

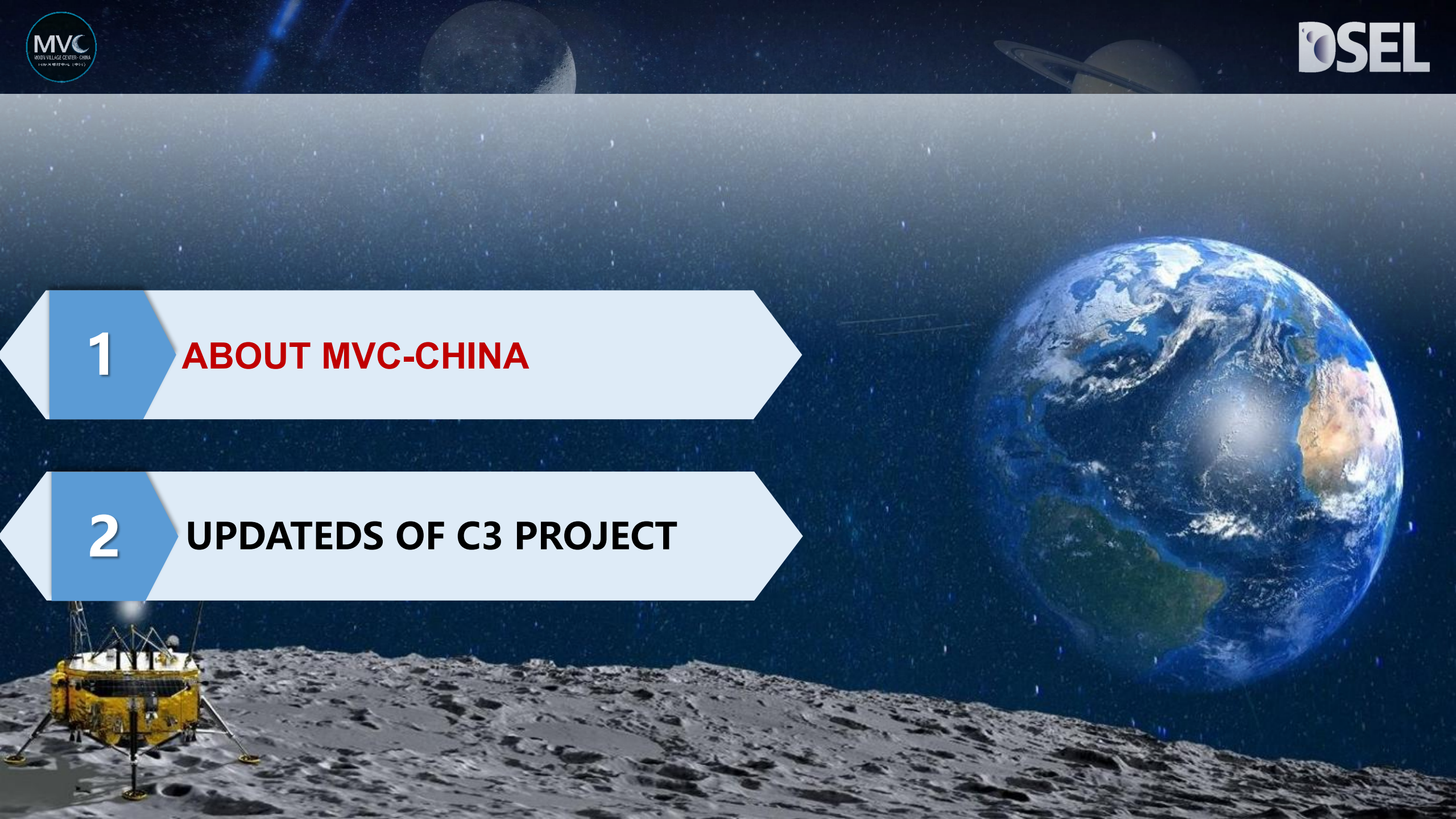
MVC-China and Updates of C3 Project

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10th Global Moon Village Workshop & Symposium, Bangkok, Thailand

October 26th 2026


1
ABOUT MVC-CHINA
2
UPDATEDS OF C3 PROJECT

MVC-China——Quick View

Moon Village Center – China

——The 1st Regional Center of MVA Globally



MVC-China Inauguration Ceremony on 3rd Sept. in Hefei 4th IDSEC

Moon Village Center - China

Facts

- The 1st Moon Village Center in the world
- Hosted by **Deep Space Exploration Lab (DSEL)**
- Officially inaugurated on Sept.3 2026 during the 4th IDSEC (Tiandu Forum 2026)

MVC-China is committed to promoting international cooperation and exchange in the field of lunar exploration, the core mission is to build bridges of communication between governments, research institutions, enterprises, and international organizations, to promote resource sharing and common development.

Missions

- Membership Development for MVA in China
- Project Incubation for lunar research/commercial projects
- Workshop & Symposium (in person/virtual)
- Education & Training Projects
- Science Outreach & Exhibition Activities
- Coordinate with other MVA members in China for their own MVA activities & events.

MVC-China——Activities

The 5th International Workshop on Lunar and Deep Space Exploration

- On 2nd Sept. 2026, Co-organized with APSCO, DSEL and IDSEA.
- 95 participants from 29 countries.
- 22 presentations in lunar science, technologies, mission architecture & capacity building.





MVC-China——Application for 11th GMWS Host



11th Global Moon Village Workshop & Symposium 2027

Welcome to Hefei !

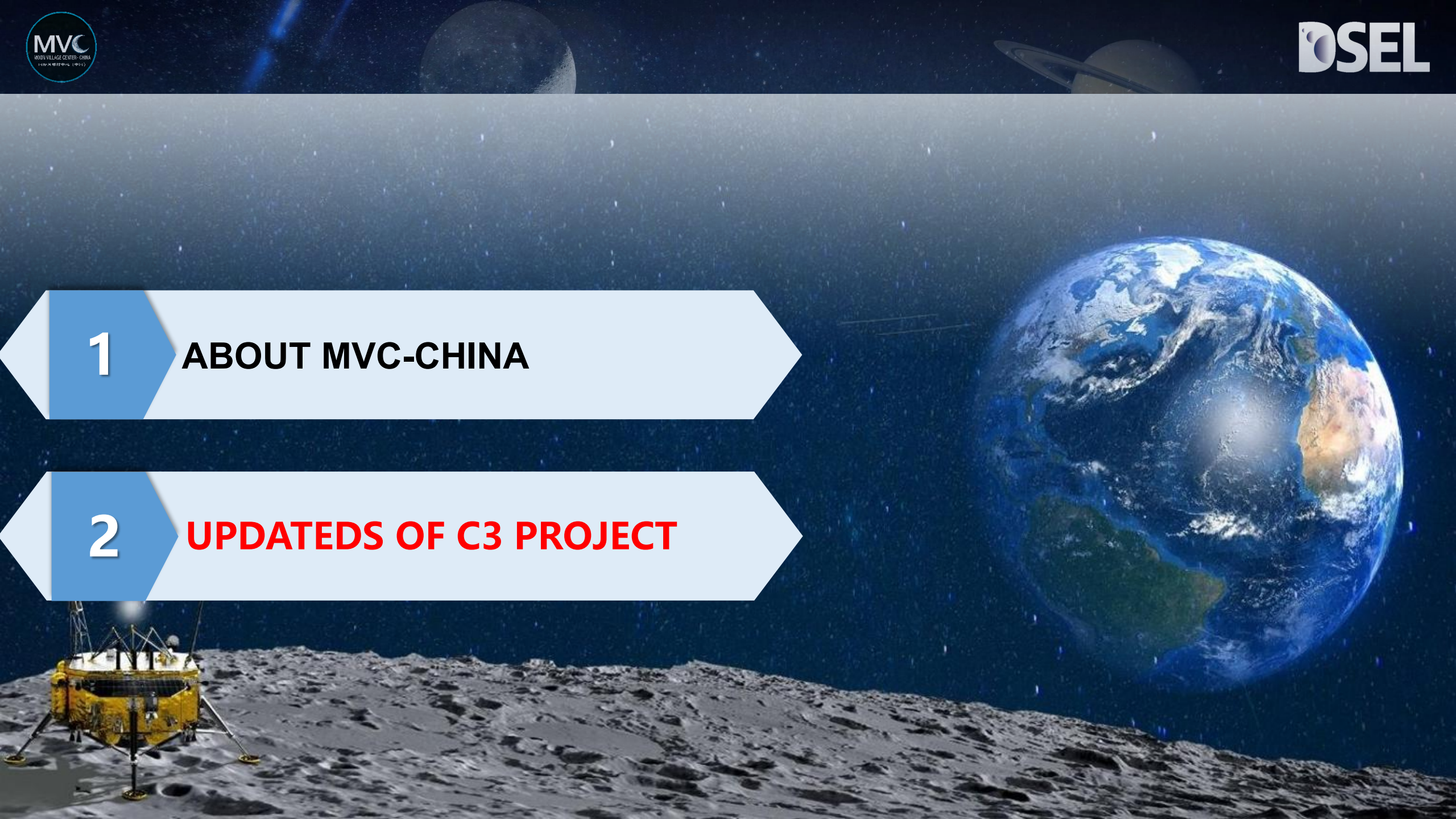
Deep Space Exploration Lab

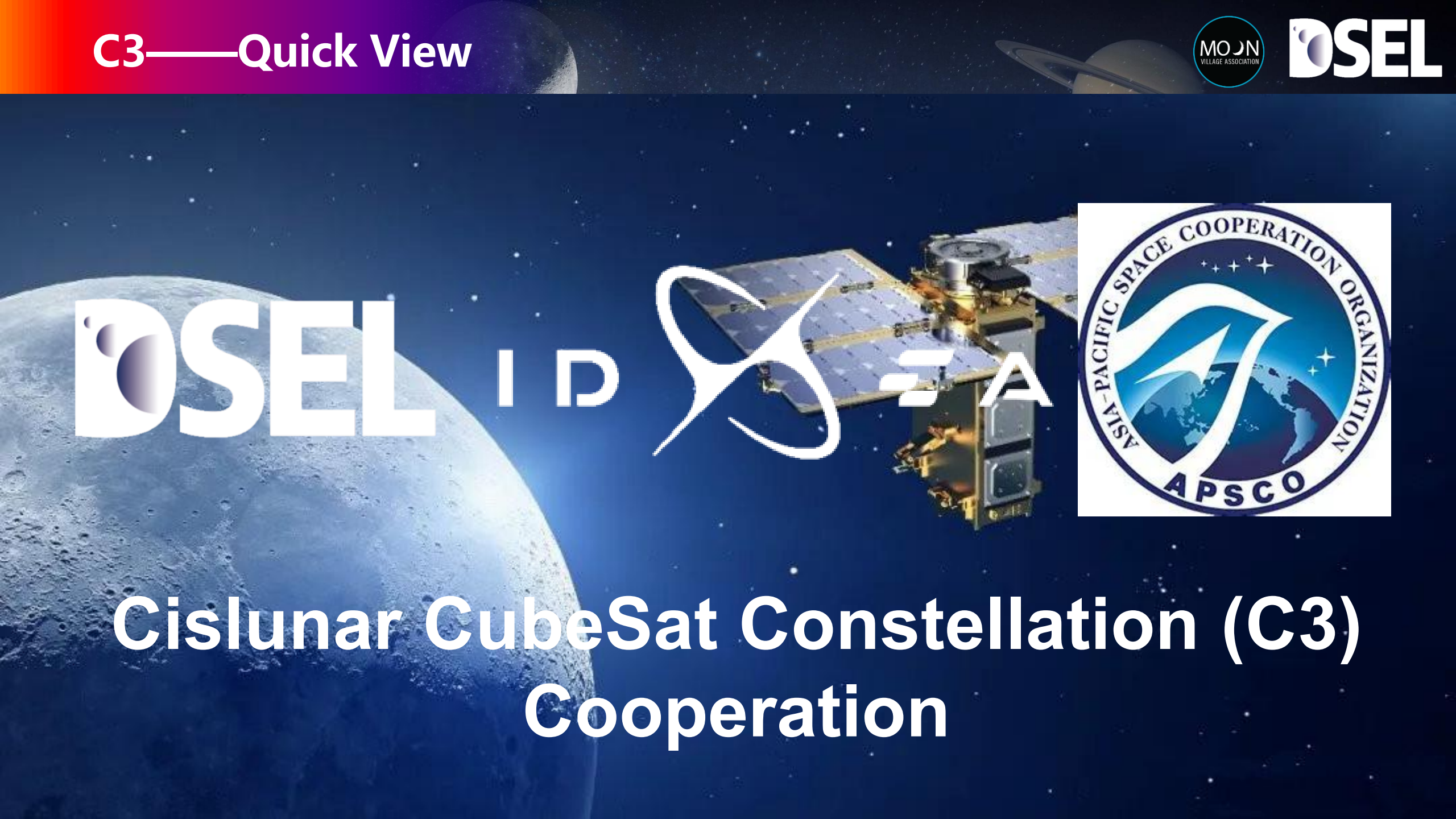
Moon Village Center-China

International Deep Space Exploration Association

1 ABOUT MVC-CHINA

2 UPDATEDS OF C3 PROJECT





CisIunar CubeSat Constellation (C3) Cooperation

C3——Quick View

Cislunar CubeSat Constellation (C3)



Key International cooperation project of DSEL &MVC-China



Deep participate,
Technology Improve

Largest scaled space environment detection in cislunar space



Free launch,
Equal opportunity

Bring most emerging countries into Lunar Era together



Together Exploration,
Shared Development

C3——Quick View

I. Cislunar CubeSat Constellation (C3)

Cislunar CubeSat Constellation (C3) is a **pioneering grand science program** initiated by the Deep Space Exploration Laboratory (**DSEL**), International Deep Space Exploration Association (**IDSEA**) and supported by the Asia-Pacific Space Cooperation Organization (**APSCO**).

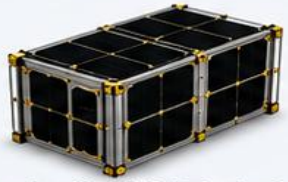
It aims to establish a revolutionary multi-point, in-situ observation network in the cislunar space.



II. Constellation Composition

34 satellites in total

30 standardized 12U CubeSats



Standardized 12U CubeSat
Mass ≤ 25 kg

+

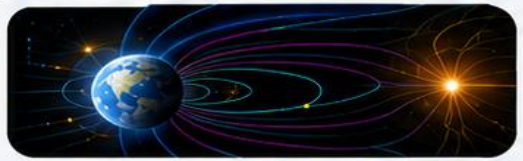
4 200 kg-class lunar resource exploration satellites



International cooperation principle:

- Joint Design
- Free Payload Accommodation
- Data Sharing
- Self-Funded Contribution

III. Scientific Objectives



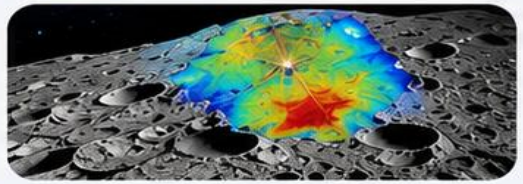
1 Cislunar Space Environment & Energetic Particles

First large-scale networked in-situ detection of Earth's magnetotail, magnetopause, and plasma sheet.



2 Deep-Space Gamma-Ray Bursts

All-time, all-coverage, long-baseline high-precision GRB localization.



3 Lunar Near-Surface Structure & Resources

Multi-dimensional geological exploration and high-precision mapping of water ice and mineral resources.

IV. Timeline & Orbit

Target Launch
2030

Orbit
1:3 Cislunar large elliptical resonant orbit
Period: 9.07 days
Perigee: 10,000 km Apogee: 360,000 km



Orbital Period	Perigee Altitude	Apogee Altitude	Inclination
9.07 days	~10,000 km	~360,000 km	42°

C3——Quick View

I. STRATEGIC SIGNIFICANCE

The C3 Program is the **world's first cislunar CubeSat constellation —** a flagship international big science initiative led by DSEL with the **highest level of global participation.**

It breaks through single-point detection limitations to achieve **large-scale networked observation** of cislunar space.

II. FOUR KEY AREAS OF PROGRESS



1. **Program Initiation:**
National and provincial-level approval secured; included in the 15th Five-Year Plan International Big Science Program database

2. **System Demonstration:**
Complete satellite platform, scientific payloads, launch/orbit, TT&C, VLBI, data center, and mission planning architectures established

3. **Project Development Progress:**
12U electrical model detailed design completed; ground test and simulation training systems developed; training programs will be delivered by the end of 2026; standards and interfaces established; Indonesia personnel exchange program underway

III. CORE BREAKTHROUGHS

- **Scientific:** First 3D stereoscopic detection of cislunar space with high-precision dynamic mapping
- **Technological:** Distributed intelligent constellation networking core technologies
- **Cooperative:** "Joint Design · Free Payload Accommodation · Data Sharing · Self-Funded Contribution" — providing free opportunities for developing countries

IV. OUTLOOK

2030

Full 34-satellite launch and network deployment



- Build an **integrated** space-ground 3D observation system
- Support **lunar landing** and lunar base construction
- Contribute **Chinese solutions** and wisdom to global deep space exploration

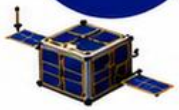
C3: From single-point detection to global perspective — *from following to leading.*

Together, we open a new era of cislunar space exploration!

C3——Mission Plan

Phase 1

Detailed Validation and Prototype Development



- Develop the ICD (Interface Control Document) for the major systems;
- Complete system prototyping for the 12U CubeSat bus and ground segment testing.

2026.01 – 2027.12

Phase 1

Phase 2

Flight Model Integration and Constellation Deployment



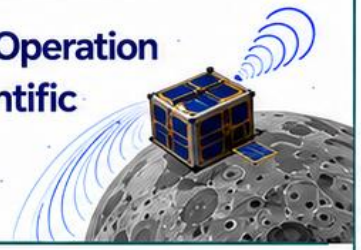
- Develop 30 CubeSats and 4 lunar resource satellites;
- Use commercial launch vehicles to conduct a single launch and complete the C3 mission orbital insertion and networking.

2028.01 – 2030.12

Phase 2

Phase 3

In-Orbit Operation and Scientific Outputs



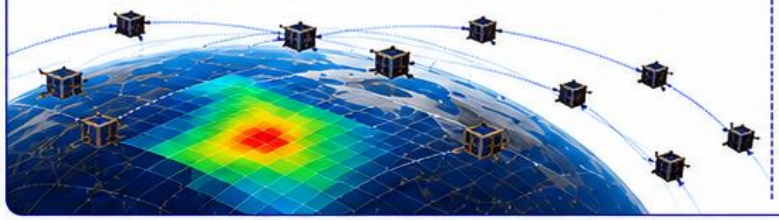
- Conduct 30+4 C3 constellation long-term stereo in-situ observation;
- Publish real-time results on the deep space big data platform to the world and deliver breakthrough scientific achievements.

2031+

Phase 3

EXPECTED LANDMARK MAJOR OUTCOMES

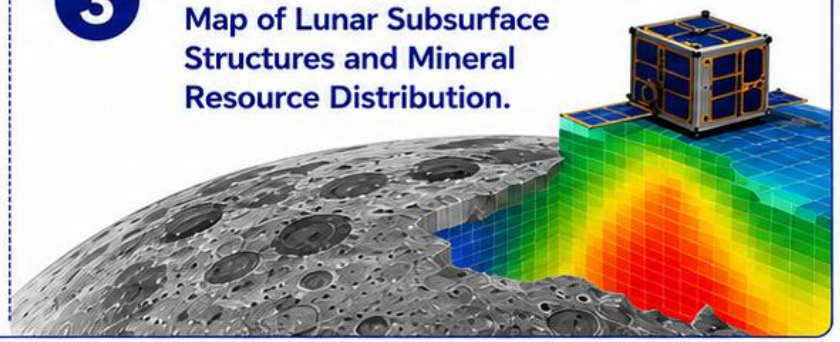
1. Produce the World's First Three-Dimensional Dynamic Evolution Map of the Cislunar Space Environment.



2. Establish the First All-Time High-Precision Deep-Space Gamma-Ray Burst Localization Network.



3. Release a High-Precision Global Map of Lunar Subsurface Structures and Mineral Resource Distribution.



New Members Joined C3 Program in 2026

Growing International Partnership for Cislunar Exploration

We are pleased to welcome new partners who share our vision of international cooperation and peaceful exploration of the cislunar space.

Egyptian Space Agency

Egypt

Cooperation in cislunar scientific missions and peaceful use of outer space.

Senegalese Agency for Space Studies (SAAS)

Senegal

Cooperation in cislunar exploration and capacity building through international partnership.

National Research and Innovation Agency (BRIN)

Indonesia

C3 project personnel exchange cooperation and training.

Microwave Research Institute, UiTM

Malaysia

Supporting scientific missions through microwave and space technology expertise.

Phemotron Systems Ltd.

Nigeria

Participation in C3 missions and contribution to satellite engineering expertise.

The number of international institutions participating in the C3 project has expanded to **15** in 2026.



We welcome more research institutes, universities, and organizations worldwide to join the C3 program!

C3——Phase I Prototype Development

1 DEVELOPER



Shanghai Jiao Tong University

School of Aeronautics and Astronautics
Smart Satellite Technology Center

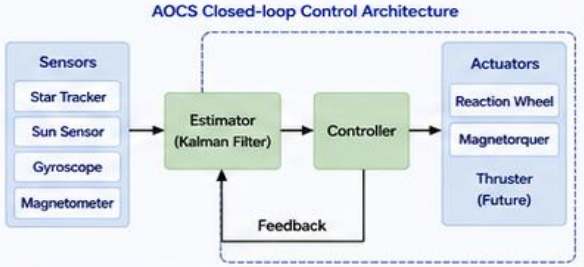
- Develop the ICD (Interface Control Document) for the major systems;
- Complete system prototyping for the 12U CubeSat bus and ground segment testing.

2 ELECTRICAL MODEL PLATFORM

- 12U CubeSat architecture
- Covers all major satellite platform subsystems
- All products are electrical-grade except satellite bracket, one star tracker (structural), and solar wings (mechanical)
- In-situ replacement capability with flight-model equivalent specifications

3 OBDH & AOCS SOFTWARE

- OBDH chip processing capability: ≥150 MIPS
- Interfaces: CAN, RS422
- Fully open hardware and software interfaces
- Delivers OBDH software and AOCS software development process files for secondary development
- AOCS software uses closed-loop control architecture with Kalman filter support





4 GROUND TEST MODULE



- X-band ground test equipment: 7GHz–9GHz RF, SMA interfaces, TCP/UDP support
- Supports standard TT&C (PCM-PSK-PM), ranging, and Doppler simulation
- Ground test software: ≥20 concurrent terminals, 360-hour continuous operation

5 SIMULATION, DEMONSTRATION & TRAINING MODULE



- Dynamics simulation: orbit and attitude propagation with 3:1 resonant orbit preset
- Sensor fault injection: star tracker, sun sensor, gyroscope failure modes
- 3D orbital flight visualization with ground station connectivity display
- Fault response strategy with preset and user-defined scenarios

6 ENGINEERING VERIFICATION PLATFORM



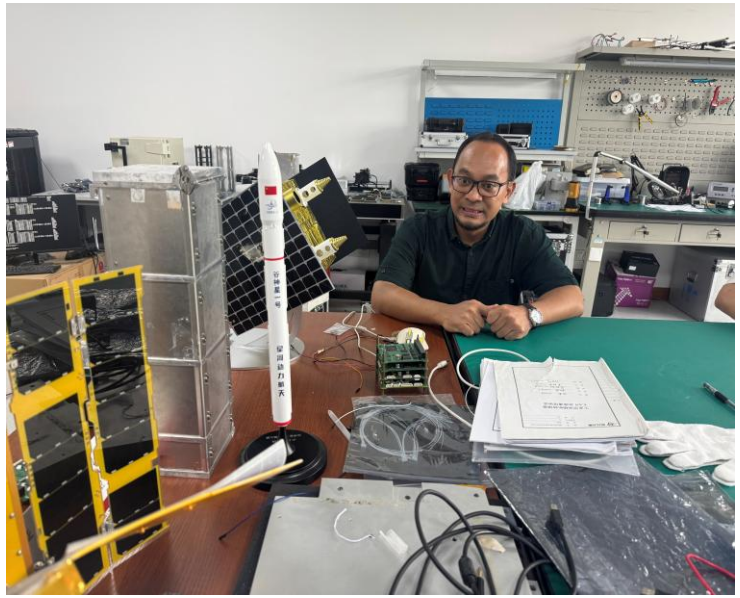
- Transforms electrical model into comprehensive ground verification system
- Supports scientific research, teaching, training, and mission rehearsal
- Provides a reliable platform for full-mission verification and capability validation

Structure & Mechanism | OBDH | Power | Thermal Control | ADCS | TT&C | Payload Interfaces

C3——Phase I Prototype Development

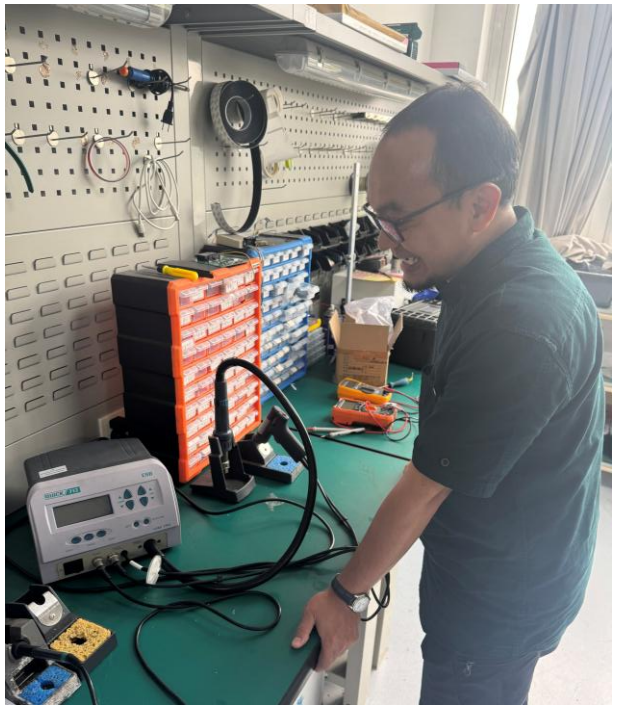
Indonesian BRIN engineer joint with China SJTU CubeSat team for the 12U EM prototype development.











C3——Phase I Training Plan

Plan in Dec. 2026.

CubeSat R&D Training Program

Over 4 Days · 16 Hours

TRAINING COURSES

1. **System Fundamental**
2. **Operations & Simulation**
3. **Fault Response & Integration**
4. **Engineering & Assessment**

TRAINING CONTENT

System Fundamental

- System Architecture
- Standards

Operations & Simulation

- System Operation
- Hands-on Practice
- Software Simulation

Fault Response & Integration

- Fault Diagnosis
- Emergency Response

Engineering & Assessment

- Engineering Practice
- Phase Acceptance



12U CubeSat Standards & Interfaces Framework

Reference Framework for International Cooperative Missions

LEVEL 1 TOP-LEVEL DOMAINS

1 Project Management
Plan, control and deliver the mission.
ECSS-M | ISO 14300-1

2 Product Assurance
Assure quality, reliability and safety.
ECSS-Q | ISO 14300-2

3 Systems Engineering
Design, integrate and verify systems.
ECSS-E | ISO 10794

4 Space Sustainability
Protect Earth and Moon environment and reduce debris.
ECSS-U | ISO 24113

5 Industrialization, Production & Maintenance
Produce, integrate and sustain the satellite.
ECSS-P | ISO 10794

LEVEL 2 DISCIPLINE STANDARDS

- Planning & Implementation
- Cost & Schedule
- Risk Management
- Configuration & Docs
- Interface Management
- Logistics Support
- Quality Assurance
- Reliability & Availability
- Safety
- Parts & Materials
- Software Assurance
- System Engineering
- Mechanical
- Electrical & Power
- Thermal Control
- Communications
- Control (ADCS/GNC)
- Software
- Ground Systems & Ops
- Space Debris Mitigation
- End-of-Life Disposal
- Collision Avoidance
- Deep Space Operations
- Manufacturing
- Assembly & Integration
- Testing & Verification
- Maintenance
- Configuration Control

LEVEL 2.5 12U CUBESAT INTERFACE STANDARDS

MECHANICAL INTERFACE
365.5 × 200 × 200 mm (X×Y×Z) standard envelope and separation interface.

ELECTRICAL INTERFACE
Power, signal, ground, voltage levels & pinouts.

DISPENSER INTERFACE
Compatible with P-POD and other standard deployers.

OPERATIONS INTERFACE
TT&C, data rates, commands & telemetry.

TESTING REQUIREMENTS
Vibration, thermal vacuum, shock & EMC.

LEVEL 3 FOUNDATION & INTERFACE IMPORTANCE

POLICY & GUIDANCE
Principles & rules

TERMINOLOGY
Terms & definitions

REQUIREMENTS MANAGEMENT
Traceability & control

INTERFACE IS THE KEY TO MISSION SUCCESS
Defines how parts connect → Ensures compatibility & interoperability → Reduces risk & errors → Improves efficiency & cost effectiveness → Enables international cooperation

INTERFACE CONTROL (ICD / IDS)
Define, document & manage all interfaces.

TRACEABILITY
End-to-end traceability of interfaces.

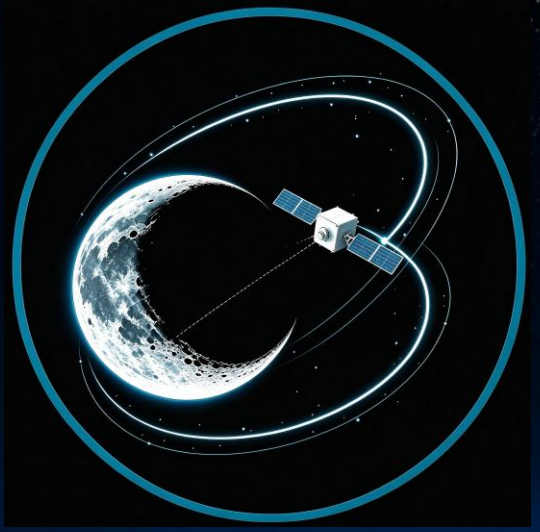
APPLICABLE STANDARDS

ECSS
European Cooperation for Space Standardization

ISO
International Organization for Standardization

GB
Chinese National Standards

International Cooperation
Harmonized standards for joint missions



Thank You!

Email: wangzhm@dsel.cc