

COSMOS CLIMBING

Alain Omont – Well, you can see how happy I am to come back to this magic site of Plateau de Bure. You can see all around the eight antennas of the NOEMA radio telescope, operated by IRAM, an international institute. Seeing the beauty but also the harshness of this site, and also how it is dedicated to the transmission of astronomical knowledge, I cannot refrain from thinking of another mountain in Southern Alps, in the Vallée des Merveilles, where Neolithic shamans climbed to the top to expose themselves to lightning, in a manner somewhat similar to how astronomers here absorb astronomical knowledge. However, NOEMA is above all a technology jewel. It succeeded in multiplying its sensitivity by an amazing factor 50 in 25 years. While it had been designed to look at nearby molecular clouds in the Milky Way and at their content of young stars and prebiotic molecules, it has proved much more powerful than in the dreams of its designers, since it can detect molecules to the edge of the Universe, and, at the other end of the cosmic scale, it can also observe nearby planetary systems in formation and their disks. I have myself used this facility for twenty five years, and for a while I have even held the record of the farthest molecule ever observed in the Universe, carbon monoxide, CO, twelve billion light years away. Although I don't belong to IRAM, I strongly feel myself as participating in this enterprise since its beginning, especially with its designing fathers, of whom several have left us, and with the whole younger team which put it into operation, a good part of which founded the astrophysics group with me at the University of Grenoble. Of course, all of us were awfully shocked by the terrible accident, in fact the terrible cable car accidents, which cost the lives of twenty five persons working for the observatory.

I am conscious of the privilege I had in participating so deeply in this unique period of exploration of the Universe, during the last half century or so, which saw such a fabulous accumulation of astronomical discoveries from quasars and the Big Bang to exoplanets and

gravitational waves. Now, while I approach the end of my personal adventure, it is of course frustrating not to know the following episodes and not to have answers to the enigmas which now stand in front of us, such as the nature of dark matter or extraterrestrial life. They meet some fundamental enigmas of physics, such as fully understanding quantum mechanics, in which I had been immersed during my PhD work at Kastler-Brossel Laboratory... The example of the past century shows that it is absolutely impossible to imagine where we will be just one century from now, and even more in one thousand years, and a fortiori at cosmic scales of millions or billions years. How could we therefore know whether we are destined to become half gods spread in the Universe, or doomed to rapidly disappear? I am convinced that some of these answers may be found here in the cosmos.

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