

# **MCAT Update**

**30<sup>th</sup> IADC Meeting  
Montreal, Canada  
2012**



# Meter-Class Autonomous Telescope (MCAT)

- **Collaboration between NASA and Air Force Research Laboratory**
- **Improve knowledge of the debris environment in under-sampled orbit regimes**
  - Low Inclination / high eccentricity
  - Near geosynchronous
- **Deploy on Kwajalein Atoll – ~~Legan~~ **Roi-Namur** Island**
  - Low latitude site
  - Existing technical infrastructure
  - Covers part of GEO belt not easily seen by other ground sensors

**Continuing facility delays have forced us to  
consider an alternative site to Kwajalein**



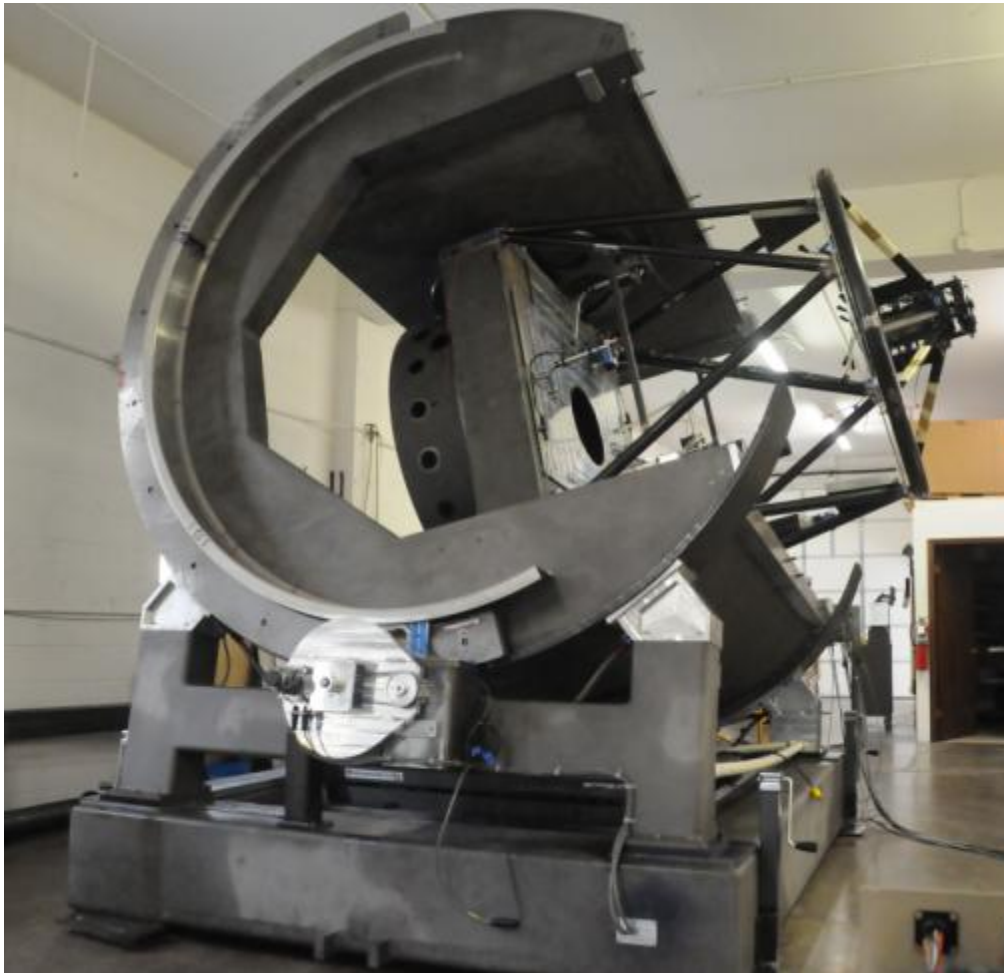
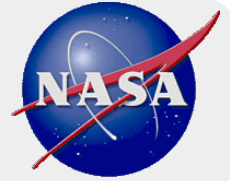
## MCAT Operations

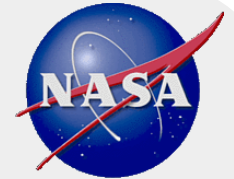
- **Will initially operate as an independent sensor performing blind searches**
  - Orbit rate track during twilight for low inclination / low altitude / high eccentricity debris
  - Geo observations similar to MODEST
- **However, future plan for more complex operations**
  - Follow-up or simultaneous operations with the 14" scope on Roi-Namur
  - SSN Tasking
  - Simultaneous operations with USAKA (US Army at Kwajalein Atoll) radars
    - Combines high angle accuracy of optics with high range accuracy of radar
    - Allows simultaneous RCS / Optical brightness measurements

## **NASA MCAT**

### Meter Class Autonomous Telescope

(@ DFM, Longmont, CO, Instrument Completion ~June 2012)



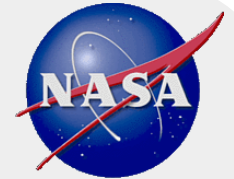


## MCAT Location

(deployment planned to Kwajalein Atoll mid-2013)





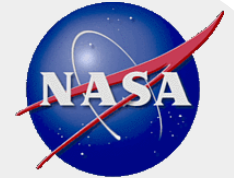


## Roi-Namur

(selected SE Point – aka Sally Point – dark and protected from sea spray)







# Sally Point

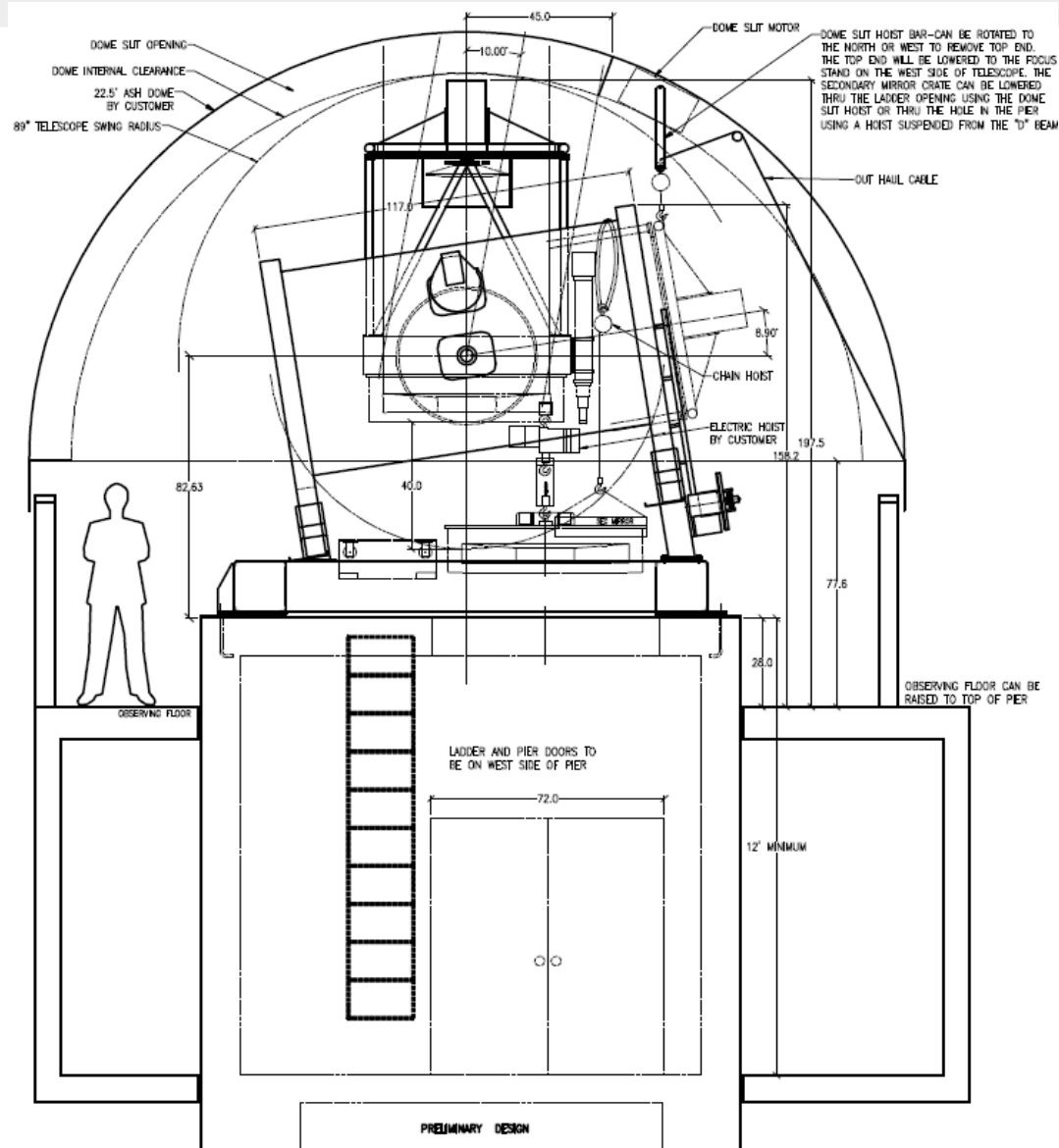
(Jan 2012 site survey – established true north bearing)





# MCAT Facility

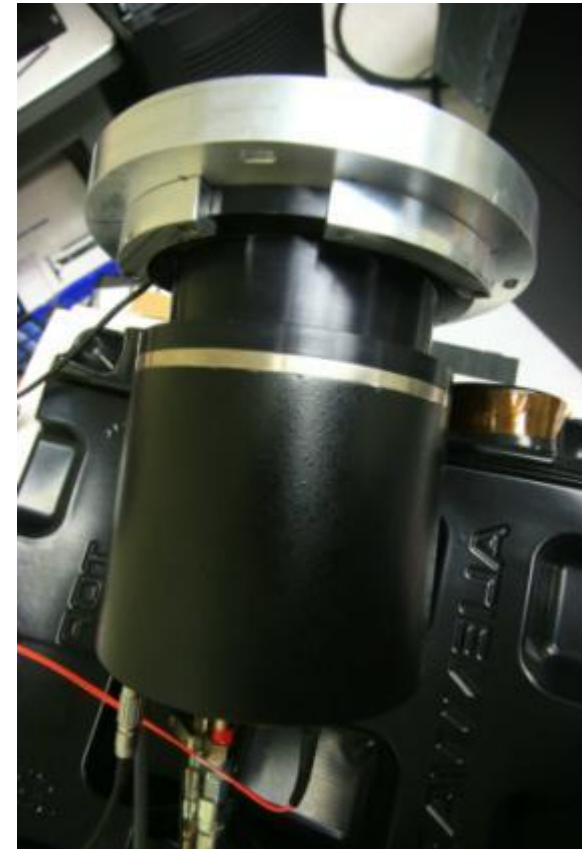
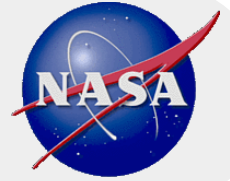
(Engineering Package approved pending Fire Suppression design)





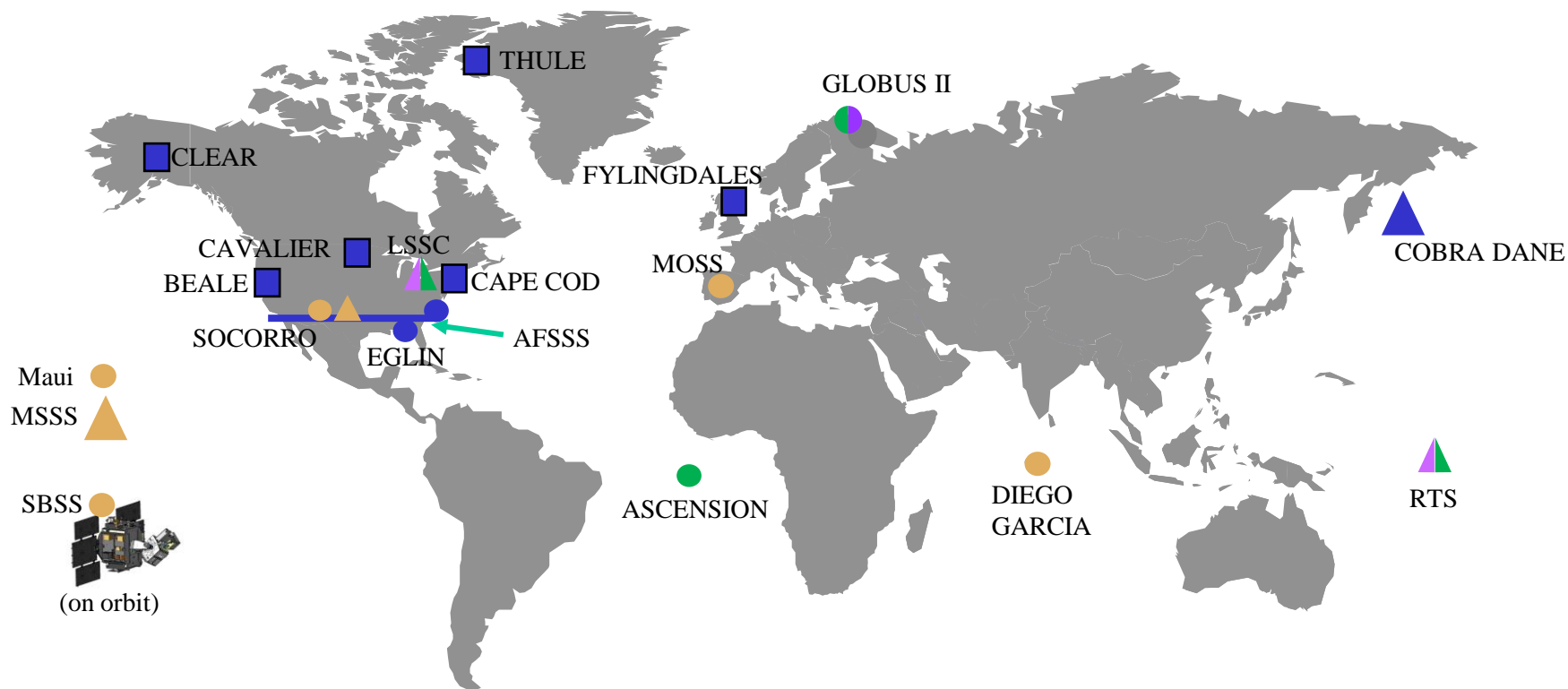
# **e2v 4Kx4K CCD Camera and Observatory Control/Image Processing System**

(HDW integrated; SW development 75% complete)





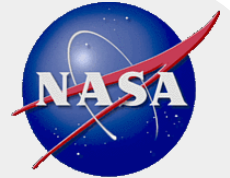
# Current US Space Surveillance Network



Tracking Radar  
Detection Radar  
Imaging Radar  
Optical Telescope

○ Dedicated  
△ Contributing  
□ Collateral

LSSC = Lincoln Space Surveillance Center  
Millstone, Haystack, HAX  
MSSS = Maui Space Surveillance System  
AFSSS = Air Force Space Surveillance System  
RTS = Reagan Test Site  
SBSS = Space Based Surveillance System



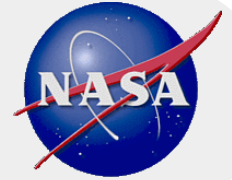
# Back-up Site Evaluation

## Ascension Island

- Site Survey planned June 1-5
- Weather – CFLOS 80-90% (Kwaj 7% @ zenith)
- Construction Costs - ~\$700K ROM
- Logistics – in process
- Infrastructure –
  - ❖ Collateral SSN Sensor (C-Band)
  - ❖ GPS ground station (1/5)
  - ❖ Telemetry/Tracking (ESA, NASA(closed))
  - ❖ BBC Relay station
  - ❖ Wideawake Airfield (10,000' long runway)







# MCAT

**MCAT being  
reassembled after  
painting**

