CHANG’E-5 AND TIANWEN-1
Mission planned prior to 2020

CLEP

Orbiting

- Chang'E-1 2007.10
- Chang'E-2 2010.10

Landing

- Chang'E-3 2013.12
- T1 Reentry Test 2014.10
- Chang'E-4 2018.12

Sample Return

- Chang'E-5 2020.11
Well-accomplished Missions

Chang'E-4

2018.05.21 Relay satellite.
2018.12.08 Probe.
2019.01.03
Landing first-ever on the far side

177.6°E, 45.457°S, -5935M
Well-accomplished Missions

Piggyback 4 cooperative payloads on CE-4
Moon subsurface data at a depth of 40m

Moon surface particle radiation dose rate

Energy spectrum distribution map of moon surface neutral atoms

Initial spectroscopic identification of lunar far-side mantle-derived materials
Well-accomplished Missions

Chang'E-5
  Obtained 1731g samples.

Carry out research on lunar samples and deepen the study of the formation and evolution history of the moon.

Lunar samples
The probe, which consists of the orbiter, lander, ascender, and return vehicle, finished earth-moon transfer, orbit the moon, soft landing on the moon, lunar sampling and scientific exploration, lifting off from the moon, rendezvous and docking in lunar orbit, returning the earth with samples, etc.
Chang'E-5

- The launching site

- Long March 5 carrier rocket sent the probe to the earth-moon transfer orbit, with a perigee of 200 kilometers and apogee of 400000 kilometers.
- CZ-5 Rocket: 56.97 meters long, with a takeoff mass of 867t and a takeoff thrust of 1068t.
- The launching site is Wenchang Spacecraft Launch Site.
Well-accomplished Missions

**Chang'E-5**

- TT&C

Tracking the carrier rocket and the probe. Re-entering measurement, search and recovering of the return vehicle.

Tracking equipment like the 35-meter deep space Tracking Telemetering & Control Station in South America and the 18-meter Tracking Telemetering & Control station in Namibia are newly built.
Well-accomplished Missions

Chang'E-5

- Ground application system
  - Storage, preparation and distribution of the lunar sample.
  - Receipt, management, and interpretation of the scientific tracking data. Application and research related to lunar sample and scientific statistics.
  - A 40-meter data receiving station in Miyun District, Beijing and a lab for lunar sample are newly built.
Well-accomplished Missions

Chang'E-5

Clips of Chang’e-5 Sampling Mission
Well-accomplished Missions

Chang'E-5

Lunar Sample 001 at national museum

Procedures for requesting lunar samples released by CNSA
Well-accomplished Missions

Chang'E-5

玄武岩  角砾岩  玻璃
Passengers’ onboard the mission

30 kinds of seeds

Song Starlight

Kids from Chinese Tibet watching the launch

Mascots of 2022 Beijing Winter Olympic games
Being Implemented Mission

Mars Mission TIANWEN-1

Orbiting & Landing & Roving
ALL-IN-ONE!


Engineering Obj.

Martian orbiting and roving.

Scientific obj.

Scientific detection of Martian surface morphology, soil characteristics, material composition, water ice, atmosphere, ionosphere, magnetic field, etc.
Being Implemented Mission

Mars Mission TIANWEN-1

Landing & rover
Orbiter
BACK SHELL
Rover
Landing platform
Heat shield
Mars Mission TIANWEN-1

- 2020.7.23 Launching phase
- Earth-Mars transfer phase
- Mars capture phase
- Mars parking phase
- Deorbit and landing phase
- Scientific exploration phase
Being Implemented Mission

Mars Mission TIANWEN-1

- Transfer phase took 6.5 months.
- In Jan. Tianwen-1 took a picture of Mars at a distance of 2 million kilometers.
- On Feb.10th, Tianwen-1 carried out 1st orbit insertion.
On Feb. 24, Tianwen-1 took the 3rd orbit insertion entering a 280km×59000km parking orbit with a period of 2 Mars days.
Being Implemented Mission

TIANWEN-1 ‘s high definition pic. of Mars

The stunning view of the Red Planet’s northern hemisphere and southern hemisphere in mid March.
Future Lunar Exploration Planning

Multiple Exploration Approaches

Robotic Lunar Exploration
- Sci. exploration
- tech. validation
- resource
- ... ...

Manned Lunar Exploration
- Manned round trip tech
- Regenerative life support tech
- EVA tech
- ... ...

Robotic and manned coordinated
- Energy
- Communication
- Life support
- Transportation
- Running
- ... ...

International Lunar Research Station
2004 - 2020

Lunar Base/Village
2036 - 2045

Sample Return
Landing
Orbiting

Con. Activities
Tech. breakthrough

2021 - 2035
Deep space exploration plan

**Near-term**
- Mars
- Asteroids...
- TIANWEN-1
- Asteroid

**Medium-term**
- Large scale sci. tech valid
- Heliospheric boundary
- Mars sample return
- Gas giant planets
- Venus

**Long-term**
- Extrasolar interstellar space explo. ability
- Long-term large-scale sci. explor.
- Observation of solar gravitational lens effect
- Interstellar environment

2025

2035
THERE IS NO END FOR SPACE EXPLORATION
PURSUING DREAMS, DARING TO EXPLORE, WIN-WIN WIN COOPERATION