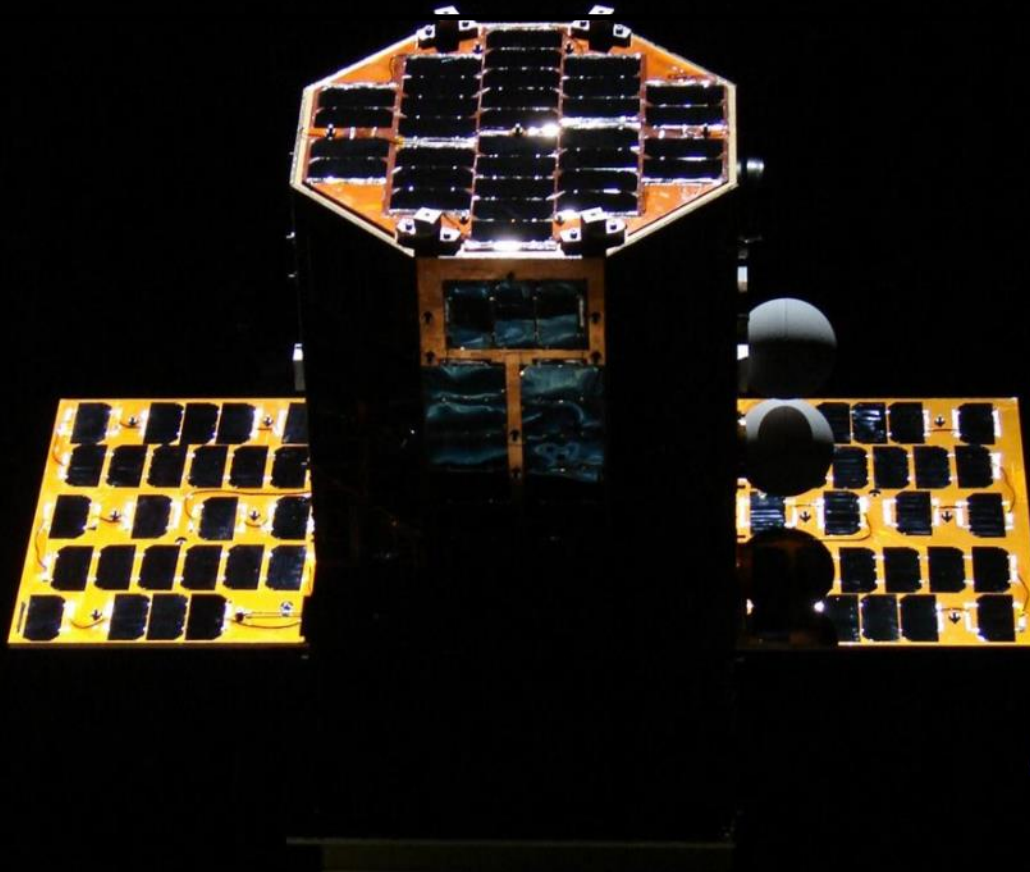




The University Nanosatellite Program: Oculus-ASR



- Located in Houghton, Michigan





University Nanosatellite Program

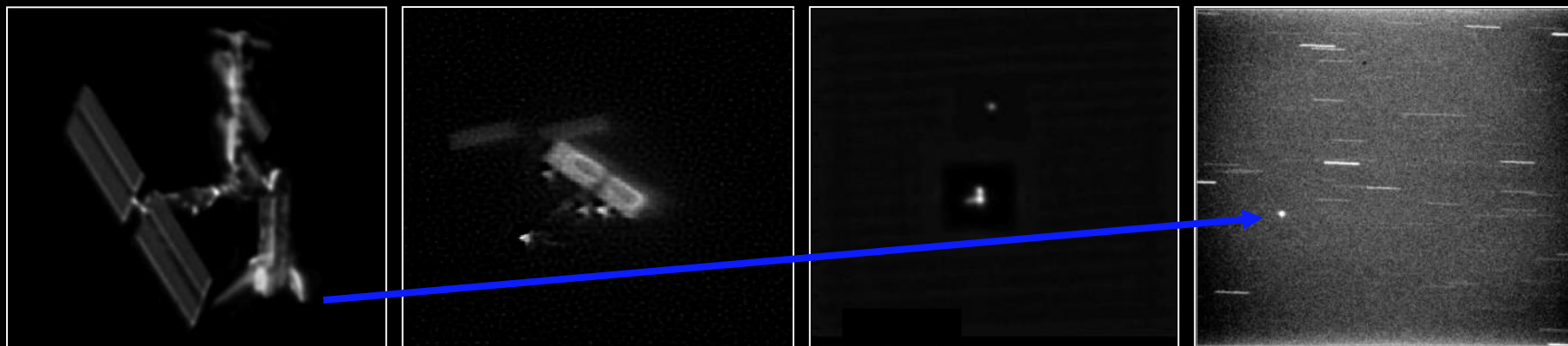
- Student Satellite Competition
 - Managed by Air Force Research Lab (AFRL)
 - 2 years and \$100k to complete a satellite
- Nanosat-6: 2009-2011
 - Winner: Michigan Tech



Mission Overview

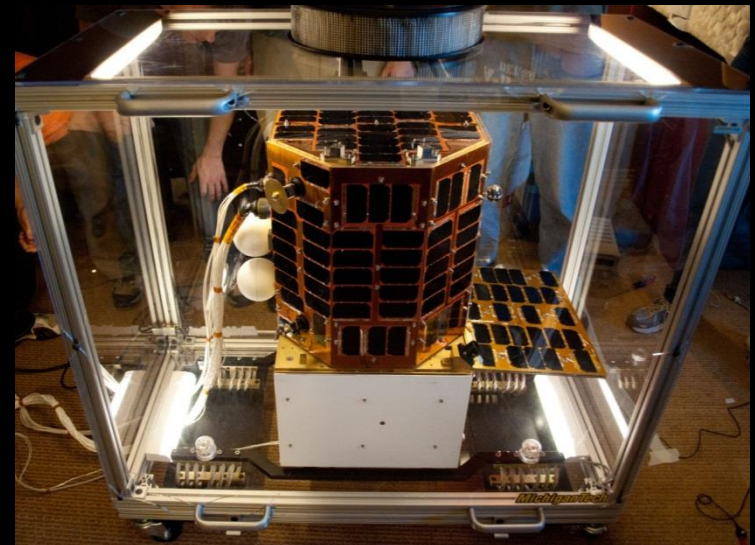
- Oculus-ASR (Attitude & Shape Recognition)
- Collaboration with
 - Air Force Maui Optical and Supercomputing Observatory (AMOS)
 - Air Force Research Lab (AFRL)

Can we determine a satellite's attitude and detect shape changes from the ground using only information gained from unresolved optical images?



Mission Overview

- Satellite Design
 - Colored Surfaces
 - Spectral Characterization of Satellite
 - Deployable Panels and Releasable Spheres
 - Configuration Changes
 - Attitude Control
 - Magnetic Torque Rods
 - Attitude Knowledge
 - Magnetometer and Gyros
 - Full Cooperation with AFRL



- ① Top Solar Panel
- ② Magnetometer
- ③ Gyroscopes
- ④ Power Distribution
- ⑤ Sensing Circuit
- ⑥ Main Computer
- ⑦ Retroreflector
- ⑧ Oculus Solar Panel
- ⑨ Battery
- ⑩ Radio
- ⑪ Corner Isogrid Panel
- ⑫ Frangibolt Actuator

- ⑬ T-Panel
- ⑭ Oculus Solar Panel
- ⑮ ASR Solar Panel
- ⑯ Magnetic Torquers
- ⑰ Charge Controller
- ⑱ Deployable Panel
- ⑲ Duralect Deployable Panel
- ⑳ Releasables
- ㉑ VHF Antenna
- ㉒ UHF Antenna
- ㉓ Magnetorquer Controller

