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.


• Galacticity – may be as important for the 21st Century, as is Relativity to 20th.
Instrumentation

• Candidate Instrument – AMIE Camera

• UV / Vis / NIR CCD Imaging Array of 1024 x 1024 pixels

• Field of View – 5.3° x 5.3° = 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

Fig. 1: Top View of the First part of the Scenario

Graphic: Paul van Susante
Lunar Orbiter 4 Picture of Shackleton and Malapert Mountain

Malapert Mountain

Completely sunlit

Shackleton Crater

Shackleton rim almost all dark
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

<table>
<thead>
<tr>
<th>Pre-sold Bandwidth</th>
<th>Bandwidth Available Upon Emplacement (May be pre-sold when launch date set)</th>
<th>Future Need</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Space Calendar Broadcast</strong></td>
<td>This Space Calendar will be transmitted from the Moon. Advertisers will pay a premium rate for transmission of their ads from the lunar surface.</td>
<td></td>
</tr>
<tr>
<td><strong>Internet Search Engine Giants</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Specialty Advertising Opportunities</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>In Situ Communications and Monitoring Capabilities for Robotic Project Operators</strong></td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>
‘The First, Best Space Calendar in the Business’
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.

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.

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

For more information about the ILO / ILOA, contact:

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