Annual HPWREN Users Meeting

MOBLAS 4

NASA
Goddard Space Flight Center
Greenbelt, MD

November 6, 2007

Honeywell

Howard Donovan

Engineering and Operations Manager

Julie Horvath

Mission and Data Operations Manager

Kenneth Tribble

MOBLAS 4 Station Manager

NASA Satellite Laser Ranging Program
Goddard Space Flight Center
Honeywell Technology Solutions Inc.

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NASA SLR Network

- MOBLAS 4 San Diego, California
- MOBALS 5 Yatharagga, Australia
- MOBLAS 6 Hartebeesthoek, South Africa
- MOBLAS 7 GSFC, Greenbelt, Maryland
- MOBLAS 8 Tahiti, French Polynesia
- TLRS-3 Arequipa, Peru
- TLRS-4 Haleakala, Hawaii
- MLRS Fort Davis, Texas

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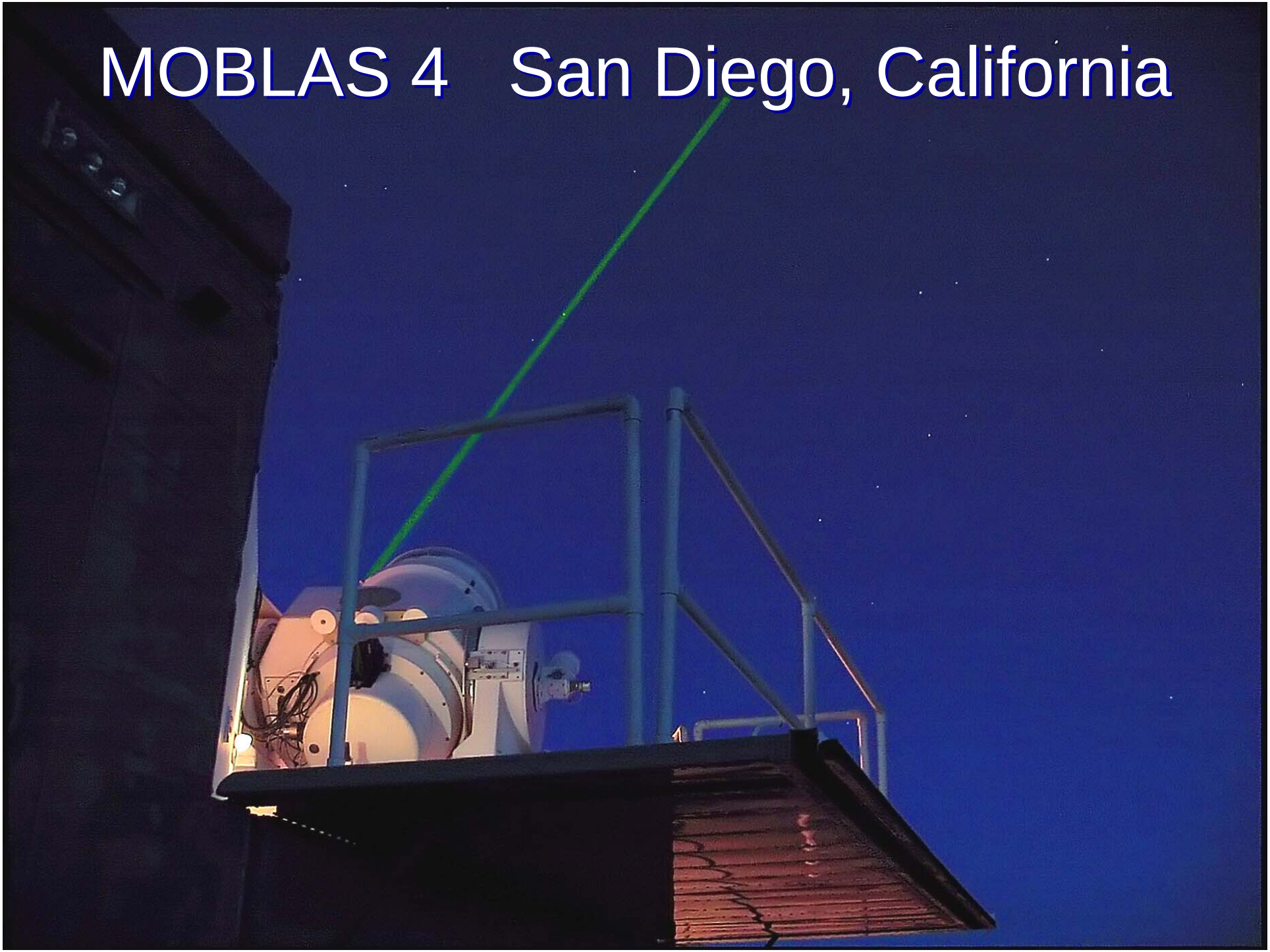
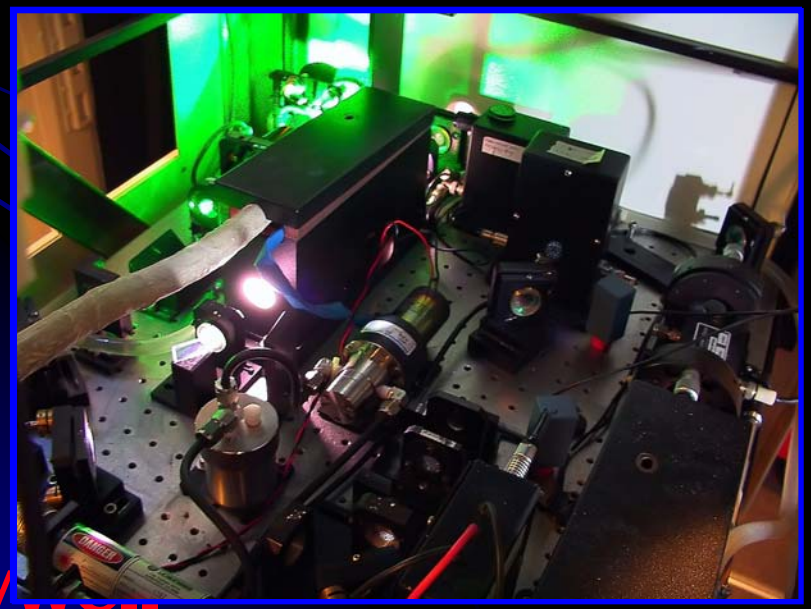
MOBile Laser RAnging System 4
MOBLAS 4, San Diego, CA.

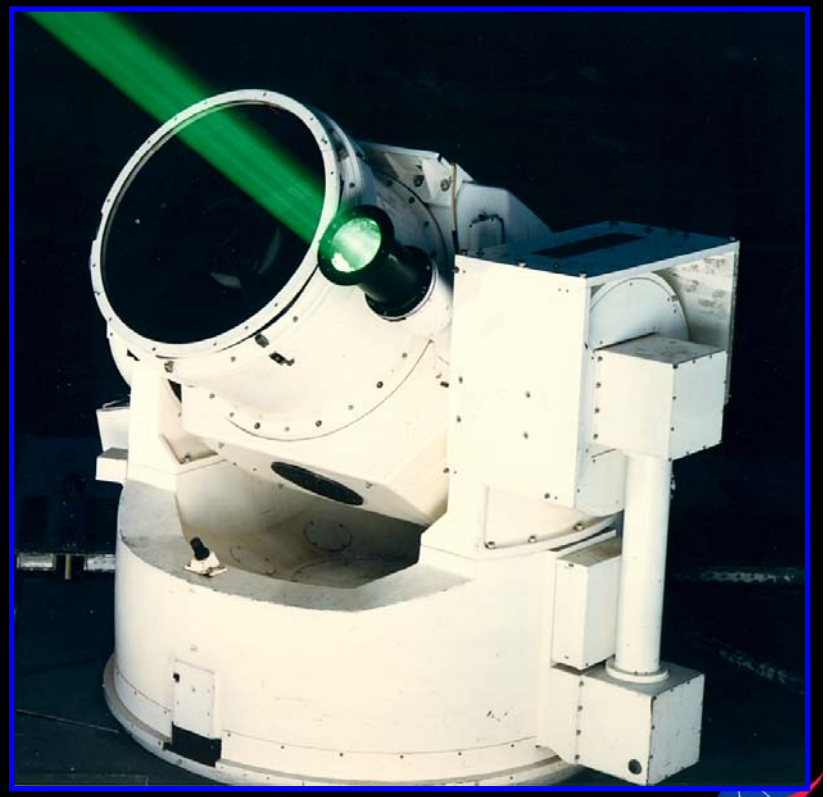
MOBLAS 4 San Diego, California



Satellite Laser Ranging

- Measure Time of Flight (TOF)
  - Time Interval Unit (TIU) – High Precision Stop Watch
  - Telescope – 30” Schmidt-Cassigraine
  - Short Pulse Laser – 200 picoseconds or 0.2 X 10^{-12} second





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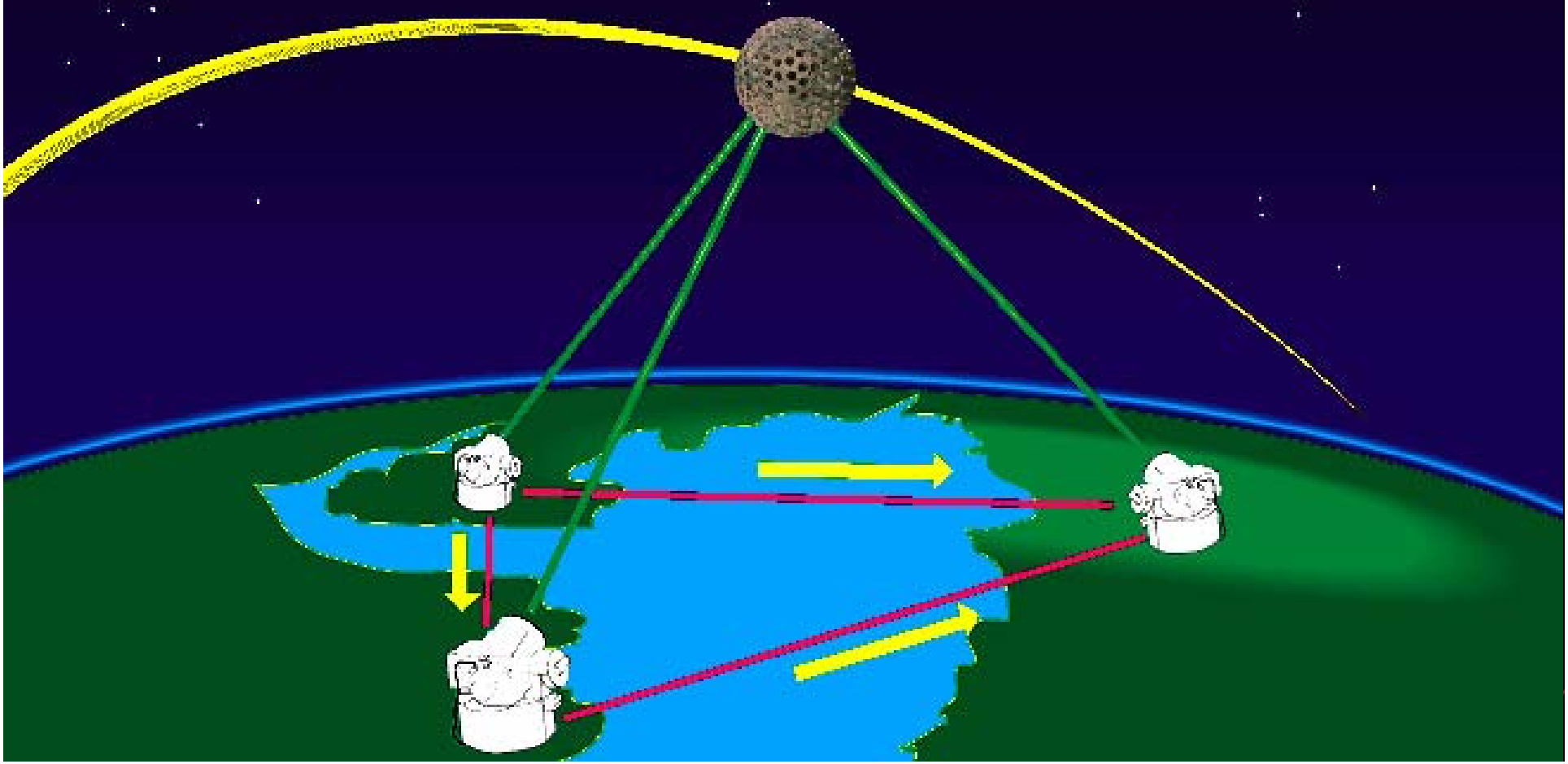
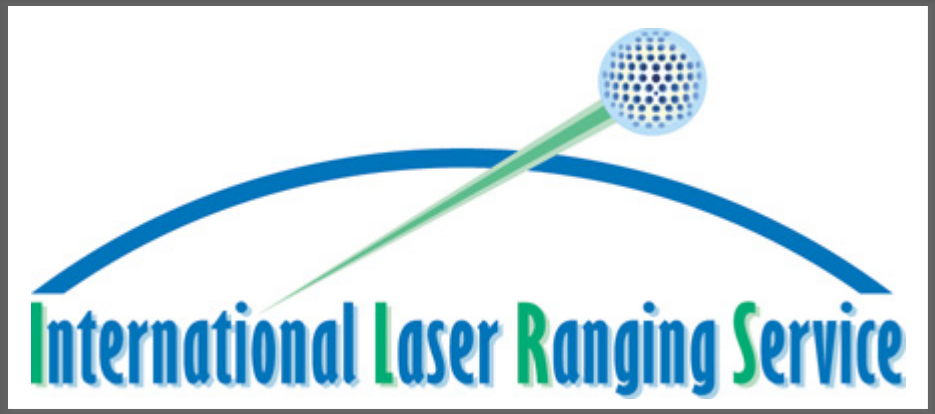
Satellite Laser Ranging

Provides Precision Range Measurement
~5mm over a 6,000 km range (3,700 miles)



International Laser Ranging Service



Provides global satellite and lunar laser ranging data and their related products to support geodetic and geophysical research activities as well as IERS products important to the maintenance of an accurate International Terrestrial Reference Frame (ITRF). The service develops the necessary global standards/specifications and encourages international adherence to its conventions.

http://ilrs.gsfc.nasa.gov/

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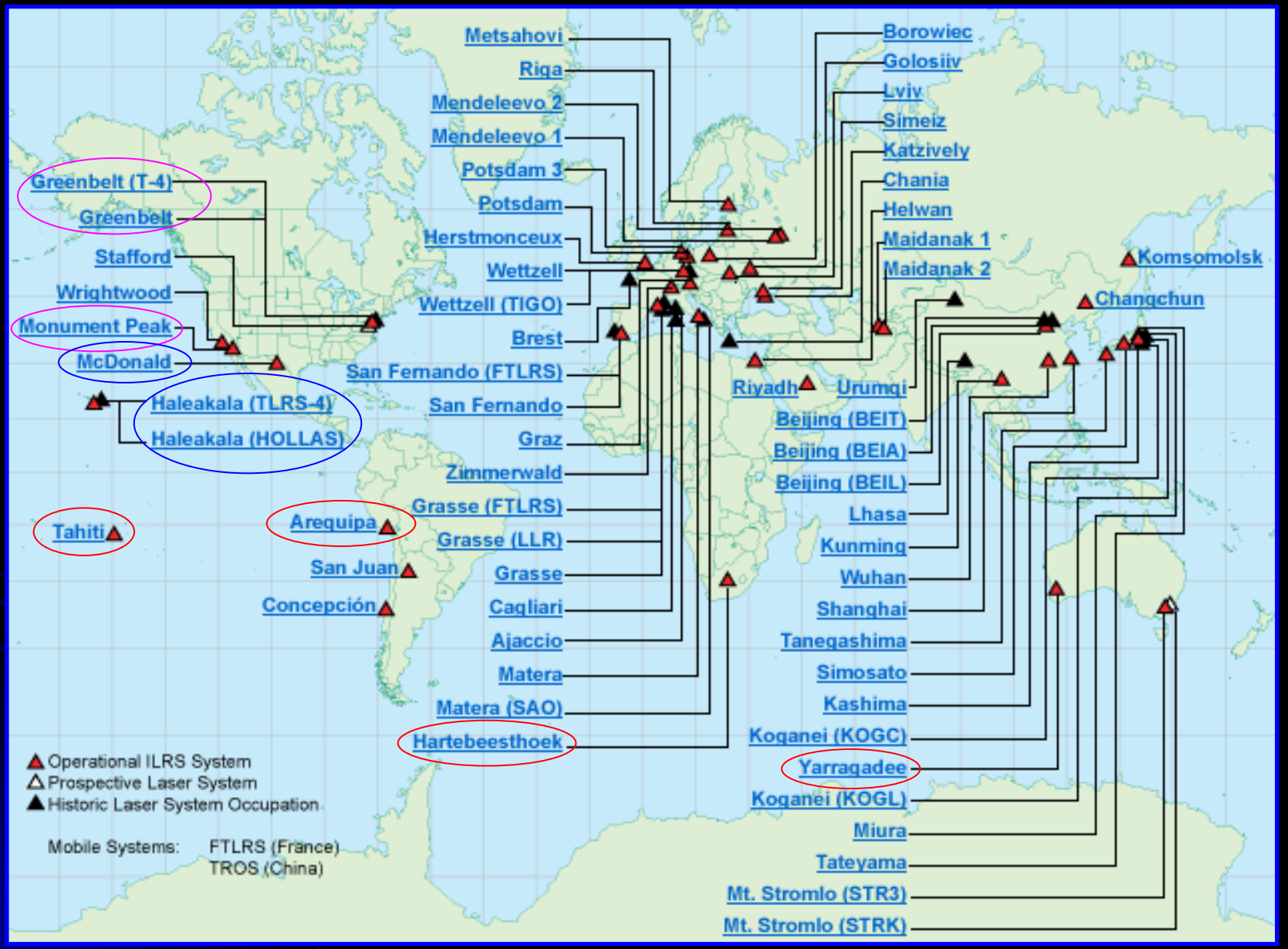

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SLR Science Contributions

- Tectonic Plate Motion
- Gravity Field
- Atmospheric Pressure Loading
- Earth Rotation
- International Terrestrial Reference Frame
- Atmospheric Refraction Model
- Altimeter Calibration
- Geocenter Determination and Monitoring
- Ocean Tides and Sea Level Monitoring
- Land and Ice Topography
- Solid Earth-Core/Mantle Interaction
- Post-Glacial Rebound
- Part of the International Network of Space Geodetic Observatories
  - VLBI, GPS, DORIS and PRARE systems

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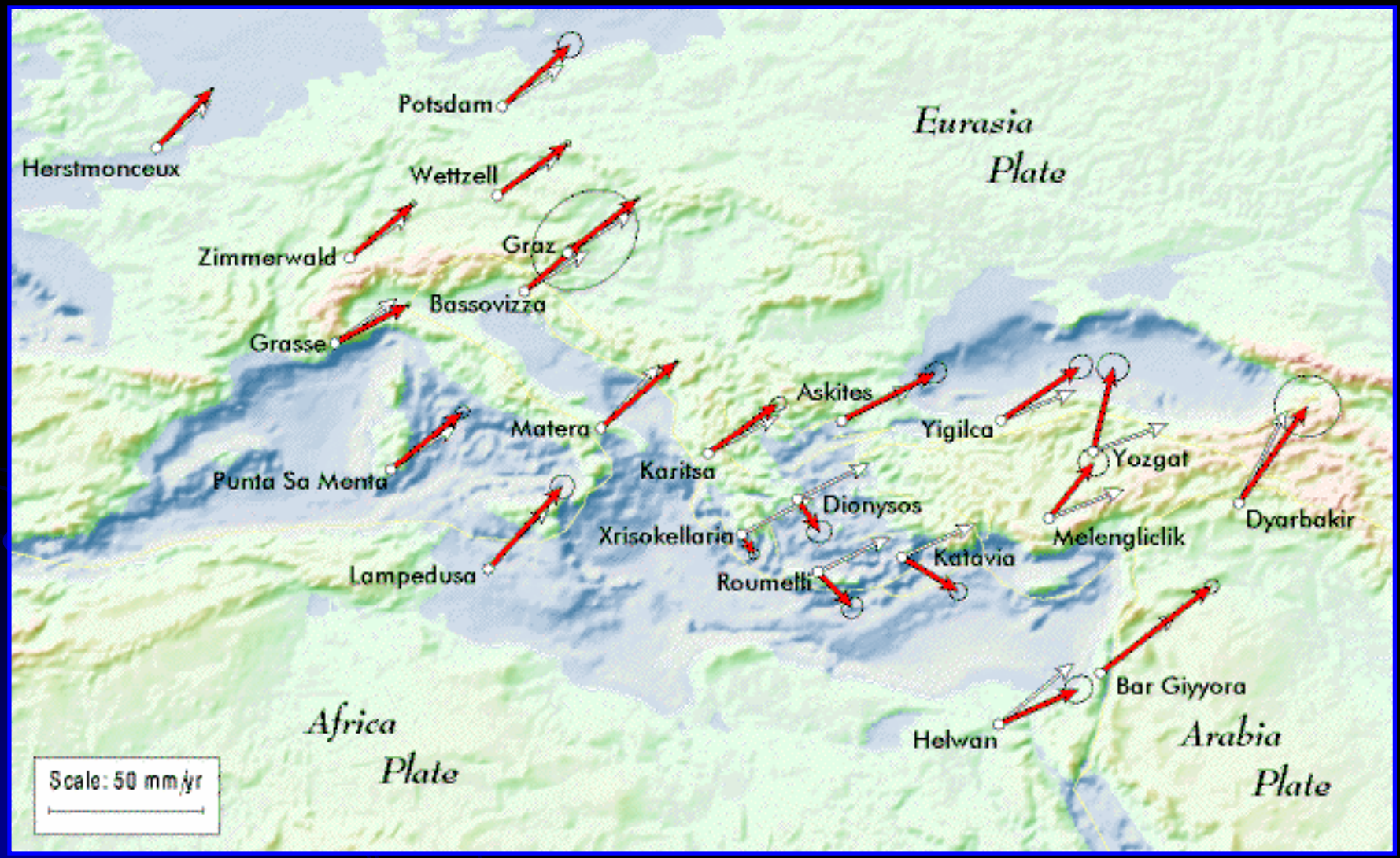
Tectonic Plate Motion



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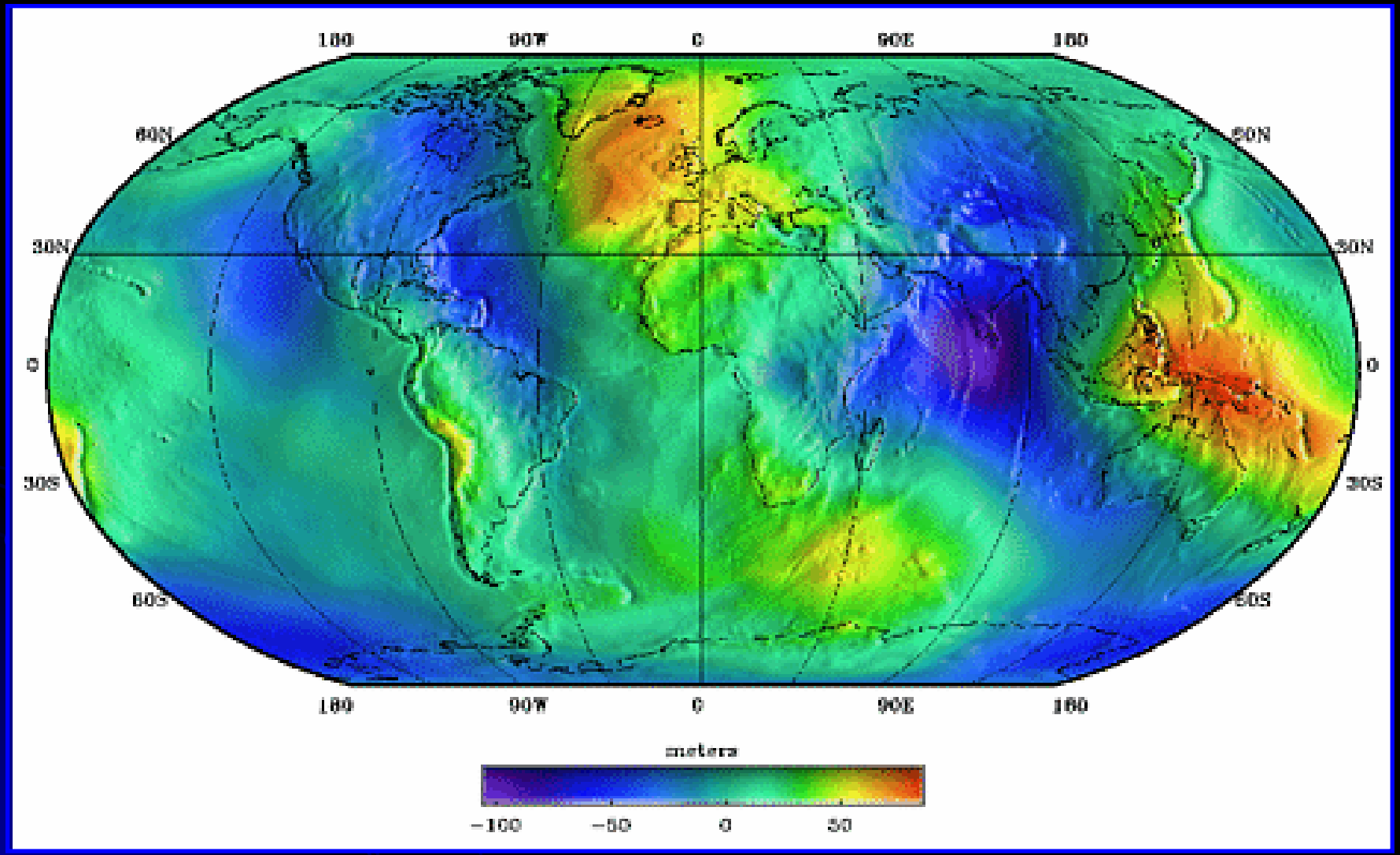
Gravity Field



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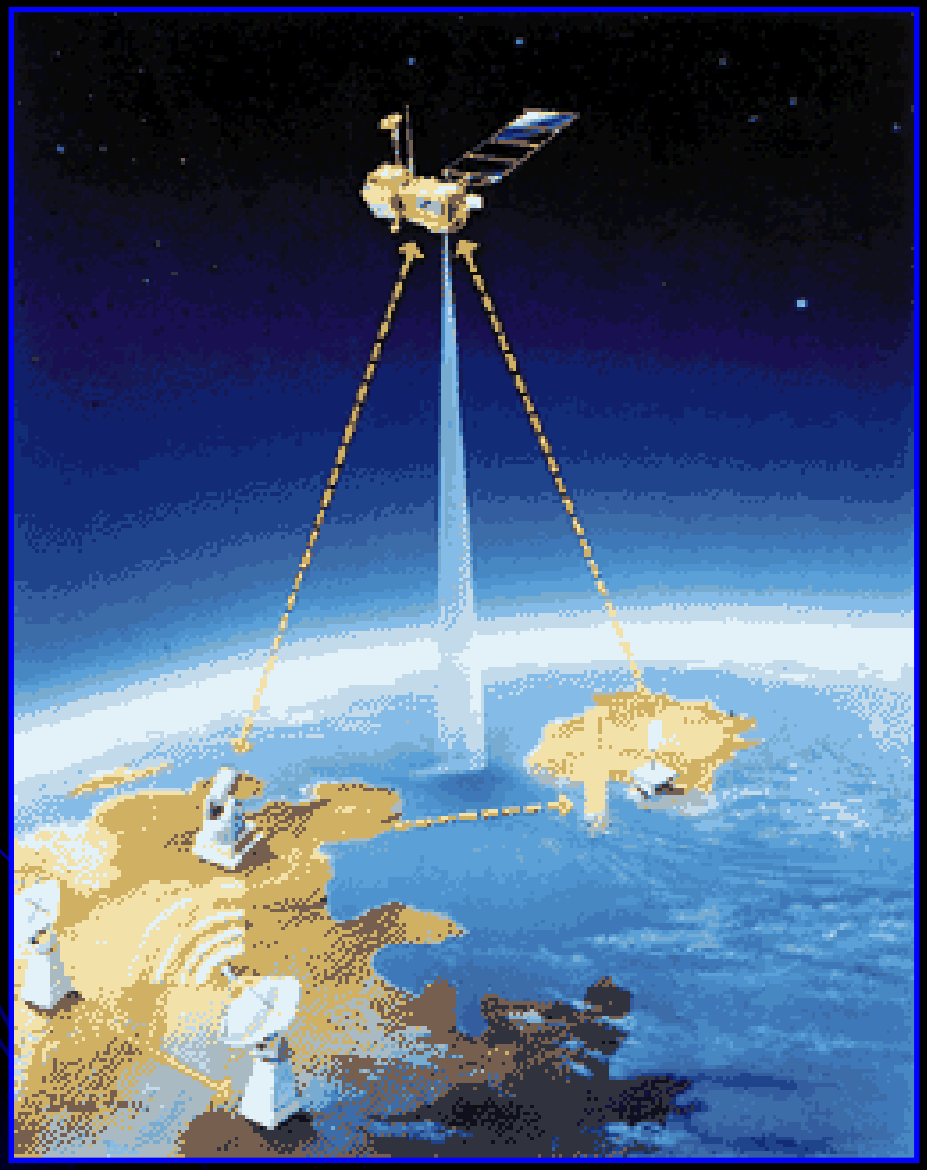
Altimeter Calibration



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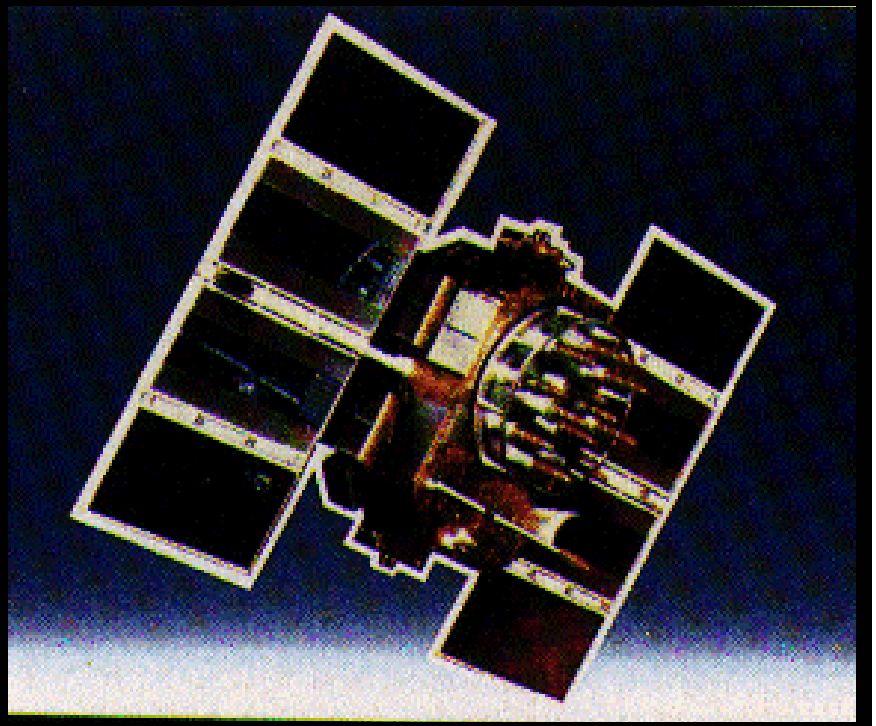
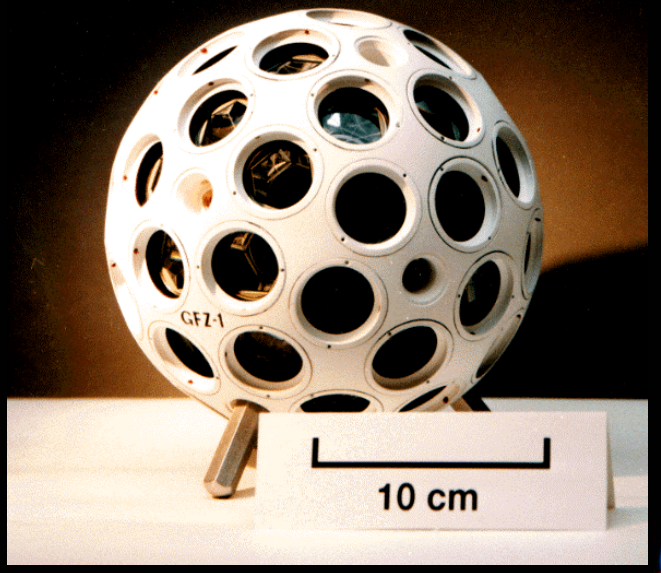
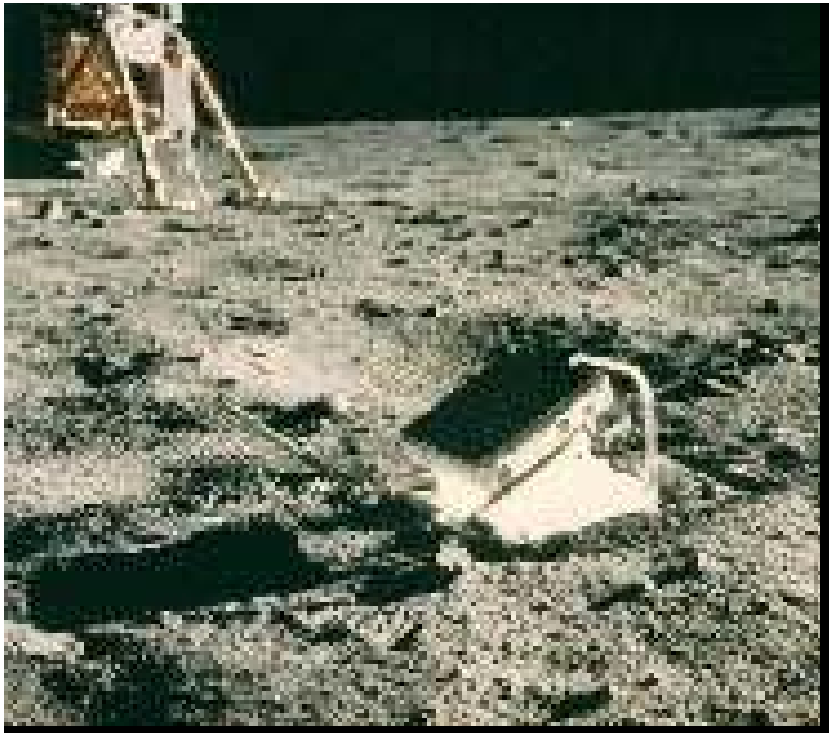
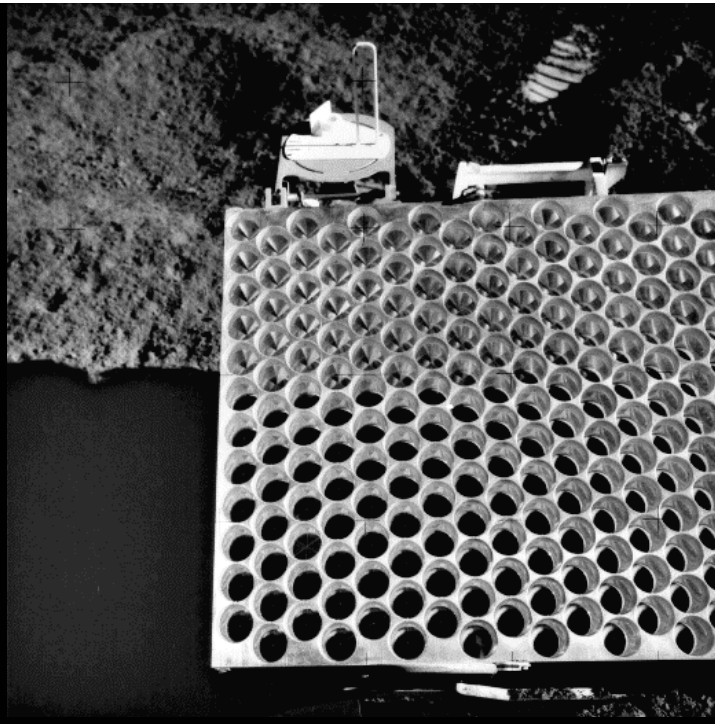



GFZ-1
10 cm



Apollo 11
Retroreflector Panel



Apollo 15
Retroreflector Panel

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Next Generation SLR

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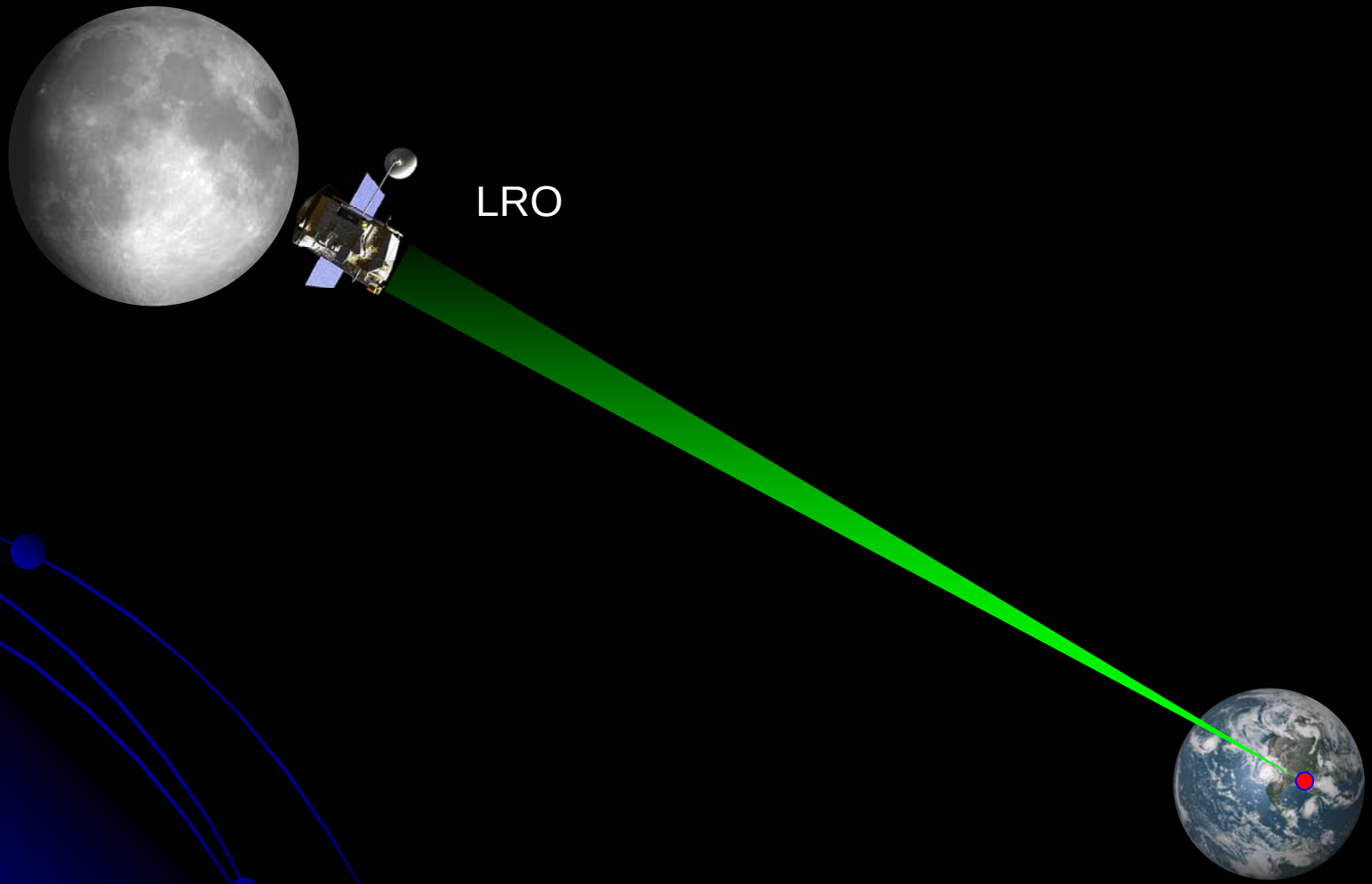
Lunar Reconnaissance Orbiter



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MOBLAS 4 Located in Mt. Laguna

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MOBLAS 4 is in a Remote Location

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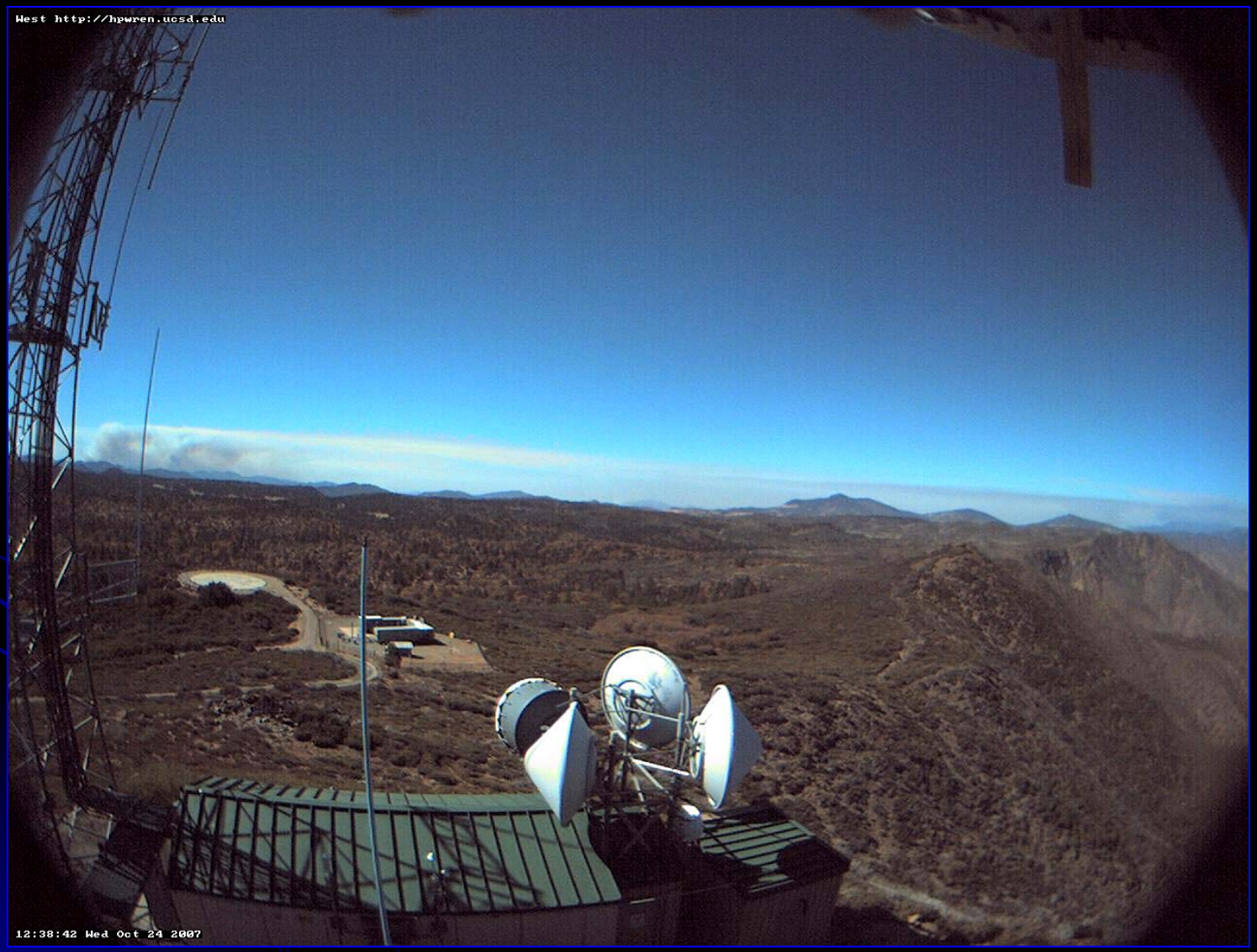
View from HPWREN Mt. Laguna West



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NASA SLR Uses of the HPWREN

- Internet Access
- Sustaining Engineering
- Hourly Data Transfer
- Software Upgrades
- Data Research
- ILRS Network Communications
- Electronic Mail
- Emergency
- Remote Status
- Satellite Prediction Transfer
- Critical Go/No-Go Operations

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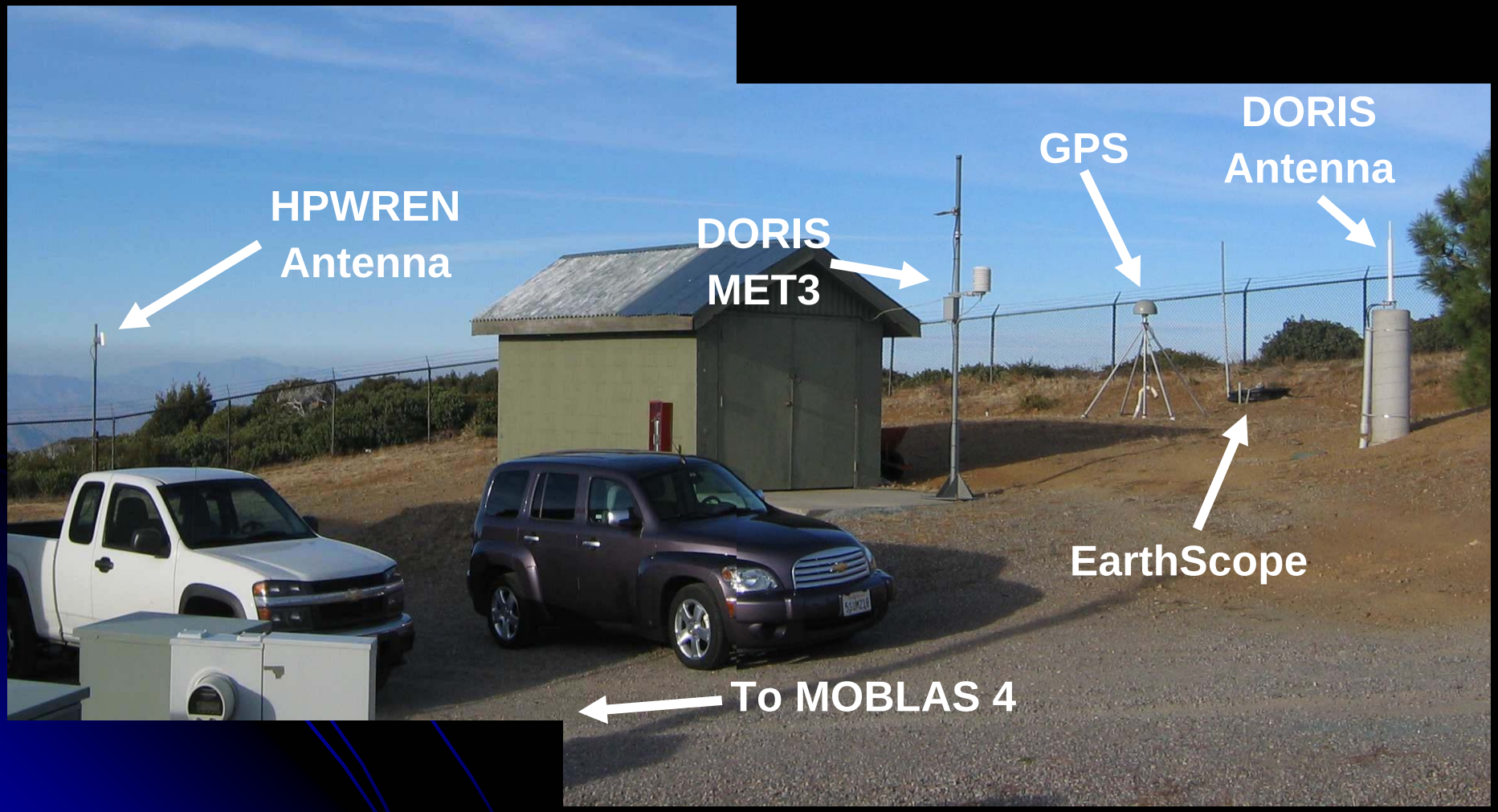
MOBLAS 4 Hosts other Science Missions



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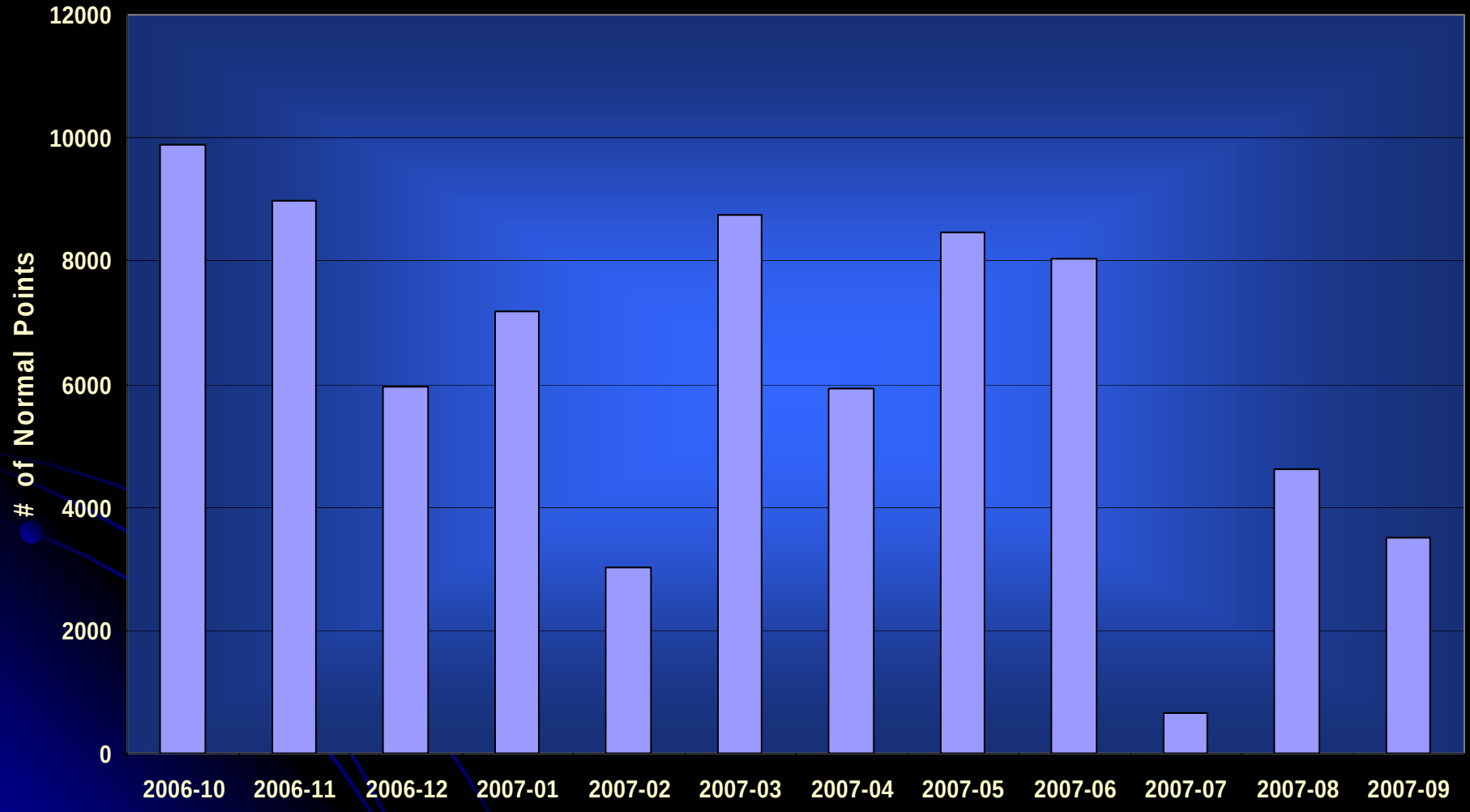
MOBLAS 4 Produces 5% of the Global Data Set



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MOBLAS 4 Fire 10/24/07

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HPWREN Valuable to NASA SLR

- Highly Reliable
- High Bandwidth
- Critical Safety Tool
- Provides Easy Access to Our Remote Location

Thanx HPWREN !

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