spectral and spatial information for hyperspectral image classification
41	Stabilization of a 3D Platform for Space Applications Against Rolling and Pitching Excitations
42	Parallel Electro-Magnetic Solver for Microwave, Infrared, and Optical applications (MIO-PEMS)
43	Design of polymer nanocomposites based wideband microwave absorbers for stealth and electromagnetic shielding applications
44	Detectability of Critical Delamination in Composite Space Components: Vibration based Approach
45	Molecular Size and Mass Sensitive Ultrasensitive Thermal Spectrometer Applications
46	Development of a NIR laser based platform for emulating single event effects on integrated circuits due to radiation strikes
47	Development of far-infrared transmitting Te based chalcogenide glasses for space applications
48	Satellite image restoration in multiplicative noise conditions
49	Improved Protocols, Techniques and Algorithms for Inter-Planetary Networks (TAN)
50	Development of software tool for multi-and hyperspectral data processing of earth science data for integration of spatio-spectral information for mineral identification and mapping using SVM and Graph-cut based method (TIM)
51	Energy efficient & wide-range 15Mb/s-1.5Gb/s SERDES
52	Modelling of Water Quality Parameters for Coastal and Inland Water Bodies using Data from Multispectral and Hyperspectral Imaging Systems
53	Physico-chemical conditions of formation of bole beds within Deccan basalt for Martian analogue

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54	Development of image quality improvement algorithms for satellite imagery/ radiometric data
55	Development and Evaluation of Multiscale CNT/polymer composites
56	Effects of simulated microgravity on expression profile of micro RNA in human cardiomyocytes
57	Relation between atmospheric aerosols and plant productivity: A missing link between agricultural production and pathogenic bio aerosols
58	Design and develop an India's most advanced carbon fibre 3D printable printer
59	Ontology enabled disaster management web service using data integration
60	A flood warning system for entire India-optimal utilization for satellite based data and development of a computationally efficient flood inundation model
61	Modelling and validation of evapotranspiration from India Space borne thermal sensors
62	Modelling and Mapping of Supraglacial Debris Cover Thickness using UAS and Satellite Remote Sensing Data in selected Glaciers of Western Himalayas
63	Development of Reconfigurable Flat-Panel Metasurface Antenna
64	Comprehensive Simulation Engine for Type-II Superlattice based Barrier Infrared Photodetectors
65	Satellite Image Super-Resolution Using Deep Neural Networks
66	Development of Nano-polishing technology for metal mirror
67	Data driven modeling of morphology and formation of impact craters in Basalt: A case study of Lonar
68	Radiation Tolerant All Digital Wide-Tuning Range Fractional-N Phase-Locked Loop (PLL)
69	Design and Implementation of Fault Attack Resilient Encryption for Secure Communication (FRS)
70	Design and Development of Substrate Integrated Waveguide (SIW) based Bandpass Filters
71	Polarimetric synthetic Aperture radar (SAR) data analysis for Earth Observation (EO) applications