Galaxy Education in the 21st Century

Galaxy Forum Kansas

Kansas Cosmosphere, Hutchinson, Kansas

Saturday, August 22, 2009 – 09:30-11:30am
International Lunar Observatory Association (ILOA) August 2009 Update

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

- Galactic / Inter-Stellar
- Earth-Moon / Inter-Global
- Hawaiian
- Multi-Functional
ILOA – 3 Missions

• ILO-X Precursor Mission (NET 2011)

• 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
We are here
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
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
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>&lt;br&gt; 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><strong>Internet Search Engine Giants</strong>&lt;br&gt; 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><strong>Specialty Advertising Opportunities</strong>&lt;br&gt; 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>
</tr>
</tbody>
</table>
‘The First, Best Space Calendar in the Business’
Human Service Mission

SpaceDev Inc – Dream Chaser, ALOHA Chair
Inter-Global / Earth-Moon / 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

Space Age Publishing Company
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
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.
ALOHA!

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