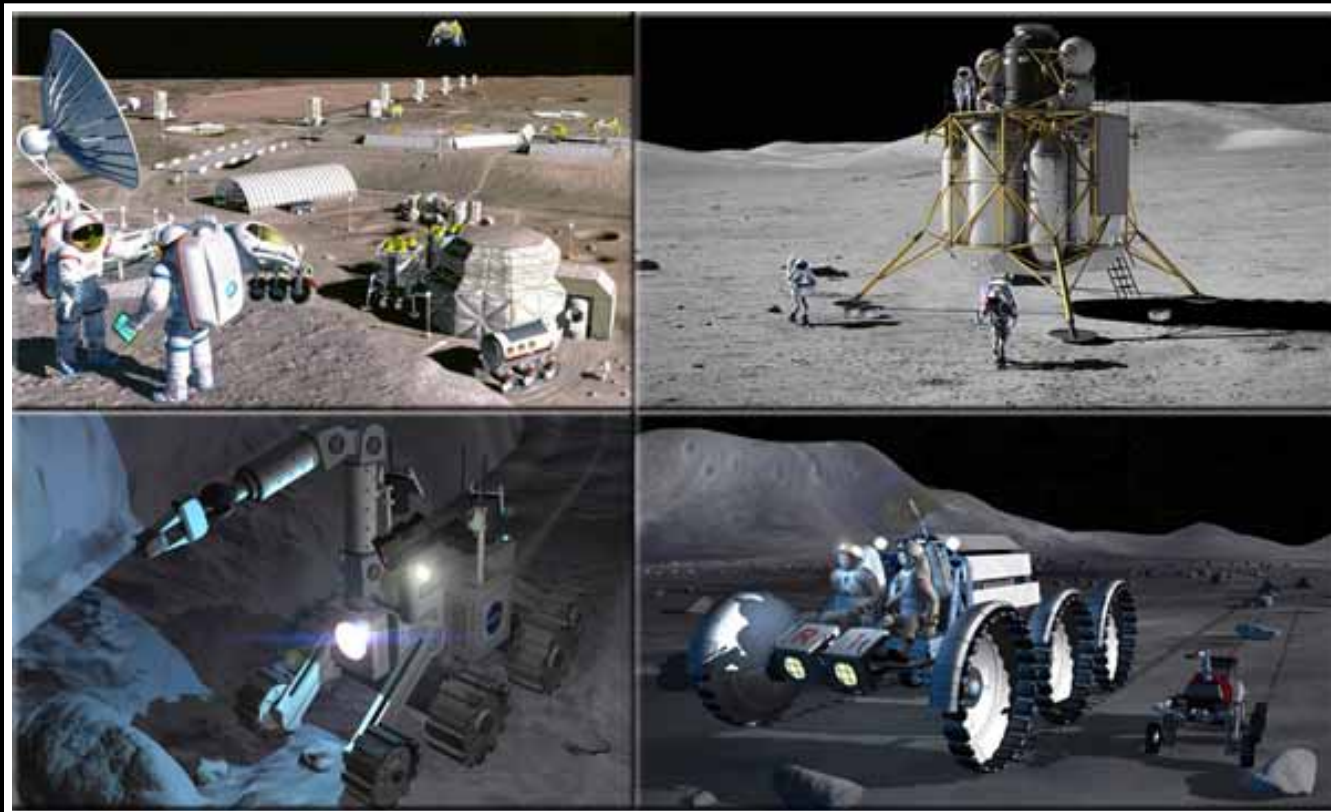


Joint Annual Meeting of **LEAG-ICEUM-SRR**

**Lunar Exploration Analysis Group - 10th ILEWG International Conference
on Exploration & Utilization of the Moon - Space Resources Roundtable**

28-31 October 2008 – Cape Canaveral, Florida, USA



International Lunar Observatory Association (ILOA) October 2008 Update

**Steve Durst, ILOA / Space Age Publishing Company
Hawai`i and California, USA**



- **Inter-Stellar**
- **Inter-Global**
- **Hawai`ian**
- **Multi-Functional**

ILOA – 3 Missions



- **ILO-X Precursor Mission**
(NET 2010)
- **ILO-1 Polar Mission**
(NET 2012)
- **ILO Human Service Mission**

International Lunar Observatory (ILO)

ILO-X Precursor:

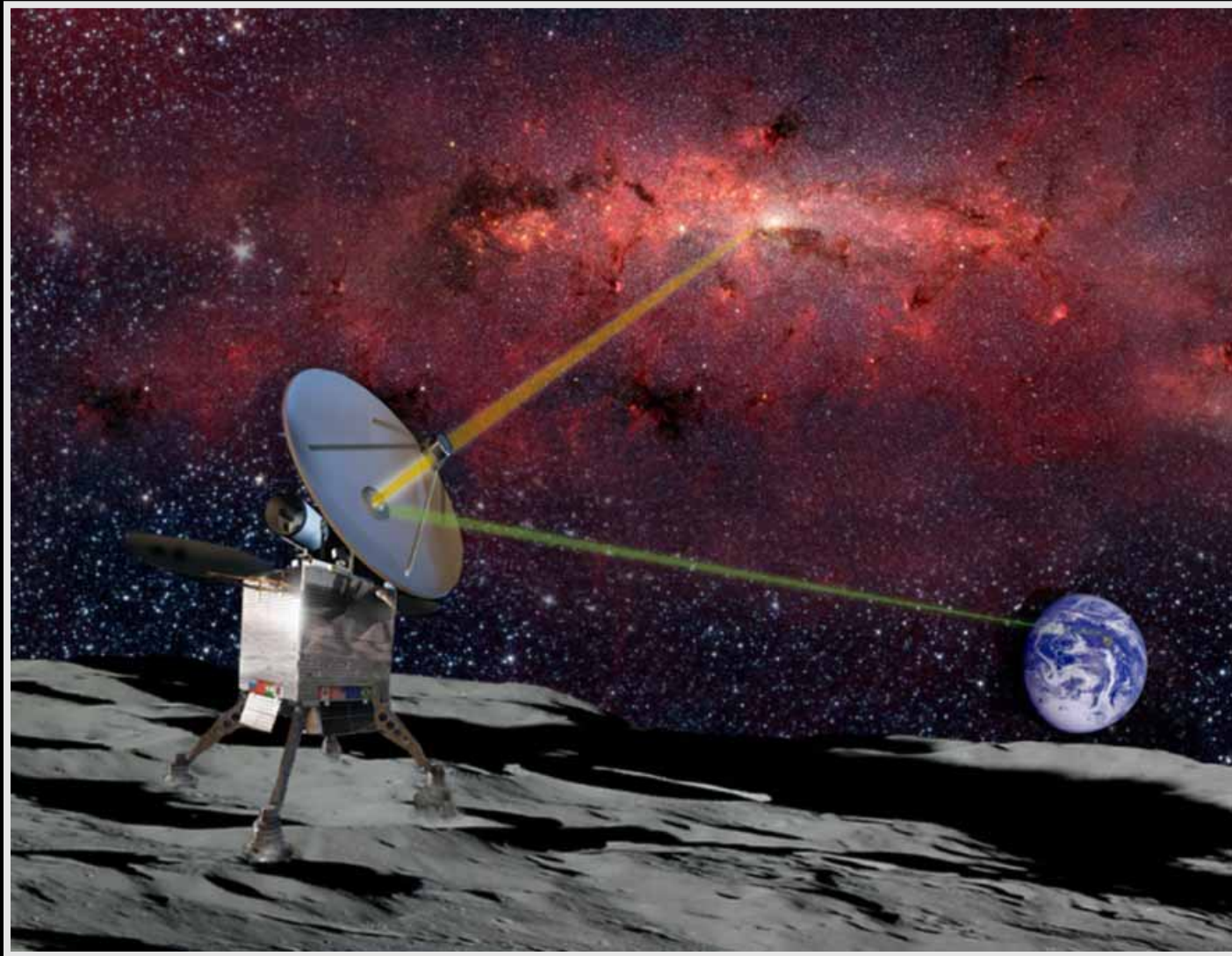
- **Odyssey Moon / MDA**
- **US\$30M Google Lunar X Prize**
- **ILO 2 Kg Technology Demonstrator Payload**
 - **AMIE Camera / Space-X**
- **Equatorial Mission**
- **Galaxy First Light Imaging, Lunar / Earth Observation**
- **Communications / Broadcasting**

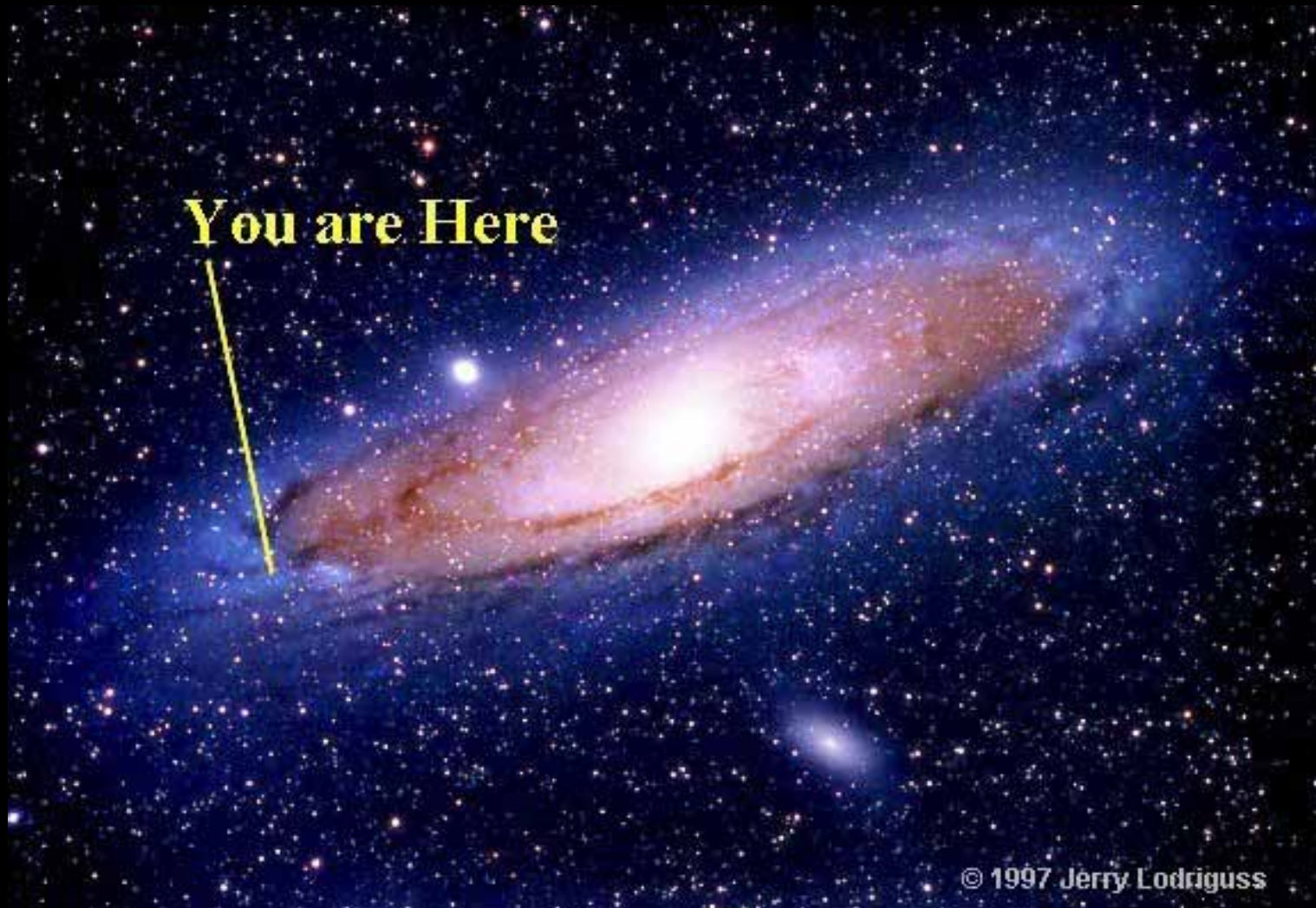


Primary and Secondary ILO Mission Objectives:

- **First Light Galaxy Imaging**
- **Initial landing site observation, local surveillance**
- **Earth observations: albedo, geocorona, etc.**
- **Search for Earth-like planets**
- **Search for Extra-Terrestrial Intelligence (SETI)**
- **Analyze interstellar molecules to determine origin of Solar System**
- **VLF observation**
- **Observe signs of life on Mars, Europa, Titan, etc.**
- **Search for dangerous NEOs**
- **Sun-Earth observations, solar storm warnings**
- **More**

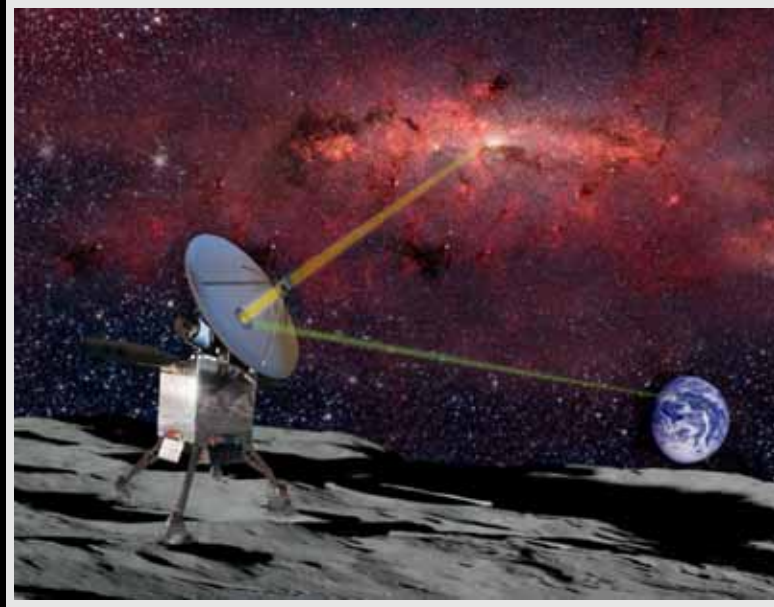
ILO Galaxy First Light Imaging





Why Galaxy Education, Consciousness & Awareness is Important for the 21st Century:

- **Education – for primary, secondary higher, and highest education: Knowledge, understanding of humanity's place in the Universe – our Milky Way Galaxy occupies a mid-position domain between Solar System finiteness and Cosmos infinity**
- **Astrophysics / Astronomy – Galaxy studies internationally are of increasing interest and value; study of our local stellar neighborhood for familiarity; center / central 10 parsecs with supermassive black hole is most dynamic region of Milky Way**
- **History of Human Civilization / Archaeoastronomy**
- **NASA, World Space Agencies – 21st Century Program and Policy Development Advance through Galaxy understanding**
- **Galacticity – may be as important for the 21st Century, as is Relativity to 20th**



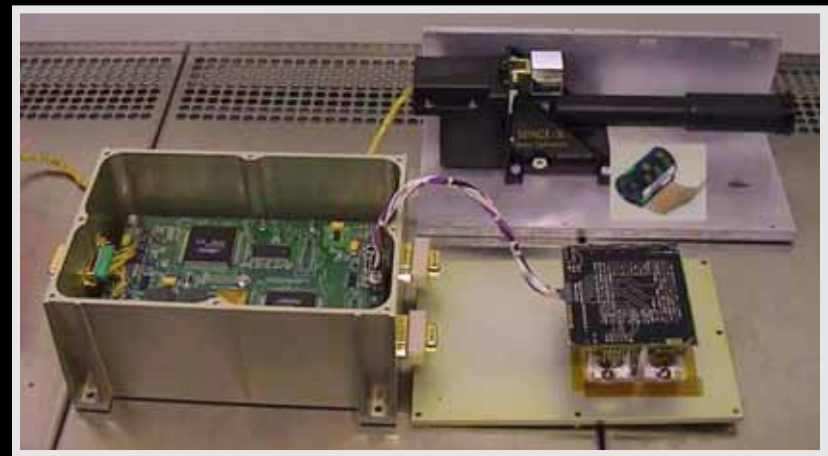
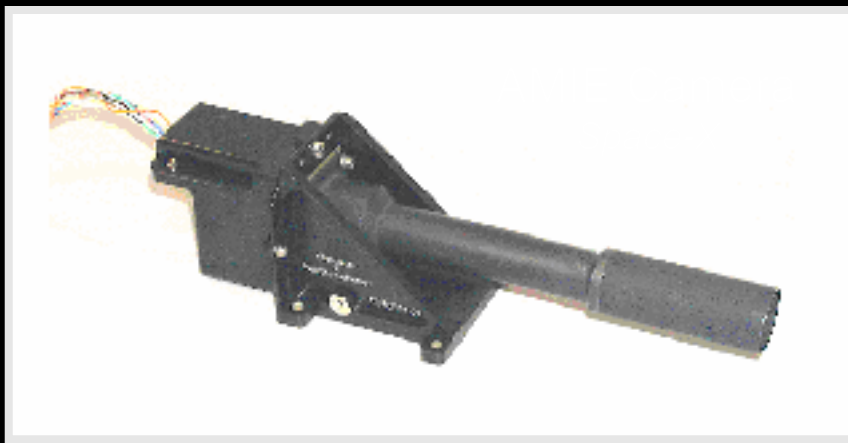
ILO Imaging Galaxy Center



EarthRise Photo : 1968 / Apollo 8

Instrumentation

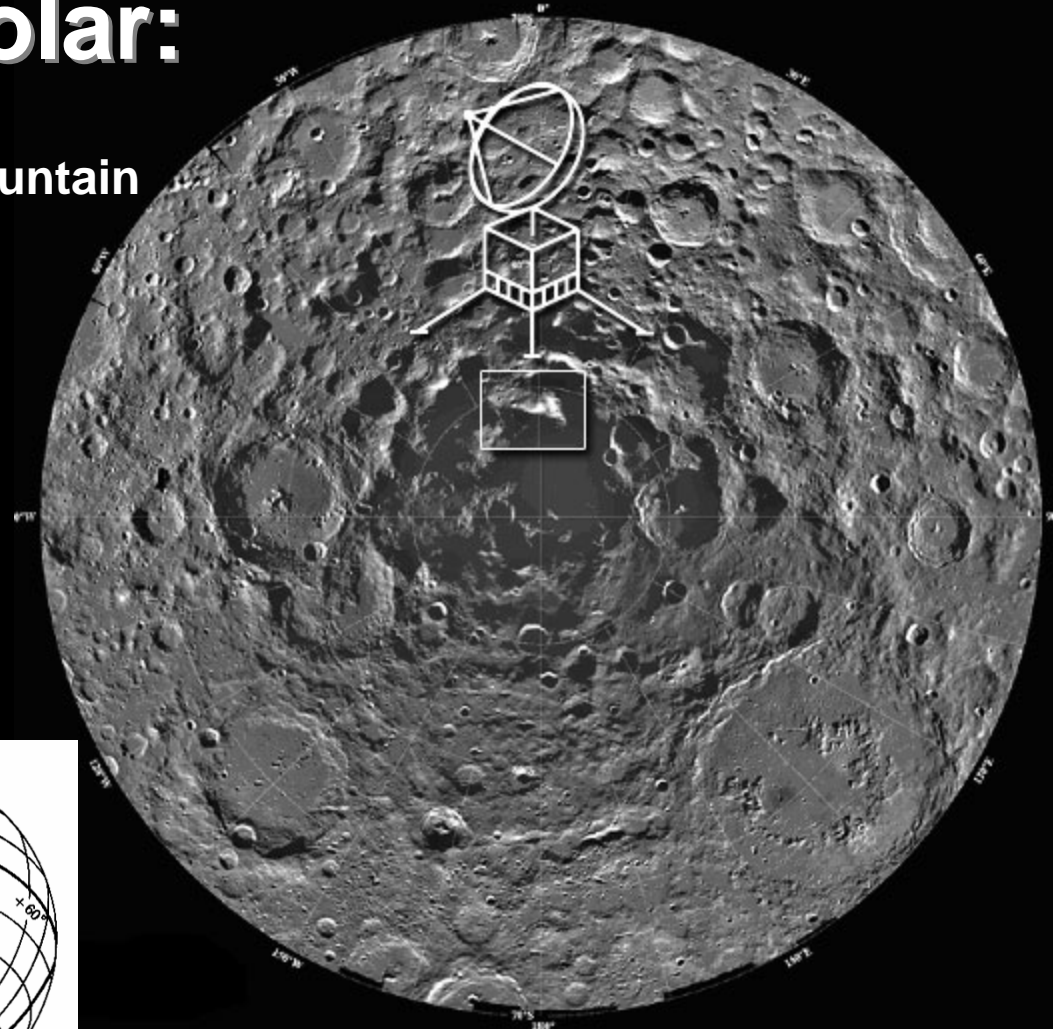
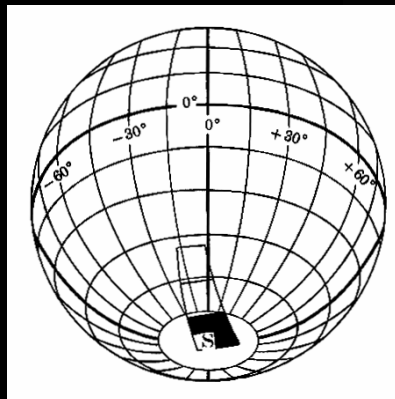
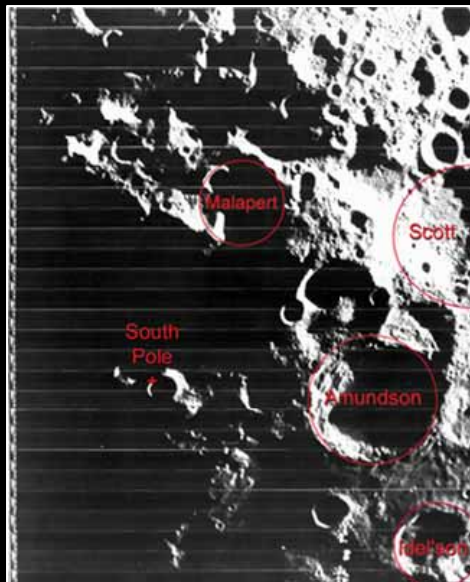
- Candidate Instrument – AMIE Camera
- UV / Vis / NIR CCD Imaging Array of 1024 x 1024 pixels
- Field of View – $5.3^\circ \times 5.3^\circ = 738$ parsecs on a side (0.72 pc / pixel)
- Mass = 2 kg



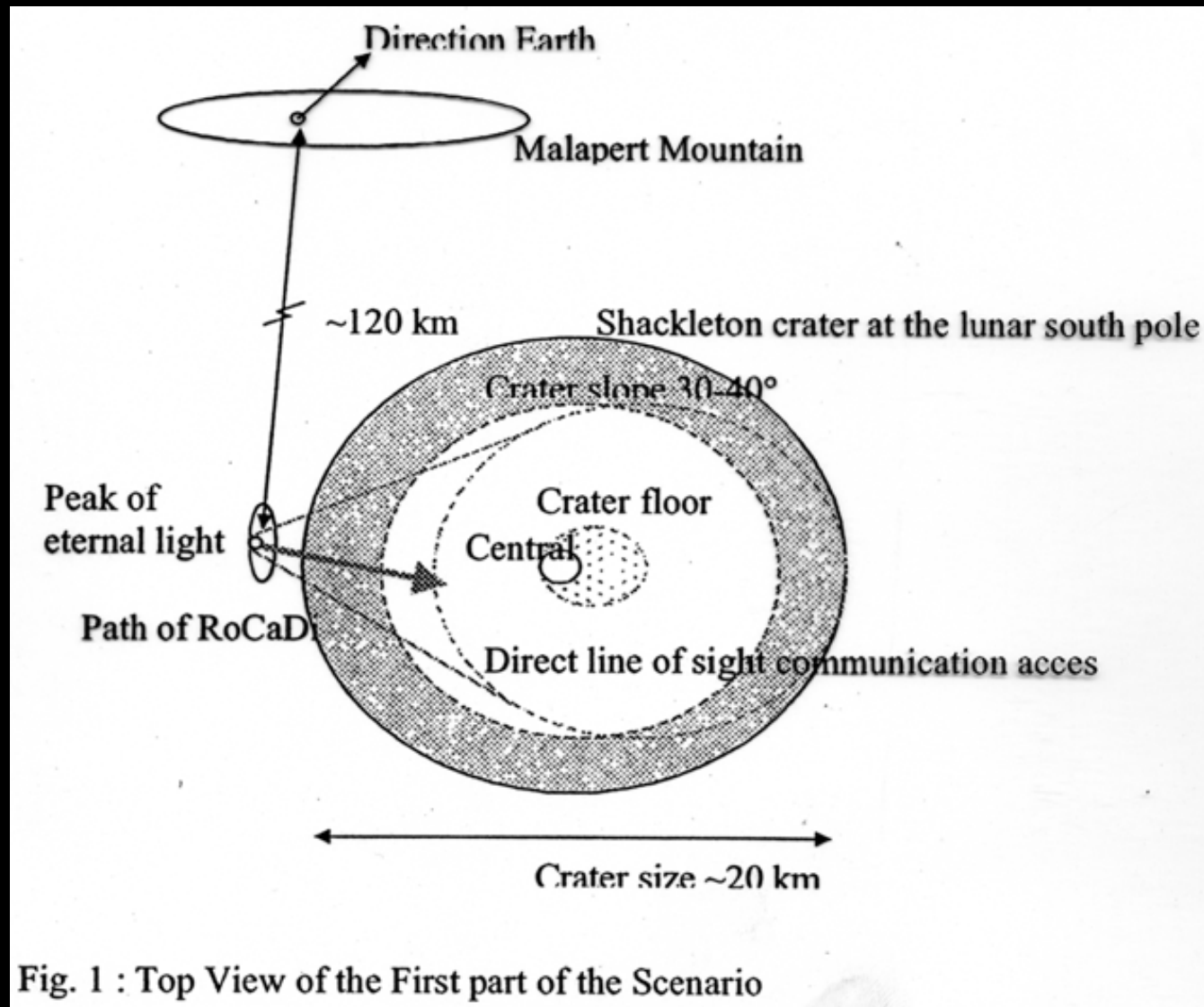
International Lunar Observatory (ILO)

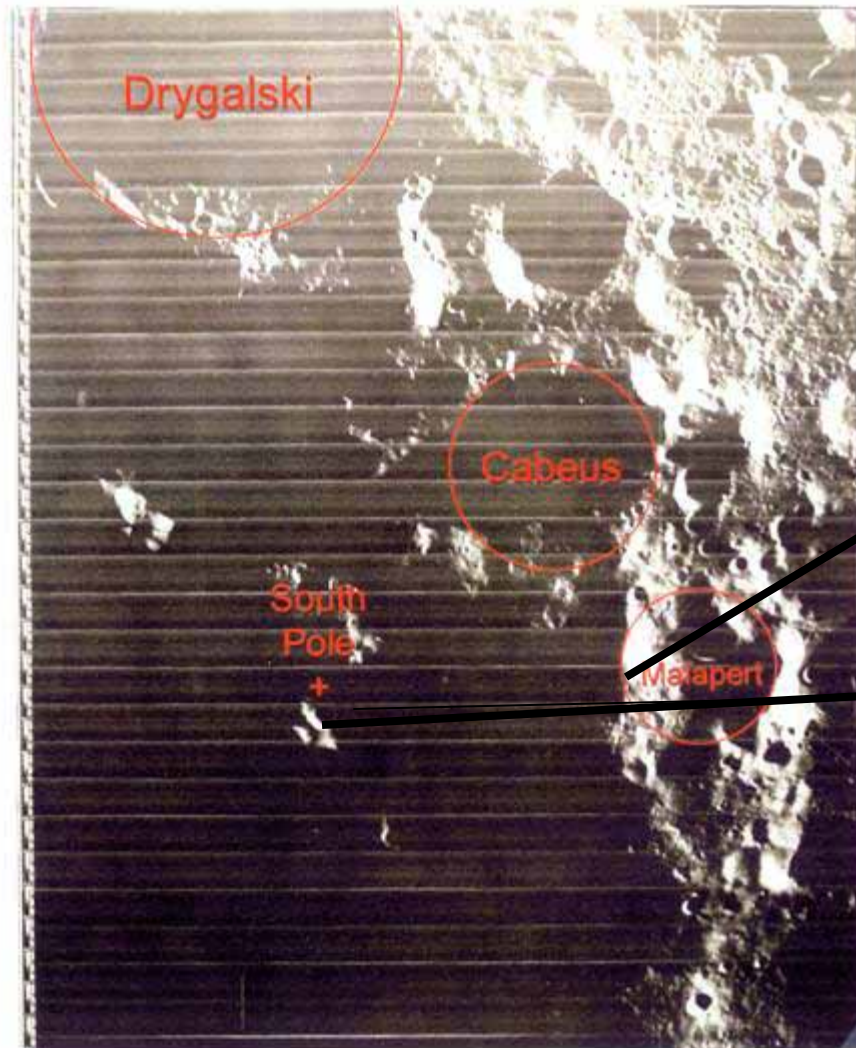
ILO-1 Polar:

- ILO to be Located at 'Malapert' Mountain
- 'Electrification' of the Moon



Shackleton Crater Location





1F-179-H1

10

Lunar Orbiter 4 Picture of Shackleton and Malapert Mountain

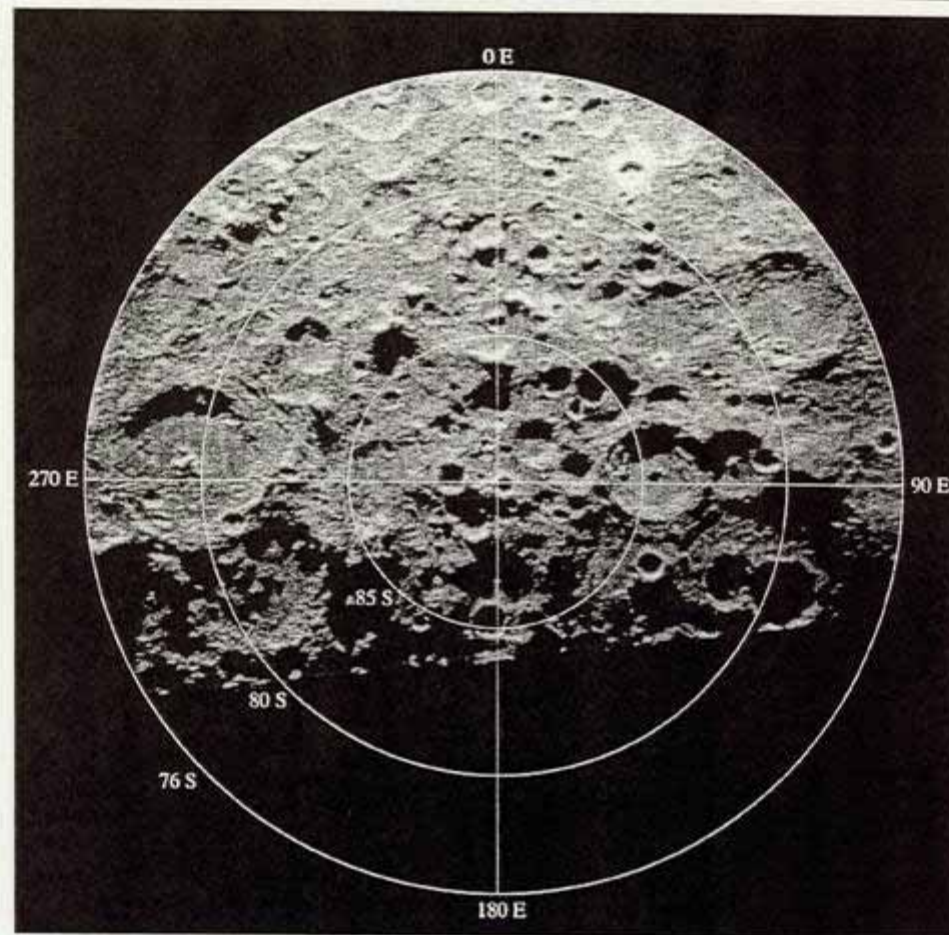
Malapert Mountain

Completely sunlit

Shackleton Crater

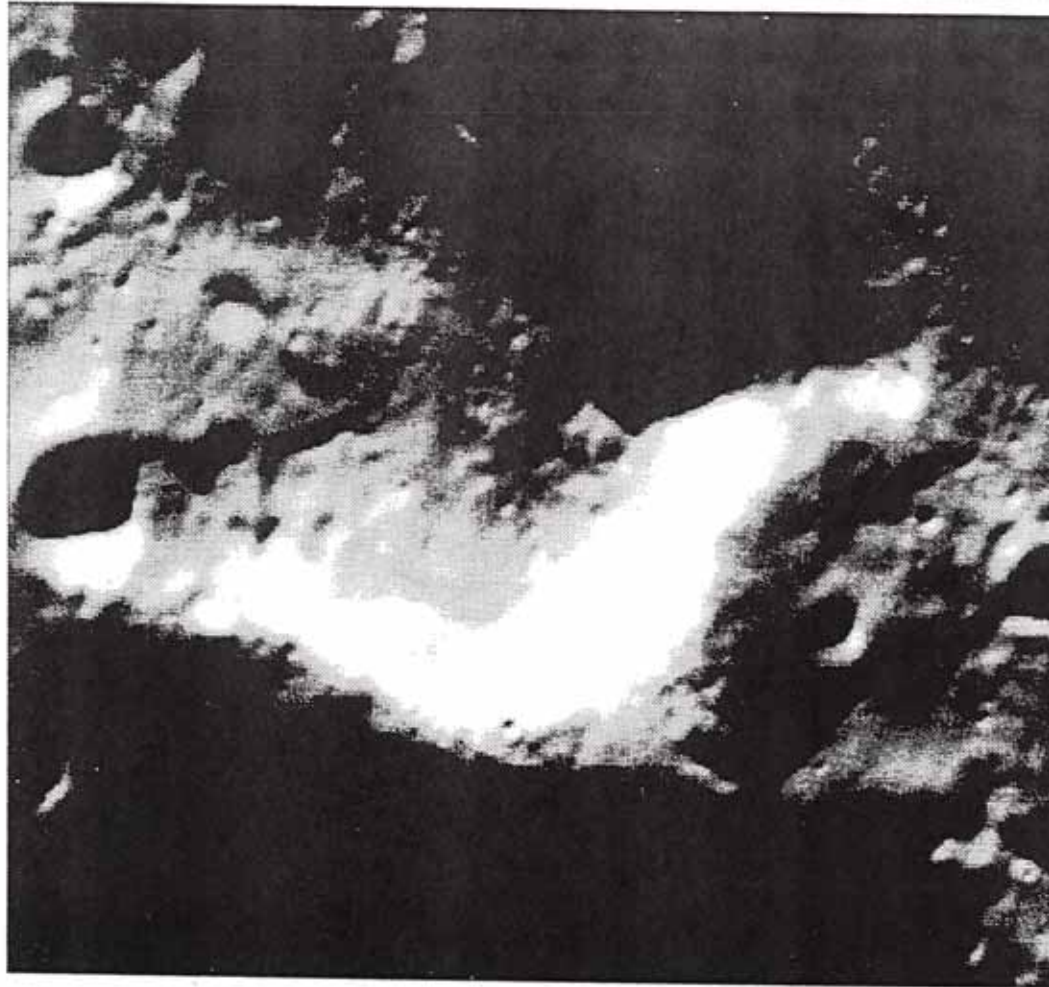
Shackleton rim almost
all dark

Arecibo Radar Image of South Pole



Earth-based radar shows area of Moon in continual microwave and earthshine visibility.

Lunar Orbiter 4 Close-up of Malapert Mountain





Lunar Commercial Communications:

The International Lunar Observatory requires communications capacity to transmit astrophysical data to satisfy its primary mission. Bandwidth not utilized for astrophysical data transmission can be made available on a commercial basis.

Commercial Usage of Additional Bandwidth

Pre-sold Bandwidth	Bandwidth Available Upon Emplacement (May be pre-sold when launch date set)		Future Need
<p><u>Space Calendar Broadcast</u></p> <p>This Space Calendar will be transmitted from the Moon. Advertisers will pay a premium rate for transmission of their ads from the lunar surface.</p>	<p><u>Internet Search Engine Giants</u></p> <p>Search engine giants, such as Google and Yahoo, as well as other internet businesses, will be able to purchase bandwidth and use it to provide special services from the lunar surface, which might include local imagery. Interactive games may be developed which actually take place on the Moon.</p>	<p><u>Specialty Advertising Opportunities</u></p> <p>Large corporations will be able to use a Moon email system to capture the attention and interest of consumers for products which may relate to any of the numerous associations modern culture attributes to Luna.</p>	<p><u>In Situ Communications and Monitoring Capabilities for Robotic Project Operators</u></p> <p>As the wave of robotic and mining/excavation missions arrive on the lunar surface, they will do so with the knowledge that communications and surface monitoring capabilities in the region of Malapert Mountain and Shackleton Crater will be in place and available for purchase.</p>

'The First, Best Space Calendar in the Business'



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Vol 27, No 43

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International Lunar Conference Deal To Realize Humans Living, Working On Moon

International lunar experts will gather in Cape Canaveral FL this week to examine the issues and opportunities related to lunar exploration. The 'Joint Annual Meeting of LEAG-ICEUM-SRR' takes place on 26-31 October and is themed 'Sustainable Moon, International Moon, Productive Moon.' The conference combines three prominent lunar meetings: the annual meeting of the Lunar Exploration Analysis Group (LEAG), created as an advisory board to NASA in 2004; the '10th International Conference on Exploration and Utilization of the Moon (ICEUM)', organized by the International Lunar Exploration Working Group (ILEWG); and the 10th Space Resources Roundtable (SRR), an annual symposium on SRR at the Colorado School of Mines. This year's joint forum will present and discuss new results from worldwide lunar activities and examine the scientific, engineering, international and commercial factors required to create a sustainable and global lunar exploration program. The chairs of the conference are Olive Neal of LEAG / University of Notre Dame, Steve Mackwell of LEAG / LPL, Bernard Foing of ILEWG / ESA, Leslie Gertsch of SRR / Missouri University, and Jeff Taylor of LEAG / SRR / University of Hawaii. A Young Lunar Explorers event will precede the conference on Oct 26-27 at the Florida Institute of Technology in Melbourne FL, and the Florida Tech Observatory will host lunar and sky observations on Oct 26. (Credit: NASA, LEAG, SRR)

China, Europe Astronautics Groups Host Conference On Satellite Communication, Navigation And Commercialization

The Chinese Society of Astronautics (CSA) and the International Academy of Astronautics (IAA) present the '3rd CSA-IAA Conference on Advanced Space Systems and Applications' on Oct 26-31 in Shanghai, China. The forum will feature discussions on all aspects of satellite applications, including communications (light, direct, wireless, etc.), remote education and medical treatment, Earth observation, new satellite technologies, microsatellites, international networks and commercialization. The opening ceremony will include remarks by China Aerospace Science and Technology Corporation President Ma Xuesai and IAA Secretary General Jean Michel Contant, as well as representatives from EADS Astrium of Europe and Lockheed Martin of the USA. Two tours are being organized to follow the event: one to the Shanghai Academy of Spaceflight Technology, and one to the Xichang Satellite Launch Center (located in Sichuan Province). Prospects for international cooperation in space have been increasing with the easing of East-West tensions and the emergence of the Asian economic revolution. 21st Century industries such as a human lunar base and human Mars mission will likely be international ventures. For their part, CSA and IAA have been cooperating since 1992 in various academic fields. The 2 groups previously held the '2nd International Space Academic Conference on Space Technology' in 2001 and the '1st Seminar on Space Activities Economic Benefits' in 1992. (Credit: IAA, CSA, CNSA)

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THIS WEEK

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● All times for terrestrial events in local time unless noted.
 ○ All times for international terrestrial events in local time unless noted.
 ★ All times for space events, and...
 ☆ All times for international space / radio events in Hawaii Standard Time unless noted. Add 10 hours to obtain UT (Universal Time) - Greenwich, England.

Weekly Planet Watch - Morning Planets: Saturn (SSE), Mercury (E) / Evening Planets: Jupiter (SDW), Venus (W2W)

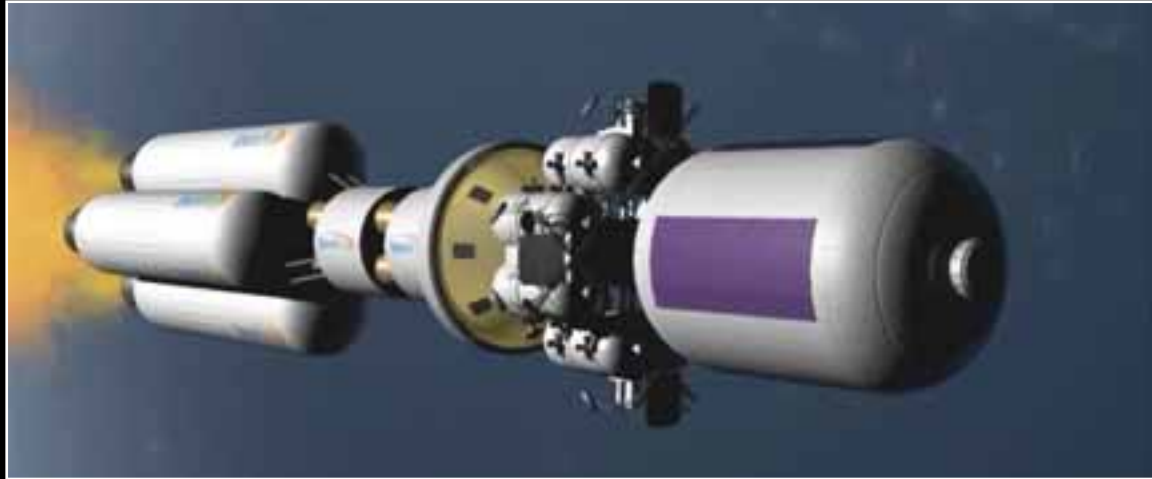
MONDAY

- Oct 27 — **International Space Station**, LEO: Expedition 18 crewmembers Commander Mike Fincke, Flight Engineers Yuri Lontchakov and Greg Chamloff take control of station following recent departure of E17 crewmembers Sergei Volkov, Oleg Kononenko with Spaceflight Participant Richard Garriott. E18 crew broadcasts special messages today on voting, ISS 10th birthday. http://www.nasa.gov/mission_pages/station/main/index.html
- Oct 27 — **Launch Rocket / GOCE**, Plesetsk Cosmodrome, Russia: Eurocket Rocket vehicle will launch the Gravity field and steady-state Ocean Circulation Explorer (GOCE) satellite for the European Space Agency. <http://www.spaceflightnow.com/rocket/index.html>
- Oct 27 — **Challenger Learning Center**, Jacksonville FL: Challenger Learning Center Director Sharon Kiamis talks with teachers and students in Japan about life and culture in Japan. <http://www.spacecraft.com/calendar/center/center.html?id=5176>
- Oct 27-28 — **Kavli Institute for Cosmological Physics**, Chicago IL: The Impacts of High-Energy Astrophysics Experiments on Cosmological Physics. <http://http://workshops.uchicago.edu/imeac/2008/>
- Oct 27-30 — **International Foundation for Telemetry**, San Diego CA: International Telemetry Conference. <http://telemetry.org/pages/information/2008.php>
- Oct 27-31 — **Shanghai Normal University**, Shanghai, China: The Starburst-AGN Connection Conference. <http://202.121.53.133/conference/index.html>
- Oct 27 — **Phoenix Mars Lander**, Red Planet: Spacecraft has finished scooping soil samples to deliver to its onboard laboratories, and is now preparing to analyze samples already obtained. http://www.nasa.gov/mission_pages/phoenix/news/phoenix-20081021.html
- Oct 27 — **Moon**: 6.5° SDW of Mercury, 01:00.
- Oct 27 — **Moon**: 2.8° SDW of Spica, 14:00.

Continued from ...

- Oct 28 — **Young Lunar Explorers**, Florida Institute of Technology, Melbourne FL: 'Young Lunar Explorers and Outreach event,' precedes 2008 ILC / ILEWG-ICEUM-LEAG-SRR, through Oct 27. <http://www.ki.usra.edu/ymef/ymef-schedule/2008/08-200811-01.html>
- Oct 28 — **Spitzer Science Center**, Pasadena CA: '5th Spitzer Conference: New Light on Young Stars - Spitzer's Views of Circumstellar Disks,' through Oct 30. <http://www.spitzer.caltech.edu/spitzer/2008/>
- Oct 28 — **NASA Marshall Space Flight Center**, Huntsville AL: '2008 Huntsville Workshop: The Physical Processes for Energy and Plasma Transport Across Magnetic Boundaries,' through Oct 31. http://www.nasa.gov/pdf/20081028main_nasa_008/

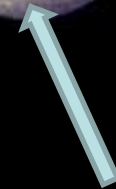
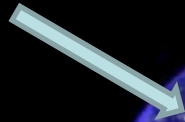
Human Service Mission



SpaceDev Inc – Dream Chaser, ALOHA Chair

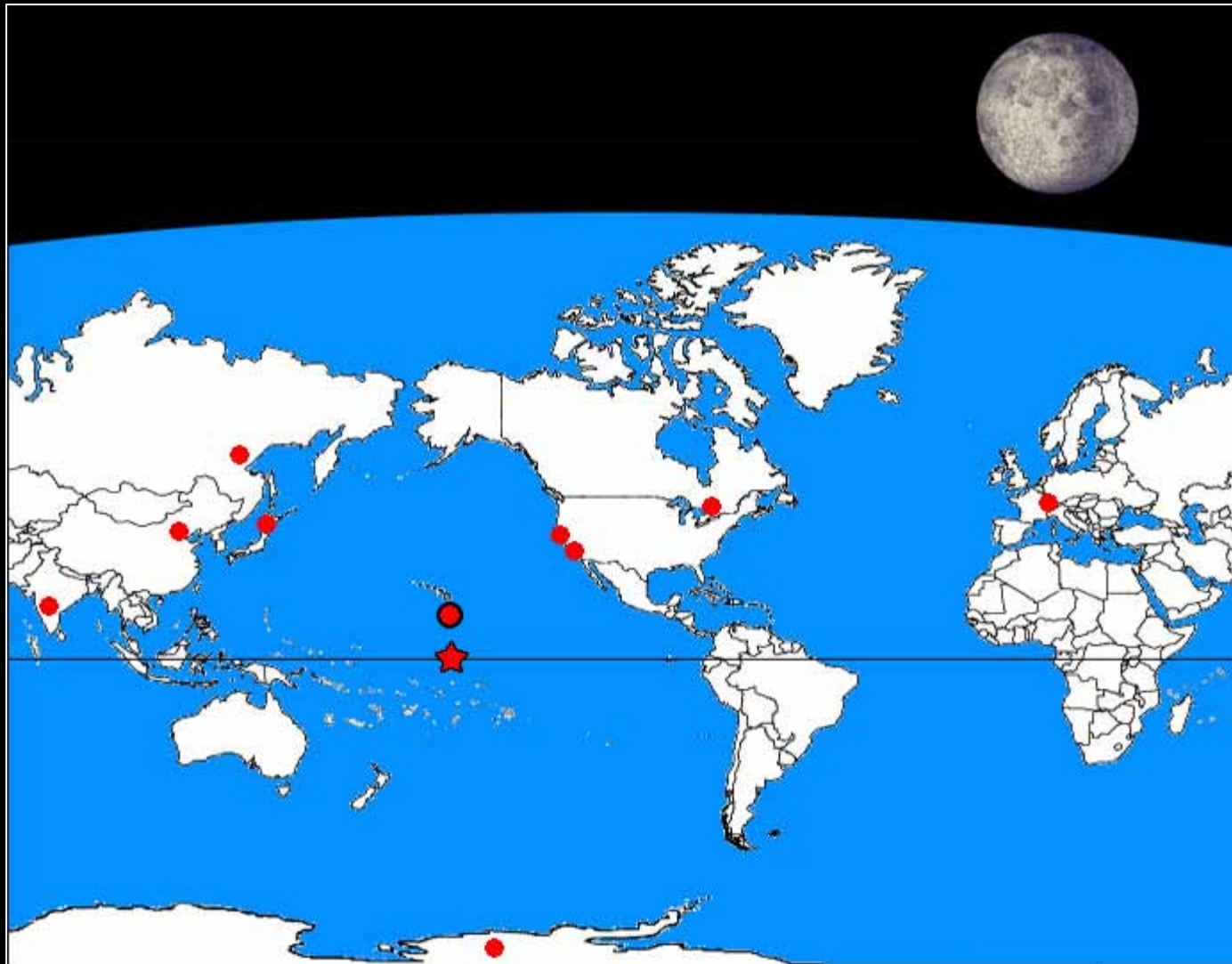
Inter-Global / Cislunar System

ILOA: Hawai'i



ILO: Malapert Mountain

A Global / Interglobal Mission



A Global / Interglobal Mission

- **Canada** –Canada France Hawai`i Telescope Corporation, MDA, Optech, University of British Columbia Astronomy Department, CASCA, National Research Council, Canada Space Agency
- **China** – National Astronomical Observatory of China, Chinese Academy of Sciences, Shanghai Astronomical Observatory, Chinese Society of Astronautics, CNSA, Beijing Planetarium
- **India** – India Space Research Organization, Physical Research Laboratory, Indian Institute of Astrophysics
- **Japan** – JAXA / JSPECS, Shimizu Corporation
- **Europe** – Space-X Space Exploration Institute, European Space Agency
- **Russia** – Keldysh Institute, Vernadsky Institute, Sternberg State Astronomical Institute, Russia Space Agency
- **Hawai`i / USA** – Kimo Pihana, UH Hilo Astronomy / Space Age Publishing Company, SpaceDev, NASA

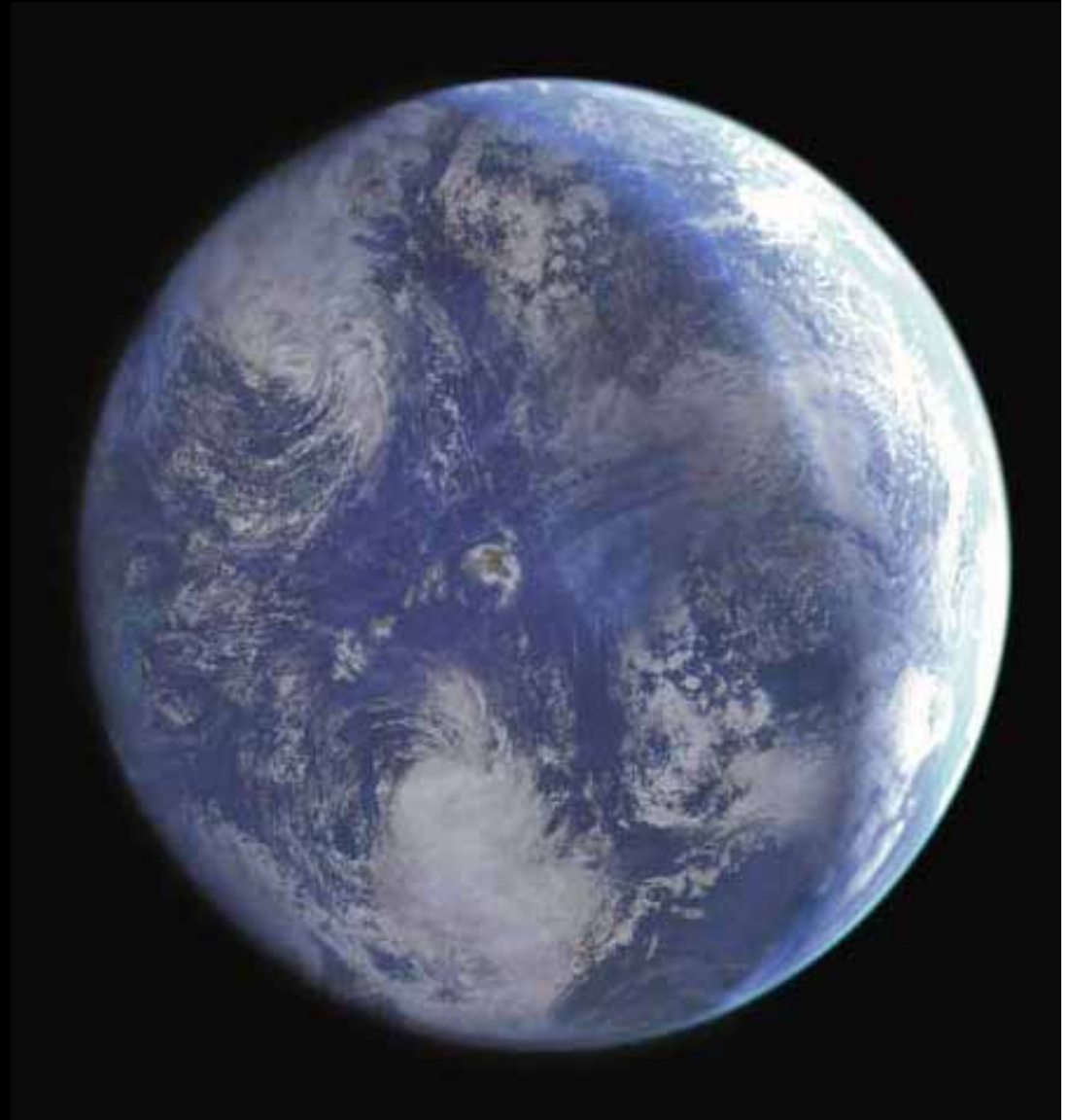
International Lunar Observatory Association

ILOA / ILO Assets ...

- **6 SpaceDev Studies 2003-2008 (ILO / Human Service Mission)**
- **Master / Business Plan**
- **MoUs with CFHT, NAOC / International Partnerships**
- **AMIE Camera, Cisco Systems Router**
- **ILOA Updates / Website / Office**
- **Lunar Commercial Communications Workshops**
- **Galaxy Forum 2008, Galaxy Forum 2009**
- **Non-Profit 501(c)3 Status**
- **Board of Directors, Exec. Committee with Operating Reserves**
- **Next Board of Directors Meeting 5-6 December 2008, Hawai'i Island**

International Lunar Observatory Association

- ILOA to be Based in Hawai`i
- Center of Pacific Hemisphere
- Global Support Centers
- Maintain Hawai`i Preeminence in Astrophysics for Next 100 Years



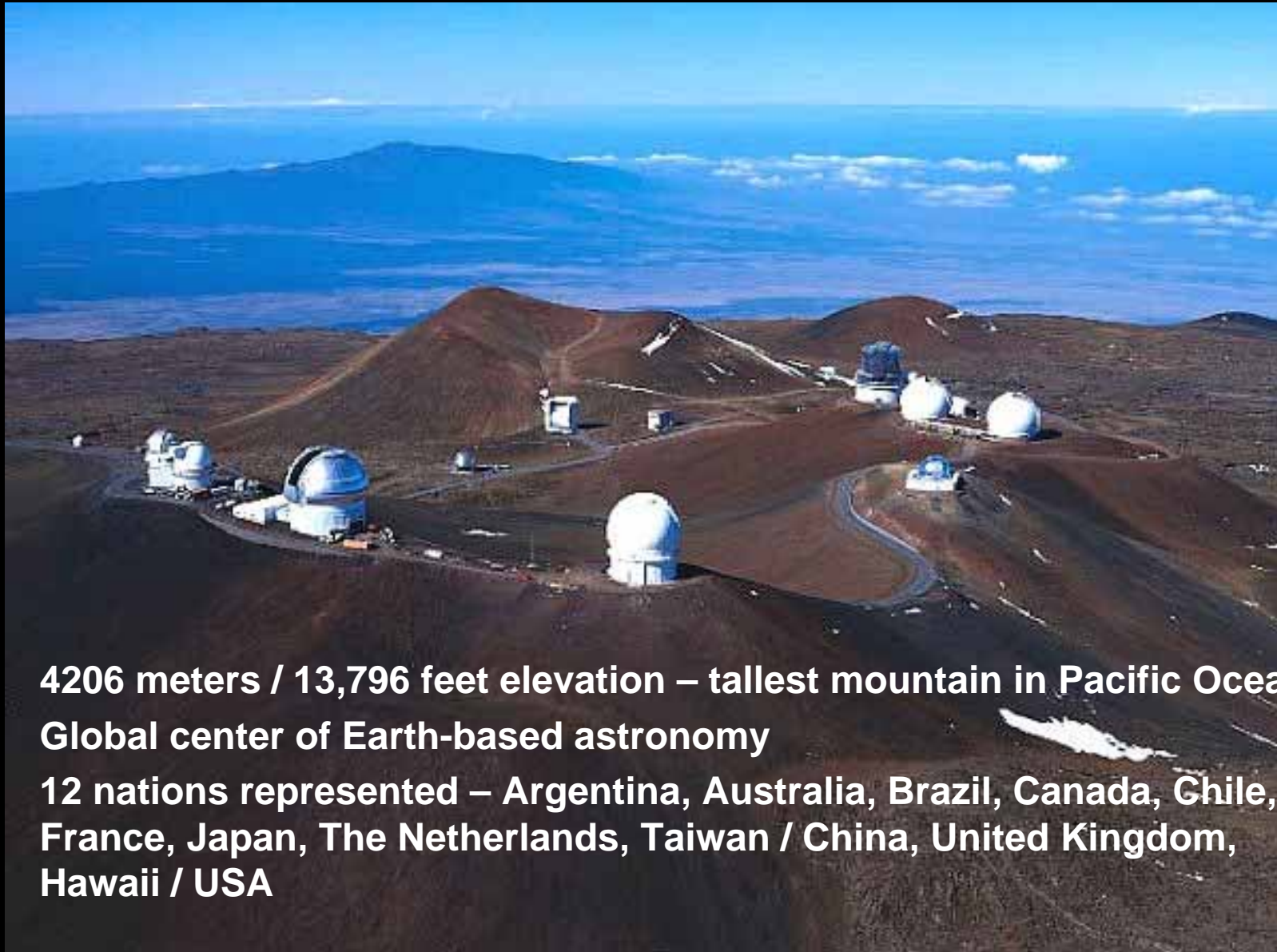
Why Is Hawai`i Important to Space Exploration?

Geographic Advantages:

- **Center of Pacific Hemisphere**
- **Southern-most site in USA / equatorial proximity**
- **Mid-Pacific islands bi-directional launch capacity (equatorial or polar)**
- **Mauna Kea – highest point in Pacific**

And Aloha!

Mauna Kea Summit Observatories



- 4206 meters / 13,796 feet elevation – tallest mountain in Pacific Ocean
- Global center of Earth-based astronomy
- 12 nations represented – Argentina, Australia, Brazil, Canada, Chile, France, Japan, The Netherlands, Taiwan / China, United Kingdom, Hawaii / USA

Smithsonian Submillimeter Array



Submillimeter Valley, Subaru, Keck 1 & 2, NASA Infrared Telescopes



Gemini Ridge



Multi-Functional

The ILO is a Multi-Functional ...

- **Astrophysical Observatory**
- **Power Station**
- **Communications Center**
- **Site Characterizer**
- **Property Rights Agent**
- **Virtual Dynamic Nexus Website**
- **Hawai`i Astronomy Booster**
- **Toehold for Human Lunar Buildout**

ILOA Spectrum of Participation

Put Your Name on the Moon!

1 ***Endorse***

Become an Endorser of the ILOA by simply providing us with your name and public support.

All people of the planet are invited to participate and will get their name on the Moon!

2 ***Invest***

Interested in valuable astrophysical data, lunar broadcasting opportunities and ownership?

The ILOA seeks qualified financial Investors from:

- *Science/astronomy, space agency and government institutions*
- *Communications and NewSpace companies*
- *Philanthropists*

3 ***Direct***

A select group of specialized and qualified Directors will be chosen to operate the ILOA and command the ILO mission and its follow-on human service mission.

ALOHA!

For more information about the ILO / ILOA, contact:

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