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China's space station project and international cooperation: Potential models of jurisdiction and selected legal issues☆

Jie Long

Faculty of Law, The University of Hong Kong, Hong Kong

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ABSTRACT

China's manned space station project was officially approved in September 2010. Under a space development strategy at the state-level, an unmanned modular space station, Tiangong-1, was launched on September 29, 2011 and Tiangong-2 is scheduled to be launched in 2016. According to the China National Space Administration (CNSA), China is targeting 2022 for the orbiting of its space station, which will establish China as the third country that has independently constructed and operated a space station. In this article, the feasibility of different models of jurisdiction for this space station is examined, namely the Soviet Salyut, Sino-ISS, European Space Agency (ESA), and China-led models, which take into account the various factors that are not only limited to legal issues. After exploring the advantages and limitations of these models of jurisdiction, it is argued that due to legal, political, financial and technological reasons, a model of jurisdiction that is led by China is the ideal model for the impending space cooperations of China. Based on the above proposition, it is concluded in this article that China should be pragmatic towards space legislation in terms of space commercialization, and the most critical legal issues need to be given prior consideration, i.e. intellectual property protection, export control and dispute resolution mechanisms.

1. Introduction

In September 1992, the Chinese government authorized the Chinese National Manned Space Program with three phases of development [1]. After successfully implementing the first phase, a manned space station project was initiated in 2010 [2]. The first target-spacecraft and space laboratory, Tiangong-1, was launched on September 29, 2011, and fulfilled the critical task of space rendezvous and docking with the unmanned Shenzhou-8 spacecraft [3]. The launch of the second spacelab, Tianong-2, is scheduled in 2016 [4]. According to official announcements, a relatively large scale state-level space laboratory which will be human-tended on a long-term basis will be established around 2022 [5].

According to the latest White Paper published by the State Council of China, the concept of "open development" is an important factor for the Chinese space industry, which means that China is fully open to international cooperation in its space activities [6]. During the past decade, China has been involved in various international space cooperation and collaboration activities by signing multilateral and bilateral agreements and memorandum of understandings (MOUs) with different countries, space agencies and organizations [7], participating in space-related activities organized by international organizations, particularly the United Nations (UN) [8], and promoting the participation of Chinese enterprises in international commercial space activities [9]. Obviously, the space practices of China to date have demonstrated that China not only prioritizes space cooperation but also emphasizes the necessity of doing so.

In reviewing historical space activities, the necessity for space cooperation originated from the scope of space activities themselves, such as the need for cutting-edge technology, the large amount of funds required for investment in space and safety insurance [10]. International space cooperation not only effectively reduces the burden of a substantial amount of capital and technology investment required of one country, but also alleviates the potential risks. Therefore, in the development of large-scale space projects, such as manned space stations, most space-faring nations will inevitably choose to cooperate with other countries [11]. In

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E-mail address: longjie@hku.hk.

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terms of the space station project of China [12], it will be most ideal for them to optimize and integrate technical, capital and human resources by cooperating with other countries in the long run.

In this article, the possible models of jurisdiction for the impending space station of China will be examined and the most critical legal issues will be discussed. The historical development of manned space stations and space cooperation between the United States (US) and the Union of Soviet Socialist Republics (USSR) (Russia) during and after the Cold War, will be examined, as well as the evolution of the space cooperation principles in the UN legal framework, with the expectation that some valuable reflections will be obtained from the cooperation between these two super space powers. Then, the possible models of jurisdiction of space stations will be investigated, and an assessment carried out to determine the ideal type for China. Following that, a discussion on whether a basic space station cooperation legislation is necessary will be carried out. By learning from the commercialization experiences of the International Space Station (ISS) and the latest developments in space activities, the principal legal issues that China would need to address in terms of its space station will be brought forth for discussion.

2. Evolution of manned space stations and space cooperation principles

2.1. Definition of manned space stations

Prior to any legal analysis, definitions are warranted, and in this case, there is no consensus on the definition of manned space stations by the academia yet. During the preparation work for the ISS, a definition was proposed by the US Office of Technology Assessment in which "a space station is an object or a collection of objects (attached or free-flying) which is in an international, long-duration earth and is, at least in part, habitable" [13]. Moreover, in the space station related literature, it is commonly believed that due to the related activities, a space station should have two basic characteristics, one is long-term orbital duration, and the other is habitability [14]. These are the preconditions to further space activities, such as science and technology research, civilian and military utilization, deep-space exploration, and space commercialization [15].

2.2. Development of manned space stations

The first space station "Salyut 1" was launched by the USSR in 1971 [16], followed by Salyut 2–7 in 1973 and 1982, and the third generation "Mir" space station was in orbit for almost 25 years from 1986 to 2001 [17]. During the Cold War, the US launched its first space station "Skylab" in 1973 to compete with the USSR, but due to technological and funding deficiencies, the Mir space station has surpassed the US Skylab which only lasted for 6 years [18]. Later, the ISS program which involved most of the space-faring nations was formally initiated in 1993, and has the most intensive cooperation in terms of space projects to date [19].

2.3. US-USSR (Russia) space cooperation

Space cooperation between the US and the USSR was initiated during the Cold War after the first artificial satellite was sent to orbit. Due to the competition for political and military advantages in outer space between these two super countries, the period of 1957–1991 was characterized by mistrust and overt hostility [20]. However, with the decline of the USSR in the late 1980s, the political relations between these two countries began to improve, which allowed them to pursue strategic partnerships in space [21]. In 1972, the US-USSR Space Cooperation Agreement was signed, which paved the way for cooperation between the US and USSR on the Apollo-Soyuz test flight in 1975, which is a good example to illustrate the space cooperation between the two space powers during that unique period [22]. Such a pragmatic way to cooperate in space enabled momentum of the space industry in both countries, despite some obstacles along the way, such as the concerns on space race and national security from both countries. The USSR collapsed in 1991, which created the opportunity for the US to invite Russian experts, who had the experiences of developing the Mir, to participate in the international space station project [23]. In 1993, cooperation between the Russian Mir and US space shuttle was announced and a new space cooperation agreement was reached in the same year [24]. It can be concluded that it is this space cooperation that saved the Mir project and stimulated the establishment of the ISS.

2.4. Evolution of space cooperation principle

The first satellite "Sputnik" that was launched in 1957 encouraged the US to proceed with its global initiative under the umbrella of the UN to develop a legal framework for peaceful space activities [25]. This led to the establishment of a special committee in 1958 for regulating space activities and the UN Committee on the Peaceful Uses of Outer Space (COPUOS) in 1959. Since then, the committee has become a technical and legal center for international space cooperation. In 1961, the United Nations General Assembly (UNGA) Resolutions emphasized the importance of "international cooperation" for the first time [26]. In 1963, international cooperation was indicated as one of the most important principles for space activities [27]. This principle was further reinforced in the 1967 Outer Space Treaty (OST) and universally accepted by the international community [28].

In 1996, the UNGA resolution emphasized again on space cooperation [29]. According to Zhao, the resolution lists out the significant provisions on the possible means (formal requirements) of international space cooperation and the conditions (substantive requirements) [30]. In terms of formal requirements, the type and formality of the cooperation can be quite flexible, such as governmental and non-governmental cooperation, cooperation in commercial and non-commercial matters, and also global, regional or bilateral scope. In addition, cooperation between developing and developed countries is also possible [31]. As for the substantive requirements, the basic requirement is party autonomy, and space cooperation should be carried out on a mutually acceptable and equal basis. Lastly, the special needs of developing countries should also be taken into consideration [32].

2.5. Reflections for China

After nearly 60 years of space development, the importance of space cooperation has been verified by past experiences, especially by the Mir and ISS, for the survival and prosperity of a long-term and well implemented space program. In terms of the forthcoming space station of China, a pragmatic attitude is recommended for international space cooperation, because only by securing the participation of different countries, regardless of the political and ideological differences, will this space station project achieve sustainable development in financial and technological aspects. The 'sustainable development' not only means the sustainable development in financial and technological aspects but also in environmental protection aspect. From the experiences of the Mir and ISS, only when the space station receives continuous capital investment and technology support, could a huge space project operates in a functional way. Moreover, in the new space