



# The International Geophysical Year: Its influence on the beginning of the French space program

Hervé Moulin

*Institut Français d'Histoire de l'Espace, France*

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## ABSTRACT

In 1957–1958, the International Geophysical Year (IGY) was the most important scientific cooperation programme in the World, after the Second World War. Thousands of scientists from 67 countries were involved in this large operation, among them a lot of French scientists. IGY was previously called the IPY (International Polar Year) and France, as many other countries, has been involved in the Arctic and Antarctic regions researches.

Everybody knows that the IGY is at the origin of Sputnik and the first launch of Russian and American satellites. But, we know less about the IGY rockets programme itself in which France had intended to participate.

This paper will discuss this programme with a special highlight on some aspects of the French participation and their relationship with the IGY programme.

This approach arises several questions, such as: Which French scientists have been involved? What was the attitude of the French Government about this program, etc. We focus our analysis on the interrogation: did the IGY have any real influence on the origin of the French space research activities?

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## 1. Introduction

In the 19th century polar expeditions to the Arctic were frequent. In 1874, an Austrian explorer, Karl Weyprecht, regretting that they had almost exclusively dedicated to the discovery of territories and to the establishment of maps, proposed to set up in these regions, a network of stations which would allow making simultaneous physical measures for several months. In 1882–1883, 12 nations participated at the First International Polar Year (IPY)<sup>1</sup>.

Fifty years later, J. Georgi, a German meteorologist, suggested renewing the operation. In 1932–1933, 49 countries participated in the second International Polar Year. But, this one intervenes in world economic depression and during a

solar period of minimum solar activity. Both reasons were not really favourable to the observations.

The third International Polar Year—which will quickly become the International Geophysical Year (IGY)—took place in 1957–1958. Thousands of scientists from 67 countries helped by thousands of volunteers contributed to its success. The landmark of this world operation was the launch of Sputnik and the entrance to the space era.

## 2. From IPY to IGY

In April 1950, James van Allen, a physicist (University of Iowa), invites some American colleagues to a dinner that he organizes in the honour of the British Sydney Chapman, a geophysician, visiting Washington DC. All the guests are concerned by the researches on the ionosphere. One of them, Lloyd Berkner, an American naval officer who participated in the polar expedition of the Admiral Byrd (1928), recalls the

E-mail address: [herve.moulin-hmi@wanadoo.fr](mailto:herve.moulin-hmi@wanadoo.fr)

<sup>1</sup> IPY web site: (<http://www.ipy.org/index.php77/ipy/history/>).

important technical progress realized, since the second IPY in the 1930s and those obtained from the second world war.

In his eyes, the new techniques—the radar and the rocket—should allow to widen the searches in the upper atmosphere. The knowledge of constituents and the phenomena of the upper atmosphere and the ionosphere are important for the long distance communications, which interest as much the Army as the scientists. This is the reason for which the operation was presented as civil would benefit most of the countries, and the support of the military would bring about their logistic and financial contribution.

With the great importance that a study of the ionosphere takes on, the International Council of Scientific Union (ICSU) organization, created in 1950, a joint committee of the ionosphere under Sir Edward Appleton's chair, together with the representatives of the three international scientific unions: the Union Radio Scientifique Internationale (URSI),<sup>2</sup> the International Astronomical Union (IAU) and the Union of Geodesy and Geophysics (IUGG).

In July 1950, the proposition of Lloyd Berkner was submitted for examination by the joint committee of the ionosphere. Having been examined by the various committees, the question came for discussion in the general assembly of the ICSU, convened in Amsterdam in October 1952. Meanwhile, other international scientific unions were interested in the project. The World Meteorological Organization (WMO), which is naturally associated, requested that the researches must not be only limited to the Arctic regions, but must also be widened to Antarctica and to the equatorial regions.

The WMO's suggestion was accepted and the Assembly adopted the project, under the name of International Geophysical Year (IGY), and fixed the dates of its realization, from July 1 1957 till December 31 1958. With its interdisciplinary character and its world scale, no one union can assure the responsibility of the operation. Also, the assembly decided to create a special committee: the Comité special pour l'Année géophysique internationale (CSAGI),<sup>3</sup> which is going to become the coordinator of the whole operation.

### 3. The CSAGI and the French National Committee for IGY

The CSAGI invited the scientific unions to submit their program of researches. In order that the operation could obtain the support of all the governments, the same invitation was made with the national members of the ICSU, including the USSR even though it was not an ICSU national member.

In France, the national member of the ICSU is the Académie des Sciences. On November 3, 1952, it created the Comité national français pour l'Année géophysique (French national Committee for the IGY) under the chairmanship of Pierre Lejay, a Jesuit priest and physicist, president of the URSI.<sup>4</sup> Professor Jean Coulomb,<sup>5</sup> was named as the General Secretary. (Annex A: Membership List)

The French committee was organized into two sections. The first one, chaired by Coulomb managed the whole program of geophysics. The second, chaired by André Danjon, director of Observatoire de Paris-Meudon, was concerned with “the world operation of the Longitudes”, (similar to those organized in 1926 and in 1933) who was added to the IGY program. The logistics and the financial management was assured by the Comité central des expéditions scientifiques (CCES) (Central committee of the scientific expeditions), especially created by the Centre national de la recherche scientifique (CNRS).

At the end of 1952, the French committee for IGY submitted to the CSAGI the first draft of its program of experiments. It contained a large program which principally concerned the ground experiments conducted in many stations localized in the Arctic regions and in several parts of the world, mainly in French overseas territories (Kerguelen Island, Crozet Islands, and in Africa).

This project also contained a special chapter dedicated to the programme of experiments conducted with rockets, established by professor Etienne Vassy, director of the Laboratoire de physique de l'atmosphère (LPA) of the Faculty of Science, Paris.

### 4. October 1954—an IGY special rockets program

The CSAGI convened its first plenary session in Brussels, at the end of June 1953. The first day was dedicated to the election of the Bureau of the CSAGI. The Englishman, Sydney Chapman, was elected as president, the American Lloyd Berkner, as vice-president, and the Belgian physicist Marcel Nicolet, as the General Secretary. During the next few days, twelve observers representing nine nations were invited to participate in these debates and to bring their contributions. During this meeting Jean Coulomb and Pierre Tardy represented the IUGG, while André Danjon and Georges Laclavère, a geographer, were invited as representatives of the French national committee.

To examine the great variety of the proposed subjects of study, several working groups were established. Among the rapporteurs we find the names of several French scientists: André Danjon (Longitudes/latitudes), Georges Laclavère (oceanography) and Pierre Lejay (gravimetry).

The second plenary session of the CSAGI was held in Rome, from September 30 till October 4, 1954. Hundred persons from 37 nations attended it, among them delegates from the Soviet Union. Just before the opening of the session, the Soviets announced their intention to participate in it, informing the CSAGI that a Soviet committee had just been created under the chairmanship of the Russian Academician I. Bardin.

Until this session, the use of rockets as a means of exploration was not really discussed in the CSAGI. Nevertheless, in the months which preceded this meeting, the IUGG and the association of geomagnetism and aeronomy had established working groups dedicated to experiments with rockets. The Bureau of the CSAGI, regularly informed about these works and decided to create a specific group. (Working Group XI-Rockets, chair by Homer E. Newell, Naval Research Laboratory, United States).

<sup>2</sup> URSI acronym is in French language.

<sup>3</sup> CSAGI acronym is in French language.

<sup>4</sup> At that time P. Lejay chaired the URSI.

<sup>5</sup> J. Coulomb, a physicist in Faculté des Sciences, Paris, was later the director of the Centre national de la recherche scientifique (CNRS) and from 1962–1967, president of the Centre national d'études spatiales (CNES).

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