SPACE POLICY in CHINA

Prof. Mu Rongping
Director-General, Institute of Policy and Management,
Chinese Academy of Sciences
2011.5.18

OUTLINE

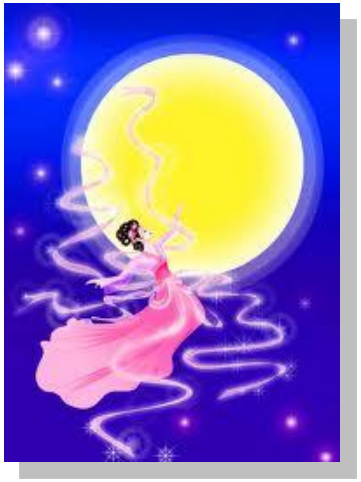
I. Overview of China's Space Activities

II. Space Policy System in China

III. Framework for Space Policy Research

IV. Conclusion Remarks

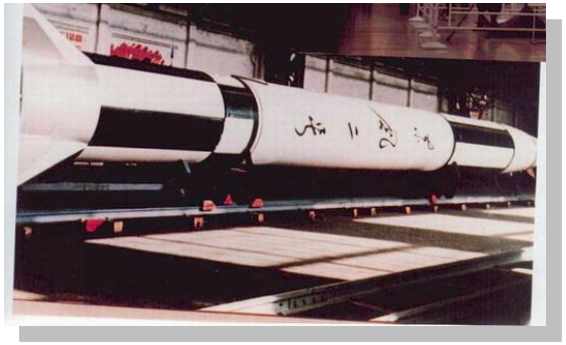
I. Overview of China's Space Activities



- Ancient legend: **Chang-Er** flew to the moon
- The first lunar probe of China is given the name ***Chang-Er***

- "Wan Hu" in 14th century (the Ming Dynasty), who tried to fly to the moon with chair bounded with rockets and giant kites in hands.

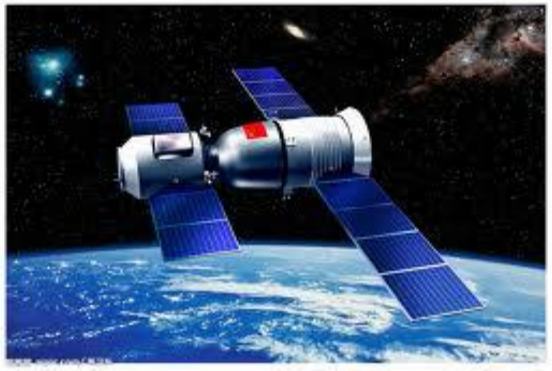
Early stage of Chinese space programs



- Dongfeng-II：June 29th, 1964, the first space launch of China

- China launched its first satellite (Dongfanghong-I), with the Long March-I on 24 April 1970, making it the sixth nation to launch its own satellite into orbit

Shenzhou manned space programs



- Shenzhou-5 spacecraft launched in 2003, which carried Yang Liwei, the first astronaut of China, in to orbit, and took him back to earth 25 hours later

- Shenzhou-6 spacecraft carried 2 crew of for five days in low Earth orbit.

- Shenzhou-7, which accomplished the first extra-vehicular activity (EVA) carried out by crew members Zhai Zhigang and Liu Boming in September, 2008

Lunar exploration and space station program

- Chang-Er lunar probe flew to the moon, Oct. 2007.

- Concept map of Tiangong-I, Chinese space station which are supposed to launch later this year

Satellite Series

- Communications satellites—Dongfanghong (DFH)
- Retrievable remote sensing satellites
- Meteorological satellites—Fengyun (FY)
- Scientific and technological experiment satellites—Shijian (SJ)
- Earth-imaging satellites—Ziyuan
- Navigation and positioning satellite— Beidou

Comparison of Major launch Vehicles

Country	Vehicle	Year of First launch	Total launches in last 10 years	Launch reliability in last 10 years	LEO launch ability（kg）	GTO launch ability（kg）
US	Delta IV Heavy	2004	3	100%	22560	12980
	Atlas V	2002	19	100%	20520	8670
	Shuttle	1981	33	100%	23435	5663
Russia	Proton M	2000	36	92%	21000	5500
EU	Ariane 5	1996	46	96%	17250	10500
Japan	H 2B	2009	1	100%	19000	8000
China	Long March 3B	1996	7	100%	13562	4491

Source: FAA,2009

Space S&T Publilcations & Citations (1999—2009)

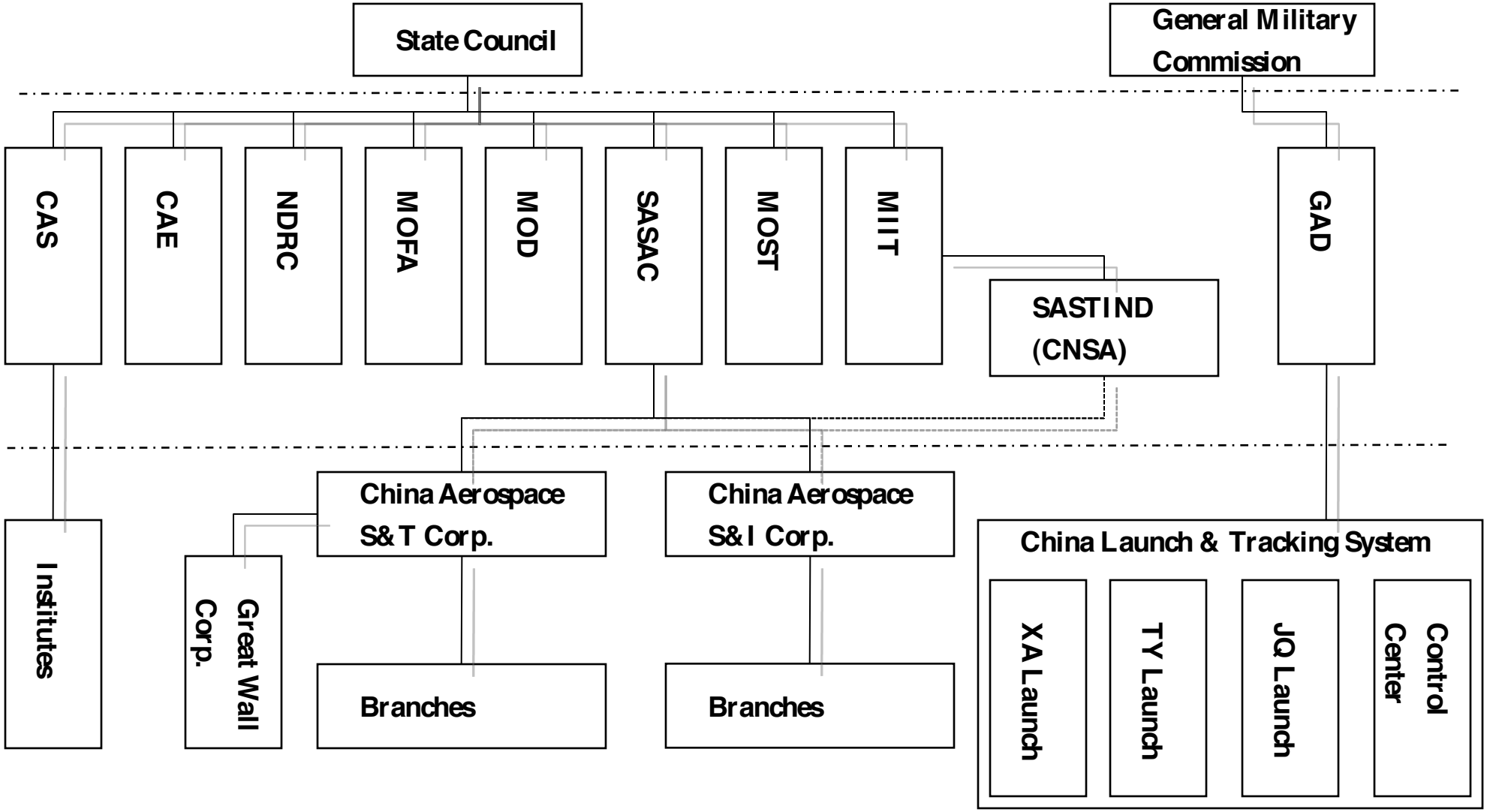
Country	No. of Publications	No. of Citation	Citation per paper
EU	92814	1572574	16.94
US	54473	1041664	19.12
UK	20044	388046	19.36
Germany	17707	325323	18.37
France	13808	215034	15.57
Italy	12002	194084	16.17
Japan	8668	124558	14.37
Russia	8572	60298	7.03
Spain	7166	100523	14.03
China	6462	42138	6.52
Canada	5833	120448	20.65
India	3118	22614	7.25
Korea	1568	16475	10.51
Isreal	1559	31990	20.52

Source:Thomson Reuters. Essential Science Indicators, 2010

II. Space Policy System in China

- The State Council
- Ministry of Industry and Information Technology (MIIT)
  - State Administration of Science, Technology and Industry for National Defense (SASTIND) (former COSTIND)
  - China National Space Agency (CNSA)
- National Development and Reform Commission(NDRC)
- Ministry of Science and Technology(MOST)

Major Chinese Space Actors



Source: adapted from Isabelle Sourbès-Verger (see ESPI, 2007) with revision

II. Space Policy System in China

National Space Policy

- Policies for space activities
- Policies for space industry
- Policies for space science

II. Space Policy System in China

- There is no explicit expressed national space policy in China, like the U.S. did.
- **The Space White Papers** (China's Space Activities in 2000/2006) are proclamation and statement concerning space issues rather than national policies in the real sense
- **The Eleventh Five-year Plan for Space Development** released by COSTIND (ministry level guideline) could also be seen as national space policy.

Two space white papers

- **“ China's Space Activities in 2000”**
  - The aims and principles, present situation, future development and international cooperation
  - “Significant event with far-reaching influence in the history of Chinese space activity” (Guo, 2007)
- **“China's Space Activities in 2006”**
  - Restated and further defined its aims and principles
  - Follow and serve to national development strategy; independence and self-reliance, and innovation; overall coordinated and sustainable development; adhering to opening-up policy (Sun, 2007)

National policies concerning space activities

- The Medium- and Long-Term Plan for National Science Technology Development (2006-2020)
- The Outline of the Eleventh Five-Year Plan for National Economic and Social Development
- The Eleventh Five Year Plan for National S&T Development (MOST, 2006)
- The Eleventh Five Year Plan for High-Tech Industry development (NDRC, 2007)

The Medium- and Long-Term Plan for National S&T Development (2006-2020)

- Defined 16 S&T special mega-projects
  - which are designed to strive for breakthroughs
  - taking full advantage of the socialist system in pooling up resources to do big things and the role of the market economy system as well
  - expected to spring from scientific and technological progress in limited areas to a leapfrogging development in overall productivity while helping fill up the country's strategic blanks.
- Space related major special projects represent 3 out of the 16 S&T mega-projects, including high resolution earth observation systems, manned space flights, and the moon probe.

Policies for Space Industry

- Several Opinions Relevant to Promoting the Development of the Satellite Application Industry(NDRC & COSTIND, 2007)
- Special Projects Relevant to Space Industry
- Industrialization of satellite navigation (NDRC)
- Market exploration and industrialization of Beidou GNSS (COSTIND)
- the second generation satellite navigation system (MOST)
- Several Opinions Relevant to Promoting the development of Strategic Emerging Industries (the State Council, 2010)

Promoting the Development of Satellite Application Industry

- the satellite application industry is positioned as a national strategic high-tech industry
- aimed at building an industrial chain which will cover satellite operation service, ground-equipment and user terminals manufacturing, system integration, and comprehensive information service
- By 2020, China will accomplish the transition of applied satellite from “testing and application–based” to “business and service-based”, and build a relatively comprehensive satellite application industry.

Commercialization endeavors of Chinese space community

- Space industry is promising to become one of the major engine of economic growth in the new century
- More attention is paid to the manned space program and deep space exploration
- From the international commercial launch service in 1980th, China is dedicated to build a competitive commercial space sector
- Chinese government raise the objection of building a innovative countries by 2020. A strong space sector fit this strategy well for its features of leverage and technology spillover effect

Policies for Space Science

- The 11th Five-Year Plan for Space Science Development (COSTIND, 2007)
  - the objection of the following 15 years is building a competitive space science system covering space astronomical observation, space environment, microgravity science, and space life science, etc.
  - Reach internationally advanced level at major space science domains, and meet the requirement of national strategy.

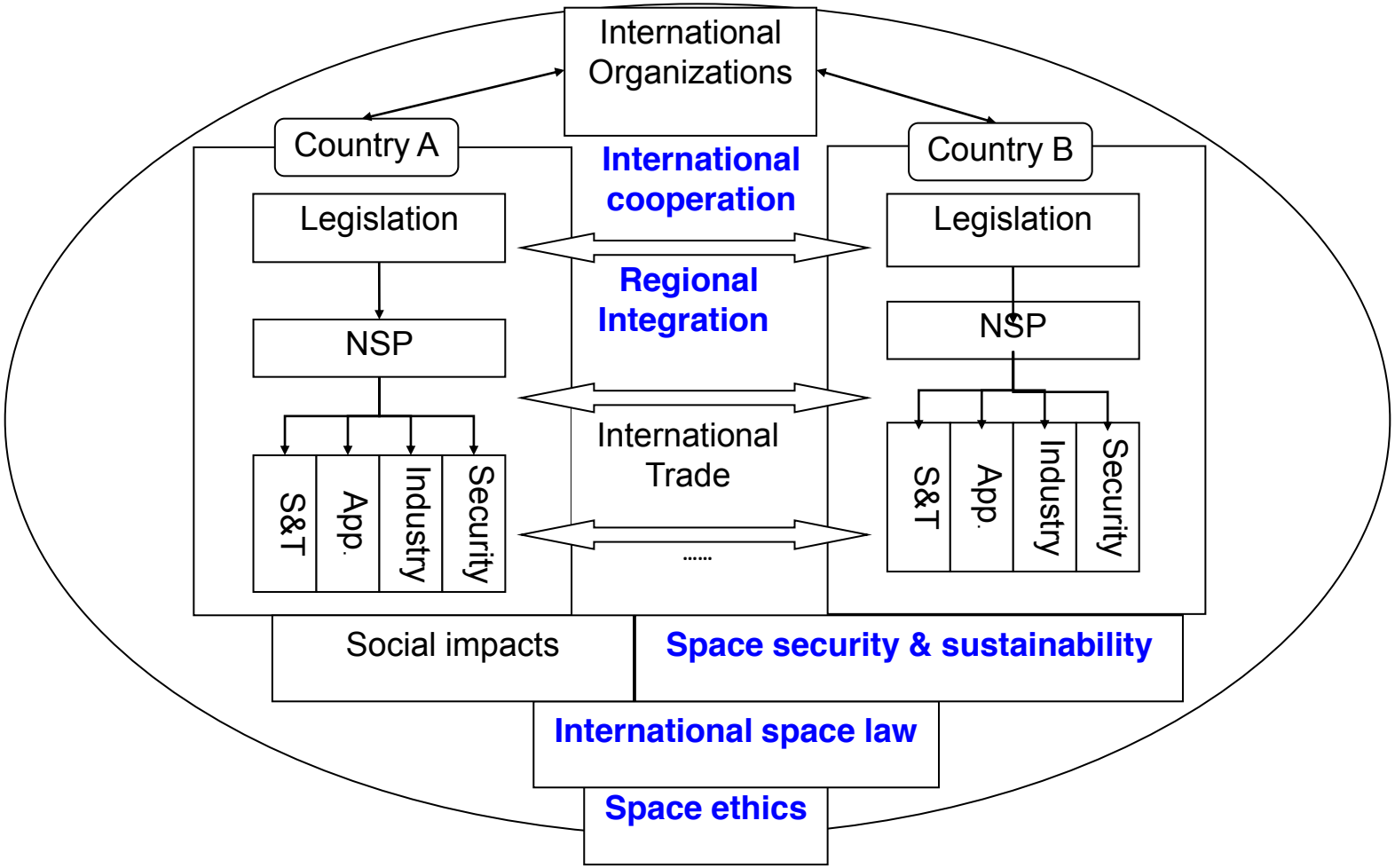
II. Space Policy System in China

- Robust and effective space policy is the basic institutional guarantee of sustainable space development
- Current space policy system based 60 years development is proven to be effective and reliable, especially for China.
- Space legislation. China is among the few major spacefaring nations without space legislation (Zhao, 2007) . Due to the absence of law base, the space policy system is unstable, inadequate, and not well targeted (Wen, 2009).
- Explicit strategy and plan for space development at national level.
- Interagency coordination and institutionalized space budget mechanism

II. Space Policy System in China

- The government, industries and the academia have reached a general consensus that cultivating and developing SEIs (strategic emerging industries) will be of strategic importance to the modernization of China.
- Satellite application including satellite communication, navigation and position, remote sensing, is listed under the high-end manufacturing industry.
- Enormous domestic market will be a great advantage for those Chinese based manufactures and service providers

III. Framework for Space Policy Research



The Framework for space policy research

The Framework for space policy research

	Research fields	Major topics
Global Level	Space ethics	（1）ethic issues about space environment （2）ethic issues concerning life （3）public ethic problems （4）commercial space ethics
	Space security and sustainability	（1）space debris （2）orbit allocation （3）radio frequency allocation and collision （4）space assets security （5）space situation awareness
	International space law	（1）legislation status （2）challenges of current international space law （3）legal issues of commercial activities
	Influence of space activities upon society	（1）domains of impacts （2）evaluation of impact magnitude （3）mechanism of impact

	Research fields	Major topics
Transnational level	Space cooperation	（1）motivation/dynamics of cooperation （2）pattern and mechanism of cooperation （3）cooperation impacts analysis
	Regional space policy	（1）regional integration （2）regional policy coordination
	International trade of space products & technology	（1）space industry value chain （2）international competition & cooperation of space industry （3）trade control on space related products

	Research fields	Major topics
National Level	National space law	（1）legislation foundation （2）legislation to government agencies （3）legislation to non-government agencies
	National space policy	（1）rationale of space activities （2）process of NSP （3）contents analysis of NSP （4）Cross-National Comparison analysis
	Space S&T policy	（1）priorities selection and roadmaps making （2）coordination of space science, technology and application （3）guarantee measure of space S&T activities
	Civil space policy	（1）satellite communication （2）remote sense and earth observation （3）navigation and positioning
	Commercial space policy	（1）policies for space industry development （2）policies for space tech commercialization
	Military space policy	（1）militarization/weaponization of outer space （2）space activities and national security （3）possible space war analysis

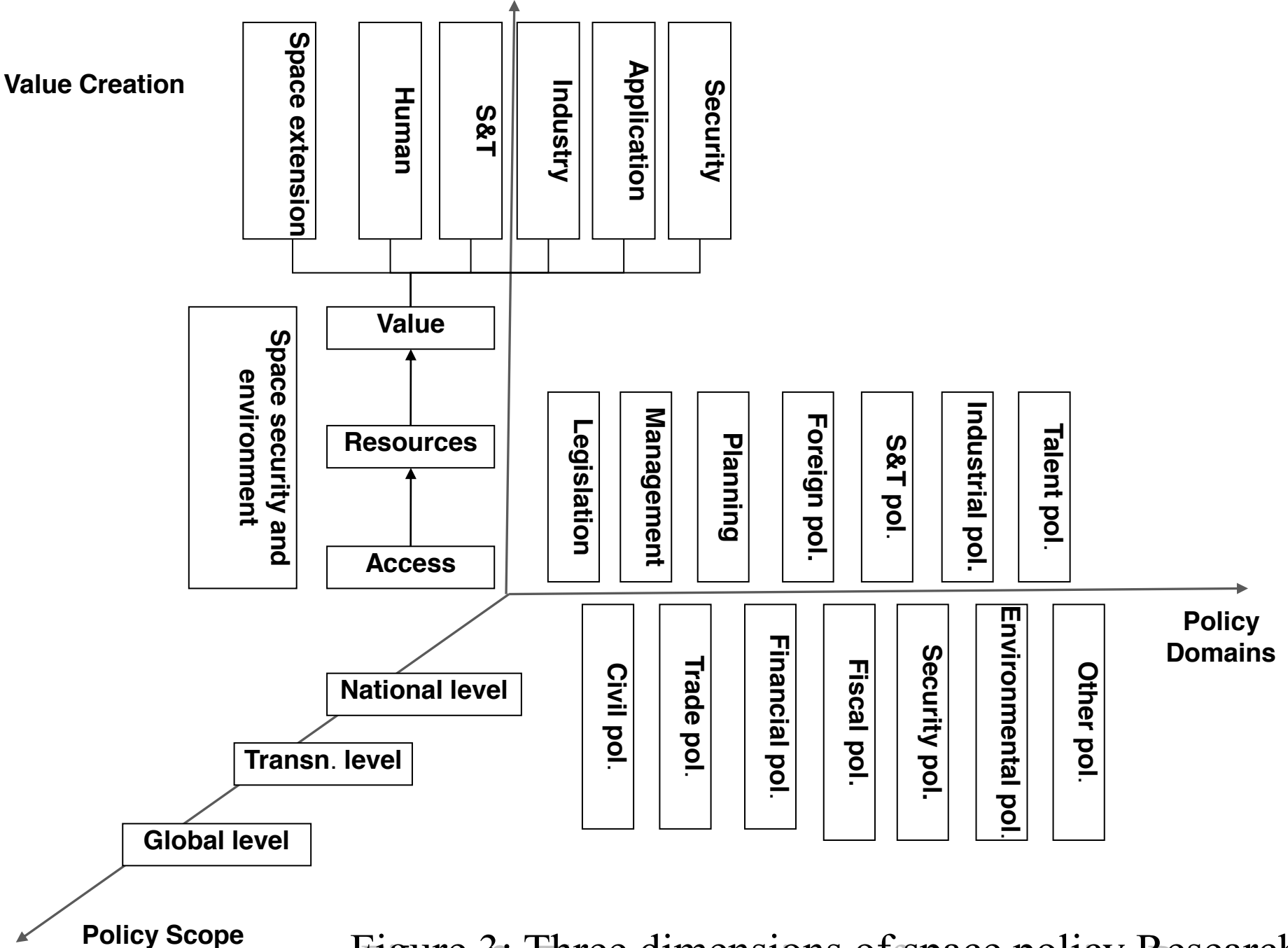


Figure 3: Three dimensions of space policy Research

Figure 3: Three dimensions of space policy Research

IV. Conclusion Remarks

1. China has a very unique system of space policy

- Strong leading role of government
- lack of space legislation, explicit and robust national space policy
- Insufficient of international cooperation

2. China needs strong research group on space policy

- Support the decision making process of space
- Make outside world understand Chinese space policy
- Initiate international communication & cooperation on space policy

IV. Conclusion Remarks

3. China should strengthen international cooperation

- Develop quality reliable, high performance space products and services, build up the brand of Chinese Space
- Play a positive role in the fields of space environment protection, debris elimination, international space agreements as a responsible space power
- Promote the transparency of civil space operations gradually
- Encourage more non-governmental organizations get involved in space activities
- Actively enhancing multilateral cooperation, especially south-to-south space cooperation

Thank you!

Q&A