

Giovanni F. Bignami, new COSPAR President: a Profile

Giovanni Fabrizio BIGNAMI was born in Desio (near Milan) in 1944. He studied Physics at the University of Milan with G. Occhialini, who introduced him to science, to Europe and to space astrophysics. For the next forty years or so, he has taken part in the conception, construction and astrophysical interpretation of most high-energy astrophysics space missions in Europe and the U.S.

From 1970 to 1990 GFB was a staff researcher in Milan with the Italian CNR, a convenient post for doing full-time astronomy using ground-based instruments (e.g. the European Chile-based telescopes) as well as space-based ones. Also, an excellent starting point from which to wander around the world for prolonged spells in various U.S. and European space research centres. After a few years at NASA/GSFC in the 1970's, he started developing a special relationship with France (he took the “**Doctorat d’Etat**” in Paris in 1981), Germany (Heidelberg and Garching), Holland (Estec and Leiden) and the Soviet Union (Moscow IKI). His main research theme was, and still is, the understanding of high-energy emission from celestial objects, going from our Galaxy as a whole to compact objects within it (such as neutron stars), and to external galaxies.

In 1988 GFB was selected by a Collaboration of 13 European Institutes (in Italy, France, Germany and England) as the **Principal Investigator** of the EPIC focal plane X-ray camera, on the ESA Cornerstone mission XMM/Newton. EPIC was delivered on time and within budget and has been performing flawlessly in orbit since 1999. In terms of scientific papers produced by its world-wide user community, *EPIC is today the most productive instrument in the history of X-ray astronomy.*

In 1990 GFB became full professor in the Italian University system, first of Physics at the University of Cassino (with access to the splendid library of the Montecassino Abbey) and later of Astronomy (FIS 05) at the University of Pavia. (In 2005, he joined the Institute for Advanced Studies (IUSS), Pavia, where he currently chairs the Science and Technology Class.)

While carrying out his duties for the development of the EPIC instrument, he continued to do astronomical observations on gamma-ray sources. In particular, with colleagues in Europe and the U.S., at **Harvard** and Columbia Universities, he led the effort to understand Geminga, the first gamma-ray-only pulsar. For this result, he shared with J. Halpern the **1993 Bruno Rossi Prize**. Geminga has now been shown by the NASA Fermi mission to be the prototype of a population of many such objects (a result ranked as “absolute #-2-of-the-year” in 2009 by *Science* magazine).

At the same time, GFB took up an active role as scientific advisor within various space agencies: ESA (Astronomy Working Group, Space Science Advisory Committee, chair of the Integral Evaluation Committee, vice-chair of the Science Programme Committee), NASA (GRO Users Committee), the French Agency CNES and with the French CNRS (Central Scientific Committee)

In 1997, GFB was elected to the Italian Accademia dei Lincei. At the time, he was the youngest Academy member.

Convinced of the need of taking an active role in science policy-making and management, in 1997 GFB joined the Italian Space Agency as **Director of Scientific Programmes**, a position he held until 2002. At ASI, GFB strengthened the size and scope of the Italian space science programme. This was done nationally (including supporting the BeppoSAX mission: 1996-2002 and starting a programme of small science satellites), within ESA and with NASA. In fact, most of the Italian scientific missions and collaborations, now active and fruitful, were set in motion at the time.

In January 2003 he was nominated *Director of the Centre d'Etude Spatiale des Rayonnements*, an "Unité Mixte de Recherche" of 150 researchers within the French CNRS and the University of Toulouse, and one of the most important space research centres in France. GFB served his four-year term as Director, enjoying the South-West of France and the Pyrenees and studying from the inside the French research system, one of the best in Europe. In the same period, he took part in the work of the CNES Planning and Evaluation Committee, as well as its Science Committee.

His research interests, still based on the gathering of original astronomical data, expanded to include some of the fundamental physics around a neutron star. Using EPIC X-ray data, **in a seminal *Nature* letter he led the first *in situ* measurement of a neutron star magnetic field.** Later, in collaboration with colleagues from the University of Toulouse, he started a continuing series of papers on the special physics induced by very high magnetic fields in the vicinity of a neutron star.

In 2004 GFB was nominated *Chair of ESA's Space Science Advisory Committee*, the *first Italian* in that position since Edoardo Amaldi held it, twenty years earlier. He served his canonical two years and was confirmed for one more year. During his term, he coordinated the writing of ESA's "Cosmic Vision 2015-2025", Europe's decadal plan for space science.

He left France to become, in March 2007, *President of the Italian Space Agency* (budget 800M/year). By a happy coincidence, his term started with the launch of AGILE, the first of ASI's small missions for science. It had been started back around 2000, when GFB was science director. AGILE is still in orbit today, doing excellent science. During his term as ASI President, GFB supported space applications, with the first two satellites of the Cosmo-Skymed Earth-observing constellation. Beyond the collaborations within Europe (Germany's DLR and France's CNES) he also started new ties with extra-European (e.g. India, Ukraine, etc.) and developing countries.

GFB's term as ASI President ended in August 2008. However, he continues today (2009-2010) to serve as an *advisor* to the Italian Ministry for Education, University and Research, notably for the Aerospace section of the *Italian National Research Plan* and for the reorganization of INAF, the Italian National Institute for Astrophysics.

Now back at IUSS, Pavia, GFB continues to do active astrophysics. In 2009 he was nominated *President of the Scientific Council of the "Groupement d'Interet Scientifique" "Physique des deux Infinis"*, composed by 19 Institutes in the Ile-de-France region (Paris), with around 1000 people.

The French *Agence d'Evaluation et de la Recherche et de l'Enseignement Supérieur* has asked him to **chair** the Evaluation Committee for the French Space Agency, CNES.

The German **Max-Planck** Gesellschaft has asked him to serve on their Director Search Committee.

Recently, he has been nominated *President of COSPAR*, the world-wide Committee on Space Research, created in 1958 by the UN and now comprising 44 nations. It is the first time an Italian scientist is chosen for this role which has the responsibility to ensure a coordinated discussion of world-wide space research policy.

GFB has about 200 papers in refereed journals, including **27 in *Nature*** and **17 in *Science***. The citation count is around 7500 and an h-index of about 43. The impact factor is high.

He has long since lost count of his numerous invited lectures and contributed papers to institutions and meetings all over the world.

His most significant recognitions include:

- the 1993 *Bruno Rossi Prize*, American Astronomical Society (with J. Halpern) (*first Italian*)
- the 2002 Royal Society/COSPAR *Massey Award* (with J. Paul) (*first Italian*),
- the 2004 Astronomy Prize of the Italian Ministry of Culture,
- the 2007 Russian Medal for the 50th Anniversary of Sputnik
- the 2010 *Blaise Pascal Medal*, European Academy of Sciences (*first medal for astrophysics*)
- the 2010 *von Karman Award*, Int. Astronautics Acad. (*first Italian since Broglio, in 1988*).

In 1997 he was elected to the Italian Accademia dei Lincei.

He is also a member of

- the International Astronautics Academy (2000),
- the European Academy of Sciences (2004),
- the Academia Europaea (2005)
- the Istituto Veneto di Scienze Lettere ed Arti (2008)
- the Académie de l'Air et de l'Espace, Toulouse, France (2008)
- **In 2009 he was elected “Associé étranger” of the French Académie des Sciences.**

In 2000, GFB was made “Officier de l'Ordre National du Mérite” of France,

In 2006, «*Officier de la Légion d'Honneur* ».

GFB is a recognized opinion-maker in the field and a strong believer in the popularisation of science. He writes on science and science policy in **newspapers**, magazines and encyclopaedias in Italy (Corriere, Messaggero, Sole, etc.), France and the US, and contributes regularly editorials and comments to *Nature*, *Science* and the opinion page of the *International Herald Tribune*. He is conscious of the need for more **science programmes on TV**. After appearances in Italian and French shows, he is now anchorman and testimonial of National Geographic Channel (Italy) for the 2009 series “*I segreti dello spazio con Bignami*” and, in 2010, “*I Marziani siamo noi*”. The first series has just won a **World Gold Award, News/Information Program Promotion** in Los Angeles in June 2010. For his work in Italy on science and the general public, GFB has received the 2006 Lacchini Prize, the 2007 San Valentino d'Oro Prize and the 2010 Rutelli Prize.

He has authored **five books**, in Italian, French and English. *Against the Donning of the Gown*, (Moonbooks, Milan & London, 2000) is the first English translation of a long poem written by Galileo Galilei around 1590. GFB's translation, like Galileo's original Italian, is in iambic pentameters, rhyming in tercets.

His other books (*La Storia nello Spazio*, Mursia, Milan, 2001; *L'Esplorazione dello Spazio*, Il Mulino, Bologna, 2006; *Explorer l'Espace pour Remonter le Temps*, Odile Jacob, Paris, 2006) are on the history of science and planetary space missions. Recently, he wrote on the single thread between the Big Bang and the birth of life (*I Marziani siamo noi*, Zanichelli, Bologna, 2010).

GFB is fluent in English and French, has a good command of Spanish, acceptable German and Russian.

GFB loves the outdoors, and has done mountaineering in the Alps, the Andes and Africa. He still tries to keep up his long-distance running and swimming.