

Inaugural Session: 20th November, 2023 (Monday)



सैक वार्षिक प्रायोजित अनुसंधान समीक्षा **SAC Annual Sponsored reseArch Review** (सैक-असर /SAC-ASAR) 20 - 24 नवंबर, 2023

अंतरिक्ष उपयोग केंद्र (अं उ कें), अहमदाबाद **Space Applications Centre (SAC), Ahmedabad**

Welcome Address by
Dr. D.R. Rajak,
GD RTMG, SAC



Dr. D. Ram Rajak
Group Director RTMG/ISRA

Invited Talk on
'Research Areas of SAC'
by
Shri. A N Bhattacharya,
AD (R&D), SAC



SHRI A N BHATTACHARYA

Inaugural Address with Invited Talk on
'Current Advanced R&D at SAC and Vision in Changed Space era' by
Dr. Nilesh M Desai, Director, SAC



DR. NILESH DESAI
Director, SAC

Keynote Address by
Dr. Sudheer Kumar,
Director CBPO, ISRO HQ



Dr. Sudheer Kumar
Director CBPO, ISRO HQ

Success stories : Sponsored Research @ SAC



SFP: Shri Akhilesh Sharma

Overview of Sponsored Research @ SAC by Dr. Abha Chhabra, RESPOND Coordinator, SAC



DR. ABHA CHHABRA
RESPOND Coordinator, SAC

Vote of thanks by
Smt. Ankita Patel,
Scientific Officer
RRMD, SAC



Smt. Ankita Patel
Scientific Officer
RRMD, SAC



Inaugural Session Programme Schedule: 20th November, 2023 (Monday)



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अंतरिक्ष उपयोग केंद्र (अं उ कें), अहमदाबाद
Space Applications Centre (SAC), Ahmedabad



Inaugural session

November 20, 2023 (Monday) (Time: 10:30 – 12:30 hrs.)

10:30 - 10:40	Welcome Address and Opening Remarks	: Dr. D Ram Rajak, Group Director RTMG, SAC
10:40 - 10:50	An Overview of Sponsored Research at SAC	: Dr. Abha Chhabra, RESPOND Coordinator, SAC
10:50 - 11:05	Success stories : Sponsored Research at SAC	: Academia
11:05 - 11:20	Keynote Address	: Dr. Sudheer Kumar, Director CBPO, ISRO HQ
11:20 - 11:45	Invited Talk on ‘Research Areas of SAC’	: Shri. A N Bhattacharya, Associate Director (R&D), SAC
11:45 - 12:25	Inaugural Address with Invited Talk on ‘Current Advanced R&D at SAC and Vision in Changed Space era’	: Dr. Nilesh M Desai, Director, SAC
12:25 - 12:30	Vote of thanks	: Smt. Ankita Patel, Scientific Officer RRMD, SAC

Web Group Photo

रिसपांड एवं अनुसंधान प्रबंधन प्रभाग

RESPOND and Research Management Division

अनुसंधान, बाह्यसंपर्क एवं प्रशिक्षण समन्वय समूह

Research, Outreach and Training Management Group

प्रबंधन एवं सूचना प्रणाली क्षेत्र/ Management and Information Systems Area



सैक वार्षिक प्रायोजित अनुसंधान समीक्षा **SAC Annual Sponsored reseArch Review** (सैक-असर /SAC-ASAR)



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An Overview of Sponsored Research at SAC by Dr. Abha Chhabra, RESPOND Coordinator, SAC



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SAC Annual Sponsored reseArch Review - 2023
(SAC-ASAR/ सैक-असर) 2023

Projects Status Reports
20th to 24th November 2023

THANKS TO THE ACADEMIC SPONSORS
RESPOND and Research Management Division
Jodhpur, Rajasthan for offering various R&D
Research, Outreach and Training Management Group
Various IISc, IITs, IIMs, IIT Bombay, IIT Madras,
Management and Information Systems Area
Jodhpur Institute of Engg. & Tech. Jodhpur,
Space Applications Centre, ISRO, Ahmedabad

Recent Documents of Sponsored Research at SAC




Success Stories: ‘Sponsored Research at SAC’



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RESPOND Project ‘Predicting Reliability and Optimal Release Time of various categories Software Systems’



**Shri Akhilesh Sharma, SRA
SAC Focal Person**

PI: Prof. Subhashis Chatterjee, IIIT (ISM) Dhanbad



Success Story : Sponsored Research @ SAC
SAC-ASAR-2023

PREDICTING RELIABILITY AND OPTIMAL RELEASE TIME OF VARIOUS CATEGORIES SOFTWARE SYSTEMS

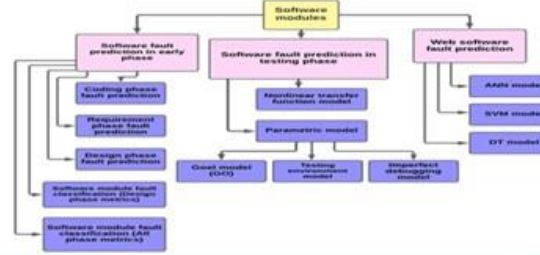
Project ID:	PI & team, (including Research fellow details):	Academia/ Institute:	SAC Focal Person:
OGP175	Prof. Subhashis Chatterjee Deepjyoti Saha	IIIT(ISM) Dhanbad	Akhilesh Sharma

Salient Features of the Project including programme linkage:

- Two parametric models and one transfer function model have been developed in this project for the fault prediction during testing phase. Release time analysis has also been carried out here based on the proposed model.
- Machine learning-based software reliability model has also been developed for fault prediction during early phase of software development.
- A software has been developed based on the different proposed models and delivered to SAC ISRO.

Project Outcome

Product development: The architecture of the software developed and delivered to SAC



Project Outcome

Fig. Two clips of developed software



सैक-असर / SAC-ASAR 2023

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Space Technology Cell (STC) Project 'Development of Reconfigurable Flat-Panel Metasurface Antenna'



Dr. Milind Mahajan and Shri Pratik Mevada, ASA
SAC Co-PIs

PI: Prof. Deepak Gupta, IIT Kanpur
Co-PI: Dr. Ashutosh Tripathy, IITK presented

Success Story | Sponsored Research @ SAC

Development of Reconfigurable Flat-Panel MSA

Avenues : Space Technology Cell (STC)

Project ID: STC 0271	IITK PI and Co-PI: Prof. Deepak Gupta, Dr. Ashutosh Kumar Tripathy	Institution: IIT Kanpur	SAC contact scientists: Dr. Milind Mahajan, Mr. Pratik Mevada
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Salient Features of the Project:

- Concept → Design → Fabrication → Integration → Testing and Demonstration
- Regular interactions between SAC and IITK teams

Success Story | Sponsored Research @ SAC

Liquid Crystal Cell Fabrication

Developed LC cell making process on 100mmx100mm substrates

Switching voltages < 10V achieved

Success Story | Sponsored Research @ SAC

TFT Backplane Technology

Backplane design and fabrication

Mask design and writing for 6 layers lithography

TFT backplanes for MSA with device yield > 80% fabricated

Success Story | Sponsored Research @ SAC

MSA Integration and RF Probing

Designed Planar MSA

Measured near RF Probing

Measured S₁₁ and S₂₁ for various V_g and V_d

Configuring Planar chip for various V_g and V_d

"The RF probing of planar MSA has shown amplitude variation of ~10dB and phase variation of ~75° with V_g varying from 0V to 20V and V_d varying from 0V to 15V.

Success Story | Sponsored Research @ SAC

Reconfigurable Planar MSA

Measured Measurement of Planar MSA

Measured Measured S₁₁ and S₂₁

Measured Measured S₁₁ and S₂₁

Reconfigurability of the radiation pattern has been established



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Space Technology Incubation Centre (S-TIC) Project 'Design and Development of X Band and Ka Band Passive Devices'

PI: Dr. R. Pandeeswari, NIT Trichy



Success Story : Sponsored Research at SAC

Design and Development of X Band and Ka Band Passive Devices

Academia	Space Technology Incubation Centre (S-TIC)
Project ID:	PI & team :
DSRO-CRPO:	Dr. R. Pandeeswari, Principal Investigator
S:	Dr. S. Dandekar, Co-PI
TTC_MCS:	Dr. G. Thirumala Rao, Co-PI
	Dr. S. K. Karthikeyan, Co-PI
	Mr. A. Ravi Varma, JRF
	Mr. M. Venkata Reddy, SRF
Academia	SAC Co-PI(s)/ Institute:
	SAC Mentor(s):
	Prof. Harshita Tolani, DSRO Mentor
	NIT Tamilchennai
	Shri Sankar Kumar Garg/DSRO Mentor

Salient Features of the Project including programme linkage:

- Most important microwave components - Matched Termination,
- Applicable in Microwave setup in academic institutions, satellite uplink and Microwave Remote Sensing Applications
- C-Type Feed through filters can be used in FMI rejection



Key to Success



RESPOND Coordinator & Project mentor handed over the deliverables to Director, SAC



Smt. Harshita Tolani and Shri SK Garg, MRSA
SAC mentors





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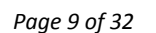
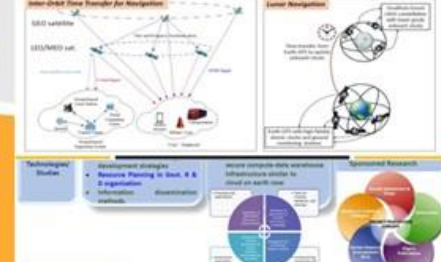
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Keynote Address by Dr. N. Sudheer Kumar, Director CBPO, ISRO HQ



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Research Areas





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ISRO and India's Space Vision : Pioneers



"If we are to play a meaningful role nationally, and in the comity of nations, we must be second to none in the application of advanced technologies to the real problems of man and society." - Dr. Vikram Sarabhai

Space Applications Centre (SAC), ISRO, Ahmedabad



Celebrating 50 Years
SAC Main Campus (30 acres)
Tech Complex, MHP&C
New Board Campus
Board Technical Campus
Satellite Earth Station
Wireless Satellite Space Exhibition (WSSSE)

ISRO's Space History



VISION TO REALITY
53
197 MISSIONS
40 Launch Missions
67 Satellite Missions
155 Foreign Satellites
145 Indian Satellites
Orbitation & Mission Team

Navigation on Moon: Lunar PNT



First ever lunar PNT interoperability demonstration could take place in 2028 (under joint agreement by ISRO, JAXA, ESA and NASA)
Source: Courtesy: ISRO Presentation at KSC-17, Oct. 2023

Indian Human Spaceflight Programme GAGANYAAN



GAGANYAAN
Human Spaceflight
Orbital Module Mass: 7 tonne
Human Rated Launch Vehicle

Gaganyaan TV-01 Mission : Crew Module Recovery



GAGANYAAN
Crew Module Recovery
Orbital Module Mass: 7 tonne





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Vote of thanks by Smt. Ankita Patel, Scientific Officer RRMD, SAC





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Web Group Photo





Day 1 – November 20, 2023 (Monday)
Session-01: Human Spaceflight and Advanced Technology
Chair: Shri D K Singh, DD HSTA



Day 2 - November 21, 2023 (Tuesday)
Session-02: RS-Data Products & Image Processing
Chair: Shri Debajyoti Dhar, DD SIPA



Session-03 A: EO Applications & Planetary Sciences

Chair: Dr. Rashmi Sharma, DD EPSA



Session-03 B: EO Applications & Planetary Sciences

Chair: Dr. Rashmi Sharma, DD EPSA



Day 3 - November 22, 2023 (Wednesday)

Session-04: Microwave Technology

Chair: Dr. Ch. V. Narasimha Rao, DD MRSA



Session-05: Antenna Systems

Chair: Dr. Milind B. Mahajan, DD ASA



Session-06: Mechanical Systems

Chair: Shri Ashwin S. Patel, DD MESA



Session-07: Reliability Testing

Chair: Ms. Shilpa Pandya, GD EQAG-SRA



Day 4 - November 23, 2023 (Thursday)

Session-08: Electro-Optic Technology

Chair: Shri Somya S. Sarkar, DD SEDA



Session-09: Cyber Services and Information Technology

Chair: Shri Rajesh Khandelwal, DD CITA



Session-10: Management Systems

Chair: Shri Vivek Singh, DD MISA



SPACE APPLICATIONS CENTRE AHMEDABAD

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अंतरिक्ष उपयोग केंद्र (अं उ कें), अहमदाबाद
Space Applications Centre (SAC), Ahmedabad

Avenues:

Project ID: YS/PD-18/2021/408

PI & team, (including Research fellow details):

Dr. Narendra Kumar (PI)
 Dr. Vishal Francis (Co PI)
 Dr. Mohammad Taufiq (Co PI)
 Dr. Ravi Pratap Singh (Co PI)

Academia/ Institute:

Dr. B. R. Ambedkar NIT
 Gandhinagar
 MAHATM BANGALU
 SPU Gandhinagar

SAC Mentor(s):

Shri Anag Kumar
 Head, P&S Information
 Division EF&A/RESA
 SAC, Ahmedabad

Project Status (Choose appropriate): Approved

Start Date: 24/12/2022

Proposed/ Actual Completion Date: 24/12/2024

Duration: 3 years

Total Approved Budget (INR): 18,88,500

Total Research Budget (INR): 18,88,500

Salient Features of the Project including actual/potential utilization and absorption of project deliverables in ISRO Programmes:

PCB manufacturing in a quick time
 Multi-material 3D Printing

Technical details of Research work carried out during last year

Flow of the work:

Phase 1: Building a Knowledge Base

Phase 2: Generating Response in natural language

Session-11: Satcom & Satnav Technology

Chair: Shri Sumitesh Sarkar, DD SNPA



Session-12: Satcom & Satnav Applications

Chair: Dr. K. K. Sood, DD SSAA



Day 5 - November 24, 2023 (Friday)

Session-13: Electronic Systems

Chair: Shri Jaimin Desai, DD ESSA



Remarks by Session Chairs / Review Committee members during 20th to 24th November 2023



Concluding Session: 24th November 2023



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Concluding Session : 24 November, 2023





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Concluding Session : 24 November, 2023



Remarks by Session Chairs /Review committee members

Left to Right → Shri D K Singh, Shri Debajyoti Dhar, Dr. A.K. Varma, Dr. Ch. V Narasimha Rao, Dr. V.K. Singh, Shri A.S.Patel, Shri Somya S Sarkar, Shri R.K. Khandelwal, Shri Vivek Singh, Dr. K K Sood, Shri Jaimin Desai, Dr. M. Senthil Kumar and Shri Arup Kumar Hait



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Concluding Session : 24 November, 2023



Remarks by Shri A.N. Bhattacharya,
Associate Director (R&D) SAC

Concluding Remarks by
Shri N M Desai, Director SAC



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