Paper ID: 32377
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SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE SPACE ASTRONOMY AND SOLAR-SYSTEM SCIENCE MISSIONS (A7)
Space-Agencies Long-Term Views (1)

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THE FUTURE OF SPACE ASTRONOMY: ELECTROMAGNETIC VS GRAVITATIONAL WAVES & HE NEUTRINOS?

Abstract

The history of space astronomy, especially in the past three decades, has demonstrated clearly the importance and benefit of access to the Gamma-ray, X-ray, UV-optical, near IR and far-IR spectrum from space. The combined use of large ground based facilities and large space observatories is playing a key role in the advance of astrophysics by providing access to the entire electromagnetic spectrum, allowing high sensitivity observations from the lower radio wavelength to the higher energy gamma rays.

It is nowadays clear that a forward steps in the understanding of the Universe evolution and large scale structure formation is essential and only possible with the combined use of multi-wavelength imaging and spectral high resolution instruments.

In fact, only a few 'Observatory Class' space missions are planned and there is a need to ensure proper ground facility coverage: the synergy Ground-Space is not escapable in the timeframe 2020-2030.

Furthermore, the recent detection of Gravitational Waves by the LIGO-VIRGO consortia and contemporary observation in the electromagnetic bandwidth has opened a new window to study and understand the formation and evolution of the Universe.

Things have profoundly changed over the last two years. Our access to astrophysical information is boosted by three new Astronomies : Gravitational Waves, High Energy Neutrinos and Ultra-High Energy Cosmic Rays are about to open new phase spaces – not only in Astronomy, but also in fundamental physic.

In fact, one of the most important observational challenges of our time is to establish the link between discoveries of the new Astronomies and the electromagnetic Universe.

This paper will provide an update of the worldwide scenario predicted for the next 2 decades in the field astronomical research to be exploited via Space and Ground and Space Large Scale facility in synergy.