In Memoriam

Giovanni 'Nanni' Bignami (1944-2017)

Professor Giovanni Fabrizio Bignami, or "Nanni" to his friends, was born in Desio, a small town close to Milan, in the spring of 1944. He obtained his degree in physics at Milan University in the group led by Professor Giuseppe Occhialini (at that time the PhD was not part of the Italian university programme). Later he obtained a doctorate in Paris in 1981.

Nanni was born to lead: he started as a student in physics and just after receiving his diploma he was (compulsorily) enrolled in the Italian army in the "Alpini" force, as an officer… what else!

He was always ready to listen to other people's views and suggestions, as a leader should be, ready to change his ideas if the person was convincing enough.

As President of the Italian Space Agency (2007-2010), of the National Institute for Astrophysics (2011-2015), of COSPAR (2010-2014) and other international bodies, he was fully aware of his role, though never authoritarian, more charismatic.

He started work in science by making use of the *SAS2* (NASA) and *COS-B* (ESA) data and making a major contribution to the identification of "Geminga" as a new type of celestial object: this work won him, the first

Italian, the Bruno Rossi Prize of the American Astronomical Society in 1993.

From the beginning of his career he was interested in space research, contributing to the first ESA satellite. The culmination of his space activity came with his appointment as Principal Investigator (1988-1997) of the *XMM-Newton X-Ray Observatory*, a cornerstone mission of the European Space Agency. The day after he dramatically passed away he should have been the *ospite d'onore* for the ceremony to cheer the 5,000 refereed papers produced by *XMM*: the instrument he led, from idea into space, for more than a decade.

As a global player in the international space arena, he gave impressive dynamism to several European and US astrophysical space missions and contributed to their success: *XMM-Newton* (launched in 1999), *INTEGRAL* (2002), *Swift* (2004), *Agile* (2007) and *Fermi* (2008), all of them still producing outstanding scientific results.

More recently he was a member of the ESA Senior Committee that selected the next European large space observatories. The first of them in the timeline, *Athena*, will be the largest ever designed X-ray mission, and is due to be launched at the end of the 2020s.

Nanni Bignami was appointed full professor in 1990 with the chair of "Fisica Generale" at Cassino University, Italy, and, from 1997, he was Chair of Astronomy at Pavia University. Since 2006 he had been Chair of Astronomy at Istituto Universitario di Studi Superiori, Pavia.

He served as Scientific Director of ASI from 1997 to 2002 and from 2003 to 2006 he was Director of the Centre d'Etudes Spatiales des Rayonnements (France). From 2004 to 2007 he served as President of the Space Science Advisory Committee (SSAC) of ESA and in that capacity he coordinated the Cosmic Vision 2015-2025 space plan. In May 2000 he was awarded the French National Order of Merit (l'Ordre national du Mérite) and became an Officier de la Légion d'Honneur in April 2006. He was a member of the Italian Accademia Nazionale dei Lincei.

In 2002 he received the Massey Award medal, jointly awarded by the Royal Society (UK) and COSPAR for leadership in space science. Among other activities as COSPAR President, he fostered the creation of *Life Sciences in Space Research* (*LSSR*) in 2013, with the first issue appearing in early 2014, a journal that is becoming well-regarded in its field. In 2013 he succeeded in attracting Lockheed Martin to become an Associated Supporter, now a major sponsor of the 2018 Scientific Assembly in Pasadena (USA).

During his mandate as President he maintained and reinforced the international COSPAR leadership started by his predecessor Prof. Roger Bonnet, appointing a number of working groups to generate new ideas in different space science fields. This resulted in the production of a number of roadmaps taking an important role in the definition of future space missions and observatories.

Among them, the working group under Commission A to steer COSPAR's developing relationship with the Group on Earth Observations (GEO), the roadmaps "Toward a Global Space Exploration Program: A Stepping Stone Approach" (*ASR*, 49, 1, January 2012), "Future of Space Astronomy: a Global Roadmap for the Coming Decades" (*ASR*, 50, 1, July 2012), "Understanding Space Weather to Shield Society" (*ASR*, 55, 12, June 2015), "Observation and Integrated Earth-system Science: a Roadmap for 2016-2025" (*ASR*, 57, 10, 15 May 2016), and, more recently on "Exoplanets" and "Small Satellites for Space Research", fully supported by the current President Dr. Len Fisk.

On a personal note: I had the privilege to work with him from the end of the 1970's on several space programmes and scientific endeavours. As *INTEGRAL* PI in the 1990's and more recently as Director of the Institute for Space Astrophysics and Planetology I was supported by him, criticized and pushed to do the best in all the common activities we had over the past four decades: Nanni was unarguably a leader and he was always thinking about the best for science and for the astronomy community at large.

I am fully aware the international scientific community has lost a leader, I have lost another friend.

[By Pietro Ubertini, IAPS-INAF, Italy]