



*Promoting Cooperative Solutions for Space Sustainability*

# China's Plans for Space

Dr. Brian Weeden  
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- China is on a path to develop a “full spectrum” of space capabilities over next two decades, fulfilling multiple goals
  - Prestige/soft power (human spaceflight, exploration)
  - Support to military ops on Earth (PNT, ISR, satcom)
  - Deterrence (counterspace/missile defense)
  - Economic development/industrial base
- China is following same/similar paths as US and Russia, and generally not moving appreciably “faster”
- US faces important questions about the future of its relationship with China in space

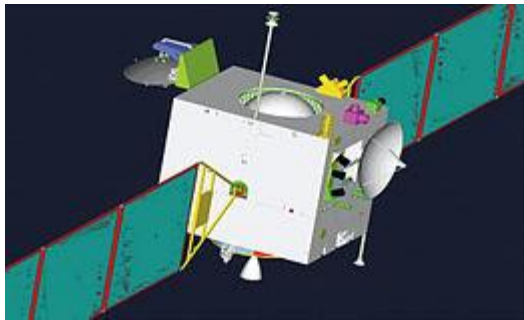


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# CIVIL SPACE

# Lunar exploration program

## Phase 1 Orbital Missions



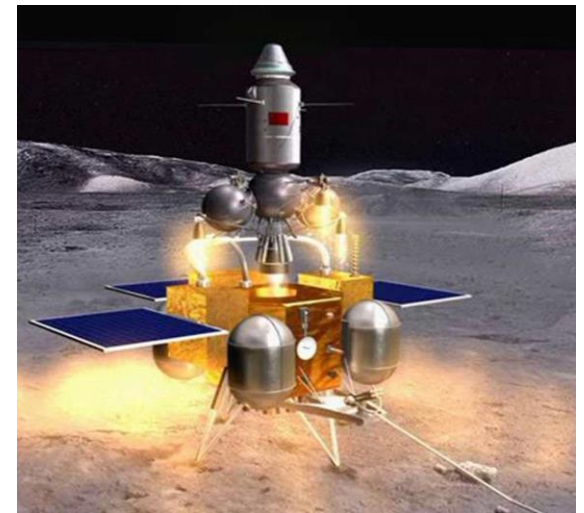
**Chang'e 1 (2007)**

## Phase 2 Landers/Rovers



**Chang'e 3 / Jade  
Rabbit (2013)**

## Phase 3 Sample Return



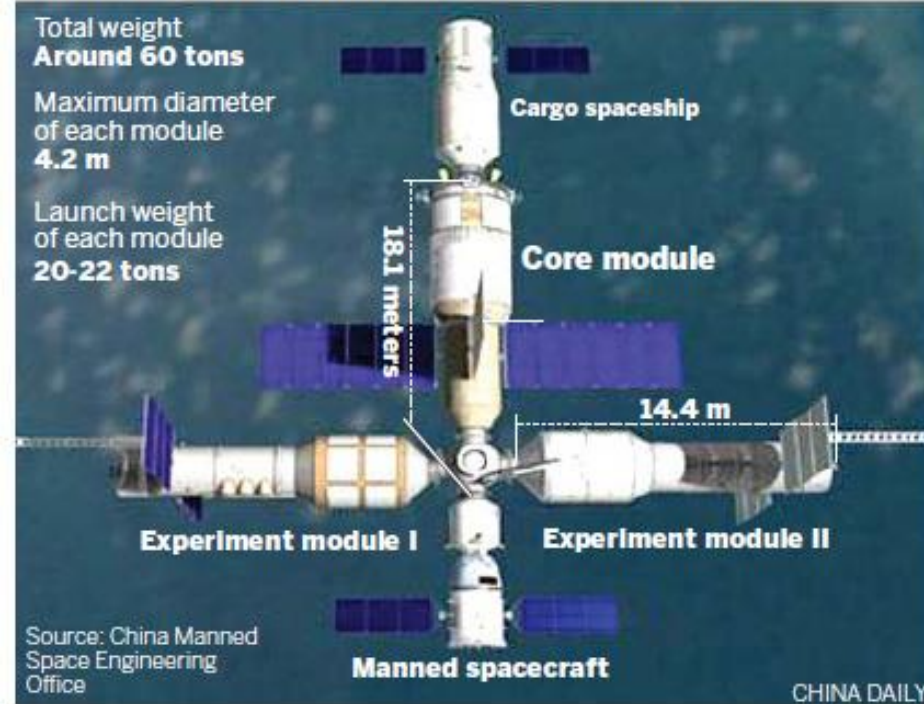
**Chang'e 5 (2017)**

# Space station program



**Tiangong-1 (2011)**

## THE FUTURE CHINESE SPACE STATION



**Tiangong-3 (2023)**



**Tiangong-2 (2016)**

## China's Space Station Planners Put out Welcome Mat

by Peter B. de Selding — October 13, 2015

JERUSALEM — China is soliciting international participation in its future manned space station in the form of foreign modules that would attach to the three-module core system, visits by foreign crew-transport vehicles for short stays and the involvement of non-Chinese researchers in placing experiments on the complex, the chief designer of China's manned space program said Oct. 12.

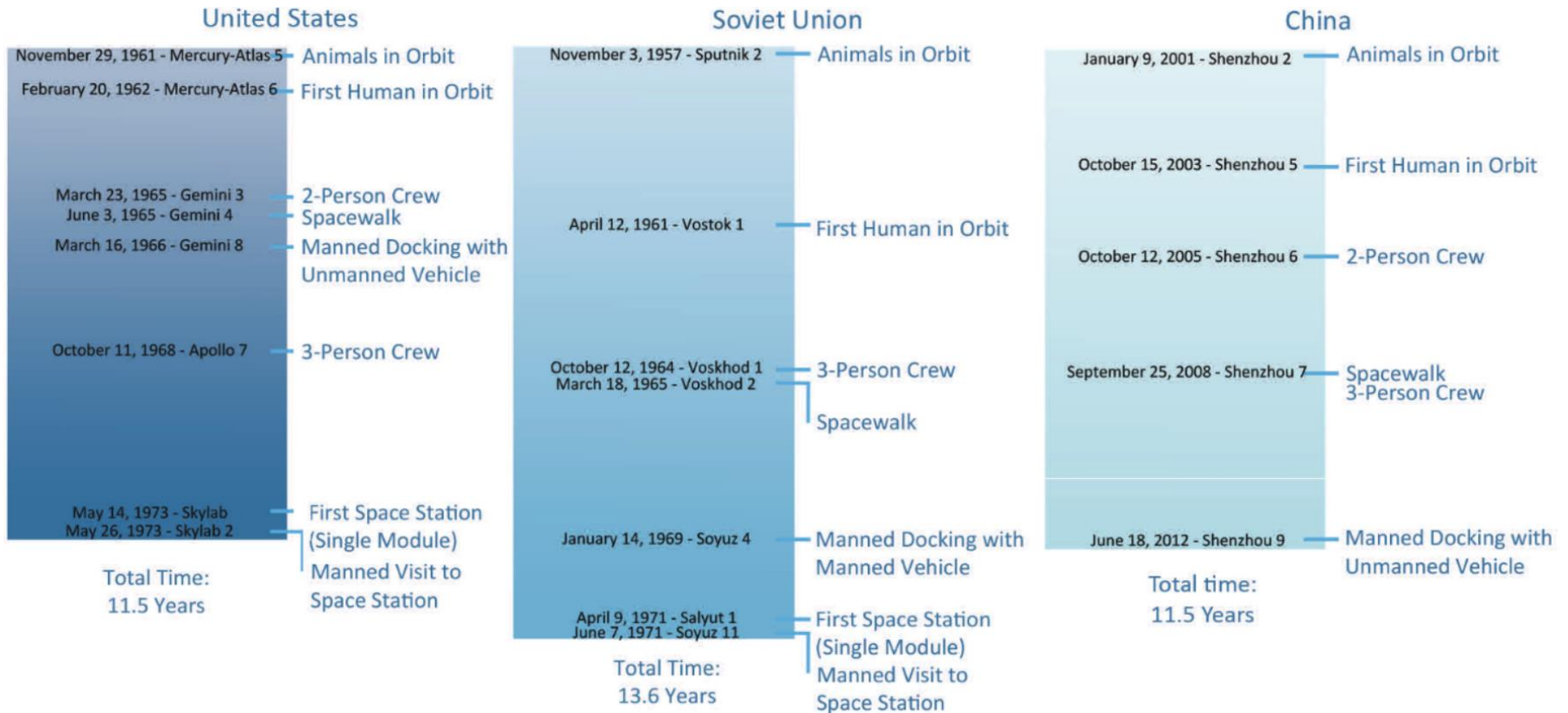
## China and the U.N. agree to help developing countries get access to space

July 27, 2016 by Tomasz Nowakowski, Astrowatch.net

Last month, China signed an agreement with the United Nations Office for Outer Space Affairs (UNOOSA) to open the country's future space station for science experiments and astronauts from U.N. member states. According to a spokesperson from the China Manned Space Agency (CMSA), this cooperation heralds better accessibility to space for developing countries.



# Is China really “accelerating”?



Source: [Secure World Foundation \(2012\)](#)



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# NATIONAL SECURITY



# Chinese space-based ISR

Satellite	Payloads	Resolutions	Number Operational
Yaogan	EO, SAR, ELINT	1-10 meters	30+
Gaofen	EO, Staring camera	EO= <1m-2m, Staring=50m	5
Haiyang	EO and color scanners	EO=250m	1
Huanjing	EO	30m	3
Jilin	EO	0.72m	4
Tainhui	Stereoscopic	5m	3
Gaojing	EO	0.5m	2

Source: [Pollpeter](#) (2017)

## Development Steps

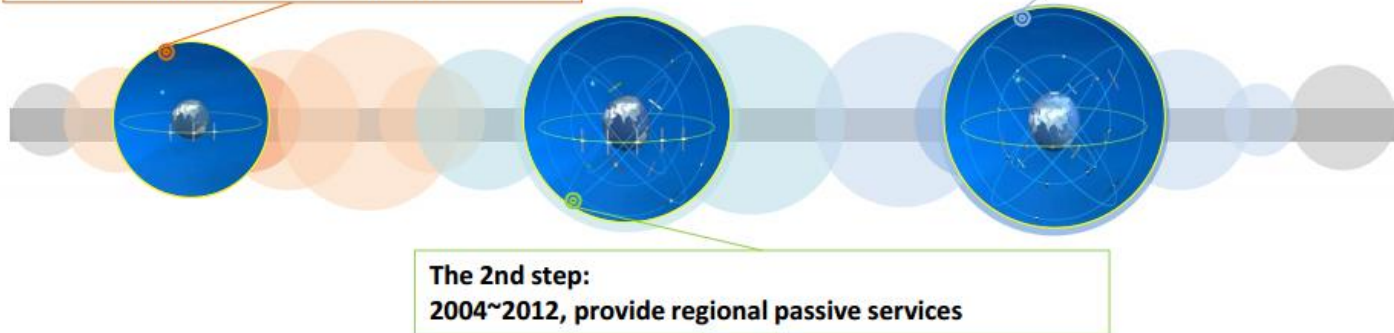
- BDS has been developing
  - in line with the *three-step* roadmap
  - the thinking of *from regional to global, and from active to passive*
  - forms a development path as *world-oriented, region-highlighted, with its unique features.*

The 1st step:

1994~2000, provide regional active services

The 3rd step:

2013~2020, provide global passive services



Source: [Shen](#) (2016)

# ASAT/missile defense testing



Source: "[Through A Glass Darkly](#)," *The Space Review*

Date of Test	Target Object	Interceptor Object	Interceptor Type	Amount of Trackable Debris Created	Notes
7/5/2005	None known	SC-19	direct ascent	0	Likely rocket test
2/6/2006	None known	SC-19	direct ascent	0	Likely flyby of an unknown orbital target
1/11/2007	FengYun 1C	SC-19	direct ascent	3,280	Successful intercept and destruction of an orbital target
1/11/2010	CSS-X-11 (ballistic)	SC-19	direct ascent	0	Successful intercept and destruction of a suborbital target
1/27/2013	Unknown (ballistic)	SC-19	direct ascent	0	Successful intercept and destruction of a suborbital target
5/13/2013	None known	DN-2	direct ascent	0	Likely rocket test of a new system capable of reaching GEO
7/23/2014	None known	SC-19	direct ascent	0	Non-destructive test
10/30/2015	None known	Possible upgraded SC-19	direct ascent	0	Non-destructive test
Total Amount of Trackable Debris				3,280	

Source: "[ASAT testing in space: The Case of China](#)", *SWF Fact Sheet*

swfound.org

## In-Space Eavesdropping? – China’s Shijian-17 completes High-Altitude Link-Up

December 9, 2016

China’s Shijian-17 with another satellite and has entered a resident object rendezvous and technology in the prescribed goal of ongoing space military

Shijian-17 – one of experimental satellite first flight of China completing its mission on 3, 2016. Lifted into Chinese rocket even for directly delivering home to a vast population of satellites support

## Mysterious Actions of Chinese Satellites Have Experts Guessing

By Leonard David, Space.com's Space Insider Columnist | September 9, 2013 07:12am ET



MORE



## Is China’s Mysterious New Satellite Really a Junk Collector—or a Weapon?

The Chinese say the high-tech satellite they launched will clean up space debris, but its extendable robotic arm has some wondering whether it could have a more sinister purpose.



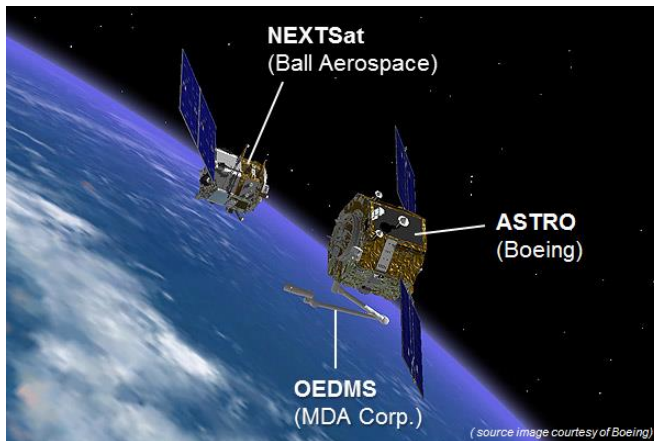
DAVID AXE 07.05.16 12:01 AM ET



# US ASAT/RPO testing



*Bold Orion missile and B-77 aircraft. Image credit [Wikimedia Foundation](#)*



*DARPA Orbital Express Image credit [Wikimedia Foundation](#)*



*Program 437AP launch. Source: [Ted Molczan](#)*



*ASM-135 launch. Source: [Wikimedia](#)*



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# COMMERCIAL SPACE



# Chinese firms making commercial push

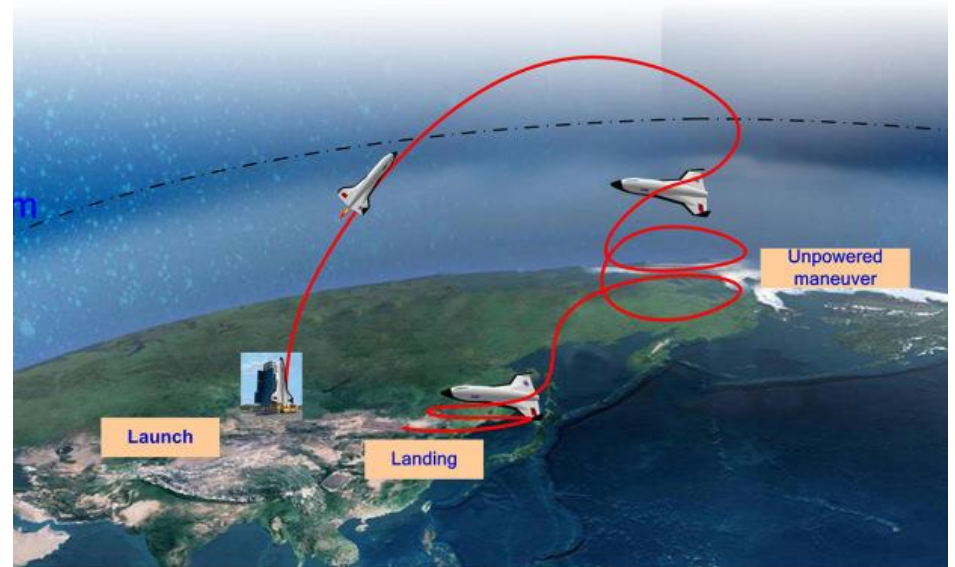
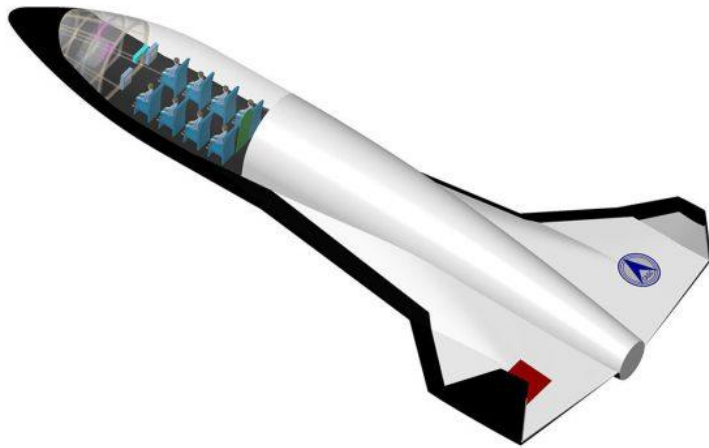


**Landspace Commercial  
Space Launch Services**



**HEAD Aerospace  
Technology Co.**

# Suborbital tourism



*Single-stage suborbital spaceplane carrying 20 passengers  
(Source: [ChinaWatch](#))*



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# **FUTURE US-CHINA SPACE RELATIONSHIP**

- Which kind of “leadership” role do we want to embrace?
  - Dominance vs Quarterback
- What is the right mix of competition and cooperation with China in space?
  - Relationship built on purely competition increases chance of conflict
- What is the right mix of government and private sector efforts to play to America’s strengths?
  - Do we really think we can run a “big government” space program better than China can?
- Will we continue to be a force for increased order in space, not disorder?
  - US helped build existing international system, will we continue to do so?



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# Thank you. Questions?

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