

EVALUATION OF SPACE COOPERATION BETWEEN CHINA AND BRAZIL:  
AN EXCELLENT EXAMPLE OF SOUTH-SOUTH CO-OPERATION

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Abstract

Space cooperation between China and Brazil started in 1986 and after 15 years of successful joint creative work, the two sides reached the 2002 Protocol, providing a more concrete framework for further cooperation in space projects. This bilateral agreement was claimed to be an authentic bilateral effort amplifying the so-called South-South relationship. A close examination of the Protocol has revealed that this document, while responding to the UN Declaration on International Cooperation, has made a significant contribution and set a good example to space cooperation among developing countries. Placed against the background of the developing space commercialization, the success of this model can test the viability of existing space commercial rules and make further improvements.

1. INTRODUCTION

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International space cooperation is intended to permeate all space endeavors and is a significant duty that will affect private industry.<sup>1</sup> Recent developments in international space cooperation signal the introduction of a new era in the rapidly developing field of space law.<sup>2</sup> The importance of international cooperation in outer space has been well received by the space-faring states. The adoption of the UN Declaration on International Cooperation (hereinafter referred to as “the UN Declaration”) in 1996 has further pushed the development of space cooperation.

In fact, international space cooperation emerged far earlier than the adoption of the UN Declaration. As earlier reported in 1991, China has executed extensive cooperation arrangements with other countries that include sharing satellite technology.<sup>3</sup> When it comes to the cooperation between China and Brazil, the history of their space co-operation is symbolized by the China-Brazil Earth Resource Satellite (CBERS) set up in 1986, followed by the signature of the Protocol on Research and Production of Earth Resource Satellite in 1988. This is China’s first international cooperation in space technology. In 2002, after 15 years’ of successful joint creative work, the two sides were able to reach a new Protocol (hereinafter referred to as “the 2002 Protocol”), providing more concrete framework for further cooperation in space projects.<sup>4</sup>

The 2002 Protocol, based on and under the spirit of the Protocols reached before, continues space cooperation between the two States. Besides developing a second generation of CBERS satellites, the Protocol also establishes that the two sides will examine the viability to develop jointly a geostationary meteorological and telecommunications satellite. It contains 19 articles of great innovation on the commercialization of outer space. This bilateral agreement was claimed to be an authentic bilateral effort amplifying the so-called South-South relationship.

This paper intends to evaluate this Protocol, highlighting its significance in promoting space cooperation. Part 2 provides a brief overview of the history of space cooperation between China and Brazil. Part 3 examines the 2002 Protocol, followed by an evaluation. This part demonstrates how the 2002 Protocol promotes space cooperation and commercialization in outer space. Finally, Part 4 provides some observations that will pave the way to the infinite rewards which may be reaped from the commercialization of outer space.

## 2. HISTORY OF SPACE COOPERATION BETWEEN CHINA AND BRAZIL

China, as one of the major space powers, persistently supports activities involving peaceful use of outer space and maintains that international space cooperation should be promoted and strengthened on the basis of equality and mutual benefit, mutual complementarity and common development.<sup>5</sup> Since 1985, China has successively signed many inter-governmental or inter-agency cooperative agreements, protocols or memorandums, and established long-term cooperative relations with a dozen countries.

Brazil is among one of the earliest countries to have cooperative projects with China. CBERS project, set up in 1986, was jointly financed by China and Brazil. And the Protocol on Research and Production of the Earth Resource Satellite was signed by both governments in 1988. However, the first consequence of the Protocol came only after 11 years when the CBERS-1 was launched in 1999 from the Chinese base in Taiyuan. It is China's first generation transmission earth resources satellite developed by China and Brazil. This satellite was officially delivered for service in 2002.\* More than 230,000 satellite data pictures have been received from CBERS-1 and have been widely applied in various areas of social and economic development for both countries.

The successful launch of CBERS-1 shows that China and Brazil began to use their own developed satellite to obtain real time remote data, ending the history that China had no home-made resource satellite for a long time. It was the first time for China to have developed earth resource satellite with remote sensors. It was also the first time to have obtained remote sensing image data about remote areas of the western part of China. This made a certain contribution to the development of the western part of China. Experts all over the world believed that the successful development and launch of the CBERS-1 satellite indicates that China's satellite development level had reached a new stage.<sup>6</sup>

Another two cooperative protocols were concluded in 1994 and 2000 respectively. Both protocols deal with cooperation in

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\* CBERS-2 was launched in 2003 since CBERS-1 has exceeded its two-year expectancy.

space technology, or more specifically, in the development of earth resources satellites. In view of joint creative work, both parties were able to reach further cooperative protocol in 2002. Soon after, CBERS-2 was launched from Taiyuan in October 2003. With this satellite, Brazil became independent in remote sensing radar imaging. This means that the country no longer needs to rent the American Landsat, or other satellites, that it has been using for at least 7 years. The satellite will monitor deforestation and forest fire in Brazil with the objective of providing data for harvest estimates.

Plans, which can be found in the 2002 Protocol, have been confirmed to launch two more satellites in the future, the CBERS-3 (launch forecast for 2006) and CBERS-4 (launch sometime in 2007), which will have more advanced cameras than the previous two satellites.

### 3. UNDERSTANDINGS ON THE 2002 PROTOCOL

The 2002 Protocol is a complementary Protocol to the 1994 Framework Agreement between the Government of the Federative Republic of Brazil and the Government of the People's Republic of China on Cooperation in the Peaceful Applications of Outer Space Science and Technology on the Continuity of the Joint Development of Earth Resources Satellites. It begins by recognizing several prior agreements. The basic purpose is to continue the cooperation between the two sides to develop a second generation of CBERS satellites (CBERS-3 and 4).<sup>7</sup> With 15 years of successful cooperation, the two sides were able to reach a higher level of cooperation. The 2002 Protocol, 19 articles in total, contains very important new dispositions.

#### 3.1. Dispute Resolution

It is important to note that the Protocol contains clear rules on dispute resolution. Indeed, an appropriate dispute resolution mechanism is critical to the success of such cooperation, since various rules and principles will only protect commercial ventures to the extent that they are enforceable.<sup>8</sup> According to the Protocol, a Coordination Committee is created to solve problems during its implementation. This Protocol further establishes a Joint Project Committee as an executive body enjoying a large competence.<sup>9</sup> Misunderstandings or disputes concerning the interpretation or application of the Protocol can be settled by mutual consultations between the parties within the framework of the Joint Project Committee. The second and final instance, at the request of either party, will be the Coordination Committee.<sup>10</sup> This Committee is different from formal dispute resolution body. Through years of cooperation, they have a trusting relationship. This informal dispute resolution mechanism can function well and maintain good relationships between the two parties.

#### 3.2. Areas for Cooperation

Rules are provided for facilitating the entry and exit of equipment and materials required for the implementation of the Project in both countries, as well as the provision of the appropriate documentation of both citizens to enter, exit and reside within the territory of the other country in order to carry out activities relating to the Project.<sup>11</sup> This is essential to the smooth operation of the project. Free movement of facilities, information and personnel necessary for the project is the basis of cooperation. Further facilitation is provided later on: both parties give to companies or institutions of the other party, priority to provide services, parts and components or equipment each

party needs to acquire to complete its duties taken on by the project.<sup>12</sup> This preference provided to the other party could promote both a friendly relationship and economic development. This arrangement is also in line with the global trend of economic development, thus meaning more than merely providing a model for space cooperation—it provides a prelude and model for future trade liberalization between the two parties.

### 3.3. Model of Cooperation

It is vital to note that equal sharing of the total investment of the project is adopted.<sup>13</sup> This is different from the previous investment model where China took up 70 percent of the cost. This means that the launching activities of the CBERS-3 and 4 will be shared on an equal basis, each sharing 50 percent of the costs.<sup>14</sup> It follows from this arrangement that both parties will have equal right of utilizing products of CBERS-3 and 4 and that these products can be used by a third party only under mutual consent of both parties.<sup>15</sup> This equal arrangement is really an improvement considering the previous 70-30 model. Moreover, plans are to launch the CBERS-3 from China, and the CBERS-4 from the Alcantara Rocket Center in Maranhao, Brazil.

Evidently, there have been great achievements made by the previous cooperation, where Brazil provided scientists, engineers, and a smaller percent of investment capital in exchange for a smaller percent of the profits. It rightly reflects the principle that space cooperation should be based on mutual benefits and common development.<sup>16</sup> Through 15 years of cooperation, Brazil is now capable of mastering stronger control over the space project and thus, able to undertake more responsibilities. This rightly

accords with both the guiding principles of China's international cooperation and the UN Resolution.

### 3.4. Commercial Benefits from Cooperation

Commercialization is the final goal of the space project. Accordingly, several articles are devoted to this purpose. Since Brazil is in charge of the CBERS-4 launching, Brazil will develop its Alcantara Launching Center as a competitive international center for commercial launching. The launch of the CBERS-4 will be a testing stone for the viability of the Center to carry out commercial launching in the future. This will have far-reaching effects on the satellite launching among developing countries. For the time being, launching activities have been largely monopolized by several countries, the work of the center will no doubt add to the competition of launching services. Developing countries can be expected to enjoy favorable conditions from their "pal".

According to the 2002 Protocol, both parties enjoy equal benefits from the satellites. For each launch, both countries will sign a contract with offset and re-flight insurance clauses, according to the rules of international commercial launching services.<sup>17</sup> Meanwhile, the model of a joint venture is to be studied for the purpose of marketing and/or distributing CBERS images to third parties.<sup>18</sup> Furthermore, we should note that the issue of intellectual property rights is included in the Protocol for the first time.<sup>19</sup> These two provisions touch on the most sensitive part on space commercialization.

As a result of increasing international space cooperation and the future commercialization of prospective

technical innovations in outer space, the protection of property rights in space activities, including issues regarding technology transfer is essential.<sup>20</sup> The ongoing multinational project on the International Space Station (ISS) is an ideal example of space commercialization. The commercial issues involved in the ISS were defined in the Inter-Governmental Agreement (1998) and arranged under a multilateral background. With 16 countries involved, the operation of the ISS has to take into account more complicated factors. It takes a long time to reach a consensus on the operational framework for the ISS. However, the special relationship between China and Brazil justified a different approach. We can expect that more and more space cooperation will be carried out in the future on a model like that of China and Brazil, especially when developed countries continue to maintain restrictions on technology transfers.

#### 4. EVALUATION AND RECOMMENDATION

##### 4.1. Establishing a Cooperation Mechanism

The principle of international cooperation is laid down in Article I (1) of the 1967 Outer Space Treaty. Two different standpoints existed during its formulation. The developed countries agreed that this principle set forth limitations and obligations to the use of outer space, but it did not diminish their inherent rights to determine how they share the benefits derived from their space activities; while the developing countries believed that this principle was not only an appeal to all States to conduct their space activities on a cooperative international basis, but actually implies that they have an obligation to do so.<sup>21</sup> As a consequence of their standpoints, most developed

countries are of the opinion that there is no formal mechanism to enforce this principle, while developing countries insist that there should be a requirement for a stricter and codified international legal instrument to ensure cooperation and access for all countries.<sup>22</sup>

The question of the need to establish a cooperation mechanism to carry out this principle has been a serious concern for the UNCOPUOS. After years of discussion, the UN Declaration was adopted, offering the basic guidance in international cooperation, namely: states are free to determine all aspects of their participation in international cooperation on an equitable and mutually acceptable basis; international cooperation should be conducted in the modes that are considered most effective and appropriate by the countries concerned including *inter alia*, governmental and non-governmental, commercial and non-commercial, global, multilateral, regional or bilateral; and international cooperation among countries in all levels of development.<sup>23</sup>

The international climate is conducive to laying the groundwork for international cooperation. The greatest impact the major space powers could have on space law is the formulation of bilateral or multilateral agreements governing cooperative space activities. Current commercial applications of outer space usage can include remote sensing, direct television broadcasting, mining mineral deposits, erecting solar panels for energy generation, space tourism; further application extends to space station, whose constitutive document has been viewed as a model for multilateral cooperation.<sup>24</sup> However, multilateral space cooperation requires long periods of negotiation and is more complicated in the process of further implementation. Bilateral cooperation, largely based on mutual trust and more readily

representing mutual interests, can be a prelude to further extension. Normally bilateral cooperation can provide a testing bed for a deeper level of cooperation and can entail implications beyond economic elements. Furthermore, bilateral cooperation can be well formulated to suit the specific requirements of both parties. This is obvious from the China-Brazil cooperation, whose achievements can have a positive, reinforcing effect on political stability and states' political relations. Bilateral cooperation is thus often adopted by many nations, avoiding the tedious negotiations.

#### 4.2. Cooperation among Developing Countries

In the last few years, we have witnessed a tremendous growth of space applications to serve different scope of activities. One of the most important ways to promote utilization of space science and technology for the benefits of all mankind is to transfer space science and technology among the countries. The establishment of an effective cooperation mechanism at global, regional, multilateral or bilateral level will play pivotal roles in guaranteeing access to space science and technology. Only through this mechanism can developing countries possess genuine capabilities in space science and technology for the purpose of fulfilling their specific needs.

While following the UN Declaration on International Cooperation, China has further specified the importance of simultaneously increasing the capability of space development of all countries, especially developing countries and enabling all countries to enjoy the benefits of space technology. With developed countries still setting limits in transferring relevant technologies, it is all the more meaningful that China is

committed to supporting the use of China's more developed space technology and space application technology to carry out cooperation with other developing countries and provide services to these cooperating countries.<sup>25</sup> The China-Brazil cooperation, one among various bilateral cooperative agreements having signed between China and other countries, is thus rightly claimed to be an excellent example of the developing countries in "South-South Cooperation" in the high-tech field.<sup>26</sup>

#### 4.3. Prospects for Further Improvements

Unfortunately, the 2002 Protocol only offers simple principles without going further into the detailed arrangements. For example, when we come to the issue of intellectual property rights, the protocol contains only simple wording, requiring future particular arrangements. Protection of intellectual property is critical to the success of the project, especially for those involved in research and development efforts through collaborative relationships. The creation, use, transfer, ownership and protection of intellectual property are of utmost importance to both parties. Accordingly, a detailed set of rules concerning intellectual property rights should be in place, pulling together the different national laws of both parties. Furthermore, both parties should also agree that they shall respect the proprietary rights in and the confidentiality of property identified and appropriately marked data and goods.<sup>27</sup>

No provisions in the Protocol touch on the issue of liability. Reference might be made to the dispute resolution arrangement, through which disputes concerning the liability of each party can be resolved. However, this arrangement does not affect the situation when a third party is involved. It is thus helpful to

refer to the 1972 Liability Convention for possible resolution.

The simple formulation of the Protocol can be a problem for further implementation, nevertheless, it is understandable. During the negotiation of the 2002 Protocol, space commercialization is still in a testing and developing stage. This is even the truth for developing a legal regime for space commercialization. Various discussions are still going on concerning appropriate legal rules for space commercialization. While the ISS project took a lead to formulate a multilateral regime for space commercialization, time is still needed to see whether it will be successful. Thus, the China-Brazil cooperation provides a good example for bilateral space commercialization. Of course, the 2002 Protocol is very simple; in future implementation, it is necessary to study other existing commercial space project and make the protocol into a more concrete document.

It is to be noted that the Protocol will remain in force for five years and will be automatically renewed for equal and successive periods of five years, unless either party notifies the other party of the intention to terminate the protocol with at least six months' prior notice. Based on such an arrangement, we can reasonably expect that more detailed rules will be further negotiated and filled in the existing Protocol for better coordination and performance.

Finally, but not lastly, for the purpose of coordination and prevention of possible conflicts among various agreements, it is to be suggested that such agreements should be under the aegis of a space organization. UNCOPUOS may be the right body to take care of this task considering its position within the UN system, which is widely considered to be

well-suited for the regulatory and coordinating function as evidenced by its proven record of formalizing treaties regarding space activities<sup>28</sup> as well as resolving other international issues.<sup>29</sup> Moreover, once an agreement is proved to be of significance to future space activities, the UNCOPUOS is the appropriate body to push forward such practices and deepen future space cooperation.

## 5. CONCLUSION

Efforts towards international space cooperation are nothing new to the space countries<sup>30</sup>: Space exploration is a tremendous undertaking requiring the resources, expertise, and efforts of many individuals from different nations throughout the world. Different nations need to work together for common goals.

Examples of space cooperation include INTELSAT, INMARSAT, EUTELSAT and ESA, which have become a solid foundation in the future endeavors. From the examples, we can see that rules, principles can be accumulated and improved while better balancing various competing interests.<sup>31</sup> As proclaimed, space co-operation between China and Brazil amplifies the so-called "South-South" relationship, especially in view of the present situation where developing countries are seen as potential clients for commercial remote sensing programs.

While developed countries are the main providers of satellite images, they tend to raise the costs, though publicly assuring the required services by subsidized prices. With the success of the CBERS program, this situation will largely change: such cooperation has the added benefit of ensuring that no one state monopolizes too many of the space resources. Additionally, the model of space cooperation can further extend to

other developing countries, encouraging developing countries to participate in ventures on a modest scale and contributing to the common benefits of those nations.<sup>32</sup>

A close examination of the 2002 Protocol has thus revealed that this document, while responding to the UN Declaration, has made its specific contribution and set a good example to space cooperation among developing countries. Witnessing the unstable legal environment created by the 1967 Outer Space Treaty, the China-Brazil cooperation model can mean more to the international society. Placed against the background of space commercialization as modern trend, the success of this model can test the viability of existing space commercial rules and make further improvements. No doubt will the achievements from such a model of cooperation provide an excellent opportunity to exceed the "one small step for man, one giant leap for mankind."<sup>33</sup>

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<sup>1</sup> Freeman & Inadomi, Who's the Captain Kirk of this Enterprise?: Regulating Outer Space Industry Through Corporate Structures, 18 *U.C. Davis Law Review* 805-806 (1985); Trimble, The International Law of Outer Space and Its Effect on Commercial Space Activity, 11 *Pepperdine Law Review* 545-546 (1984).

<sup>2</sup> For further discussion, see T.S. Twibell, Space Law: Legal Restraints on Commercialization and Development of Outer Space, 65 *University of Missouri at Kansas City Law Review* 603-606 (Spring 1997).

<sup>3</sup> G. Milhollin & G. White, A New China Syndrome: Beijing's Atomic Bazaar, *Washington Post*, C1, May 12, 1991.

<sup>4</sup> See further Brazil Expects to Further Space Tech Cooperation with China, *Xinhua News Agency*, October 22, 2003,

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available at <<http://www.china.org.cn>> (viewed on January 11, 2004).

<sup>5</sup> See White Paper on China's Space Activities, available at <<http://english.people.com.cn/features/spacepaper/spacepaper5.html>> (viewed on January 11, 2004).

<sup>6</sup> Y. Chen, CBERS and Its Applications, available at <<http://www.cnsa.gov.cn/espacechina/v3n7.htm>> (viewed on June 15, 2004).

<sup>7</sup> Article 1 (1) of the 2002 Protocol.

<sup>8</sup> Bockstiegel, Proposed Draft Convention on the Settlement of Space Law Disputes, 12 *Journal of Space Law* 136-138 (1984)

<sup>9</sup> According to Article 4 of the 2002 Protocol, within 60 days of the entry into force of this Protocol, Brazilian Space Agency and the Chinese National Space Administration, designated to coordinate and manage the Project, shall establish the Joint Project Committee.

<sup>10</sup> Article 17 of the 2002 Protocol.

<sup>11</sup> Article 7 and 8 of the 2002 Protocol.

<sup>12</sup> Article 10 of the 2002 Protocol.

<sup>13</sup> Article 9 of the 2002 Protocol.

<sup>14</sup> Article 11 of the 2002 Protocol. China is in charge of the CBERS-3 launching and Brazil is in charge of the CBERS-4 launching.

<sup>15</sup> Article 12 of the 2002 Protocol.

<sup>16</sup> See the UN Declaration on International Cooperation, G.A. Res. 51/122, U.N. Doc. A/AC.105/572/Rev. 1 (1996).

<sup>17</sup> Article 11 of the 2002 Protocol.

<sup>18</sup> Article 13 of the 2002 Protocol.

<sup>19</sup> According to Article 16 of the 2002 Protocol, aspects concerning intellectual property rights of the Cooperation Project, where they could be applied, shall be object of particular arrangements taking into account the national laws of each country and the international rules accepted by both countries.

<sup>20</sup> R. Moenter, The International Space Station: Legal Framework and Current



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Status, 64 *Journal of Air Law and Commerce* 1052 (Fall 1999).

<sup>21</sup> N. Jasentuliyana, Ensuring Access to the Benefits of Space Technologies for All Countries, *Space Policy* 8-9 (1994).

<sup>22</sup> *Id.*, at 9.

<sup>23</sup> UN Declaration, para. 2 and 4.

<sup>24</sup> L.L. Manzione, Multinational Investment in the Space Station: An Outer Space Model for International Cooperation?, 18 *American University International Law Review* 515 (2002).

<sup>25</sup> See further *supra* note 5.

<sup>26</sup> See further China-Brazil Earth Resource Satellite (CBERS), available at <<http://www.cast.ac.cn>> (viewed on January 11, 2004).

<sup>27</sup> See for example, M.B. Broadwell, *Intellectual Property and the Economic Development of the International Space Station*, presentation at Space Technology and Applications International Forum (STAIF-2000), Albuquerque, NM, February 2000.

<sup>28</sup> N. Jasentuliyana, Treaty Law and Outer Space: Can the United Nations Play an Effective Role?, 11 *Annals of Air & Space Law* 226 (1986).

<sup>29</sup> J.B. Ashe, III, Space Station Alpha: International Shining Star or Legal Black Hole?, 9 *Temple International & Comparative Law Journal* 353 (Fall 1995).

<sup>30</sup> See for example, F. Kosmo, The Commercialization of Space: A Regulatory Scheme that Promotes Commercial Ventures and International Responsibility, 61 *University of Southern California Law Review* 1086 (May 1988).

<sup>31</sup> L.B. Malagar & M.A. Magdoza-Malagar, International Law of Outer Space and the Protection of Intellectual Property Rights, 17 *Boston University International Law Journal* 364 (Fall 1999).

<sup>32</sup> L.M. Fountain, Creating Momentum in Space: Ending the Paralysis Produced by the "Common Heritage of Mankind"

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Doctrine, 35 *Connecticut Law Review* 1778 (Summer 2003).

<sup>33</sup> Statement made by Neil Armstrong on July 20, 1969 when he became the first man to walk on the Moon.