

Mesdames les Ministres,
Monsieur l'Ambassadeur,
Signor Prefetto,
Signor Senatore,
Messieurs les Maires,
Madame la Directrice Générale
Signor Presidente
Signori Direttori
Ladies and gentlemen,

It is a great honour for me and the council of the European Gravitational Observatory (EGO) to welcome you all here for the inauguration of VIRGO.

I am chairman of this council since only last month, so I hope you will forgive me if I sometimes take an external point of view and cannot help but being impressed by the steps that lead us to this important day.

The credit for this achievement goes first of all to the people that imagined the concept of VIRGO (and in particular its two promoters the Italian A. Giazotto and the French A. Brillet), then to those that worked out the details and built this magnificent instrument.

The credit should also go to the long series of VIRGO/EGO councils that accompanied the project; and especially to E.Giacobino, here present, chairman of EGO during these last pivotal years.

Last but not least the credit should go to the directors of EGO, with a special mention to our host Filippo Menzinger. His scientific competence, great international experience, gentleness and sense of wisdom is already permeating deeply this project and is the best guarantee for its future.

It is my firm conviction that VIRGO and EGO are charting new territory. New territory in science, new territory in science organisation, new territory in the European and world research area.

New territory in Science:

We live in a world where the accomplishments of nanotechnology, go side by side with the rich promises of biotechnology and information sciences.

Nevertheless, we should not forget that we are also living exciting times in fundamental physics. The current experimental precision permits a series of questions to which we have not yet a convincing answer. Among these questions, prominent are the nature of gravity, of dark matter and energy, of the origin and dimensionality of the universe, of the sources of violent phenomena, the questions of the mass of the neutrino and lifetime of the proton.

The majority of these questions need to be treated with methods that do not belong to a single discipline. Astrophysicists, particle physicists, relativity and field theorists need to work together in order to tackle complex problems in theory and in instrumentation.

These questions have become structural themes of a field that is called Astroparticle physics and VIRGO is an integral part of it.

New territory in the organisation of science:

VIRGO is an instrument that extends the concept of observation of the Universe. One has not only to redefine what constitutes evidence, but also to organise the scientific community around it and establish a blending of different scientific cultures.

VIRGO is neither a simple telescope, where observers can reserve time to observe the stars, neither a dedicated experiment in an accelerator. It is something in between. From this cross disciplinary situation a series of novel institutional situations arise. They concern the exploitation of the results, the relationships between the collaboration and the host laboratory, the invention of new relationships between theorists and experimentalists etc. etc.

New territory in the national, European and world organisation of science:

A new field that falls between established disciplines, is threatened by low or erratic funding.

So, it is only proper to thank the CNRS and in particular Genevieve Berger who, with foresight, has inscribed in the CNRS pluriannual action plan the Astroparticle as one of the 5 interdisciplinary priorities, side by side with biology, information, energy, and nanotechnology.

VIRGO has also obtained, at the highest level the support of the governments, under the budget of large equipment. This must be the first astroparticle experiment that has obtained this status. I would like therefore to thank, in the name of **VIRGO** and **EGO**, the Ministers of France and Italy, for that.

Further, **VIRGO** and **EGO** are fully participating in the programs of ApPEC, the Astroparticle Physics European Co-ordination. ApPEC was founded in 2001, by several European funding agencies, under the auspices of the European Science Foundation. In this effort, E. Iarocci as well as the IN2P3 former and present directors are playing a key role.

The pioneering role of **VIRGO** and **EGO** is well understood in Brussels, as can be seen in the warm letter by Dr. Achilleas Mitsos Director General of Research, who deeply regrets that he could not be liberated in order to be with us, wishes to **VIRGO** and **EGO** a great success and goes on to say (I translate from French):

“This inauguration is an important event for European Science. The franco-italian collaboration **EGO/VIRGO** is exemplary as an efficient collaboration between two European states, promising to serve as a basis for an ambitious European scale program. It permits to Europe to be positioned favourably with respect to future international collaborations.”

EGO indeed means European Gravitational Observatory, and in order to become fully European, we have to work actively towards a collaboration with all the European scientists, as for instance our British and German colleagues of **GEO**. There is a strong will, in all European countries, to join efforts for the next generation of gravitational wave antennas.

Beyond the horizon of European integration lies the goal of an international network of these antennas.

In a few years time, one could envisage that a train of gravitational waves from a distant cosmic source hits the earth. It first, by chance, crosses **VIRGO**, then passes through the earth and hits **LIGO** the equivalent antenna's in the US, and finally hits the Japanese and the Australian antennas.

All signals are then transmitted through satellites to a central computer and researchers use the combined signals and time of arrival to find the direction of the source and the polarisation of the gravitational waves.

The same signals are compared to a catalogue of theoretically calculated forms, in order to identify the type of the event. Let us suppose that they match the signature of the coalescence of two black holes.

The astronomy community is then alerted, and among the catalogues of radio or X and gamma ray emitting galaxies, the astronomers locate the source. By examining the activity in all wavelengths, a picture of the final stages of black hole formation is taken.

We could be only less than a decade away from this sequence of events. It explains clearly the necessity of world collaboration and why we insist calling VIRGO a Gravitational Observatory.

Ladies and gentlemen,

In the beginning of the XX^e century, Einstein put in doubt the vision of Galileo, Descartes and Newton, according to which space and time are rigid and given once and for all. In this earlier cosmology space and time are the stable stage upon which bodies and particles interact. Space-time is not, properly speaking, an object of physics and cannot be explained by it.

In General Relativity, on the contrary, space time and matter are closely inter-linked. The movement of a body is interpreted as a gliding along distortions of space-time and these distortions are created in return by the very presence of bodies. The Universe and space-time with it becomes a physical object capable of deformation, collapse and expansion depending on the amount of matter it contains. Space-time waves can be formed and fill the Universe with propagating ripples. We are not anymore standing on the stable ground of the Newtonian cosmos; we are literally swimming in an ocean of gravitational waves. Those of you that cannot swim should not worry.... one needs a very sensitive instrument like VIRGO to feel them.

This is the world picture that VIRGO will try to reveal in its details. In order to do that it will have to win the battle of extreme sensibility, and face the challenge of a European and world collaboration. Let us wish to the people of VIRGO and EGO an outright success.

Once more, welcome