Innovation and Exploration

--China’s Space National Report

Nov, 2018
Space Activity

- Ground based observations
- Access to Space
- Integrated Satellite constellations
- Science Missions
- Lunar and Mars Exploration
- Human Missions
- Space Law for exploration
Gound based observations

• FAST - Five Hundred Meter Aperture Spherical Radio Telescope (largest radio telescope in the world)

• LAMOST-Large Sky Multi-Object Fiber Spectroscopy Telescope (4000 spectra in a single exposure)
FAST
LAMOST
Access to Space

• 18 kinds of Long March Launch Vehicle
• 4 launching sites in China
• LEO capability 25 T
• GTO launching capability 9 T
• New Generation launch vehicle under development (100 T to LEO)
• Complete TT&C network
• Commercial Launch Started
Launch Vehicle
Launch sites and TT&C
Future Plan (Launcher)

100+ Ton to LEO

10m Diameter

97 meters height
Integrated Satellite Constellations

• Beidou Global Navigation (36 Satellites)
• Spacial Infrastructure (100+ satellites)
• Telecommunications
• Meterological (polar and GEO)
• Scientific Missions
• Commercial satellites
Satellites and new technology

- Atmosphere Infrared Ultra-spectral Spectrometer
- Environment Monitoring Sounder
- Multi-Spectral Imager
- Directional Polarization Camera
- Greenhouse gases Monitoring Instrument
- Advanced HyperSpectral Imager
Satellite
Science Missions

- Quantum Experimental Mission (2016)
- CFO-SAT Ocean study satellite (2018)
- Smile Mission for Solar Storm Study (2020)
- SVOM Astro-physic Study (2021)
Science Missions

CFOSAT

SJ-10 Recoverable

Dark Matter

Quantum Experiment
Human Mission

• Human Space Flight
• EVA
• Docking Technology
• Space Lab
• Space Refueling
• Space Station
• Astronauts Training
Lunar and Mars Mission

• 3 Steps: Obiting, Landing, Sample Return
• Obiting completed by 2 missions
• Landing completed by 1 mission
• Sample Return mission in 2019
• Future Missions: CE-4, CE-6, P-1, P-2...
• Mars Mission: 2020
• Mars Sample Return Mission
• Jupiter and Astroeds
CE-3 Landing Mission
ChangE-4 Mission Scenario

ESA, Holland, Sweden, Saudi Arabia, Germany

(Poland, Italy joining)
Landing Sites

- Chang'E 5
- Chang'E 3
- Luna 17
- Luna 2
- Apollo 15
- Luna 21
- Apollo 17
- Luna 24
- Luna 13
- Luna 9
- Surveyor 1
- Surveyor 3
- Apollo 12
- Apollo 14
- Apollo 16
- Surveyor 7
- Surveyor 5
- Apollo 11
- Luna 20
- Luna 16

**Regions:**
- MARE IMBRIUM
- MARE SERENITATIS
- MARE VAPORUM
- MARE TRANQUILLITATIS
- MARE NECTARIS
- MARE COGITUM
- MARE NUBIUM
- MARE HUMORUM
- OCEANUS PROCELLARUM

**Countries:**
- **USA**
  - Apollo
  - Surveyor
- **USSR**
  - Luna
- **CHINA**
  - Chang'E
Future Plan (Mars)

- Viking 1
- Mars pathfinder
- Opportunity
- Viking 2
- Candidate site
- Site 1: 50° -20° W, 20° -30° N
- Site 2: 90° -134° E, 4° -20° N, 80° -98° E, 19° -30° N
- Curiosity
- Spirit
Thank You