

MOON
VILLAGE ASSOCIATION

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What is the Moon Village?



THE MOON VILLAGE IS ...

- An ensemble of efforts/interest worldwide of governments, industries, NGOs, academia, the general public
- A moon community
- Aiming to explore and use the moon resources in a sustainable manner



THE MOON VILLAGE IS NOT ...

- An “ISS on the Moon”
- A literal village or single science facility
- On the surface of the Moon only

What is the Moon Village Association?



The Moon Village Association (MVA) was created in June 2017, to foster the implementation of the Moon Village

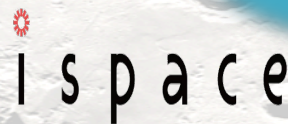
A forum to advance development of the Moon Village involving Industry, government, space agencies, international organizations / NGOs, and the Public at large

A catalyst stimulating a virtuous cycle of investments for the development of a lunar economy aiming to settle humankind on the Moon as well as cultural inspiration for future generations

**Individual Members:
150 from 34 countries**

MOON
VILLAGE ASSOCIATION

**Institutional Members:
8 from 7 countries**



Individual Members



Get Information

Receive updates on global Moon-related developments via social media, newsletters, networking, press releases, meetings & more...

Join a Global Community

Participate in MVA global & regional activities, with others from companies, NGOs, Agencies, venture capitalists, etc.

Make a Difference

Participate in MVA Working Groups & Workshops and help build a global consensus *vis-à-vis* Humanity's lunar future

Institutional Members



Lead the Future

Participate in the emerging multi-billion Moon Market of goods and services

Widen Horizons

Develop contacts with prospective customers, service providers, employees across the globe

Savings

Get discounts on MVA events



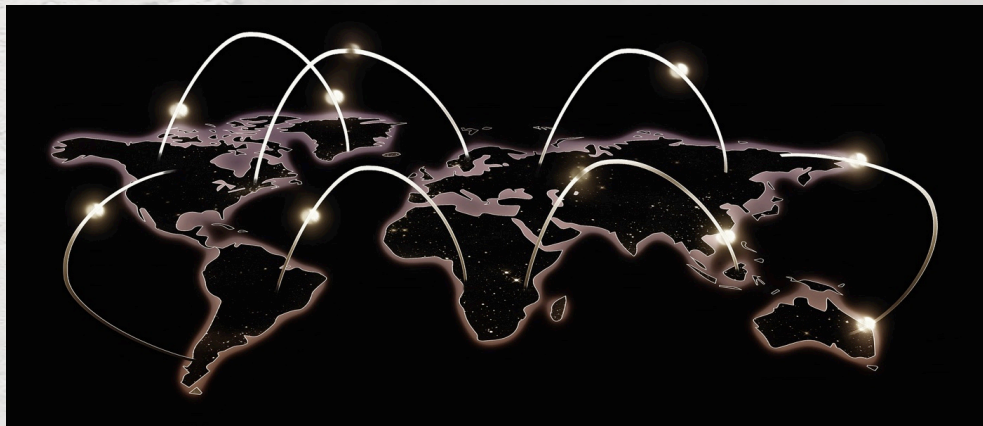
Win Recognition

Eligibility for the annual MVA Award for best achievements in Lunar exploration, utilization & settlement



Global Network

Among all members



The Present Network is...

Now : Africa, China, Hungary, Cyprus, South America, Russia, Italy

Coming : India, US, Japan, the rest of the world...

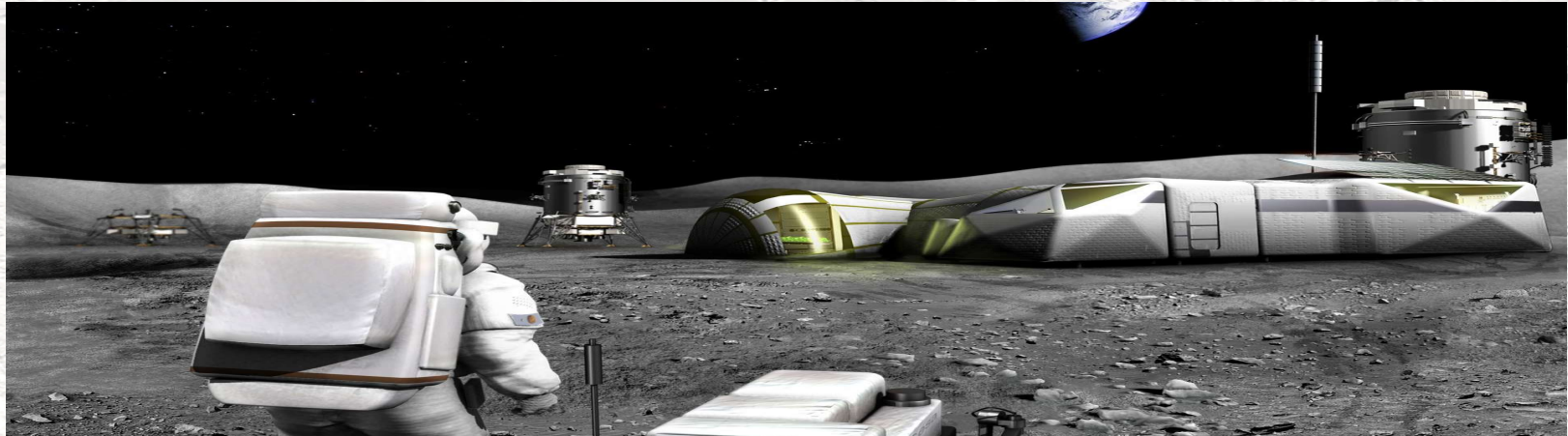
The Network Provides...

Direct connections with the major local stakeholders worldwide, including space agencies, experts, companies, think tanks, venture capitalists etc.

Regional/National Coordinators

Lead local MVA activities, including regional meetings, special events, and more...

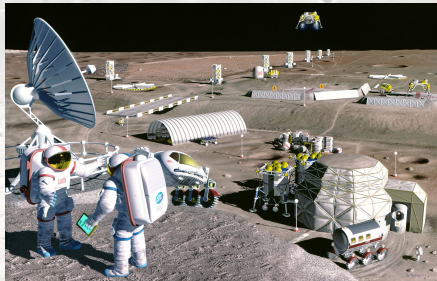
Moon Market



MVA plans the following steps, for Institutional members, to foster the establishment of the Moon Market:

1. Inform the public about their achievements and plans via MVA website and social media
2. A data base of technologies, goods and services applicable to Moon Exploration will be generated, it will be accessible only by MVA members, with a password
3. Ad hoc events will be organized by MVA focusing on specific aspects of the Moon Market

Working Groups



**Moon Village Architectural
Concepts & Issues WG**



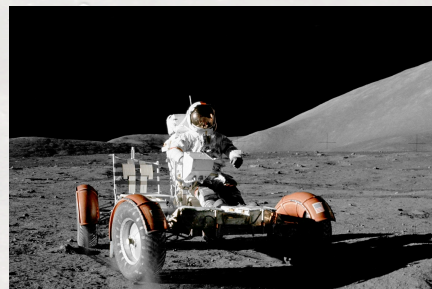
Moon Village Standards WG



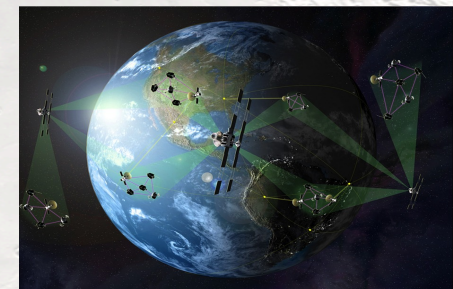
Human Factors WG



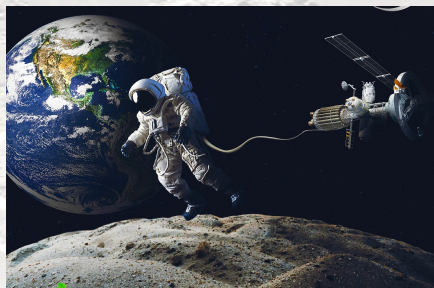
**Moon Market, Missions &
Economics – Forecasts and
Financials WG**



**Lunar Data
Harmonization WG**



**Moon Village Critical
Services WG**



**Moon Village & Exploration
Analogues WG**



**Cultural Considerations
WG**



Outreach WG



**Coordination and
Cooperation WG**

Cooperation and Collaboration Options (Examples / v1)



Specific Agreements

- Government to Government No cooperation (e.g., US / Russia in the 1960s)
- Government to Government Bilateral Agreement for a single Mission (e.g., US / Russia for the 1975 Apollo-Soyuz Mission)
- Government to Instrument Vendor + Country Agreements for a particular Mission (e.g., US / ESA for the Ulysses Mission)
- Government-Company Cooperative Agreement with shared funding (e.g., NASA / Lockheed Martin for X-33)

Overarching Frameworks and Policy

- Single Government Policy (e.g., US Space Transportation Policy)
- Multiple Government Treaty (e.g., Outer Space Treaty)
- Technical Standards (ISO, IEEE, etc.)

Investment Funds

- Government-sponsored investment funds (e.g., Luxembourg)
- Industry-sponsored investment funds (various)

Ways for ... MVA members undertake to pursue synergistic lunar exploration and utilization

- *Single, international treaty-level agreement among multiple countries (e.g., ISS model)*

WG Activities

WG Framework Moon Village Scenarios



- **WHO** is driving the MV-related activity? In other words, which type of organization is the principal player?
- **WHAT** is the MV-related activity?
- **WHEN** might the MV-related activity occur? Defined as three timeframes:
 ✓ the Near-Term (Present-to-2030)
 ✓ the Mid-Term (2031-2050)
 and,
 ✓ the Far-Term (2051-2100)
- **WHERE** on, or near the Moon will the primary activities take place?
- **WHY** would this MV take place? (What are primary purposes?)

SCENARIO ALPHA

Human Spaceflight
Dominated

SCENARIO BETA

Science
Dominated

SCENARIO GAMMA

Private Venture
Dominated

	Scenario Alpha Gov't: Human Space Flight Predominates	Scenario Beta Gov't: Space Science Predominates	Scenario Gamma Private Venture Space Predominates
Near-Term	Present-to-2030 ⁱ	Present-to-2030	Present-to-2030
Who?	• Government Space Agencies • Commercial Services Providers	• Government Space Agencies • University Space Science Labs • Commercial Services Providers	• Private Ventures / Firms • Government Space Agencies
What?	• Robotic Orbiters, Landers, Rovers • First Human Sortie Mission(s) • Near Moon "Gateway" Facility(ies)	• Robotic Orbiters, Landers, Rovers	• Robotic Orbiters, Landers, Rovers • Low-Cost Earth-to-Moon Transport • Near Moon "Gateway" Facility(ies), including a Propellant Depot
Why?	• Resource Exploration • Demonstration of Capabilities for later Humans-to-Mars Missions	• Science-of-the-Moon • Science-on-the-Moon • Science-from-the-Moon	• For-Profit Business Ventures • Resource Exploration • Demonstration of Capabilities
Where?	• Lunar Surface • Lunar Vicinity Orbit	• Lunar Surface Areas of Research Interest (e.g., Lava Tubes, etc.)	• Lunar South & North Poles / Shadowed Regions
Mid-Term	2031-2050 ⁱⁱ	2031-2050	2031-2050 ^{iv}
Who?	• Government Space Agencies • Commercial Services Providers	• Government Space Agencies • Commercial Services Providers	• Private-Firm Ventures • Government Space Agency Services Customers
What?	• Lunar Resource Development / Space Stations	• Demonstration of Capabilities for later Humans-to-Mars Missions • Lunar Surface Operations	• Resource Development • Tech Demos • Local Manufacturing for Cost Reduction
Why?	• Permanent Human Presence Beyond Earth	• Science-of-the-Moon • Science-on-the-Moon • Science-from-the-Moon	• Resource Development • Tech Demos • Local Manufacturing for Cost Reduction
Where?	• Lunar Mare (e.g., Apollo Sites)	• Lunar Far-Side	• Lunar South & North Poles / Shadowed Regions
Far-Term	2051-2100	2051-2100 ⁱⁱⁱ	2051-2100 ^v
Who?	• Government Space Agencies • Commercial Services Providers • Private Ventures Firms	• Government Space Agencies • Commercial Services Providers	• Private-Firm Ventures • Gov't Space Agencies (buying Services)
What?	• Human Lunar Surface Base (Rotating Crews)	• Human-Tended Lunar Surface Science Camp (Occasional Sorties)	• Self-Sustaining Human Lunar Settlement
Why?	• Permanent Human Presence Beyond Earth	• Science-on-the-Moon (e.g., bio labs) • Large-scale radio-astronomy	• Large-scale commercial development of the Moon • Permanent Expansion of Humanity Beyond Earth
Where?	• Lunar Mare (e.g., Apollo Sites)	• Lunar Far-Side	• Lunar South & North Poles / Shadowed Regions
Scenario Notes	ⁱ All characteristics in a given timeframe persist to later timeframes ⁱⁱ First Humans-to-Mars Missions occur during this timeframe	ⁱⁱⁱ First Humans-to-Mars Missions occur during this timeframe	^{iv} First Humans-to-Mars Missions occur during this timeframe ^v Human Settlement on Mars Established in this timeframe

WG Activities

Moon Mission / Markets Data

Near-Term Plans / Prospects (GER+)



	2018	2019	2020	2021	2022	2023
INDIA	Chandrayaan-2 Orbiter + Lander + Rover					
CHINA	Chang'e 4 Lander + Rover	Chang'e 5 Sample Return				
JAPAN		SLIM Pinpoint Lander	OMOTENASHI Tech Demo			
PRIVATE		EQUULEUS Cubesats				
		Moon Express Hopper	Astrobotic Rover			
		PTScientists Lander	TeamIndus ?			
US		Cubesats Various	Cubesats Various?	Cubesats Various?		
		Commercial P/Ls? "Resource Prospector"	Commercial P/Ls? "Resource Prospector"	Commercial P/Ls? "Resource Prospector"		
			EM-1 Demo			
RUSSIA				Luna 26 Polar Orbiter	Luna 27 Aiken Basin Lander	EM-2 Crewed Cislunar

WG Activities

Moon Mission / Markets Data



Near-Term Plans / Prospects (GER+Gaps)

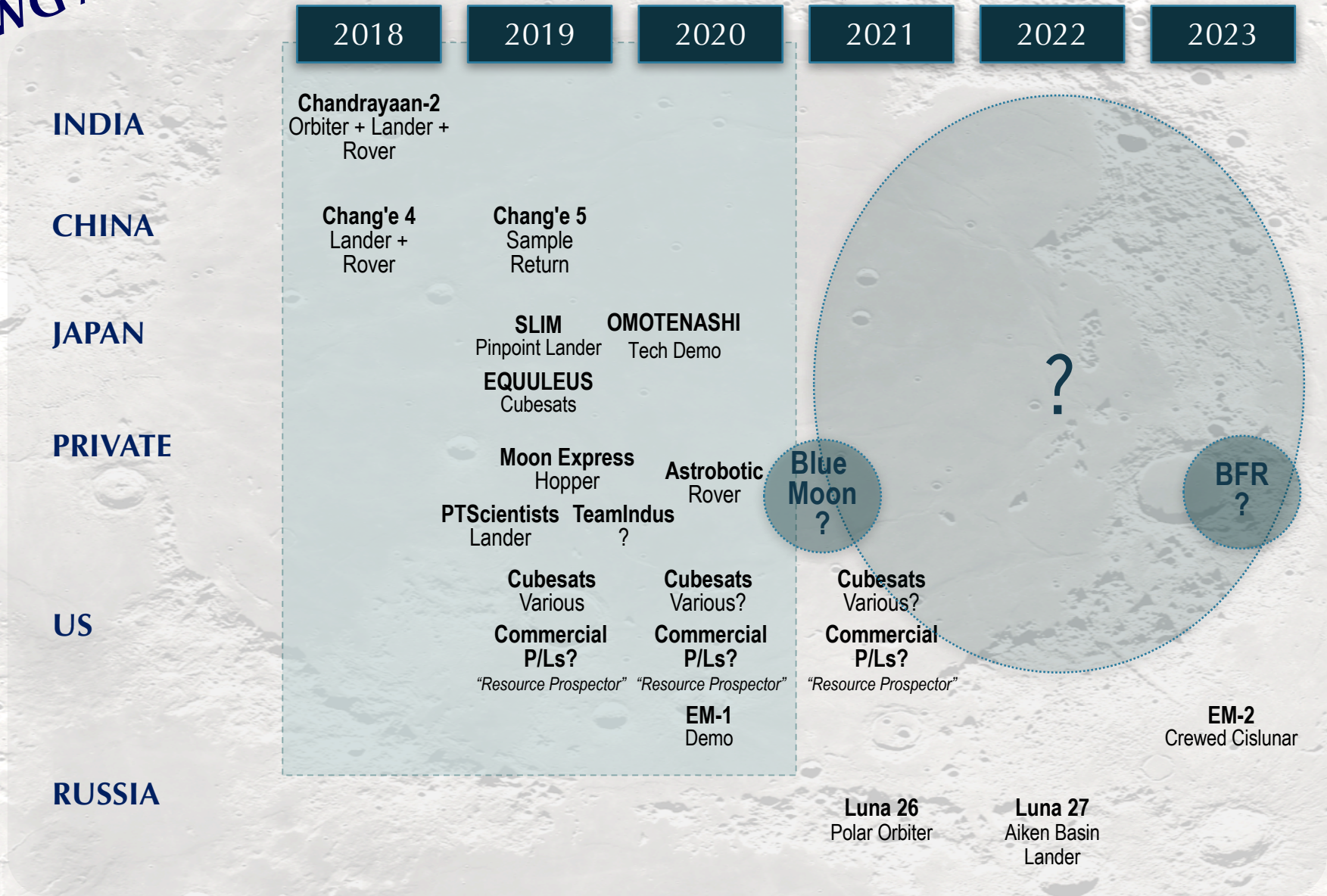
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PRIVATE		EQUULEUS Cubesats				
		Moon Express Hopper	Astrobotic Rover			
		PTScientists Lander	TeamIndus ?			
US		Cubesats Various	Cubesats Various?	Cubesats Various?		
		Commercial P/Ls? "Resource Prospector"	Commercial P/Ls? "Resource Prospector"	Commercial P/Ls? "Resource Prospector"		
			EM-1 Demo			
RUSSIA				Luna 26 Polar Orbiter	Luna 27 Aiken Basin Lander	EM-2 Crewed Cislunar



Moon Mission / Markets Data



Near-Term Plans / Prospects (GER+Gaps+'Revolution')



2nd Moon Village International Workshop

November 4-5 2018



Objectives

- Follow-on the successful 1st Workshop (November 2017), organized by MVA and ISU
- Gather major Moon exploration stakeholders
- Continue and integrate progress accomplished by diverse other events during 2018 (e.g., SRR Lunar Workshop)
- Review & update 2018 MVA Working Group Products ; establish WG objectives for 2019

Approach

- Plenary events, providing keynote talks from global leaders in Lunar planning
- Use Breakout Sessions to review 2018 WG results and to produce reports defining the technical, economical, cooperative and cultural implementation of the Moon Village
- Create an integrated Workshop Report and Use this report as an MVA input to future international gatherings

Logistics

- Workshop will be held in cooperation with the National Space Society and the University of Southern California USC
- Location: USC, Los Angeles, CA USA
- Dates: November 4-5, 2018
- SAVE THE DATE...!

Additional information will be available later this summer



*The Moon Village Association
Please Join Us...*

www.moonvillageassociation.org