

INTRODUCTION TO THE AIR FORCE MAUI OPTICAL AND SUPERCOMPUTING SITE (AMOS)



**Presented to the CCMC
Workshop at the Maui High
Performance Computing
Center (MHPCC)**

by

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Air Force Maui Optical and Supercomputing Site (AMOS)



- **Extraordinary AEOS Telescope on Haleakala**
 - Latest Addition to Maui Space Surveillance Complex (MSSC)
 - New 3.67 Meter Primary Mirror
 - Adaptive Optics Nearly Eliminate Atmospheric Distortion
 - Highly Advanced Imaging and Other Information

- **High Performance Computing at Research and Technology Park**
 - In This Building (MHPCC)
 - 12th Largest Supercomputer in the World

- **Unique Combination Provides:**
 - Operational Support to Space Command
 - Research Opportunities

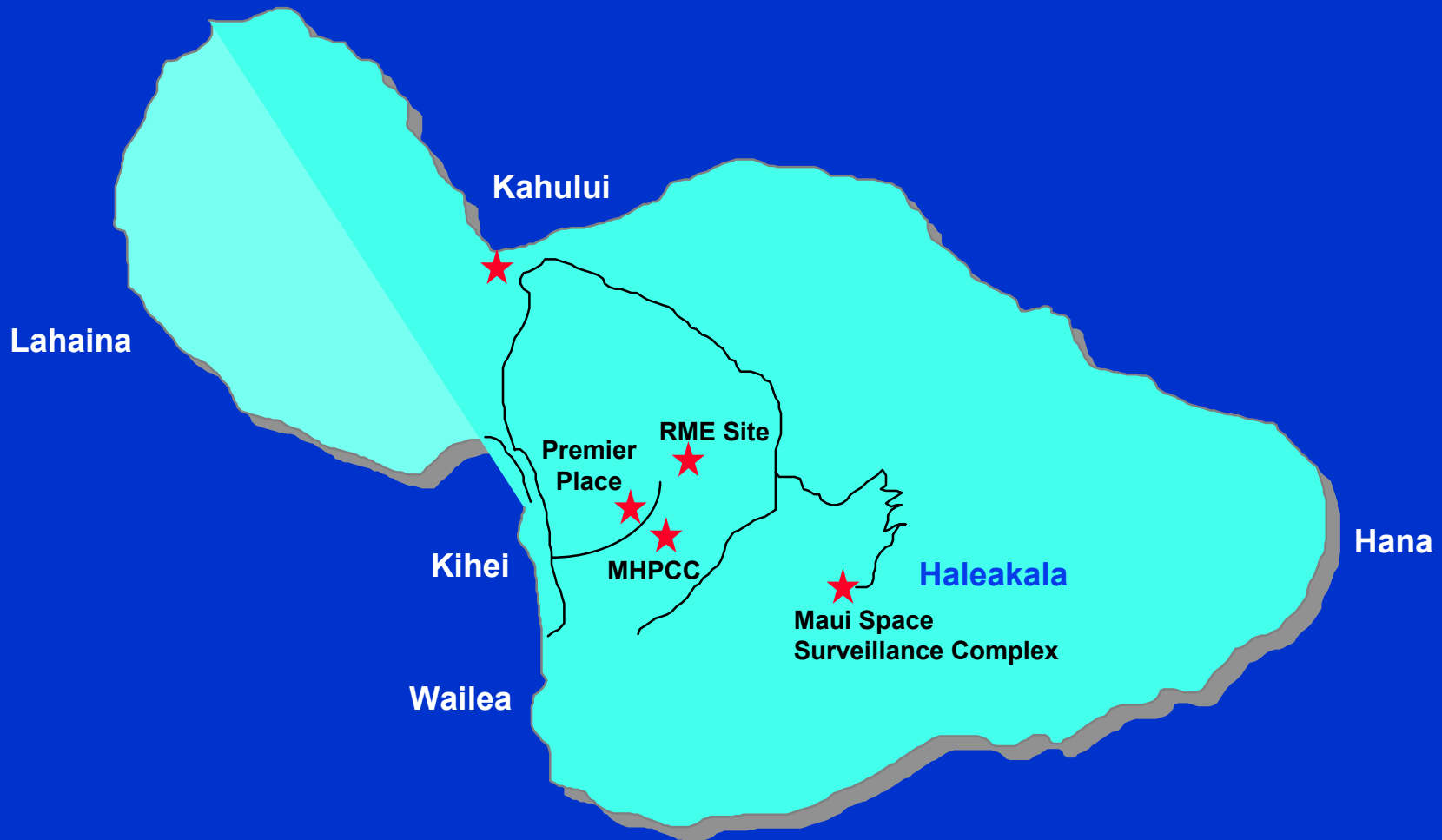


AMOS PHYSICAL LOCATION

(Current Threatcon Precludes Tours)

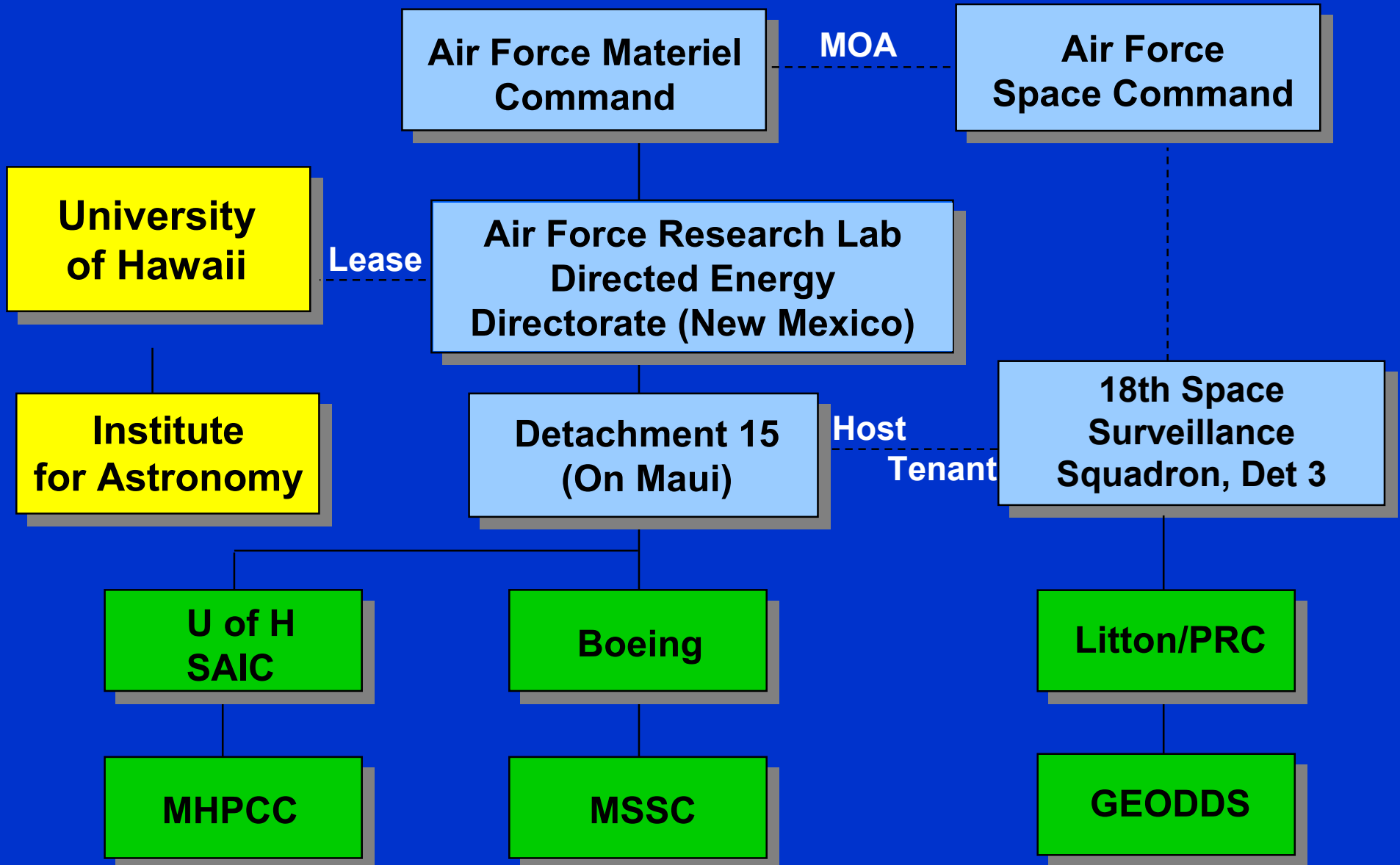


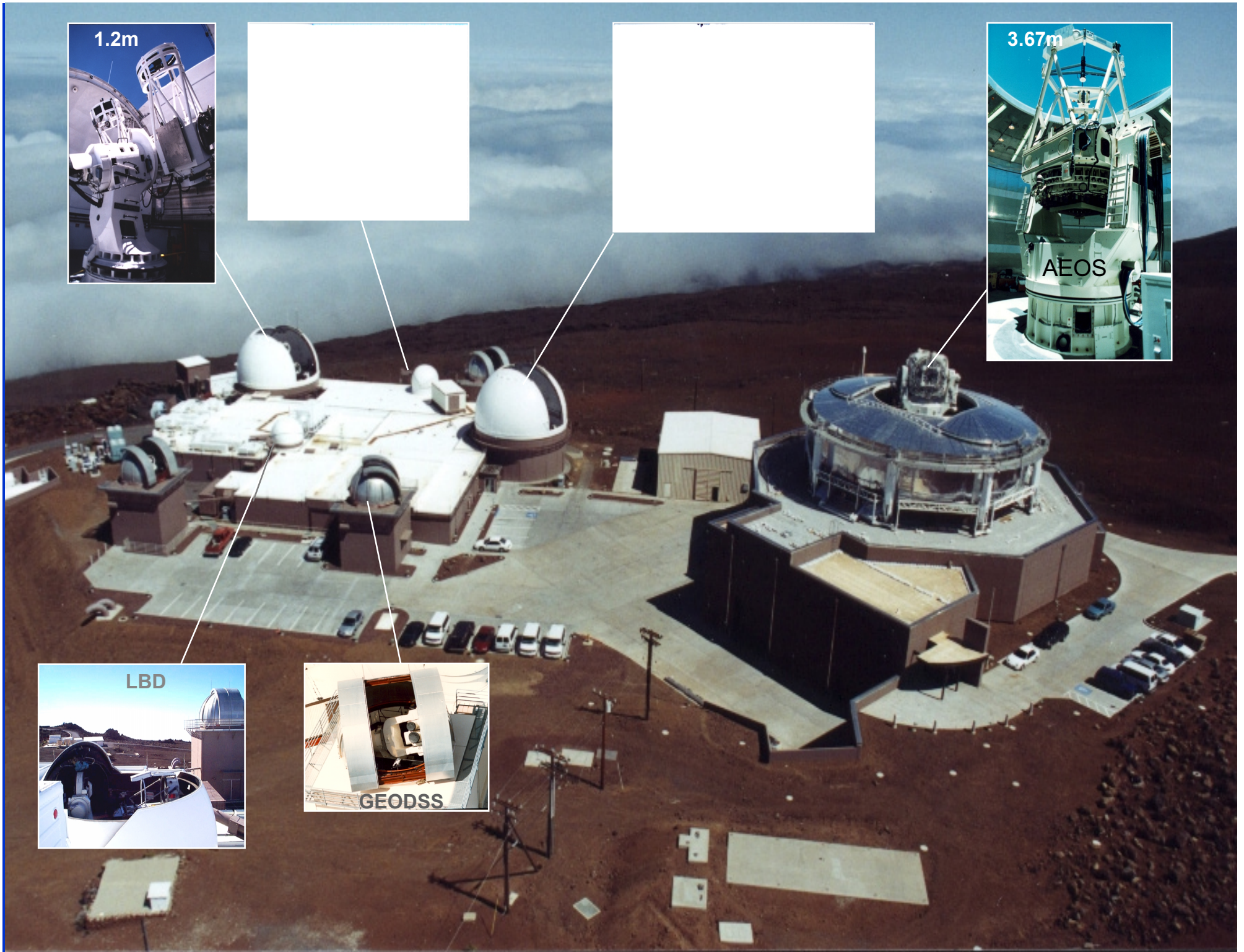
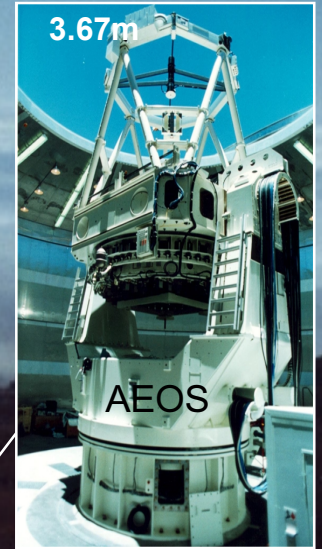
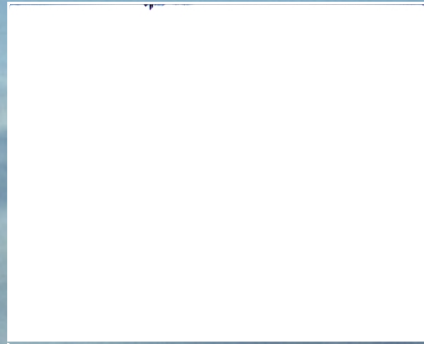
★ = Air Force Offices/Activities





TEAM MAUI







1.6m TELESCOPE





1.6m TELESCOPE IMAGERY



ATLANTIS (STS-71), 660 km

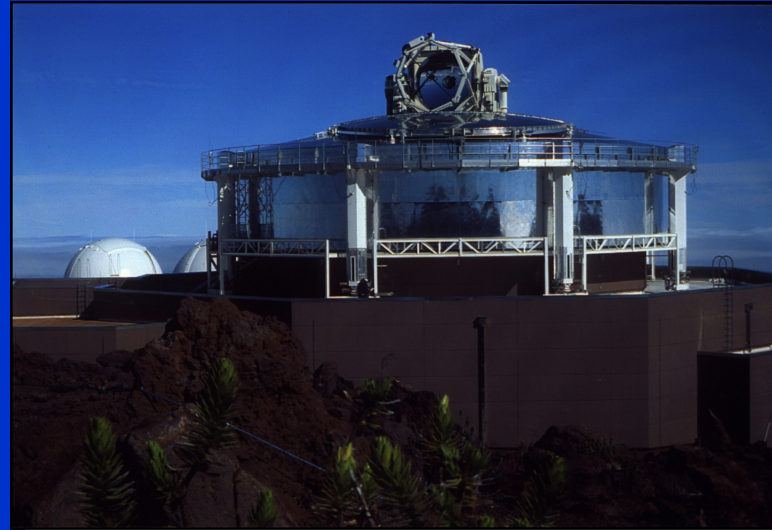
Daytime Pass



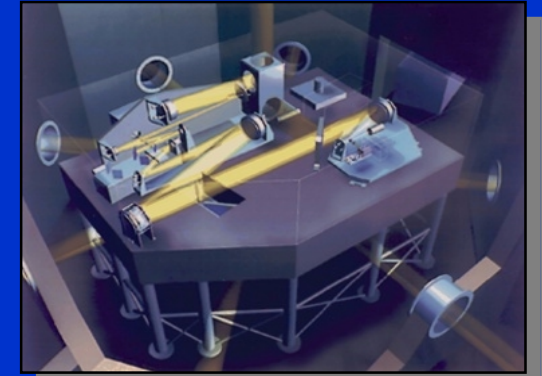
ADVANCED ELECTRO-OPTICAL SYSTEM (AEOS)



3.67m AEOS Telescope



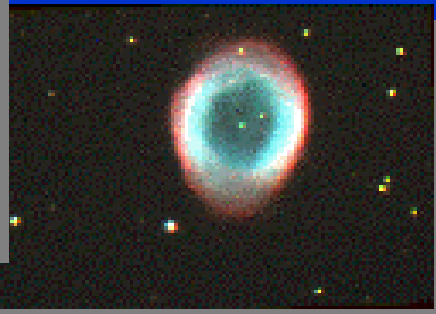
AEOS Facility



Adaptive Optics

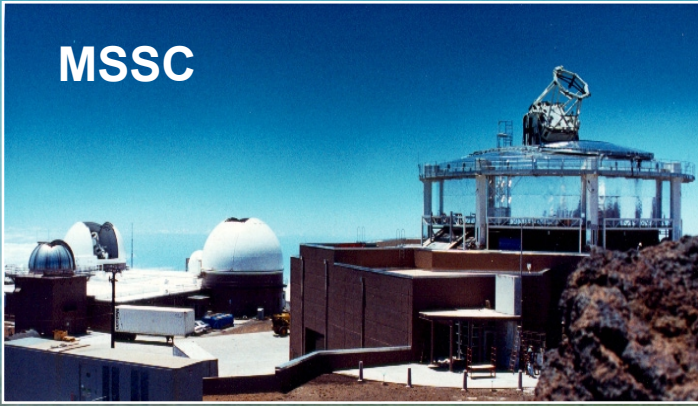


Imaging



Observatory Control System

MSSC



Relay Mirror Site (RME)



Premier Place



MHPCC





A DOD Distributed Center



Deputy Director, Defense Research and Engineering

High Performance Computing Modernization Program

Major Shared Resource Centers

- Aeronautical Systems Center (ASC)
- Army Research Laboratory (ARL)
- Engineer Research and Development Center (ERDC)
- Naval Oceanographic Office (NAVO)



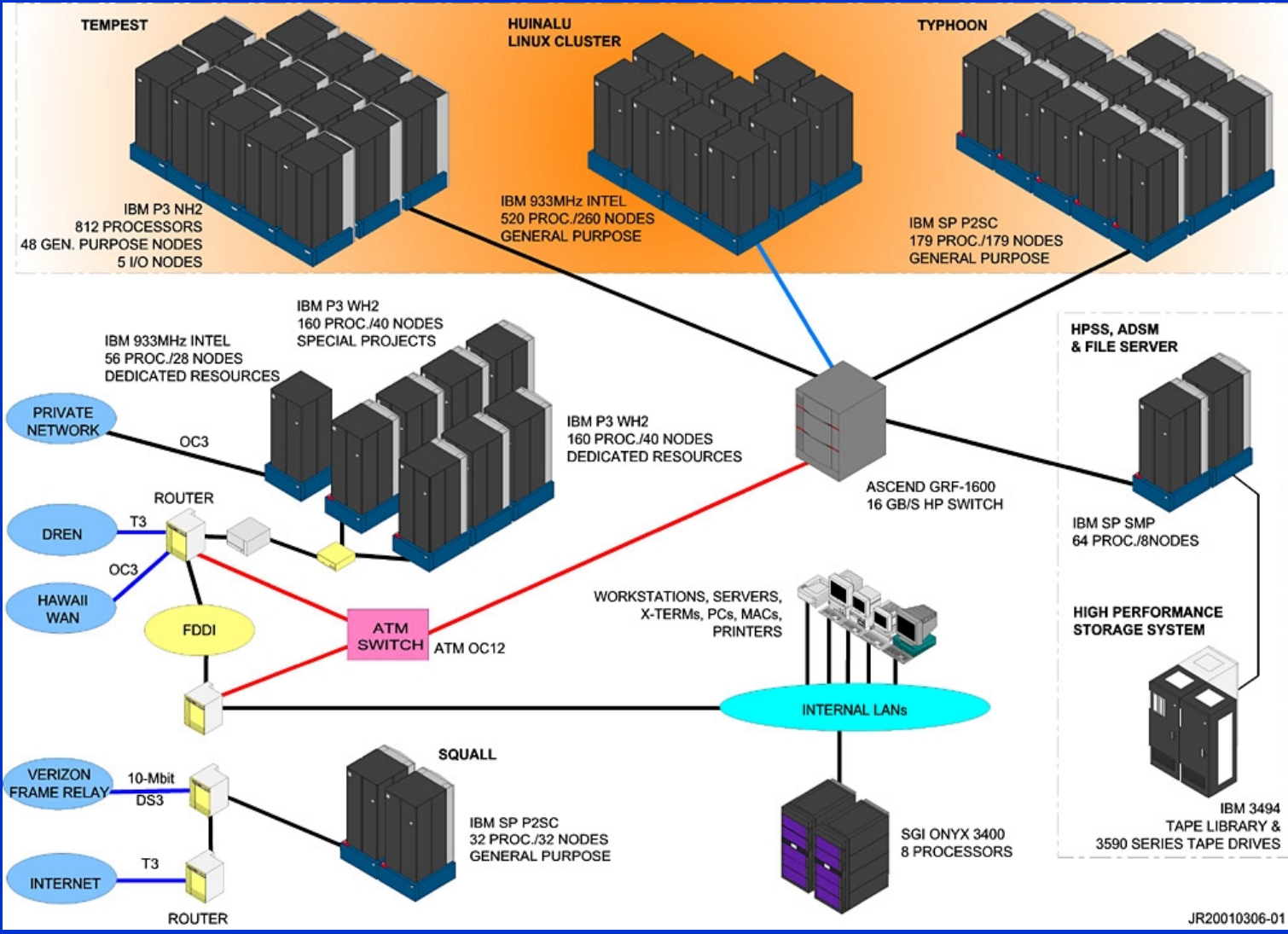
Distributed Centers

- Air Force Air Armament Center (AAC)
- Air Force Flight Test Center (AFFTC) *
- Air Force Research Laboratory/Information Directorate (AFRL/IF)
- Air Force Research Laboratory/Sensors Directorate (AFRL/SN) *
- Army High Performance Computing Research Center (AHPARC)
- Arnold Engineering Development Center (AEDC)
- Arctic Region Supercomputing Center (ARSC)
- Joint National Test Facility (JNTF)
- Maui High Performance Computing Center (MHPCC)
- Naval Air Warfare Center Aircraft Division (NAWC-AD)
- Naval Air Warfare Center Weapons Division (NAWC-WD)
- Naval Research Laboratory - DC (NRL-DC)
- Redstone Technical Test Center (RTTC)
- Space and Missile Defense Command (SMDC)
- Space and Naval Warfare Systems Center (SSCSD)
- Tank-Automotive Research, Development and Engineering Center (TARDEC)
- White Sands Missile Range (WSMR)

* FY00 Distributed Center



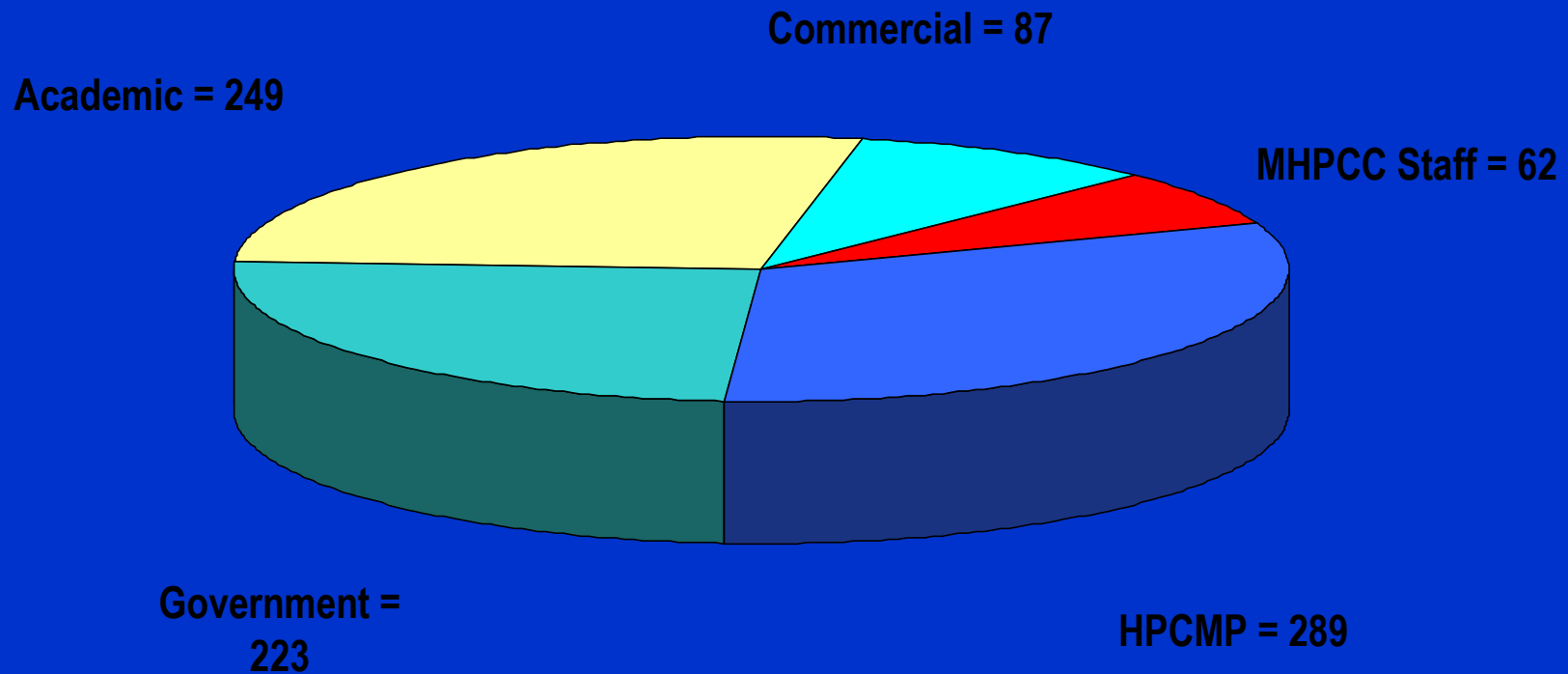
MHPCC COMPUTING RESOURCES



- IBM SP SYSTEMS**
- Tempest/Typhoon (USM)
 - 812 P3 NH2 processors
 - 179 P2SC processors
 - 64 SMP processors
 - Squall (UNSM)
 - 32 P2SC processors
 - Special Projects
 - 160 P3 WH2 processors
 - Dedicated Resources
 - 160 P3 WH2 processors
- IBM LINUX SYSTEMS**
- Huinalu (USM)
 - 520 933 MHz Intel processors
 - Dedicated Projects
 - 56 933 MHz Intel processors
- COMPUTING CAPABILITY**
- 1983 processors
 - 2.36 TFLOPS
- MEMORY**
- 956 GB total memory
- STORAGE**
- 8.6 TB disk storage
 - 23.9 TB on-line tape storage



MHPCC USER POPULATION



Total Number of Accounts = 910
1st Q FY 01



What is Changing Now



- **Air Force Research Laboratory Now Managing AMOS**
- **AFOSR and NSF Providing New Research Funds**
- **U of H Now Operates MHPCC, Winning with a Strong Team – Increased Maui Presence**
- **Maui Community College Becoming a Four Year Institution**
- **Hawaii Is Now a DEPSCOR AND EPSCOR State**
- **Rumsfeld Commission Emphasis – Space Situational Awareness**

Looking Ahead...

- Clear Vision
- New and Improving Capabilities
- Fully Resourced, Key Core Competencies

...Poised for the Future!



BACKUPS



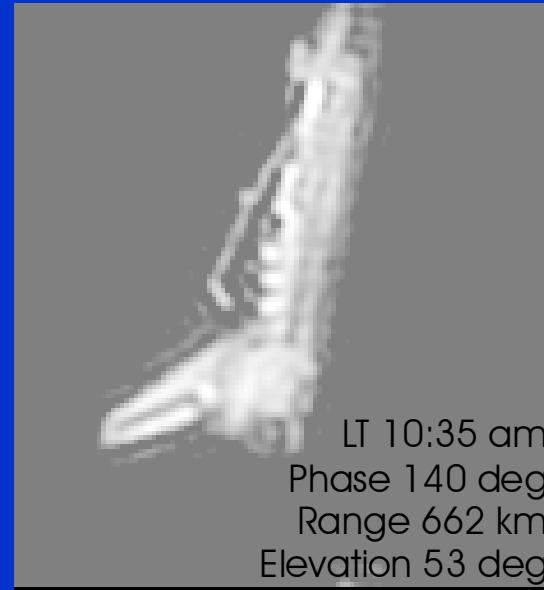
- **Space Shuttle with Missing Panel**
- **DOD Challenge Projects at MHPCC**



Imaging Samples



**Area where
door panel
fell off**



LT 10:35 am
Phase 140 deg
Range 662 km
Elevation 53 deg



LT 8:30 am
Phase 122 deg
Range 663 km
Elevation 60 deg



DOD Challenge Projects

FYTD 2001



PROJECT	SPONSOR	ALLOCATION
Time-Domain Computational Ship Hydrodynamics	Office of Naval Research	19,165
Atomistic Simulation of MEMS Devices via the Coupling of Length Scales	Naval Research Laboratory	100,000
Automatic Target Recognition Performance Evaluation	Air Force Research Laboratory	100,000
Unsteady RANS Simulation for Surface Ship Maneuvering & Seakeeping	Naval Surface Warfare Center	105,000
Airborne Laser Challenge Project II	Air Force Research Laboratory	175,000
Parallel Simulations of Flow-Structure Interactions	Office of Naval Research	175,000
Analysis of Full Aircraft with Massive Separation Using Detached Eddy Simulation	Air Force Research Laboratory	200,000
Characterization of DoD Relevant Materials & Interfaces	Air Force Office of Scientific Research	200,000
New Materials Design	Air Force Research Laboratory	220,000
TOTAL		1,294,165

("ALLOCATION" QUOTED IN CPU HOURS)