

# Ashra Situation

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# Ashra Project Plan



2002

2003

2004

2005

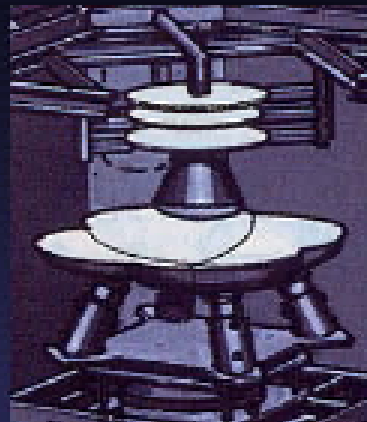
2006

2007

**phase 0**

**R&D**

**sub-telescope**

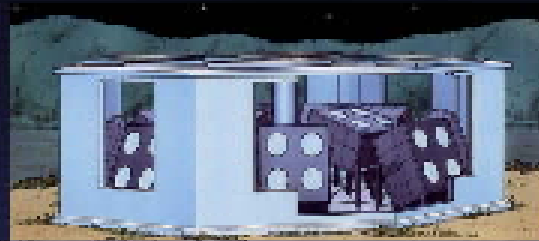


prototype in labo.

**phase 1**

**Pioneering**

**1 + 1/3 stations**



2 Mt.s on the Hawaii Is.

**phase 2**

**High Statistics**

**complete 3 stations**



3 Mt.s on the Hawaii Is.

# Prototypes

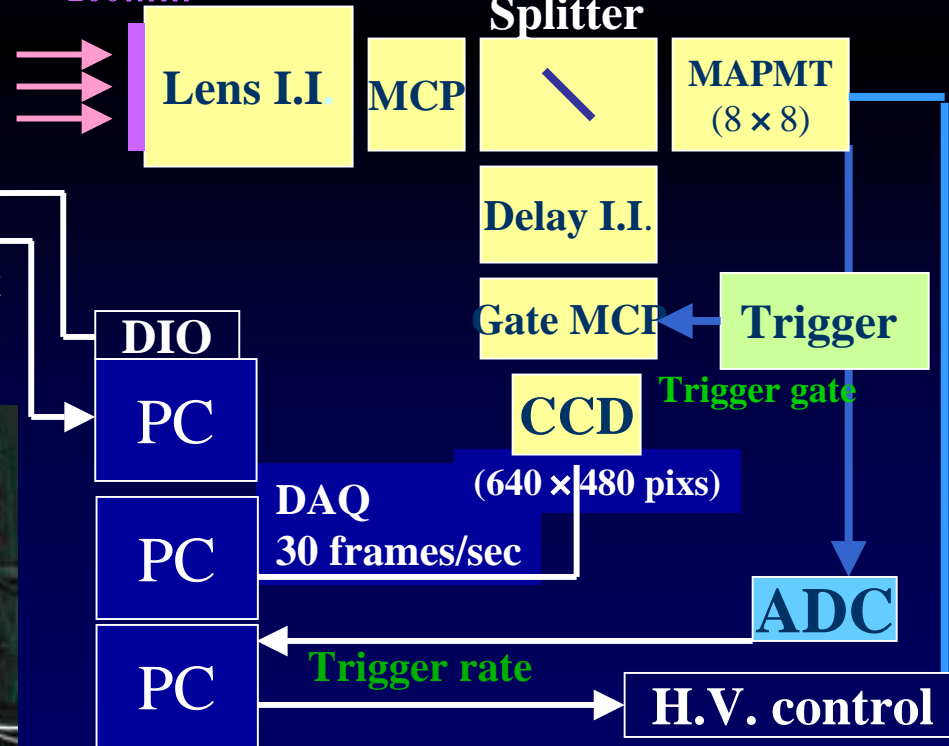
- Ashra-P0:
  - Old 3m -altazimuth + Image Pipeline
  - Test @ Akeno => TeV @ Haleakara
- Ashra-P2/3:
  - 2/3-scale Ashra Optics + 16in-Lens IIT
  - Test @ NAOJ => GRB Opt. Flash @ Haleakara
- Ashra-P1:
  - Real size Ashra Optics + 24in-Lens IIT
  - Construction => Ashra/NuTel @ MLO

# TeV Observation with Ashra-P0

3m -altazimuth telescope



100mm



Elec. crate Encoder, Servo-amp.

Feed-back control with RT-Linux

Electronics



near camera



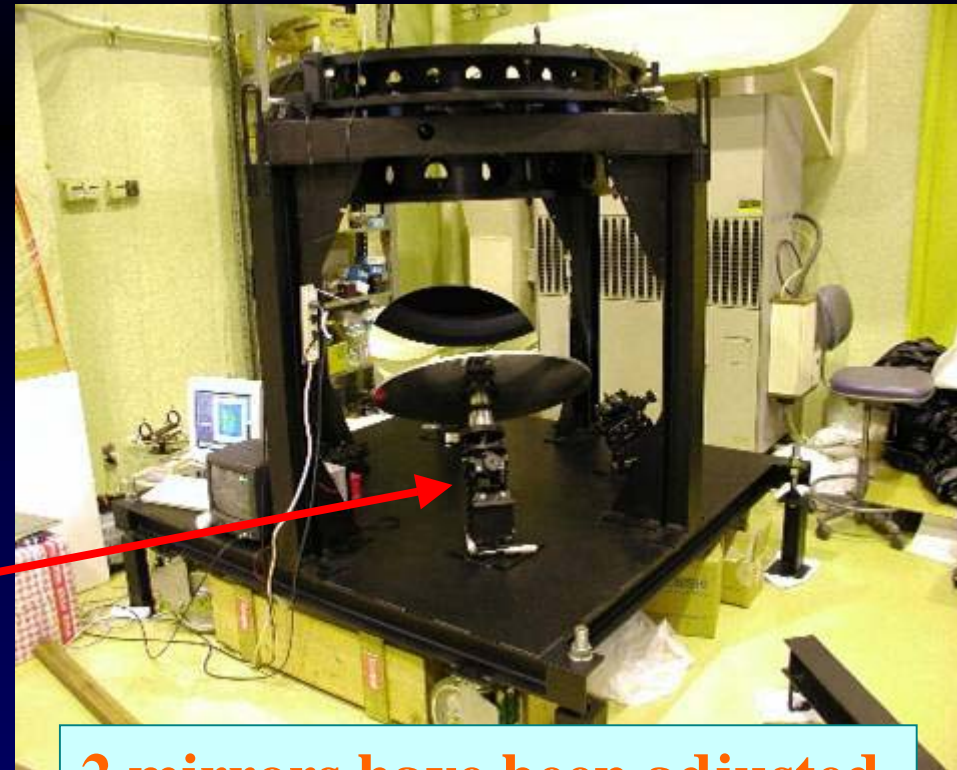
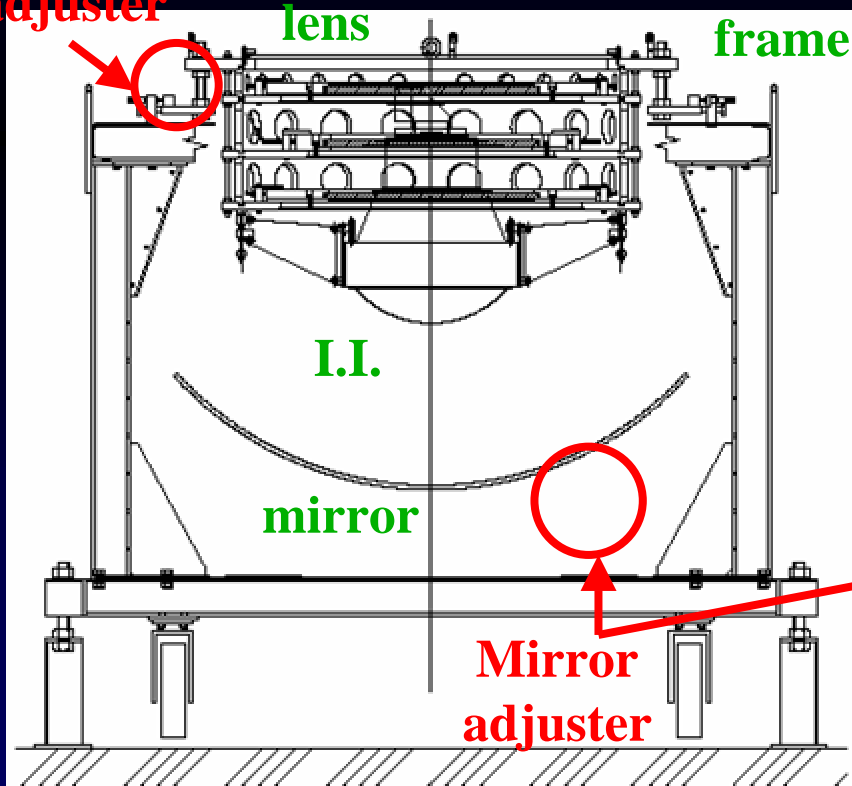
# Ashra-P2/3 @ NAOJ



## Integration test of optical system

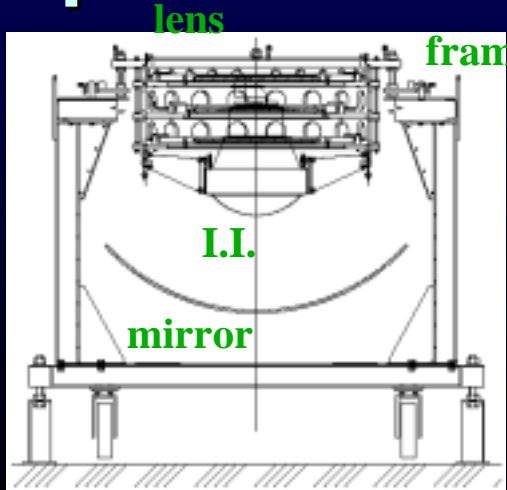
- Achieve 1 arcmin resolution
- Develop fabrication processes

Lens mount  
adjuster



2 mirrors have been adjusted.

# Ashra Prototype for GRB Opt. Flash Observation

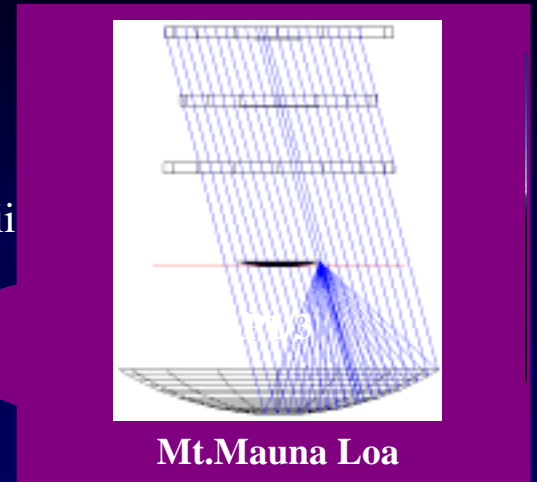
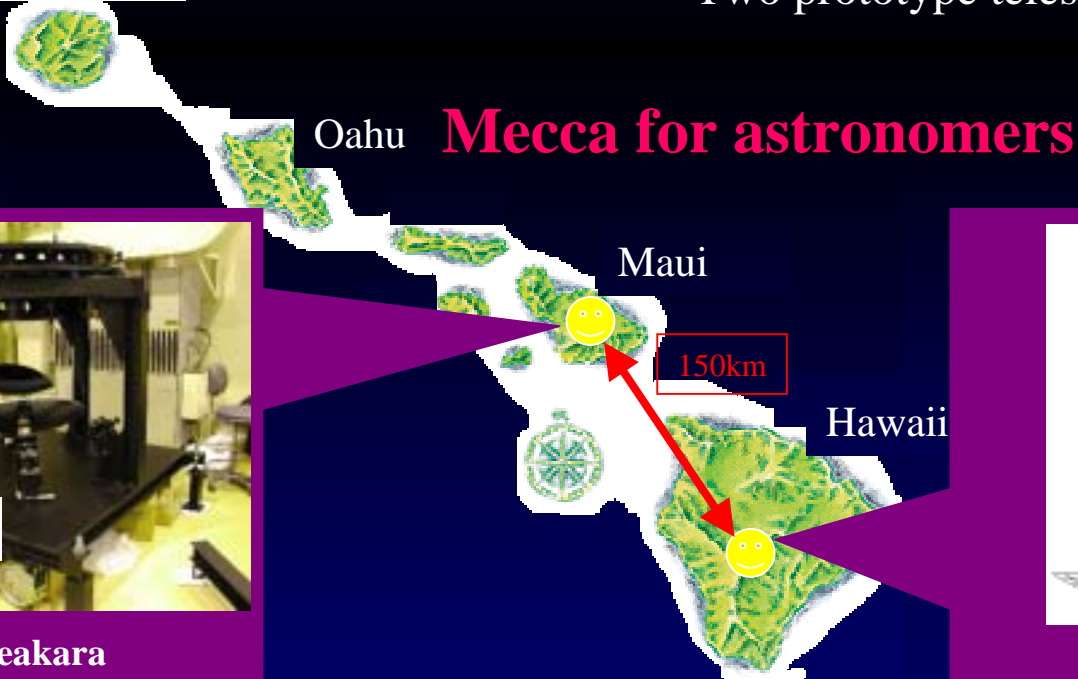


	Ashra-P1/3	Ashra-P2/3
F.O.V.	30 ° x 30 °	45 ° x 45 °
Aperture (mm)	340	600
Resolution	0.6	1

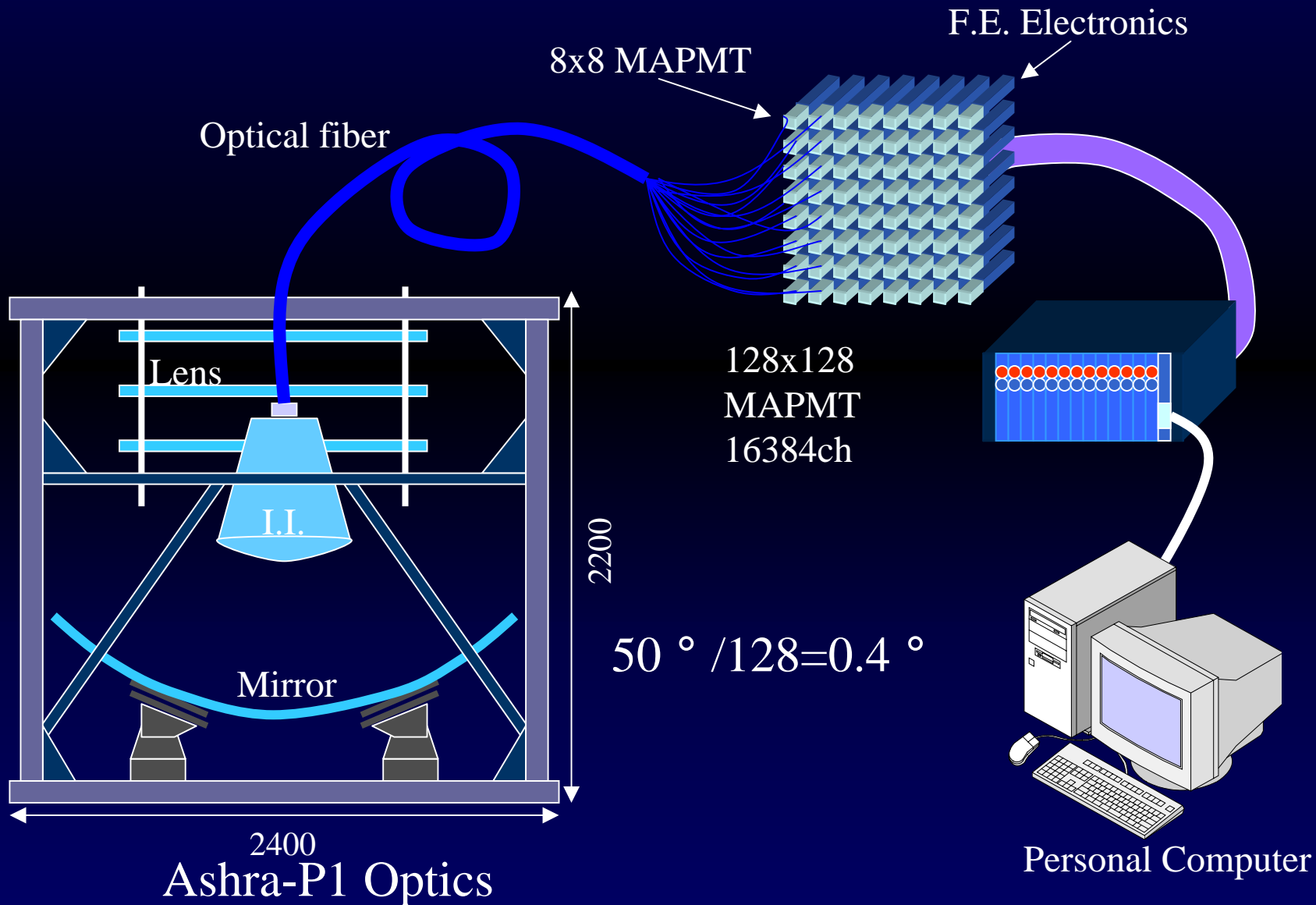


11M pixel CMOS  
Canon EOS-1Ds

Two prototype telescopes



# Ashra/Nutel Outline Design





# Test Observations

**R&D**

**-2003**



**TeV  
@ Haleakala**

**GRB Opt. Fla.  
@ Haleakala**

**Ashra/NuTel  
@ MLO**



**Ashra-  
phase1  
Obs.**

**2005-**

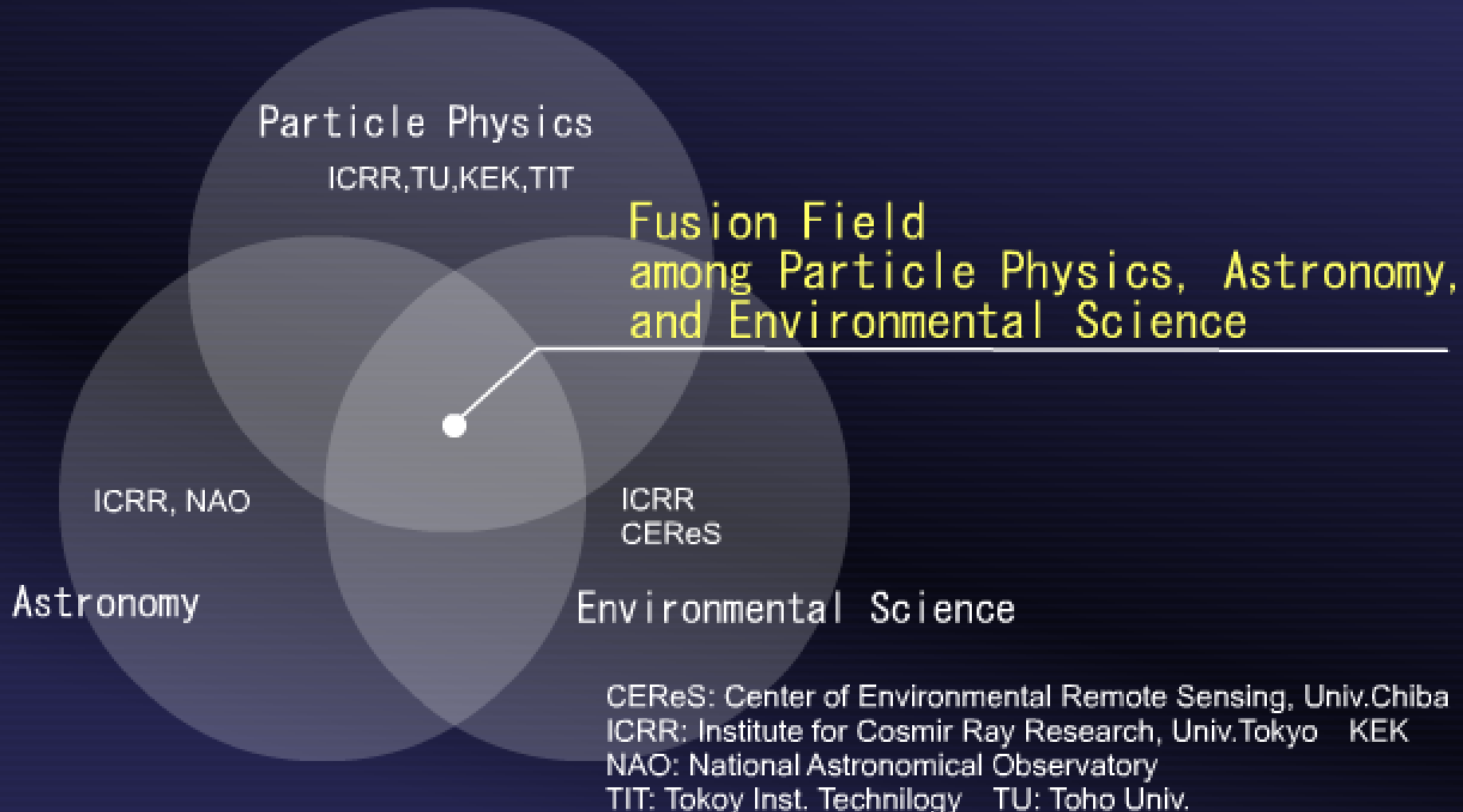
**1~2 years**



# Funding Situation

- **Ministry of Education, Culture, Sports, Science and Technology**
- **budget name: Coordination of Science and Technology**
- **project code: 157-20004100**
- **project title:**  
**Pioneering Very High Energy Particle Astronomy with All-sky High Resolution Air-shower Telescope**
- **total budget:**  
**direct for research 600,000,000yen (~5.6M\$)**  
**x reduction factor (~90%)**  
**+ additional indirect expense to Univ.Tokyo (30%)**
- **period: 3 years**

# Ashra-1 Project Concept



# The Budget 157-20004100

- Covered:

- Optics
- Lens IIT
- Image Pipeline
- Fine CMOS Sensor
- Trigger Sensor
- Imaging Lidar

- Not Covered:

- Station House
- Operation hut
- Calibration
- Slow Control
- Civil Engineering
- Running costs
- .....