

CALL FOR PAPERS

Abstracts due 15 December 2002



The National Space Society's 20th Annual

International Space Development Conference

ISDC 2003:

The Roadmap to Space

23 - 26 May 2003
Hyatt San Jose
San Jose, California

Papers are invited in all of the programming track areas of the National Space Society's 22nd annual **International Space Development Conference**, "ISDC 2003: The Roadmap to Space" to be held 23-May through 26-May, 2003, at the **Hyatt San Jose**, San Jose, California.

The International Space Development Conference (ISDC) is the annual meeting of the **National Space Society** (NSS). For the past 21 years, leaders in the space community -- scientists, engineers, astronauts, politicians, administrators, and entrepreneurs, -- have gathered to advance the development and exploration of space. Based on registration figures from previous ISDC's, the anticipated attendance is 700-1000 people.

Technical tours being planned include: Chabot Space & Science Center , NASA Ames, and TheUSS Hornet Museum.

Diversity and innovation are sought in this *Call for Papers*, together with topics that provide avenues for Conference attendee interaction and discussion. The Conference will consist of program tracks that will endeavor to cover the scientific & educational activities relevant to space exploration, its utilization, and man's future in space. The daily programming focus of the conference will be the fine tuning of the Roadmap to Space developed by NSS. The Roadmap consists of Mile Stones and Barriers.

Mile Stones

- *Legal Protection of Property Rights Assured*
The NSS believes that private property rights, which are the basis of our civilization's liberty and prosperity, can be used for creating a free society out in space.
- *Commercial Launch Purchases*
Right now, only governments can afford to buy and launch rockets.
- *Technology for Self Sufficiency*
For human beings to survive in space, they obviously need to carry the necessities of life with them, especially air, water, and food. In order to survive on a space station, the Moon, or Mars, we need to develop "closed-loop" life support systems that will allow us to recycle liquid and solid wastes, as well as replenish the inhabitants' supply of oxygen.
- *Robots Confirm Ice on Moon*
Even with closed-loop life support systems, ample supplies of local water would be helpful for inhabitants.
- *Lunar Research Facility*
The International Space Station provides a unique environment for scientific research because of its pure vacuum and freefall. The Moon could provide a similarly unique environment, with its one-sixth gravity and pure vacuum.
- *Government Base on Moon*
Again, like the International Space Station, a permanent habitat on the Moon can provide openings for commerce, tourism, and research. If the government puts up the initial investment, other organizations will be more inclined to invest there, as well. As the saying goes, "If you build it, they will come."
- *Industrial Base on Moon*
The government base on the Moon could provide the core facility for a future industrial base.
- *Mission Goal for Settlement*
This could be something as simple as a statement of intent for settling the Moon or Mars. The Northwest Ordinance of 1787, for example, established the conditions of life, freedom, and law in what is now the Midwest.
- *Robotic Exploration of Mars*
Human beings have sent probes to the Red Planet since 1965. Before we decide to send human beings there, we need to get specific information about the landscape, the atmosphere, and the potential for life there.
- *Human Explorers on Mars*
While robots might give us technical information about the surface of Mars, they cannot reason as we do, react as quickly as we do, or make up connections or theories the way we do.
- *Robotic Exploration of Asteroids*
Asteroids may prove to be practical sources of resources including metals, nonmetals, and volatiles.
- *Human Explorers on Asteroids*
Human explorers, of course, would follow the robotic probes to confirm the best prospects, and settlers (engineers and miners) will settle those that offer real economic opportunity.

- *Advanced Propulsion Systems*
Human travel beyond Mars will not be practical with the propulsion technologies now in use or in development.

Barriers

No Long Term Government Funding Mechanism

Lack of Incentives for Private Capital Investment

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Lack of Affordable Transportation to Space

Lack of Sovereignty

Liability Insurance Costs and Conditions

Proposed Passenger Restrictions

Lack of Public Interest

The general public is rapidly losing interest in space development because:

- (1) The pace of space development is frustratingly slow, especially when compared to incredibly fast pace of the home computer revolution and other industries.
- (2) NASA is forced by taxpayer watchdogs to portray human space activities in the most boring manner possible.
- (3) People are frightened by the real and exaggerated perceived risks of outer space.
- (4) Activity, planning, or public discussions regarding private trips into space are not a part of the national discourse.

Moon Treaty and “Common Heritage” Principles

No Closed-loop Life Support System

U.S. National Space Policy Limitations

Launch Vehicle Reliability

Government Obstacles to Commercialization

Space Technologies and Systems

Papers are solicited in areas of enabling space technologies and systems that offer the potential for significantly influencing human involvement and advancement into space. Potential topics of interest include, but are not restricted to:

- * Launch systems and revolutionary transport & propulsion systems for leaving the earth and reaching the moon, planets, and beyond. Includes expendable launch vehicles (ELVs), reusable launch vehicles (RLVs), in-space propulsion, electromagnetic launchers, launch facilities, and innovative designs for orbiters, reentry vehicles, landers, and rovers.
- * Space power technologies
- * Space environment, orbital debris
- * Intelligent/autonomous systems and robotics
- * In-space assembly and servicing
- * Satellite communications
- * Payloads, including advanced sensor packages
- * Space system test and evaluation
- * Satellite guidance, navigation, and control systems

- * Structures and habitation systems for the Space Station and lunar/planetary bases; materials research
- * Microsats and Micro Electro Mechanical Systems (MEMS) technology, including satellite arrays and satellite “swarms”
- * Computational methods: modeling & simulation, space system design, data processing, and spacecraft control software

Exploration & Utilization of Space

Papers are invited in all areas of the exploration and utilization of space. The emphasis is on science and exploration missions, and techniques for in-situ resource utilization (ISRU). Topics of interest include, but are not restricted to:

- * **Earth Orbit** -- Potential areas of interest in this category include Space Station sciences, remote sensing and Earth science from orbit, Space Station commercialization, low-earth orbit tourism, X-Prize, space ports, power beaming to Earth, Earth orbit colonization, and Earth orbit tethers.
- * **The Moon** -- Papers and presentations are sought in the areas of exploration and utilization of lunar resources. Topics in this category include lunar sciences, resource utilization and development, and lunar basing and colonization.
- * **Mars** -- Papers are sought in the areas of exploring and developing Martian resources. Potential presentation topics include human and robotic exploration of the Martian surface and interior, Martian resource utilization, search for Martian life, the greening of Mars, and Mars colonization.
- * **Ad Astra (To the Stars):** -- Papers and presentations are sought in the areas of exploration and utilization of the deep solar system and beyond. Potential areas of interest include outer planet science missions, Kuiper belt exploration, interstellar precursor missions, and interstellar mission concepts.

Space Science Education

Technological advances are dependent upon a strong educational base. The teaching of space sciences presents a considerable challenge. Presentations are sought addressing all areas of student and general public space science education. We are seeking techniques and methodologies that provide workable approaches to classroom instruction and public outreach. Potential topics include, but are not restricted to:

- * The development of space awareness in science curricula
- * Understanding the space environment
- * Teaching about space- student motivation and interest, and lessons learned in science education
- * NASA programs useful to space science awareness and instruction
- * Using the International Space Station as a learning tool
- * The role of multi-media and computers in space science education
- * Elementary and secondary school media -- teaching modules, demonstrations, and methods
- * Using space examples to teach subjects other than math and science
- * The role and synergism of core curricula in meeting the goals of space science education
- * University programs in space science / engineering / business / international policy / law

Special Topics

- * **Space Law – Commercial Policy** -- Presentations and papers are sought that seek to identify and clarify barriers to successful commercial enterprises in space. While the focus of this topic concerns the presently perceived legal barriers to successful commercialization of space, other presentations and papers are of interest. Topics of specific interest include national, trans-national and treaty limitations on ownership, capital formation, revenue generation and sale, transfer, use and modification of space resources for commercial purposes. Other topics include barriers to mission development due to present distribution of scientific information and potential mechanisms for commercial sale of scientific information.
- * **International Policy** -- Presentations and papers are sought that provide clarification on presently perceived International Policy on space commercialization. Specifically, presentations and papers that address areas of ownership, salvage rights, property rights, compensation for services, sale, transfer, trade and distribution of manufactured items, commodities in original and processed condition, and abandoned or stranded assets are of particular interest. Presentations that clarify ambiguities in these areas, particularly with historic precedent are of interest. Presentations

and papers are also sought that address the benefits and challenges associated with international space exploration and space development efforts (inter-government & private sector).

- * **Space Industrialization** -- Presentations and papers are sought that identify mechanisms, approaches, concepts, technologies leading to commercial and/or government space industrialization. These topics can range from repair or refurbishment of assets on orbit, sample returns, rovers, science and/or entertainment based concepts or capabilities, extra-terrestrial bases or colonies. Specifics regarding potential science and/or commercial mission descriptions are desired.
- * **Breakthrough Physics** -- Presentations and papers are sought that identify concepts or technologies leading to revolutions in access to or operations in space over present capabilities. Concepts that employ advances at the leading edge of physics knowledge in information transfer, communications, transportation, propellantless propulsion, and energy production are of interest. Also of interest are areas that explain phenomenon incompatible with presently held views of cosmological genesis.
- * **Space Medicine / Life Sciences** -- Presentations and papers are sought that cover medical issues for space travel and lunar/planetary bases. Topics include: treating patients in zero-g; medical problems on long missions; NASA's spinoffs used in medicine; medical research in space; biological risks and possible solutions; effects of space on animals; licensing and standards; special training for physicians in space; obstetrics and geriatrics in space.
- * **Astronomy** – Presentations and papers are sought that provide overviews of earth-based astronomy facilities (capabilities and recent discoveries); and space-based astronomy (astronomy satellites in earth orbit; lunar-based astronomy; advanced concepts).
- * **Spacecraft Anomalies** – Prediction, detection, and resolution of anomalies.

Instructions for Abstract Submission: Authors are requested to submit their abstracts using the following format:

1. Title of presentation
 2. Author(s) full name (list principal author first)
Affiliation(s), addresses, telephone, fax number, and email address
 3. Abstract should contain 200-450 words, text only (no pictures, graphics, charts, etc.), in English. Submitted abstracts should contain recent results of research, applications development or investigation, and implementation. Abstracts should address the purpose, scope, objectives of the work, and briefly summarize approach or methodologies, important results, and the significance and envisioned applications. Student papers from all tracks are strongly encouraged.
 4. Files should be submitted via email to credfield@stmarytx.edu. Submittals should include a 3.5” disk or CD with the hardcopy when mailing or faxing. Format the abstract and accompanying information in Word 6 or better or in a .txt file.
 5. Abstracts are due 15 December 2002. Abstracts will be reviewed and selected by the conference program committee, program co-chairs. The Abstract due date should be strictly observed. Authors will be notified of acceptance by Jan 15, 2003. It is highly encouraged to submit abstracts via email, but if ground mail must be used, submittals should include a 3.5” disk or CD with the hardcopy when mailing or faxing. Please submit to the following address:
Dr. Carol Redfield, Editor
NSS-ISDC 2003
609 Ridge View Dr.
San Antonio, TX 78253
- Please direct any questions concerning abstract preparation to Dr Carol Redfield, credfield@stmarytx.edu,
or (210)436-3298
6. Final papers are due 15 March, 2003.
 7. A CD ROM of the ISDC 2003 proceedings will be distributed to each registrant at the conference.