



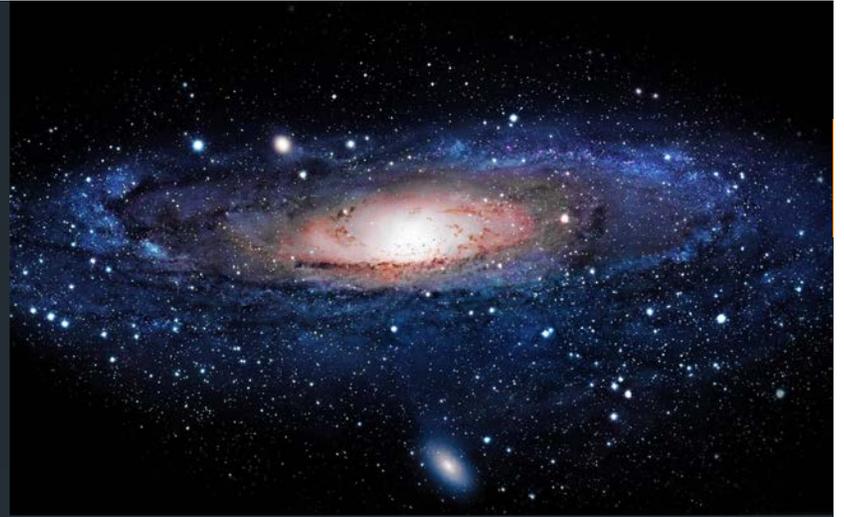
**Alliance for Collaboration  
in the  
Exploration of Space**

# Space Enterprise



- Humanity is now embarking on a new era of space exploration and development.
- Both public and private space institutions, educational and training organizations, and regulatory agencies worldwide are pursuing innovative approaches to help advance diverse and pioneering space enterprise.
- Opportunities are also being explored to apply space technologies and resources in ways that could improve and sustain life on our home planet.

# ACES Worldwide



- ACES Worldwide is a space-related alliance established to enhance international space ventures that can help make space enterprise more collaborative and environmentally sustainable.
- Known as the Alliance for Collaboration in the Exploration of Space, ACES Worldwide's goal is to promote public-private space ventures, strengthen space education and training programs, enhance space safety standards, and help advance long-term visions for sustainable space activities - making these more equitable, expanding their environmental benefits, and accelerating timetables for peaceful space enterprise (that ultimately could benefit all nations).

# The ACES Worldwide Vision

- This multinational space initiative is focused on engaging not only major space-faring nations (and their space agencies), but also developing countries, multinational space organizations, entrepreneurial/private space enterprise, diverse educational programs, and not-for-profit organizations.
- ACES Worldwide is reaching out to both space-faring and non-space-faring nations, space agencies, and other space-related organizations around Earth. This includes members of the International Astronautical Federation, participants in COSPAR, and members and observers of U.N. COPUOUS.
- Several international organizations currently exploring this effort include: Space Renaissance International (SRI), McGill University IASL, the International Association for the Advancement of Space Safety, and International Space University.

# KEY ISSUES

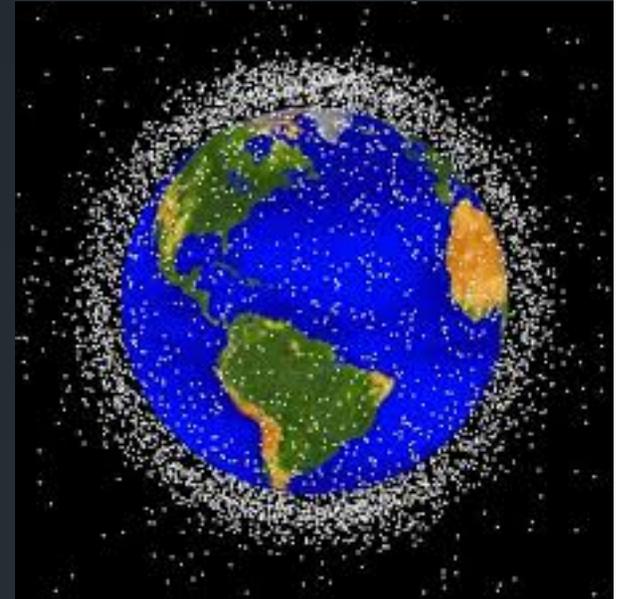


## Space Safety

- Public safety (during launches, controlled re-entry, commercial space flights, hypersonic transport).
- Environmental protection and sustainability (space debris, atmospheric and ground pollution, radiation).
- Ground personnel protection and aborted launches.
- Space situational awareness / space traffic control / on-orbit services.
- Global standards and regulations.
- Cosmic hazards and planetary defense.

## Orbital Space Debris

- Education, training, and public awareness.
- Space situational awareness.
- Active debris removal and mitigation.
- Space insurance and risk assessment.
- Liability conventions and legal constraints.
- On-orbit servicing.
- Space debris reuse for space infrastructure construction.
- Standards for rendezvous and proximity operations.
- Improved debris removal and mitigation policies.
- Issues related to new large-scale LEO constellations.



# Space Education and Training



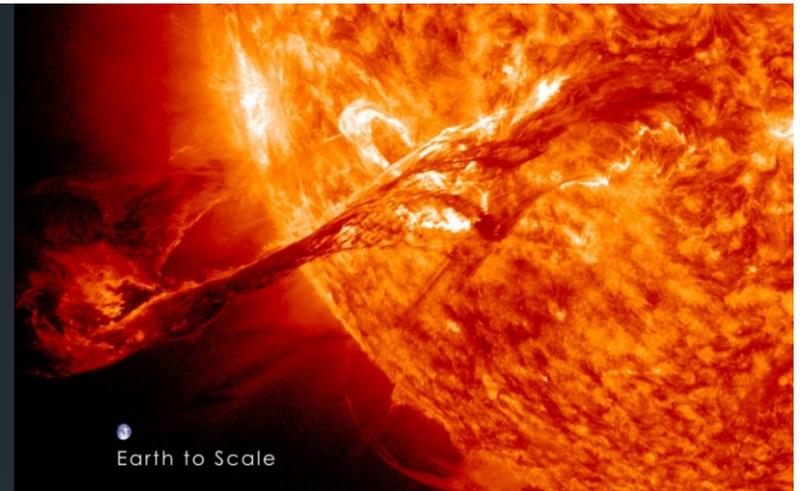
- All nations can benefit from space enterprise that promotes student education and training, understanding of the use of space technologies, and systems to advance economic, environmental and other key developmental goals.
- This training will include space tools and analytics to monitor global pollution, weather, and climate change trends.
- Space education and training will be key to achieving the United Nation's seventeen Sustainable Development goals for 2030.
- Innovative tele-education programs will also be focused on capacity building for nations initiating new space programs.

# Institutional, Legal, and Financial Arrangements for Space Initiatives



- New types (and methods for implementing) public-private partnerships and international alliances.
- Improved educational and training programs, as well as enhanced definitions/concepts related to space systems and activities.
- Long-term sustainability of space and environmental policies and regulations.

# Research Related to Cosmic Hazards & Planetary Defense



- Coronal mass ejections (CME's) and solar flares.
- Potentially hazardous asteroids.
- Comets and how to defend against them.
- Anti-matter / super-novas / cosmic hazard research and detection systems.
- Planetary defense systems, preparedness, and solar shields.

# Space-Related Enterprise to Enhance Global Sustainability



- Development of a Global Sustainability Treaty and related space applications and educational concepts/programs.
- Development of remote sensing and global pollution monitoring concepts, data analytics, and educational programs.
- RF monitoring from space and environmental applications.
- Space systems addressing ocean acidity and global warming.
- Space systems for monitoring global pollution, and new ways to address key sustainability issues.

# Research Related to Lunar & Other Off World Settlements



- On the Moon, on Mars, or in Gerard O'Neill Cylinders.
- The ethics of expanding civilization into outer space.
- Technologies that will be required to enable sustainable off-world settlements.
- The potential size(s) of sustainable space colonies, and where they might be located.
- Potential biological seeds to grow livable structures in space.
- Potential space settlements independent of Earth (how they could be developed, governed, and viably operated).

# Key Questions Concerning the Future of ACES Worldwide



- How should ACES Worldwide optimally be administered to help realize its potential contributions to global space enterprise?
- Can a "roadmap" be developed to help prioritize and guide ACES Worldwide's activities and long-term goals?
- What operational strategies could best initiate/enhance global engagement with ACES Worldwide ?
- Are there sustainable roles for lesser developed and non-space faring nations to engage in space enterprise - and if so, how could ACES Worldwide help realize these opportunities?

