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Latin-America and Colombia Space Policy Approach to  
Future International Developments:  
Useful Applications of  
Space Technology and Cooperation

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**ABSTRACT**

Space exploration is a great human adventure: culturally, scientifically, technologically and industrially. Since the earliest of times, civilizations have been awed and inspired by the cosmos, in particular the peoples and cultures of the Central and South American continent in pre-Columbian times.

Today, space systems have become an essential scientific tool for understanding the universe, including our own planet and its close and remote environments. The main objective of this research is to explain way in which Latin America, rich in myths and secular legends connecting mankind to the universe, must in the present tackle the issue of its development of space activities. The context in which it could be carried out is also described, along with a perspective of the current state of space science and technology on a global scale.

**PREFACE**

In recent years, important initiatives have been undertaken that have opened great perspectives in the American region. After a long time of evasive starting overcome by the intense and vaporous calm of inaction, the Latin American nations have begun to analyze important subjects very closely, such as the use and development of space technologies accompanied by minimal international cooperation.

The United Nations summoned all the countries of the world to the Third Conference of the Space, UNISPACE III, held in Vienna, Austria in June 1999. This was the final result of a series of preparatory missions realized in the last decade in diverse regions of the world and therefore in the Latin American continent. One of these was the regional preparatory meeting for Latin America and the Caribbean, in Concepcion, Chile in 1998. At this meeting one of the main recommendations of the official final statement was the creation and strengthening of governmental institutional mechanisms that allow suitable development of space activities, which will contribute to solving the socioeconomic problems of the region.<sup>1</sup>

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<sup>1</sup> DECLARATION OF CONCEPTION emitted the last day of the meeting held from 12 to 16 October 1998, at the facilities of the University of Concepcion, Chile, at the preparatory Regional Conference for UNISPACE III that reunited the countries of Latin America and the Caribbean.

## **A Little History**

We can quickly talk about the last space conferences that were made in the region under the trusteeship of The UN Office for Outer Space Affairs, supporting in these initiatives the governments of host nations since it was celebrated in 1990, the First Space Conference of the Americas - I CEA, which was hosted by the government of Costa Rica, meeting being made in supportive logistic with Colombia, following historical data that has been possible to reference.<sup>2</sup>

Dr. Vittorio Canuto, Adriana Ocampo, Sergio Camacho, and the astronaut Dr F. Cheng-Cheng-Diaz<sup>3</sup> were the promoters of this first meeting<sup>3</sup>. They invited some of their friends from NASA, where they worked in different scientific and technical fields, to build a first forum in Latin America for the space science and activities. They were looking to create a mechanism to generate concrete projects, valid and innovative projects that would break the isolationism that slighted many areas of scientific and technological research. The general panel was therefore very clear: the central axis had to be space science and technology and the frame had to be the already existing political-diplomatic agreements so clearly expressed in the meetings of the COPUOS.<sup>4</sup> This early idea was supported by the UN Financing System for Science and Technology for Development/PNUD at that time into the hands of their Director Dr Ramirez Ocampo.

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<sup>2</sup> Personal communication of the Dr Vittorio M. Canuto and mentions of a document without reference written by one of the pioneers: At the end of 80's a group of scientists of the NASA, from Latin American extraction, they met on informal way, by their initiative and to its own expenses, to discuss the form to support the space activities of many technically advanced Latin American countries. The idea was and continues relatively simple: if they united their efforts, without a doubt they would magnify its multiple results "

<sup>3</sup> Franklin R. Chang-Díaz, Astronaut - Costa Rican American Born 1950 / Raised in a poor family in Costa Rica, Franklin Chang-Díaz studied hard to become a scientist. He also became a U.S. citizen. Chang-Díaz was the first Hispanic person to enter the US space program, becoming an astronaut in 1981. He is a veteran of six space missions and has spent nearly 1,300 hours in space.

<sup>4</sup> COPUOS: United Nations Committee on the Peaceful Uses of Outer Space

This first experience was followed by the coming of a Second Conference in 1996, engaged by Raimundo Gonzalez and hosted by the Government of Chile. The chosen subjects were Education, the legal Aspects of the space activities, Science and Technology. The Third Conference, hosted by the Government of Uruguay, was held in Punta del Este from the 4th to the 8th of November 1996. One of the main points of the final declaration urged the development of national programs, governmental agencies and international organisms to support the educational activity in the field of science and technology, and the promotion of action by scientific groups and academic participants in projects and space activities in the region.<sup>5</sup>

Finally, reaffirming the importance of the International Cooperation in the exploration and use of Space with peaceful aims, the IV Space Conference of the Americas was celebrated in Cartagena, Colombia in May 2002. This meeting proposed mechanisms for the identification and implementation of projects to use space technologies, emphasizing the importance of offering equitable and opportune access to the information.<sup>6</sup>

Colombia was conferred with the Secretariat Pro Tempore of the Conference, a 3-year responsibility. Attended by an international group that supported the Secretariat and contributed to the fulfillment of the recommendations, mainly the following concerning a proposal issue of the Chilean delegation: The creation of a mechanism of regional agreement related exclusively to space matters; Basically this recommendation kept the furtive hope to create a Latin American Regional Space Agency in the future.

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<sup>5</sup> DECLARACION DE PUNTA DEL ESTE - III Space Conference. Punta del Este, Uruguay 4th to the 8th November 1996

<sup>6</sup> Declaration of Cartagena de Indias, IV Space Conference of the Americas, Cartagena May 14-17 2002.

Mexico has participated actively not only in the regular workings of the COPUOS but in other meetings, such as the Space Conference of the Americas and the Preparatory Regional Conference of the Nations United for UNISPACE III, held in Concepcion, Chile from October 12-16, 1998. This conference defined the criteria necessary to optimize the use and advantage of outer space.<sup>7</sup> In this spirit, Mexico, along with Brazil, participated in the establishment of the Regional Center of Education of Space for Latin America and Caribbean (CRETELAC), a joint project in which various governmental sectors and academic and research institutions participate.

### **Observations**

Nevertheless, due to the passage of time and against the ambitious expectations of each conference, the results have been slow and difficult. Perhaps it is necessary to evaluate the trouble that has been under evaluated; a cautious regard to estimate the reasons that still out of perception phases of reality, and to understand whereupon the rapidity that these technologies fruit of the space activities have advanced. It is comprehensible that the average man or woman has a carefree attitude towards technological things. It is more difficult to accept the lack of vision of political leaders who through neglect or ignorance are indicating a desire to relegate the sciences, and in particular space technologies, to a lower importance level than poverty and social strife, which are considered more pressing priorities.

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<sup>7</sup>DECLARATION OF the DELEGATION OF MEXICO RELATED TO THE SUBJECT 82 OF THE AGENDA International Cooperation for the Peaceful Uses of Outer Space ". Fourth Commission - Subjects of Special Policy, 53 Period of Sessions of the General UN Assembly New York, N.Y., 26 of October 1998

## **THE LATIN-AMERICAN EXPERIENCE**

In Latin American countries, the general notion that we have concerning the contributions of space technology has been frozen in the past, at relevant moments of the history of the space adventure.

Around 1960, several Third World Countries had their first expectations of space exploitation and began to generate an ample literature on the importance of space science, and later, the application of space technologies. The potential connections that those resources have with social and economic development has also been examined.<sup>8</sup> These ideas infiltrated Latin America and it was on this continent where an enthusiastic debate began. The social image of the contribution of space science and technology has been compared to that of general social and economic development, and each has experienced different levels of support over the last forty years.

We experienced a strong resistance when it was suggested that a space organism should be in charge in each country with the necessary task of coordinating, supporting and promoting those initiatives that appear as crucial to our development. With certain curiosity we verified then that the mentalities of some Latin American compatriots concerning space technology haven't changed since the first man walked on the Moon.

The position in science and technology in our countries is precarious by definition, sometimes lamentable. The data available in Investigation and Development are often inadequate indices: Official statistics, suggesting the attribution equivalent to the 0.1 – 0.5 per cent of the Gross National Product GNP, regularly are inflated and they are not based on

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<sup>8</sup> The first black into space as well as the first Hispanic was Col. Arnaldo Tamayo Mendez from Cuba 1980 Sep 18, Flight: Soyuz 38. Flight Back: Soyuz 38. Flight Time: 7.86 days

standardized definitions when they are collected. The figures often do not take into account the difference in the way that investigation is organized. Without a doubt there are few research centers that can compete with those located in the top of the list of the institutions from developed countries. But in most of the cases the investigation activities are dispersed between a great number of small laboratories or research centers, which are poorly financed and badly equipped. Generally the quality of the investigation decays even more when it belongs to universities or establishments of the state.

In our contemporary system everything has to do with technique, the human race does not exist without materialized civilization.<sup>9</sup> But even if technique is an important ingredient of development it is not its only component. The infrastructure and the technical capacity are only some indices accompanied by others and of course do not give us the definitive result related to the collective well-being or social harmony that our societies, culturally and economically disturbed, are not able to restore.

In our countries the use of telecommunications satellites has influenced views of space technology. In 1986 Latin America extended its network of direct diffusion based on North American satellites that were in orbit over the region. The system of direct diffusion corresponded, at that time, to a new technical conception of broadcasting, in which the broadcast power density allowed radio-reception with nonprofessional facilities that were able to be acquired and mounted by the public in general. The transmissions that were included in this system included television, radio broadcasting, and data transmission.<sup>10</sup>

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<sup>9</sup> Braudel Fernand, 1979, *Civilisation matérielle, économie et capitalisme, XV e - XVII e siècle*, Vol. 1 Colin. Paris. P 291

<sup>10</sup> Communication without reference: Dr. Javier Esteinou Madrid, Profesor investigador Titular del Departamento de Educación y Comunicación de la Universidad Autónoma Metropolitana, Unidad Xochimilco, México, D.F.

There are in our region some countries like Argentina and particularly Brazil that are worthy examples to evoke. Perhaps their space programs were born as result of disappointment, the insolvent dream to obtain a technology that allowed them to join the atomic club in the Sixties.<sup>11</sup>

Although many local scientists at that time were not able to cherish illusions about the viability of those projects: there were no sufficient specialists, the industrial infrastructure was inadequate and the politicians were under the thumbs of military regimes and under pressure of United States. The nuclear programs fell little by little to the background, but the scientists took advantage of the governmental project opportunities to form their students, to improve their laboratories, fully well knowing that they could not satisfy the ambitions of the military rule, it was an excellent chance to elevate the quality of the universities. It was also in this propitious environment that the space programs were then developed. After Brazil, only Mexico, Chile, and Argentina succeeded in setting up a construction schedule of satellites.<sup>12</sup> Whereas Mexico and Chile have encountered some technical difficulties with these missions, Argentina was able to manage and to launch some scientific satellites,<sup>13</sup> the SAC-a and B, and the SAC-c. Uruguay has also organized several relative activities with space and with technological projection. One of the principal objectives was to discuss the directions of education in this field, considering future possible developments within all the countries signatories of MERCOSUR<sup>14</sup> treaty. Ecuador, by intermediary of the Center of Remote Sensing for Natural resources CLIRSEN,<sup>15</sup> also carried out several missions in the fields of remote sensing and monitoring the territory. Mexico, Nicaragua, Honduras,

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<sup>11</sup> Salomon Jean-Jacques et Lebeau André. 1993. Mirages of Development. Science and Technology for the Third Worlds. Lynne Rienner Publishers Inc. Boulder & London.

<sup>12</sup> Susen Tania Maria. 1999. A Educação Espacial na América Latina e a Posição do Brasil no Contexto Regional. Cooperação internacional na área espacial. Parcerias Estratégicas número 7 Outubro- Brasil.

<sup>13</sup> SAC / Satellites of Scientific application / Argentine

<sup>14</sup> MERCOSUR / Southern Common Market Agreement (Also Known as The Treaty of Asunción signed on Mars 26 - 1991 by Argentine, Brazil, Paraguay and Uruguay/ Mercado Comun del Sur)

<sup>15</sup> CLIRSEN Centro de Levantamientos Integrados de Recursos Naturales por Sensores Remotos / Equateur

Venezuela, Costa Rica, and Colombia centered their investments mainly in the fields of remote sensing, meteorology, Earth observation and astronomy.

With the inauguration of the Satellites System Morelos de (SMS) in 1985, Mexico entered the reduced circle of countries that counted on domestic satellite infrastructures to carry out their internal communications. This system allowed the country, for the first time in its history, to stay communicated from all the points of the national territory.

In Mexico it is very interesting to emphasize The University Program of Space Research and Development (P.U.I.D.E.), which was born along with the necessity of Mexico to integrate the development of space technology and the training of skilled personnel that would face the challenges of such technological field.<sup>16</sup> In order to achieve this, the UNAMSAT project was conceived jointly with the Universidad Nacional Autonoma de Mexico (UNAM). UNAMSAT-1 was launched on March 28th, 1995. Unfortunately, the rocket failed and did not achieve the desired orbit, and was destroyed as it reentered our atmosphere. A twin satellite UNAMSAT-B was then projected, to be launched to the required orbit ranges from 700 to 1000 Km height over sea level.

Bolivia represents, in the field of the space activities, a very particular case in Latin America. If we compare it with its neighbors it appears relatively economically handicapped, with its priorities concentrated elsewhere. However, Bolivia's use of space technologies, in order to contribute to its own development, constitutes an interesting and promising example.

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<sup>16</sup> It is important to mention Dr. Rodolfo Neri Vela, that was the first Mexican astronaut and also Dr. Ellen Ochoa - Astronaut, Mexican American / Ellen Ochoa Born 1958 was the first Hispanic woman to become an astronaut. A veteran of two space flights, she first flew in space on the shuttle Discovery in 1993

Knowing indeed how to draw profit from international cooperation agreements, and organizing some significant resources, Bolivia began to concentrate its effort on creating an organizational structure mainly articulated around the Bolivian Association of Remote sensing and Environment ABTEMA.<sup>17</sup> A non-profit association, recognized by the Bolivian government since June 1992, it is made up of national and international institutions in direct relationship with the environment and the development. In the programs using space information that have been carried out by organizations like ABTEMA, it is essential to be supported by means of information exchange and also to often associate some inter institutional experiences. On this level, in a national and regional context, ABTEMA has, since 1993, played a determinant role in the creation and the coordination of the Bolivian group of SELPER.<sup>18</sup> [Latin American Society of Specialists on Remote Sensing and Space Information Systems]. It has also been working very closely with the Sustainable Andean Development Consortium (CONDESAN),<sup>19</sup> which has been closely working with in-situ practice of agriculture in some countryside and isolated areas of Bolivia, Colombia, Ecuador, Peru and Venezuela.

These localities are representative of the various agro-ecological environments, which we can find throughout the Andean territories. It is thus hoped that the sum of analyzed results resulting from these first experiments will be easily transferred and exploited in similar environments. Very good examples are the rural centers of Internet for sustainable development, "Tele-centers," handled by communities in different Latin American countries.

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<sup>17</sup> Asociación Boliviana para Teledetección y Medio Ambiente ABTEMA

<sup>18</sup> Sociedad de Especialistas Latinoamericanos de Percepcion Remota y Systemas de Informacion Espacial SELPER / Selper initiates its activities in 1980, in Ecuador, it is a society of international character that is conformed by national chapters, belonging to different countries from Latin America (Argentina, Brazil, Bolivia, Chile, Colombia, Costa Rica, Cuba, Ecuador, Mexico, Paraguay, Peru, Venezuela and Uruguay) and also with special chapters, corresponding to countries that have an advanced development related to the technology of remote sensing, supporting the development of different activities carried out by SELPER's commitments (Germany, Canada, Spain, United States and France). The society seat is traveling and has an international directory conformed by authorities belonging to the host country.

<sup>19</sup> Consorcio para el Desarrollo Sostenible de la Ecoregión Andina CONDESAN

The Inter-American Development Bank IADB and the International Center of Research for Development CIID are supporting these initiatives. The First National Experience for Peruvian Tele-centers was held in the city of Cajamarca on March 16-17, 2001.<sup>20</sup>

### **"Simon Bolivar" the Andean Community's Satellite**<sup>21</sup>

The Andean Satellite "Simon Bolivar" project has been collected and integrated for a long time. It expresses the aspiration of the Group of Andean Countries to have a telecommunications satellite system under their control, management and direct administration. For more than fifteen years they have made multiple technical and feasibility studies, while managing to hold necessary orbital positions. An International agreement for the satellite installation had even been signed, always under the supervision of the Member States. However, a change in policies in the Andean countries, the deregulation problem and the monetary release caused by the economic opening, finally caused its adjournment in February 1991.

In 1997, the ANDESAT Company was created and very quickly associated in a strategic agreement with the French company ALCATEL. This decision resulted in the constitution of a new company called BOLIVARSAT, intended with ANDESAT to manage the system that put the Andean satellite into orbit. Thanks to the orbital position of 61 and 67 W. it opened new market possibilities: satellite communication, tele-transmission, and Internet services with multiple signals, as well as traditional telephone services in some remote areas. Indeed this position guarantees an excellent cover of North and South America, from Canada to Argentina, ensuring a direct connection with Portugal, Spain, France, a part of the United

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<sup>20</sup> The results of this first experience are available in <http://www.infodes.org.pe>

<sup>21</sup> Sistema Satelizable Andino Simon Bolivar SSASB / Bolivia, Colombia, Ecuador, Peru and Venezuela

Kingdom and some other strategic areas in Europe, which are already connected by optical fiber; and would finally make it possible to reach any place in the world.

The potential market is designed reach 600 million people and the objective is to meet the new requirements and trends of the digital age. ANDESAT remains the owner with 51 per cent. In accordance with exclusive rights concerning the use of orbital position, the five Andean Community countries have an advantage to exploit, with a reduction of 7.5 per cent, the physical capacity of the Simon Bolivar Satellite. Development of communitarian activities in favor of the cultural integration, tele-medicine, and remote education is possible.

One of the fundamental objectives of the Andean Satellite is to contribute to the development of the Internet. Per capita, Latin America shows a low incidence of network use.

### **SPACE Situation in Brazil**

The space activities in Brazil begin on May 17, 1961, when the president of the Republic, Janio Quadros, established a commission charged with studying and advising the policy and the programs of Brazilian space research.<sup>22</sup> In 1962, the creation of the Group of Organization of the National Commission of space Activities GOCNAE<sup>23</sup> took place. In addition, two other significant institutions of space search in the country, the Aerospace Technical Center CTA,<sup>24</sup> and the National Institute of Space Research INPE,<sup>25</sup> were created. During recent decades, Brazil has succeeded in consolidating a scientific community recognized today on the international level. This group of researchers focuses on remote

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<sup>22</sup> Susen Tania Maria. 1999. A Educação Espacial na América Latina e a Posição do Brasil no Contexto Regional. Cooperação internacionala na área espacial. Parcerias Estratégicas número 7 ;Outubro- Brasil.

<sup>23</sup> Grupo de Organização da Comissão Nacional de Atividades Espaciais - GOCNAE / Brésil

<sup>24</sup> CTA Centro Tecnológico Aeroespacial - Instituto de Estudos Avançados -

<sup>25</sup> INPE Instituto Nacional de Pesquisas Espaciais

sensing and meteorology.<sup>26</sup> In addition, Brazil could succeed in launching the first satellites designed, developed and manufactured in the country.

The SCD-1 and the SCD-2, Data Gathering Satellite,<sup>27</sup> still under development. In addition, a second prototype of the Satellite Launch Vehicle VLS has been developed, which has been programmed to put into orbit, at a distance of 700 to 800 kilometers, a satellite of 200 kilograms. Brazil managed to establish a very significant logistic infrastructure, which, except for China and India, has proven to be unique in the world.

The benefits of international co-operation were described in an article by Mr. Marcio Nogueira Barbosa,<sup>28</sup> former Director of the Brazilian National Institute of Space Activities INPE, and a first line witness. Regarding international co-operation, an important point he makes is the possibility of offering a positive image of its own country. Thanks to the establishment of international co-operation in the space sector, in particular with developed countries, Brazil had the opportunity of presenting a better image, different from the one international opinion generally has of the country, resulting of frequent social and economic crises crossing its history. The International co-operation also takes shape like a significant alternative in the costs-reductions optic.

Mainly coming from the United States and Europe, the support received through foreign institutions has been considerable, particularly in the improvement of specialized human resources concerning various scientific and technological fields, a major interest for the development of the space sector of the country since its installation.

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<sup>26</sup> Teracine, E.B. 1998 (f) Benefícios Estratégicos e Socio-Econômicos da Observação da Terra a Partir do Espaço. Projeto RHAE/CNPq/Agência Espacial Brasileira. Relatório Básico no. 9. Brazil.

<sup>27</sup> SCD Satélite de Coleta de Dados / Brazil

<sup>28</sup> Barbosa Nogueira M. 1999 A Importância Estratégica da Cooperação Internacional na Área do Espaço. Cooperação internacional na área espacial. Parcerias Estratégicas No. 7- Outubro. Brazil

The establishment of an infrastructure necessary for the gathering and management of the scientific data and also the development of the derivate products became, after the human resources training, the second priority for the Brazilian space program. In the launchers branch, the international support has been also very significant, especially with regard to Europe, and this since the initial development phases of the Satellite Launch Vehicle (VLS). Since 1988 China and Brazil have cooperated in developing a satellites program on remote sensing, CBERS: Chine-Brazil Earth Resources Satellite. These satellites, designed for a total coverage obtained by optical cameras, are showing similar characteristics to those already present on the market (LANDSAT and SPOT).

It is also necessary to mention another example in the field of joint projects development, resulting from international co-operation that constitute the International Space Station ISS Program. In 1995, after having finished with the international political disturbance started by its adhesion to the Treaty for the Missile Technology Control Regime, MTCR, Brazil has been declared "eligible" again to share in exchanging co-operation with industrialized world countries. In international accordance with an agreement signed between Brazil and the United States, the Brazilian Space Agency AEB is responsible for the development and the provisioning of equipment appearing in the contract with NASA within the framework of program ISS. On the other hand, the Brazilian Space Agency AEB receives the allowance rights to use the International Space Station.

## **SPACE Situation in Argentina**

Under the Presidency of A. Frondizini, The National Space Research Commission CNIE<sup>29</sup> was created on January 28, 1960, as an entity dependent on the Argentinean Air Forces. The first director and principal promoter of the CNIE was Mr. Teofilo Tabanera.<sup>30</sup> Some years later, in 1991, The National Commission on Space Activities CONAE<sup>31</sup> was created under the supervision of the Ministry for Foreign Affairs. Responsible for the national space Program, this institution justifies its objectives around the following basic elements: Argentina regards itself as a "space country" and wishes to promote an intensive use of space science and its technology. That means that Argentina is an active consumer that has exploited and wishes to exploit the products derived from space science and technology in the future.

From analytic references of various "products" that are contributing to its social and economic development, Argentina concluded that it must generate, in identifying the applications of these products, summarized by a concept called the Complete Cycle of Space Information CIS and which thereafter must constitute the fundamental column on which respite the Argentinean "space dialectic".

The satellite images are the source of all information for posterior use on remote sensing techniques. But the commercial activity in generating data and in selling these images represents today only a very limited market that doesn't justify the investments made in a complex space program. On the other hand, we estimated that in Argentina the application, diffusion and generalized exploitation of this information should produce a considerable increase in the output of the gross national product related to certain sectors of the national

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<sup>29</sup> Comisión Nacional de Investigaciones Espaciales CNIE / Argentine

<sup>30</sup> Torres Perrén H. B. 1996. Un perfil de TABANERA. CONAE. Argentine

<sup>31</sup> CONAE Comisión Nacional de Actividades Espaciales / Argentine

economic life. To carry out an economic evaluation, it could be recommendable also to involve other markets that are linked at the same time to software development, data management, environmental applications and weather forecasting. The tax recovery associated with the growth of the gross national product should make it possible, supporting in a favorable way the investments envisaged on space activities. The text of the National Space Program,<sup>32</sup> defined in 1994, gave a report on "Argentine in Space 1995-2006." Re-examined every two years, it generally renewed its objectives in order to ensure a horizon period of at least a decade.

The Argentinean Space Program has been conceived as a significant national project in which it should be possible to concentrate some means and some resources to carry out the fixed goals designed by different human groups. The likely actions to meet these objectives should involve the direct and indirect participation of a large number of actors coming from the productive sector, the government, the Academy, and of course from the national system of science and technology. Today we continue to mobilize all the possible efforts in order to arrive at an integral incorporation of these various groups, which should entrust, little by little, more specific functions.

### **The Space Race of CHILE**

On May 24, 1991, the Air Force of Chile, FACH, created the Aeronautic and Spatial Studies center CEADE.<sup>33</sup> Dependent on the Estado Mayor General de la Fuerza Aérea de Chile, this organism was designed to study, research and diffuse strategic, political, economic and social variables relative to the aerospace activity and to the national defense.<sup>34</sup> It was intended to

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<sup>32</sup> National Space Program, defined in 1994, giving the vision 1995-2006 of Argentina in Space

<sup>33</sup> CEADE Centro de Estudios Aeronáuticos y del Espacio / Chile

<sup>34</sup> Varas, Augusto y Leopoldo Porras, 1992. El espacio: nueva frontera para la cooperación hemisférica FLACSO/CEADE, Santiago, 94 p.

constitute a superior institutional and academic instance, destined to represent the aeronautical and space interests of Chile, on similar national and foreign organisms.

The Chilean Space Agency became then an initiative long wished and impelled by the Air Force of Chile,<sup>35</sup> especially during the management of the ex-designated senator and Commander-in-Chief, general Ramon Vega, who encouraged the participation of this institution in space activities, through the FASAT Project, that put two Chilean satellites in orbit.

Chilean personnel from the Direction of Aeronautics and from the Air Force, FACH, constructed the Fasat-Alpha satellite and took for the first time a direct bonding with the space technology. The Fasat-Alpha was sent up in an Ukrainian rocket on August 31st 1995, however the satellite could not be activated when it managed to come off from its mother ship, being adhered to this in a polar orbit to a height of 650 kilometers. Its replacement was the Fasat-Bravo, also sent up by the Russians by means of a Zenith rocket, on July 10th 1998, as part of the payload of the Russian satellite Resurs. It operated successfully and finished its mission after 13,000 orbits around the Earth when its batteries were exhausted. With the first communication between the micro satellite and the Chilean monitoring station the FASat-Bravo mission concluded successfully. At this moment begins a new stage in the Chilean technological development and, according to the staff managers of the Air Force of Chile FACH, they required the quick creation of a Chilean Aerospace Agency: Impelling the construction and putting in orbit the first Chilean micro satellite in 1997, FASat-Bravo. Chile lost important resources that were promised by the international cooperation, because of the absence of a representative Chilean State institution that could receive it.

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<sup>35</sup> Jorge Ianiszewski R - Space Information web page <http://www.circuloastronomico.cl/noticias/chile.html#3>

Through the Decree I number 338 of the Defense Ministry (secretary of Aviation), published on Friday, August 17, 2001 in the Official Newspaper, the Government created an advisory commission to the President of the Republic, denominated Chilean Space Agency ACE",<sup>36</sup> which was in charge of centralizing the efforts of the country's institutions interested in this matter. This was the first passage of the Executive to create an "Institution" that will assume the development of the space activities permanently. So it will be the best way for the country to become familiar with satellite information, to know its forest resources better, its marine, agricultural and mining and its opportunities concerning geologic research, use of the ground, urban development, territorial management, natural prevention of the climatic changes, natural disasters, Earth desertification and warming. Another one of the important intentions of the Chilean Space Agency ACE is "the necessity to reflect the official opinion of Chile facing international organisms related to space matters, and to successfully obtain the benefits that can be derived from international cooperation in space scope."<sup>37</sup>

We calculate that Chile spent near 500 million dollars in dispenses related to space products and satellite services. Therefore a dispersion of resources exists; also it was necessary to accomplish a cadastre survey that went ahead to know the amount of "critical mass" that the country has "with the wish to construct in the medium term its own satellites of Earth information". President Ricardo Lagoss described the cost as "without criterion. It is spent because it is needed, because we have to be involucrate," and he emphasized the creation of the Agency because it will avoid dual efforts. The first stage of this very modest Agency should be to consider the country's economical difficulties, Its primary target will be: "To propose a national space policy, as well as undertake measures, plans and programs to its

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<sup>36</sup> ACE Agencia Chilena del Espacio

<sup>37</sup> The future Chilean astronaut, Klaus von Storch, that originally was promised for a future mission with NASA may travel to the space in April 2003, with the support of the Russian Space Agency ", The date stipulated for the launching, turns the Commander of the Air Force of Chile, in the first South American that will travel to space".

final execution and fulfillment." The executive secretary of the Agency is the head of the National Commission for Scientific and Technological Research, CONICYT.<sup>38</sup> This move was a first step to reach a civil institutionalization on the matter of a Space agency in Chile.

On December 27th, 2001 the first work session for the Chilean Space Agency ACE was held, headed by the secretary of Aviation Nelson Hadad. The agent chief executive emphasized that one of the agency objectives was to rationalize dispersed efforts in universities and other institutions. At the beginning of 2002 Chilean Space authorities proposed an original idea to create a space agency with Argentina, Brazil and Mexico, a project that little by little has been maturing. In fact, at the IV Space Conference of the Americas, held in Colombia on May 2002, the proposal of Chile became one of the recommendations unanimously accepted: the "creation of a mechanism of regional agreement in space matters." Inspired by the form of the European Space Agency ESA, it seems to be the beginning of the future creation of a Latin American Regional Space Agency.

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<sup>38</sup> CONICYT Comisión Nacional de Investigación Científica y Tecnológica. / Chile

## **CONCLUSION**

This survey of the space situation in Latin America has enabled us to note the diversity of organizational types, from the most sophisticated institutions, such as in Brazil, to the most pragmatic, for example in Bolivia, to the highly dynamic, as in Chile. In the years to come the effectiveness of all these experiments will probably be observed and analyzed very closely. It is particularly the case for Argentina. Engaged in an epic process, this country has in fact developed an interesting environment of research and information exchange at a high international level that allows their researchers a broad framework from which to work. Much is anticipated from this program.

Brazil comes across as the leader of an exceptional program, however not easily reproducible elsewhere, at least in the Latin-American context. Its presence in regard to space policies, which already are starting to collect fruits, is accompanied by the existence of a dynamic industrial sector, which is very vigorous in space activities. This country should be designated a priori as the ideal partner to develop future common adventures within the Latin America region. Forming relatively powerful groups of space research at the regional level is the best overall plan; and so the creation of a space institution in each country is becoming increasingly necessary.

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