

Hello!

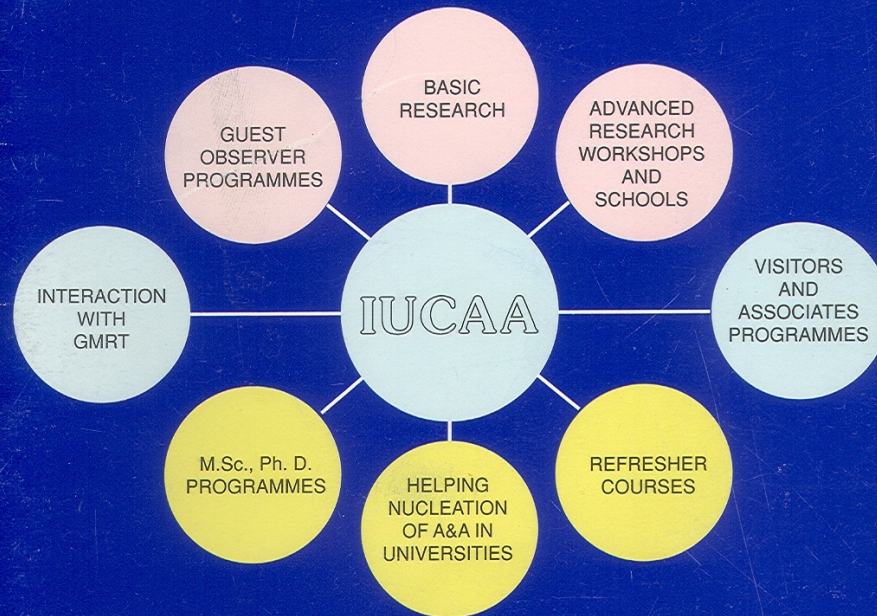
Inter-University Centre for Astronomy and Astrophysics



The IUCAA Story

Set up on December 29, 1988
An autonomous institution under the
University Grants Commission

INTER-UNIVERSITY CENTRE FOR ASTRONOMY AND ASTROPHYSICS



Project Report
July 1988



*1989
Goley Bunglow,
Pune University*

1989
The Lay of the Land



1989, Aditi





1992, Bhaskara



1992, Inauguration



1992, Inauguration

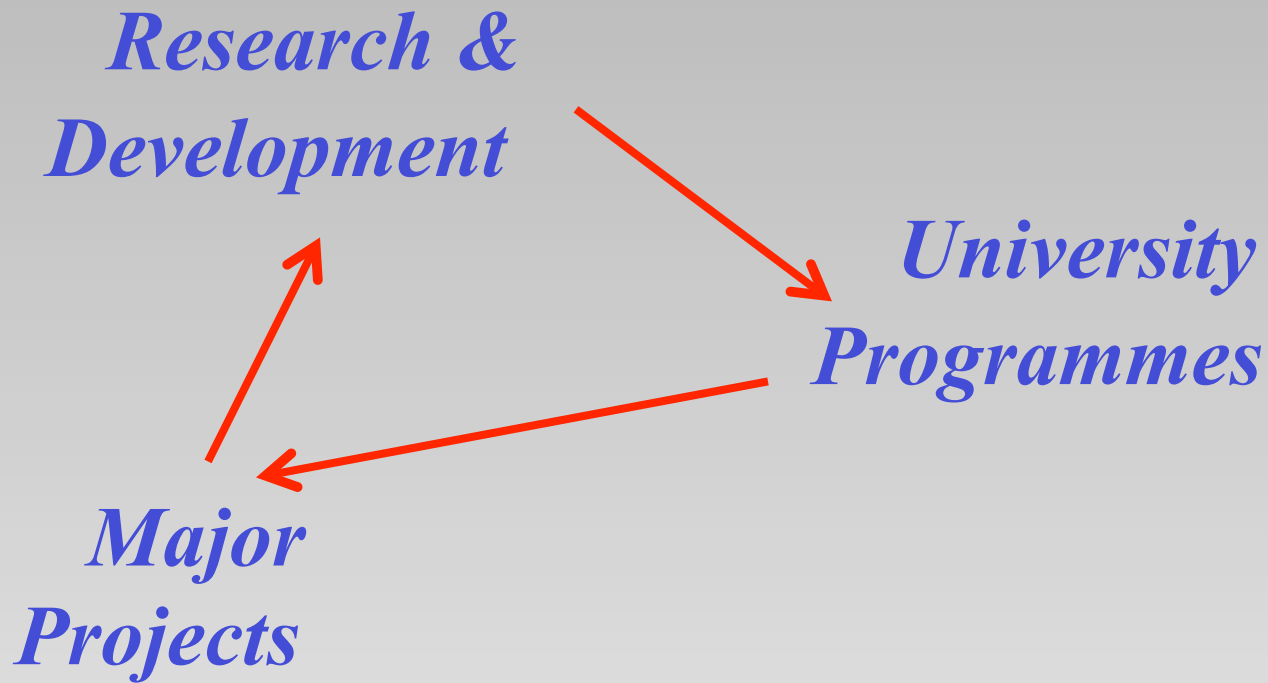
Activities at IUCAA

*Research &
Development*

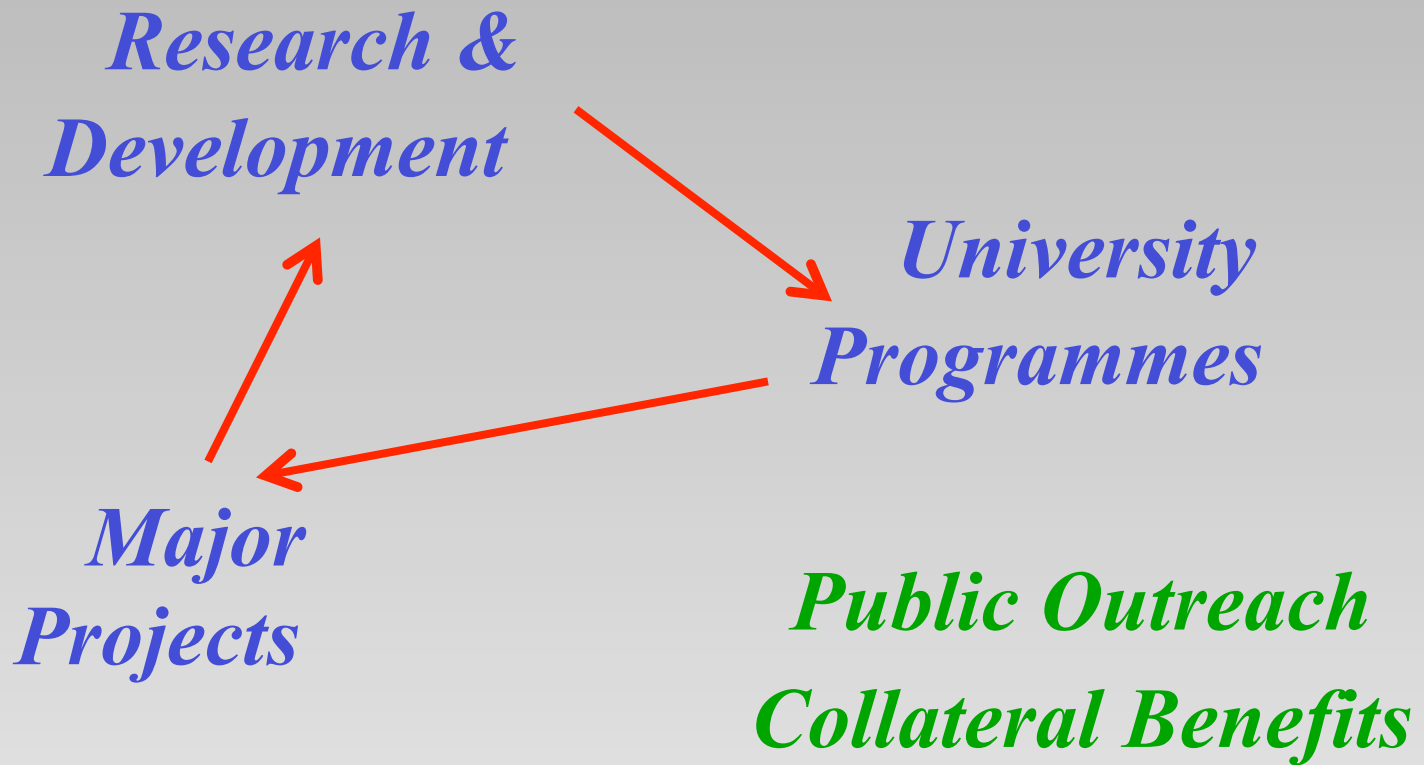
*University
Programmes*

*Major
Projects*

Activities at IUCAA



Activities at IUCAA



- Excellent faculty, students, postdoctoral fellows
- Vibrant visitors programme, visiting associates, visiting students
- State-of-the-art library, computing facilities, instrumentation laboratory
- Astronomical data centre, Virtual Observatory
- Observing facilities, IGO, SALT,...
- IUCAA Resource Centres
- Science centre for school students

IUCAA Faculty

Wide range of interests in
theory, observation and instrumentation

Faculty engaged in

Research and Development,
Bilateral International programmes
Teaching and Supervision,
Workshops and Meetings,
University Activities, Shared Students



IUCAA Faculty

Wide range of interests in
theory, observation and instrumentation

Faculty Members 16 + 1

Emeritus Professors 3

Visiting Professors 3

Bilateral international programmes

Teaching and Supervision,

Workshops and Meetings,

University Activities, Shared Students



Research Scholars and Post Doctoral Fellows

Present number of research scholars ~28

Present number of postdoctoral fellows ~15

Research Scholars and Post Doctoral Fellows

Research scholars from IUCAA go as postdoctoral fellows to the best places in the world, including Cambridge, Oxford, Princeton, Caltech, MIT, SISSA, SAAO....

scholars ~28

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Research Scholars and Post Doctoral Fellows

Present number of research scholars ~28

Present number of postdoctoral fellows ~15

Research scholars and postdoctoral fellows from IUCAA have found faculty positions in the best universities and institutions in India and abroad, including Professorships and senior positions in Cardiff, Texas, Washington State and Caltech.

Facilities

Computer Centre

Computing Facilities

Communications, ISP

Technology Demonstrations

Consultancy,

Support to Universities



High Performance Computing & Data Centre

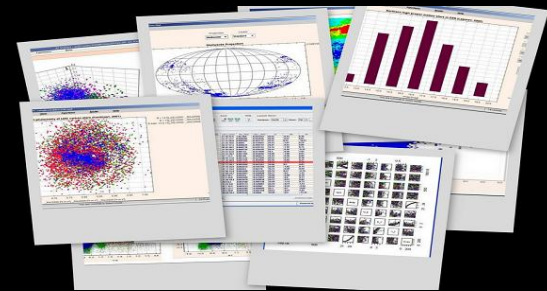


New HPC

Virtual Observatory - India

Industry-Institutional
Partnership

- Visualization Tools
- Statistical Tools
- GMRT, IGO Proposal Management Systems
- GMRT, IGO, SALT Data Archive Systems
- Data Archives, Mirrors

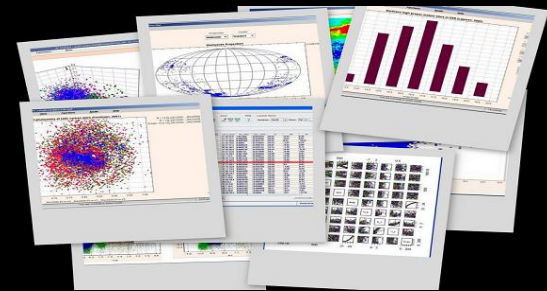


Virtual Observatory - India



Industry-Institutional
Partnership

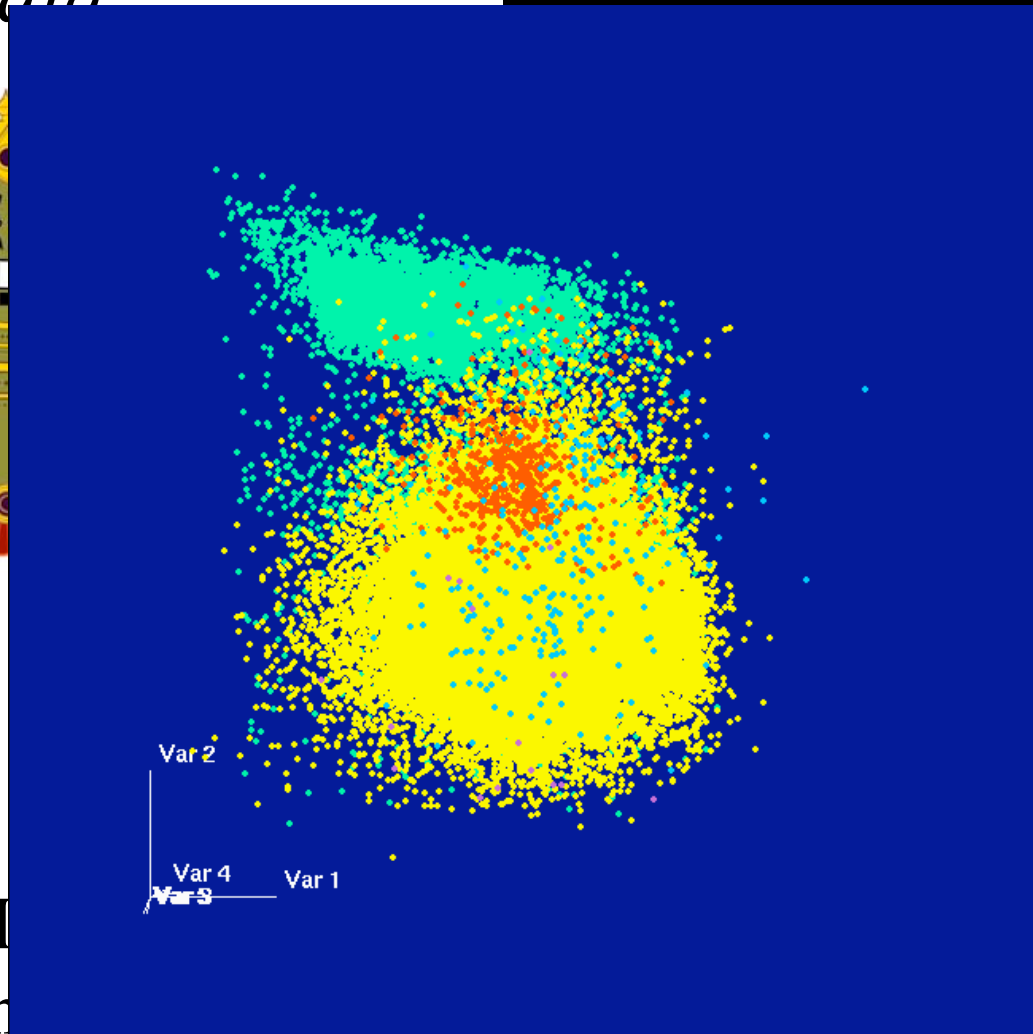
- Visualization Tools
- Statistical Tools
- GMRT, IGO Proposal Management Systems
- GMRT, IGO, SALT Data Archive Systems
- Data Archives, Mirrors



Virtual Observatory - India



Industry-
Partn



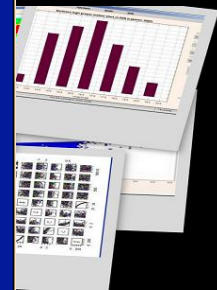
- Visualization Tools

ols

Proposal
Systems

SALT Data
ems

s, Mirrors



Instrumentation Laboratory

Installation and Commissioning of the
2m Telescope

Maintenance of the 2m and IGO

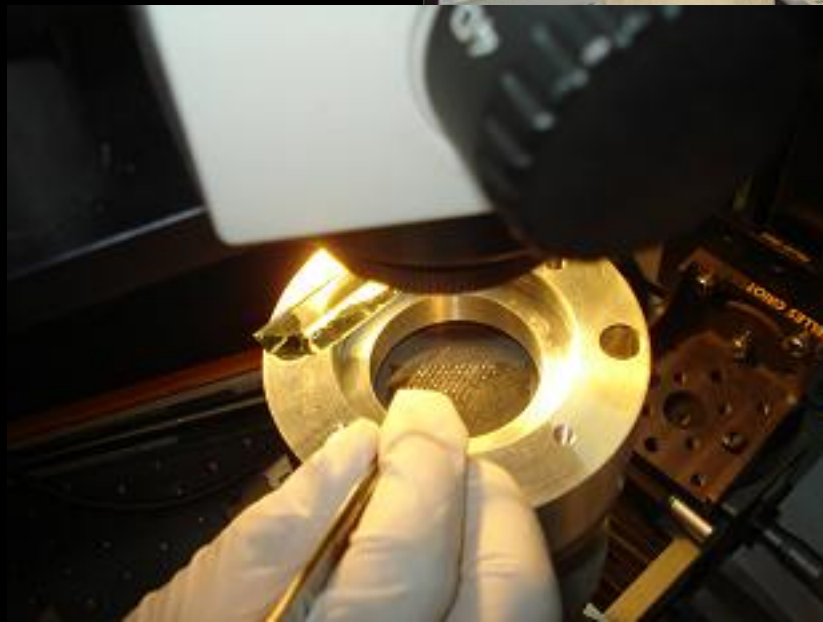
Design and Development of IFOSC

Development of CCD Control System

Design and Development of Near-IR Imager

Adaptive Optics, RSS-NIR Controller

PTF, iPTF, PTF2



IUCAA Giravali Observatory 2m optical and near-ir telescope



IUCAA Giravali Observatory 2m optical and near-ir telescope

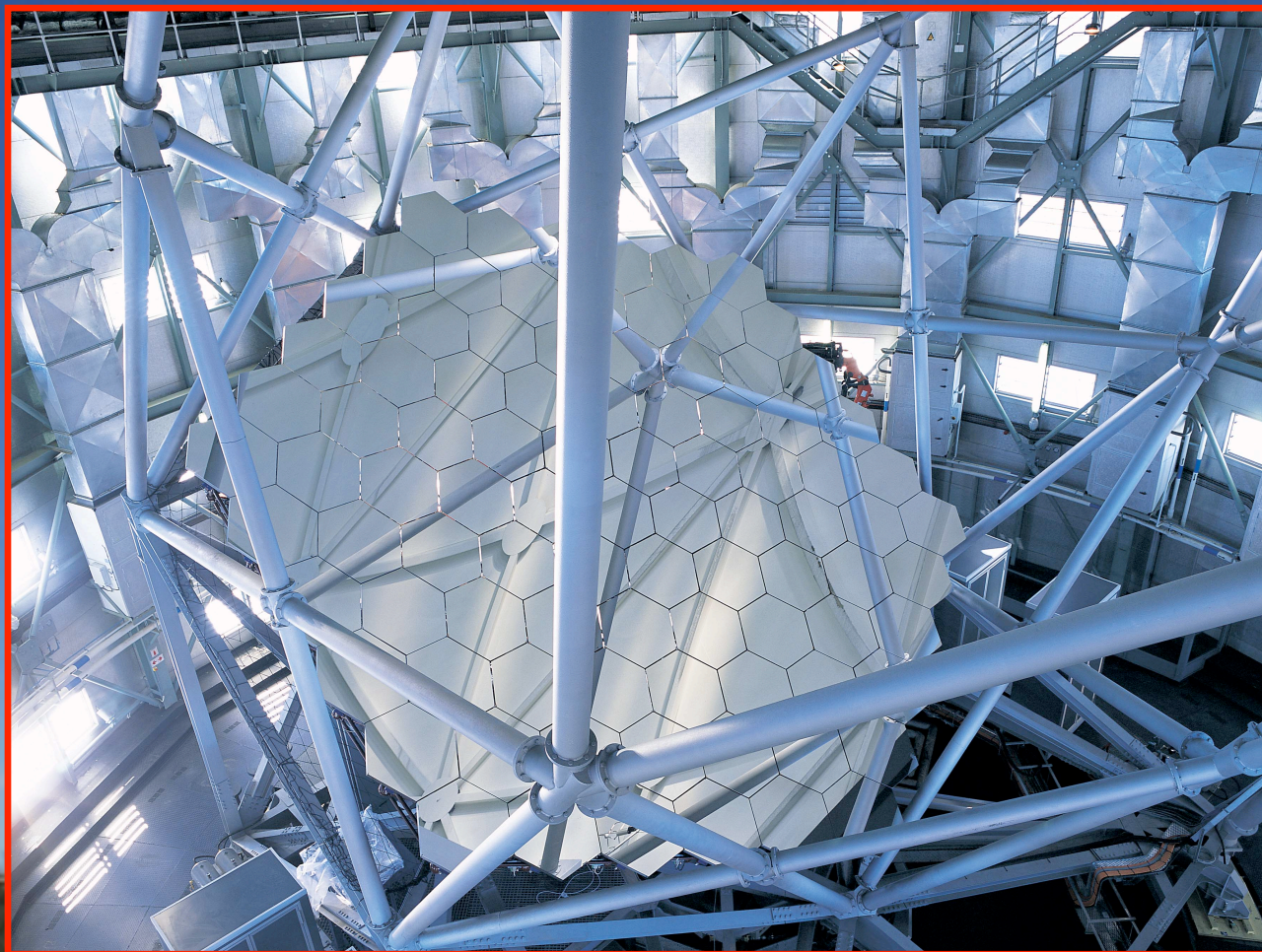


Southern African Large Telescope

July 21, 2007



Southern African Large Telescope



The ASTROSAT Mission

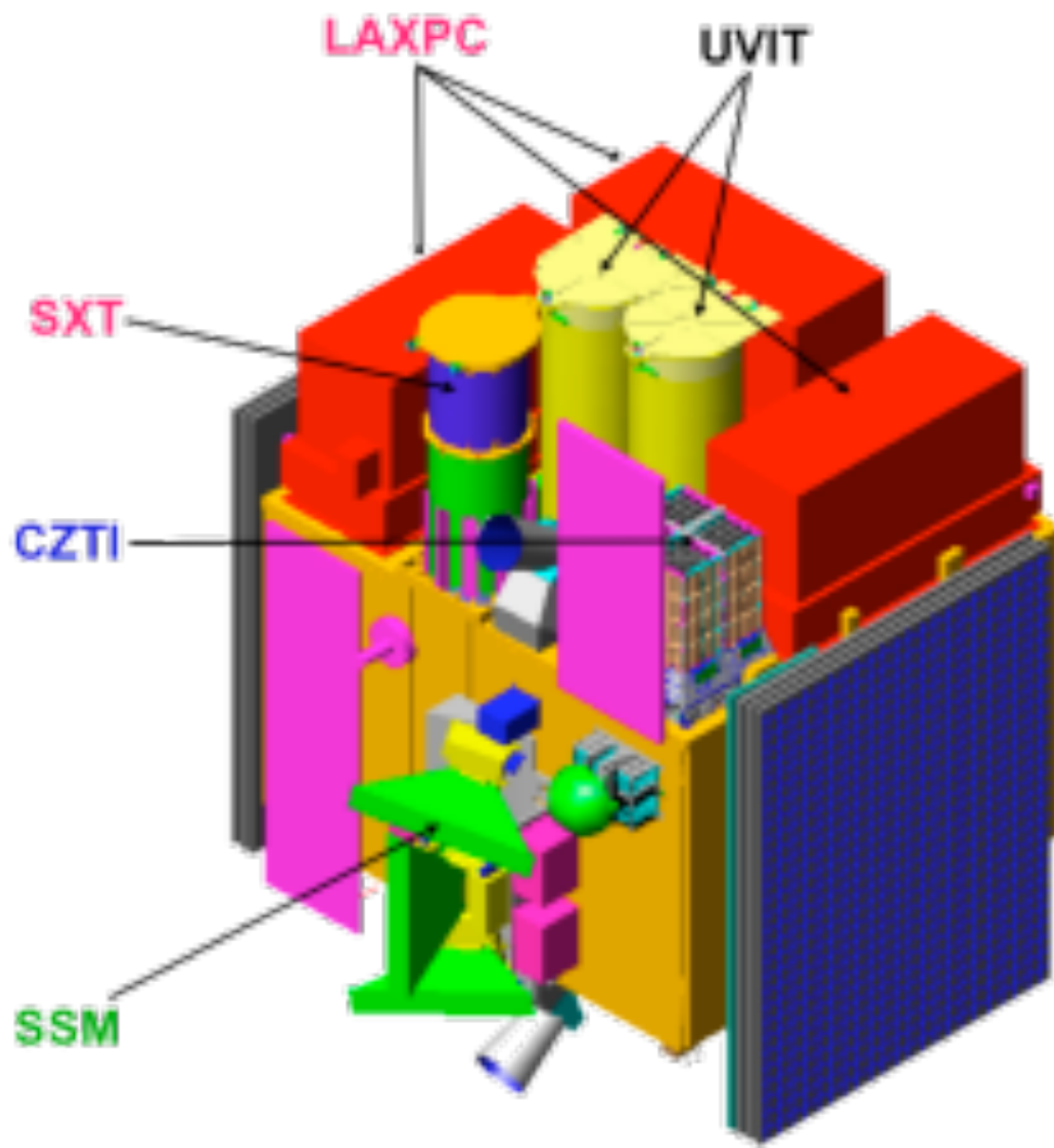
Fabrication of the UVIT Instrument in
Collaboration With IIA, Bangalore

Software Development for Data Pipelines for
Various Instruments

Proposal Management System

Creation of ASTROSAT Data Archives and
Analysis Facility at IUCAA

ASTROSAT



ASTROSAT Science Goals

- Simultaneous multi-wavelength monitoring of intensity variations in a broad range of cosmic sources
- Monitoring the X-ray sky for new transients
- Sky surveys in the hard X-ray and UV bands
- Broadband spectroscopic studies of X-ray binaries, AGN, SNRs, clusters of galaxies and stellar coronae
- Studies of periodic and non-periodic variability of X-ray sources

	UVIT/OPT	SXT	LAXPC	CZTI	SSM
Detector	UV: photon counting CCD Opt: CCD photometer	X-ray CCD (at the focal plane)	Proportional Counter	CdZnTe detector array	Position-sensitive proportional counter
Imaging property	imaging	imaging	non-imaging	imaging (< 100 keV)	imaging
Optics	Twin Ritchey-Chretien 2 mirror system	Conical foil (~Wolter-I) mirrors	Collimator	2-D coded mask	1-D coded mask
Bandwidth	130-320 nm	0.3-8 keV	3-100 keV	10-150 keV	2-10 keV
Geometric Area (cm²)	1250	250	10800	1000	180
Effective Area (cm²)	60 (depends on filter)	125@0.5 keV 200@1-2 keV 25@6 keV	6000@5-30 keV	500 (<100 keV) 1000 (>100 keV)	~40@2 keV 90@5 keV (Xe gas)
Field of View	0.50° dia	0.35° (FWHM)	1° x 1°	6° x 6° (< 100 keV) 17° x 17° (> 100 keV)	
Energy Resolution	<100 nm (depends on filter)	2%@6 keV	9%@22 keV	5%@10 keV	19%@6 keV
Angular Resolution	1.8 arcsec	3-4 arcmin (HPD)	1-5 arcmin in scan mode only	8 arcmin	~10 arcmin
Time resolution	10 ms	2.6s, 0.3s, 1ms	10 microsec	1 ms	1 ms
Typical obs. time per target	30 min	0.5 - 1 day	1 - 2 days	2 days	5 min
Sensitivity (Obs. Time)	21 st magnitude (5 σ) (1800s)	10 microCrab (5 σ) (10000s)	0.1 milliCrab (3 σ) (1000s)	0.5 milliCrab (3 σ) (1000s)	~30 milliCrab (3 σ) (300s)

Mega-Projects

Thirty Metre Telescope



Indian Institute of Astrophysics
Aryabhata Research Institute
IUCAA



Advanced LIGO - India

Advanced LIGO - India



LIGO - Hanford

Advanced LIGO - India



LIGO - Hanford

Advanced LIGO - India



The Planning Commission of India has recommended the project.

The Atomic Energy Commission has considered it favourably, and will be preparing a Cabinet Note.

The US National Science Board has permitted the US National Science Foundation to approve the project.

LIGO - Hanford

Advanced LIGO - India



Institute of Plasma Research - Vacuum
Raja Ramanna Centre for Advanced
Technology - Laser and detector installation
IUCAA – Site survey and acquisition, science
lead, data centre, human resources
development

LIGO - Hanford

Inter-University Activities

Inter-University Activities

- **Vibrant Visitors Programme**
- Serves faculty and students with interests in astronomy, astrophysics and related areas
- Meant principally for faculty and students from Indian Universities and Colleges
- The programme also serves people from other countries
- **About 100 Visiting Associates**

Types of Visitors

- IUCAA Associates + Students
- Other Visitors:
 - From Universities and Colleges
 - From Institutes
 - From Abroad

Senior Visitors ~ 400/yr, Students ~150/yr

IUCAA Visiting Associates

Number of Associates ~100

Work spans a wide range including theoretical, observational and instrument related research.

Associates often work with IUCAA faculty or other associates, and involve their students in the work.

Several Associates use telescopes in India and abroad for their observational programmes.

Visiting Associates

Current Associates 98

82, 78, 70, 69, 76, 85

Number of Visits: ~80

Duration: 2 to 6 weeks

Number of Papers in International Journals: 131+9

Number of Students of Associates: ~ 25

Associates Fest 2012

University Students and Young Faculty

A number of University students work closely with IUCAA faculty as official or non-official co-guides. This is proving to be a very important scheme

Current Number of Students 16

A number of young college teachers too work with IUCAA faculty on various frontier topics in astronomy

University Students

University students who have used IUCAA
facilities ~1500

University students who have attended IUCAA
graduate school 21

University students who have PhD work partly
done in IUCAA 18

University Students

University students who have obtained postdoctoral fellowships in India and abroad, and faculty and research positions in good institutes and universities.

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JCAA

IUCAA

rk partly

Research Areas of Associates

Cosmology & structure formation

Cosmic Microwave Background

Stars & interstellar medium

GR and higher dimensional
Theories of gravity

Nonlinear dynamics

Mathematical Physics

Astrostatistics



Observational astronomy

Galaxies and Quasars

Radio astronomy

Compact objects & X-ray binaries

Solar system, comets

Classical & Quantum cosmology, brane worlds

Activities on University Campuses

Visits for Lecture

Workshops, Schools, Conference

Research Collaborations

M. Sc. Teaching

IUCAA resource Centres

INAAD

IUCAA Resource Centres

*Siliguri, Kolkatta, Raipur, Udaipur,
Delhi, Cochin*

New IUCAA Centres

College INAAD

Venkateshwra College, New Delhi

*Government College, Gangtok Newman
College, Thodupuzha*

University Centres

Calicut University

Tezpur University

S.R.T.M. University, Nanded

Meetings and Workshops

*Introductory level workshops at the IRC and at other
Colleges/Universities nearby, primarily using local
resources*

National and International Scientific Meetings

IUCAA Workshops 2011-12

TMT Science Meeting

Workshops on Galaxies in Absorption

2nd IUCAA X-ray Astronomy School

Transients and Timing: A Multi-Wavelength Approach

Workshop on LIGO Identity and Access Management

Workshop on LIGO Computing and the LIGO Data Grid

IUCAA Resource Centre Events

INAAD Workshop on Science With Optical Spectra
St. Thomas College, Kozhencherri, Kerala

Workshop on Advanced Data Analysis Techniques in
Astrophysics
University of Calicut, Kerala

Introductory Workshop on Virtual Observatories
Calcutta University

Workshop on Cosmology
University of Delhi

Events Outside IUCAA

Workshop on Cosmology
Bangalore University

IIST-IUCAA Introductory Workshop on Solar Physics
IIST Thiruvananthapuram, Kerala

Workshop on Gravitational Wave Data Analysis
BITS-Pilani, Goa

Radio Astronomy Winter School
NCRA, Pune

Workshop on Mathematical Methods and Astronomy
Indian School of Mines, Dhanbad

Academic Calendar 2012-2013





UGC Infonet Engine





UGC Infonet Engine



*Connectivity,
Access,
Education,
Research*

The Indian *Higher Educational System*

Universities	~310
Colleges	~16,500
Students	~11 million
Teachers	~800,000

The Indian *Higher Educational System*

Universities	~310
Colleges	~16,500
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Number of universities covered under the
INFONET ~170

Scalable Architecture which can grow from
Universities to Colleges

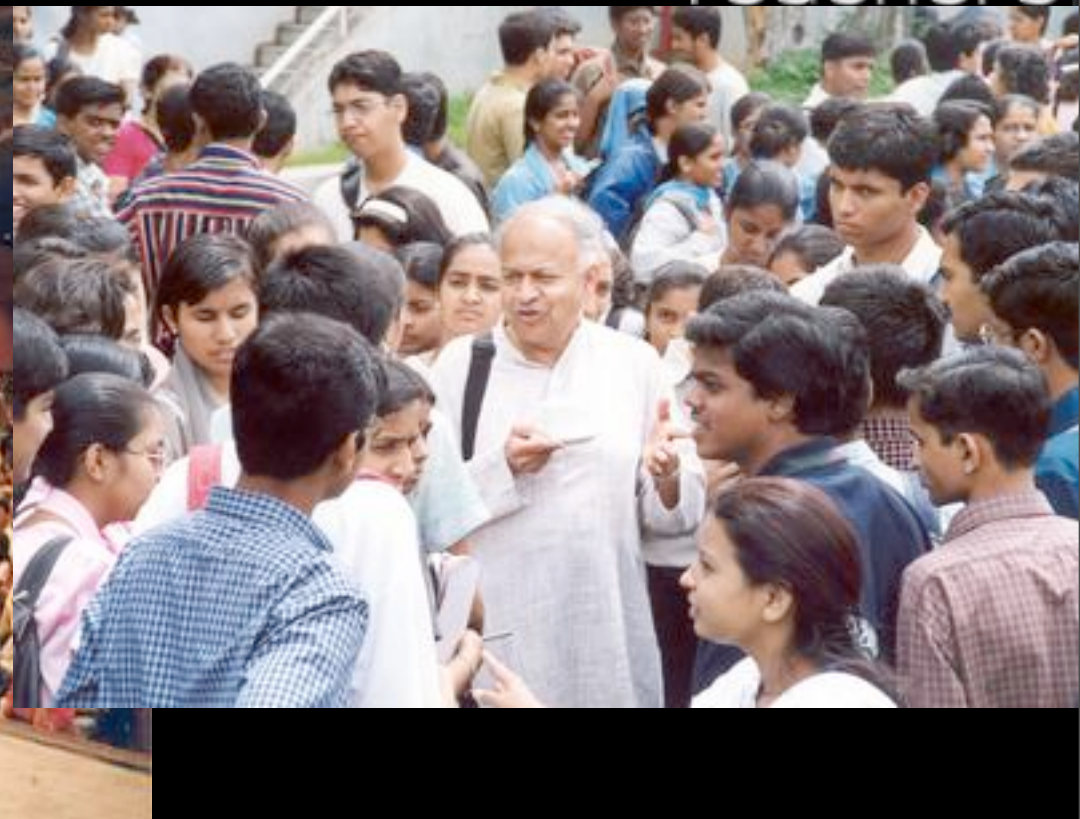
Public Outreach



Muktangan Vidyan Shodhika Science Centre



The cultivators of modern minds **Teachers**





The Summer Mini School in Astronomy

**Organized by the Department of Physics, Newman College, Thodupuzha
in collaboration with the IUCAA Resource Center, CUSAT, Kochi**

18-20 May, 2011

Elements of Cosmology

Prof. V.C.Kuriakose



Evolution of Stars

Dr.N.Shaji

Interesting phenomena in galaxy clusters

Dr.Joe Jacob



Live sky watch

SESSIONS

May 18, 2011

May 19, 2011



Astronomy-a bird's eye view

Dr. Ninan Sajeeth Philip



Web based astronomy &VO

Mr.Vivek.M & Ms.Bhavya



Astronomical Questions

Dr.K. Indulekha



Astronomical observatories

Mr.Vivek.M

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Astronomical observatories

Mr.Vivek.M



Galaxy Cannibalism Dr.C.D. Ravikumar

Galaxy Zoo & WWT Mr.Vivek. M Ms.Bhavya & Ms.Sheelu



Feedback & Evaluation



May 20, 2011



Live sky
watch



SDSS tools and Projects
Ms.Sheelu,Mr.Vivek,Ms.Bhavya

Elements of Cosmology-II
Prof. V.C.Kuriakose





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Feedback & Evaluation



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May 20, 2011



**Live sky
watch**



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Prof. V.C.Kuriakose

SDSS tools and Projects
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... Studies
... College, Thodupuzha
... SCIENTIST PROGRAMME, Sarva Shiksha Abhiyan, Idukki presents

AN EYE IN THE SKY



...NOMY POPULARIZATION PROGRAMME FOR CHILDREN

October 14-

...ing, Worksh...ool teachers, ...ie sh...



SCIENTIST DEPARTMENT College, The Sri



Other Inter-University Centres

Inter-University Accelerator Centre

DAE-UGC Consortium

INFLIBNET

Consortium for Educational Communication

National Accreditation and Assessment

All Inter-University Centres
are Funded by the UGC

Thank You!