On 25 November 1964, the aeronomy service of the Royal Meteorological Institute of Belgium became an independent national scientific research centre entitled The Belgian Institute for Space Aeronomy. The nucleus of the service of aeronomy was formed in 1957-1958, at the end of the International Geophysical Year, by the creation of the 'Groupe d'Etudes et de Recherches d'Aéronomie Spatiale' (GERAS) depending on the 'Centre National de Recherche de l'Espace' (CNRE), directed by Professor Marcel Nicolet, head of the department of solar radiation of the Royal Meteorological Institute and General Secretary of the Special Committee for the International Geophysical Year. Already, before World War II, part of the research work of Professor Nicolet was devoted to aeronomical problems although the word 'aeronomy' only became official in 1954 when the International Union of Geodesy and Geophysics (IUGG) adopted it in the title of one of its associations (the International Association of Geomagnetism and Aeronomy, IAGA). The goal of the IUGG was to stress the importance of the study of the higher atmosphere which is completely determined by the physical and chemical processes resulting from the dissociation and ionization phenomena under the influence of solar ultra-violet radiation.

The essential functions of the Belgian Institute for Space Aeronomy consist of (1) the tasks of a public service and (2) research in space aeronomy; i.e. those tasks which can only be carried out through knowledge of data obtained with the aid of balloons, rockets and satellites within the framework of the physics and chemistry of the higher atmosphere and extra-atmospheric space. Therefore, the Institute is entrusted to acquire and classify information obtained by balloon, rocket or satellite borne experiments and to put this information at the disposal of persons and organizations interested in space problems.

To fulfil part of these tasks, the Institute has set up a computer file in which all past and present satellites and interplanetary spacecrafts are described. Moreover, the ephemeridae of satellites which can be observed from Belgian territory are regularly calculated and published, and a bibliography of scientific papers concerning space research and, particularly, aeronomy is collected and printed on a monthly and an annual basis.

The Belgian Institute for Space Aeronomy is also charged with examining the experimental methods used in space aeronomy, interpreting the observations, and performing the research necessary for the development and application of mathematical methods in aeronomical problems. Since most of the theoretical and experimental studies at the Institute can only be brought to fruition with the help of a computer and appropriate methods of numerical analysis and data processing, the Institute shares a Univac 1110 computer with the Royal Meteorological Institute and the Royal Observatory.

Among the theoretical studies undertaken at the Institute mention may be made of satellite drag which allows interesting information on the density distribution in the upper atmosphere to be deduced and leads to the study of the different variations in the neutral atmosphere related to solar activity. In particular, the effect of solar activity on the helium and hydrogen belts surrounding the Earth has been studied since the launching of the first satellites.

It is also worth noting that the Institute has become very famous for its work concerning the chemosphere, e.g., the formation of nitrogen oxide in the mesosphere was envisaged quite early and precise indications were given which allowed its observation with the aid of rockets. The very complex problems related to the distribution of the minor constituents in the mesosphere and in the stratosphere have been studied thoroughly, and one- and two-dimensional stratospheric models in which the chemical processes and transport phenomena were taken into account were set up. In particular, the destruction of the ozone layer by anthropogenic activities has been investigated by means of time-dependent models.

In addition to studies of the neutral atmosphere and related problems on the dynamics of rarefied gases, the Institute takes an active research interest in the physics and chemistry of the ionosphere. This leads to studies in plasma kinetics, ranging from the development of a generalized invariant for a charged particle interacting with a linearly polarized hydromagnetic plane wave to the mechanics of the formation of the plasmapause and to the morphology of the magnetosphere implying the penetration of solar wind plasma elements. The kinetic model calculations for the polar and solar wind, developed at the Institute, have proved to be very useful and are nowadays commonly applied in ion-exospheric problems.

The experimental activities at the Institute consist of laboratory and space experiments. For the interpretation of in situ observations of the upper atmosphere, the actual structure of the atmosphere must always be considered, this structure depending mainly on the photochemical conditions. Therefore, laboratory measurements of the ultra-violet absorption cross-sections of important atmospheric constituents have been undertaken. In particular, the absorption spectrum of molecular oxygen in the Schumann-Runge bands has been investigated thoroughly, giving a significant contribution to the understanding of the photodissociation processes of O_2 in the upper stratosphere and in the mesosphere. Moreover, in view of the study of stratospheric chlorine chemistry, related to the ozone depletion problem, absorption cross-sections of chloromethanes, chlorofluoromethanes and chlorofluoroethanes have been measured, taking into account the effect of temperature in order to obtain accurate photodissociation coefficients in the stratosphere.

The space observations at the Institute mainly consist of absolute solar irradiance measurements, ion composition measurements in the stratosphere, and the determination of vertical profiles of atmospheric constituents. The first in situ observations have been made using stratospheric balloons which are particularly well suited for stratospheric studies. Indeed, these platforms can remain for many hours at an altitude of about 40 km and allow the use of sophisticated and heavy payloads such as a stabilized gondola pointed to the Sun. Moreover, stratospheric balloons facilitate the recovery of instruments which, in many cases, can be used to repeat the experiment.

With the aid of balloon-borne spectrometers, the solar irradiation flux has been measured for many years, and these observations still continue in order to measure the ultra-violet irradiance variability during the 11-year solar cycle. The ozone in the stratosphere was determined from absorption in the ultra-violet and the vertical distributions of CH_4, NO_2, NO and HCl between 15 and 40 km have been calculated from infra-red absorption spectra, measured by a balloon-borne grille spectrometer. The ionic composition of the stratosphere is also studied by a balloon-borne mass spectrometer conceived and built at the Institute for the identification of positive ions at altitudes between 30 and 40 km. With this mass spectrometer, the presence of non-proton hydrates in the stratosphere has been confirmed for the first time by a balloon-borne instrument.

The rocket experiments proposed and realized by the Institute were mostly designed to minimize the costs of the payload without diminishing the importance of the scientific results which could be expected. For example, the release of NO between 80 and 105 km created artifical clouds from which not only the atomic oxygen concentration could be deduced, but which also allowed the determination of the wind velocities at these altitudes. On the other hand, the molecular oxygen concentration in the thermosphere and vacuum ultra-violet irradiances have been measured successfully with the aid of rocket-borne spectrometers.

At the present time, a major part of the resources of the Institute is devoted to the preparation of three experiments which will fly on the first *Spacelab*. These experiments are (1) the observation of solar irradiance from the ultra-violet to the near infra-red: (2) the determination by means of a grille spectrometer of the minor constituents in the middle atmosphere for which local concentrations are higher than 10^8 mol cm^{-3}; and (3) the determination of deuterium abundance in the thermosphere by means of absolute photometry of hydrogen and deuterium lines.

It is clear that any experiment in space must be supported by many technical studies and measurements made in the laboratory. Indeed, one of the principal requirements of an experiment in space is the knowledge of absolute values of the parameters to be measured. Since it is practically impossible to perform direct absolute measurements, a calibration is needed. The most efficient method for calibration is based on spectro-radiometric techniques. Accordingly, the Institute runs a laboratory for optical photometry and spectroscopy, in which calibration measurements in various spectral domains are performed regularly, in order to adjust the instruments before flight.

Finally, it should be stressed that the theoretical as well as experimental results obtained at the Belgian Institute for Space Aeronomy could only be achieved through an intense and well-organized collaboration with many research centres all over the world. This collaboration, which will continue and will be enlarged, can be illustrated by participation in the International Solar Polar Mission, scheduled for 1983, and for which an interdisciplinary study of the discontinuities and current sheets in the solar wind proposed by the Institute has been accepted by ESA/NASA, and by the three experiments which will fly on *Spacelab*.

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The Institute of Oceanographic Sciences, U.K.

The Institute of Oceanographic Sciences (IOS) is a research institute within the Natural Environment Research Council (NERC), funded through Government Science Vote and by contracts coming mainly from the U.K. Departments of Industry, Energy and the Environment. It was formed in 1973 on the combination of three laboratories, the National Institute of Oceanography (NIO) at Wormley near Guildford, the Institute of Coastal Oceanography and Tides (ICOT) in Bidston near Liverpool, and the Unit of Coastal Sedimentation (UCS) in Taunton. NIO was by far the largest of the three and its work, centred on deep-sea oceanography, covered all oceanographic disciplines, marine physics, geology and geophysics, chemistry and biology, while the work of ICOT and UCS was centred only on physical processes in the water column and underlying sediment. The original division of interests still remains in the three laboratories of the Institute. Total study (of both ocean and earth tides) formerly divided between NIO and ICOT, is now centred at Bidston and, in addition to shelf sea and estuarine sedimentation, much of the data collected on surface waves, particularly that for contract work, is at Taunton. The Institute Director, Dr A.S. Laughton (a geophysicist) is at Wormley; Bidston and Taunton each have their own Assistant Directors.

The total staff numbers about 360, of whom some 75 are post-doctorate, or equivalent, research scientists. Few are involved in university teaching or in the supervision of research students. Some students are employed by