Scientists of the UGR participate in the most ambitious mission of the ESA to discover the origin of the Universe

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What happened after the Big Bang? How did the Universe originate? or When did life arise?

They are some of the questions mission Planck intends to answer starting on 2007, one of the most ambitious projects of the ESA (European Space Agency) in which the University of Granada takes part with the design of an instrument and the study of the formation of galaxies in that first Universe. The professor of Theoretical and Cosmos Physics, Eduardo Battaner, responsible for the participation of the University, explains that the objective of the project is to observe the Cosmos only 400,000 years after the Big Bang, a fact of enormous transcendence taking into account that, at present, it is 14,000 million years old.

Although two missions have been previously launched with this same goal –COBE in 1992 and WMAP in 2003- the results obtained until the moment have not allowed to observe with such accuracy the cosmic of microwaves –a fossil radiation from the first stages of the Universe- that will allow to get to know how the Cosmos was originally, what it is made of and how it has evolved. However Planck, that was conceived more than ten years ago, is ready to take on this objective as, according to Battaner, “it is ten times more sensitive than its predecessors, doubles their frequency range and has three times more resolution”.

The satellite, that will land 1.5 million kilometres from Earth and in which design have taken part France, Germany, England, Denmark and Spain between others, ill take twice images of the complete sky, an information that will make it possible to get to know in detail the formation, structure and role of the first cosmic objects such as galaxies or stars.

A window to the past

But, how can a satellite observe how the Cosmos was fourteen million years ago? The professor of the UGR [http://www.ugr.es] explains this fact mentioning the distance between Earth and most space objects: “In Universe we are lucky to see what happened thousand million years ago as light takes much time to come up to us turning present into a very distant past”. “It is like if we wanted to know how has been the evolution of a man who is forty now; to see such evolution we need a photograph of how he was as a baby, and if we do not have it will not be possible to explain the changes it has suffered in time. The same happens to our Universe”, adds the researcher.

With regard to the distance the probe will be launched at, in which two Spanish teams have collaborated supervised by Rafael Rebolo of the Institute of Astrophysics of the Canaries and by Enrique Martínez of the University of Cantabria, the scientist explains that 1.5 million kilometres far we can find the point of Lagrange, “a place where the satellite keeps stable without running the risk of orbiting in a random way”.

Planck will cost more than 400 million euros and is now in its final phase. With the instruments completely finished, they still have to calibrate them to determine their functioning and initiate the phase of assembly and integration to the satellite.

According to Battaner, the integration of the team –that participates for the first time in a space mission, although they have been studying for years the formation, evolution and structure of the galaxies- and the University in the European project “is essential” as it is, “without doubt, the main space work ever developed in this line”. If the mission is finally successful we are going to discover things that “will change completely our image of the Universe from its formation and evolution to the material it is made of. That is a very important step not only for the advance of Cosmology but also for the development of science in general”, says the physician.

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