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Why the LHC?

http://lhc2008.web.cern.ch/lhc2008/images/lhc-fond.jpg

World View and Philosophy

In order to know more about the nature of matter scientists need to conduct experiments (collisions) at a very high energy, energies never tried before.

LHC project will address the most fundamental questions of physics.
In this set of experiments unexpected phenomena could appear and scientist should be ready for that form of serendipity.

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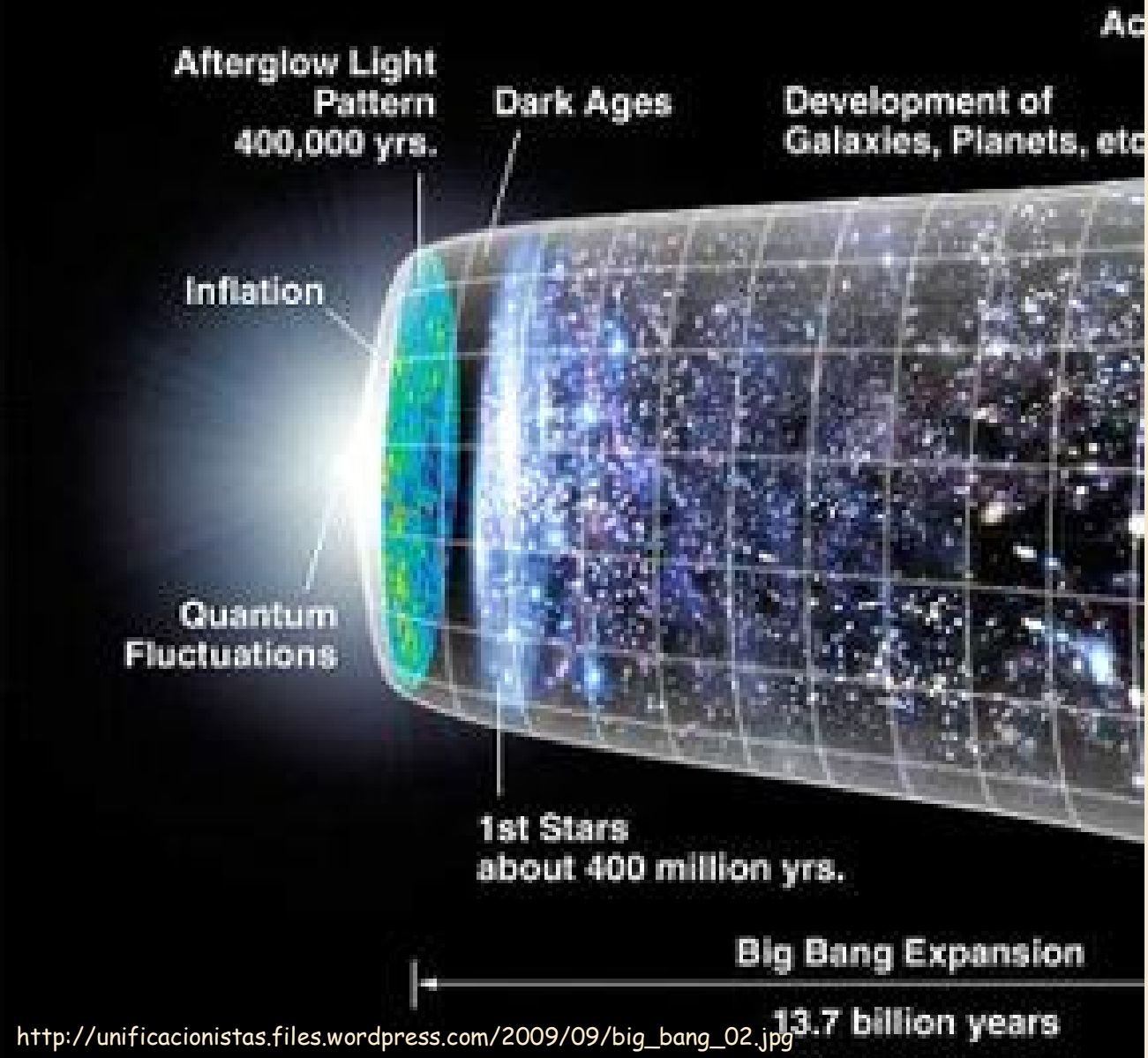

http://unificacionistas.files.wordpress.com/2009/09/big_bang_02.jpg

Ideas about the origin of the Universe

The Universe was created after an explosion (Big Bang).

Theorists think that Higgs boson is the particle that gives mass to the matter.

Both aspects are related.

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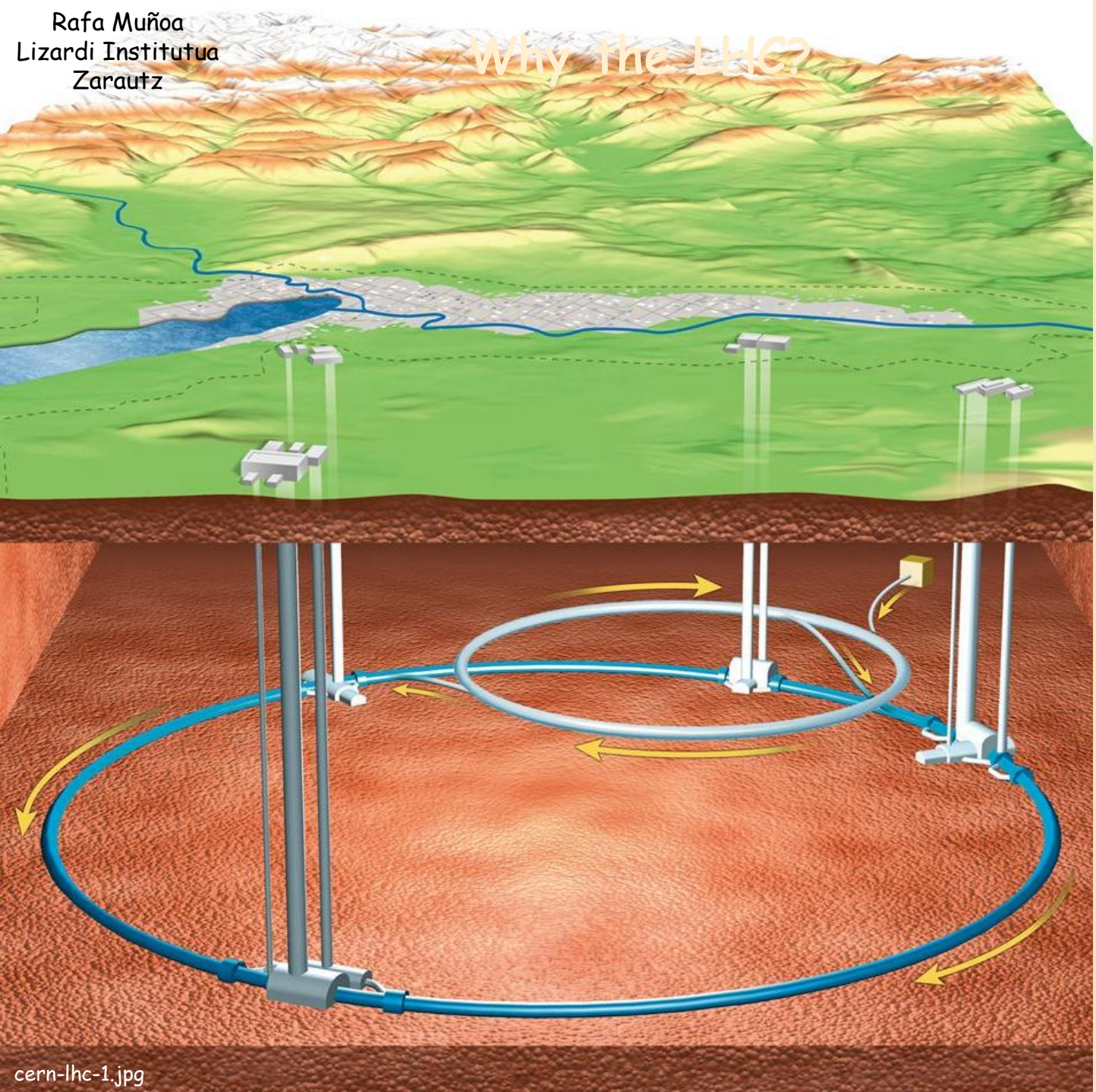

cern-lhc-1.jpg

LHC Collider and collisions

The LHC is the highest-energy accelerator and collider.

LHC is composed of three modules:

- The **Collider**: the element that is in charge of collisions.
- The **Detectors**
- The **Grid**: Global network of computers to process the data recorded at the detectors.

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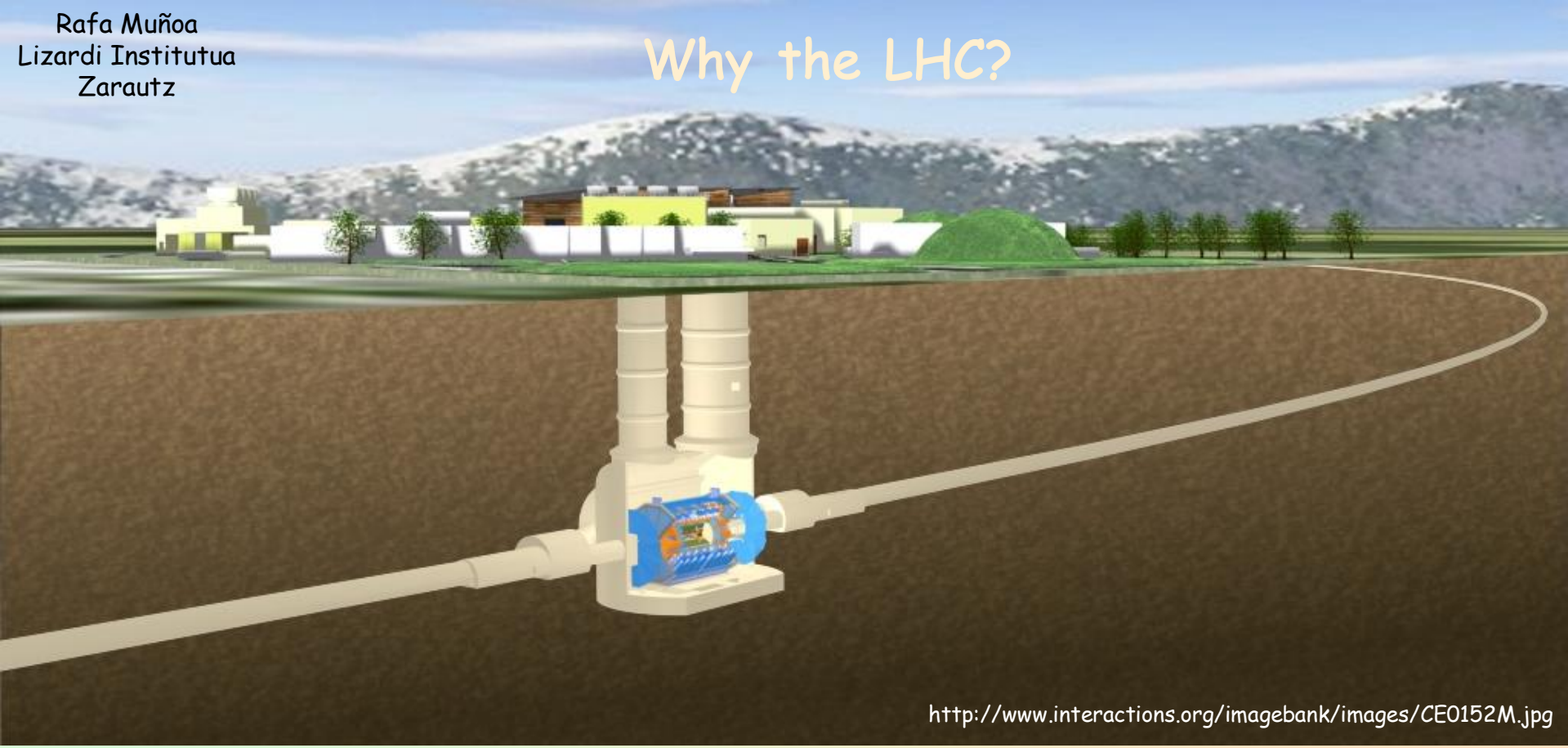

http://www.interactions.org/imagebank/images/CE0152M.jpg

Data Acquisition: the detectors

ATLAS is one of two general-purpose detectors at the LHC. It will investigate a wide range of physics, including the search for the Higgs boson and particles that could make up dark matter. ATLAS will record sets of measurements on the particles created in collisions - their paths, energies, and their identities.

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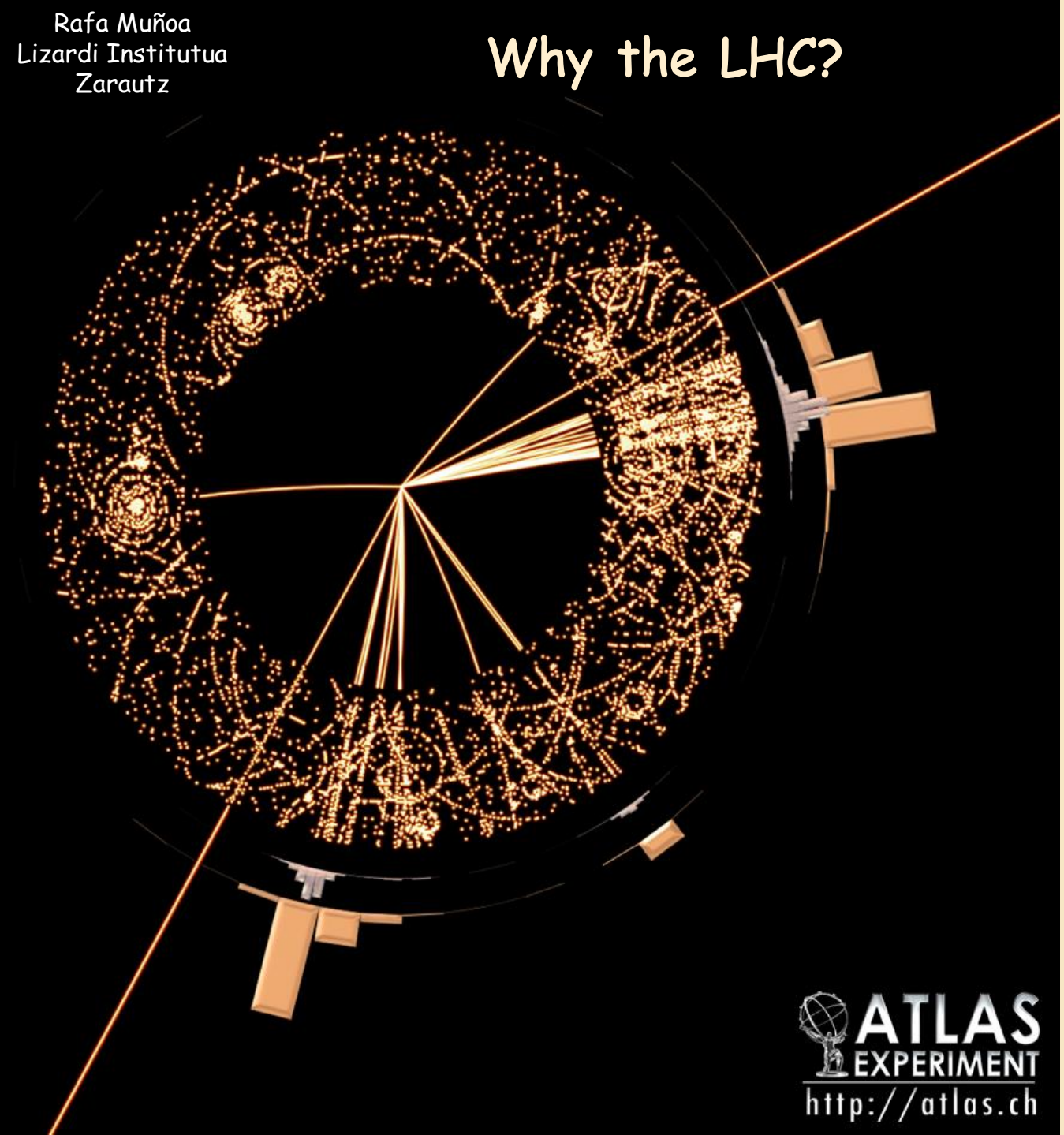

Data transformation

The signals from the detector will help indentify physics particles.

Grid computing will be used for event reconstruction, allowing the parallel use of university and laboratory computer networks throughout the world.

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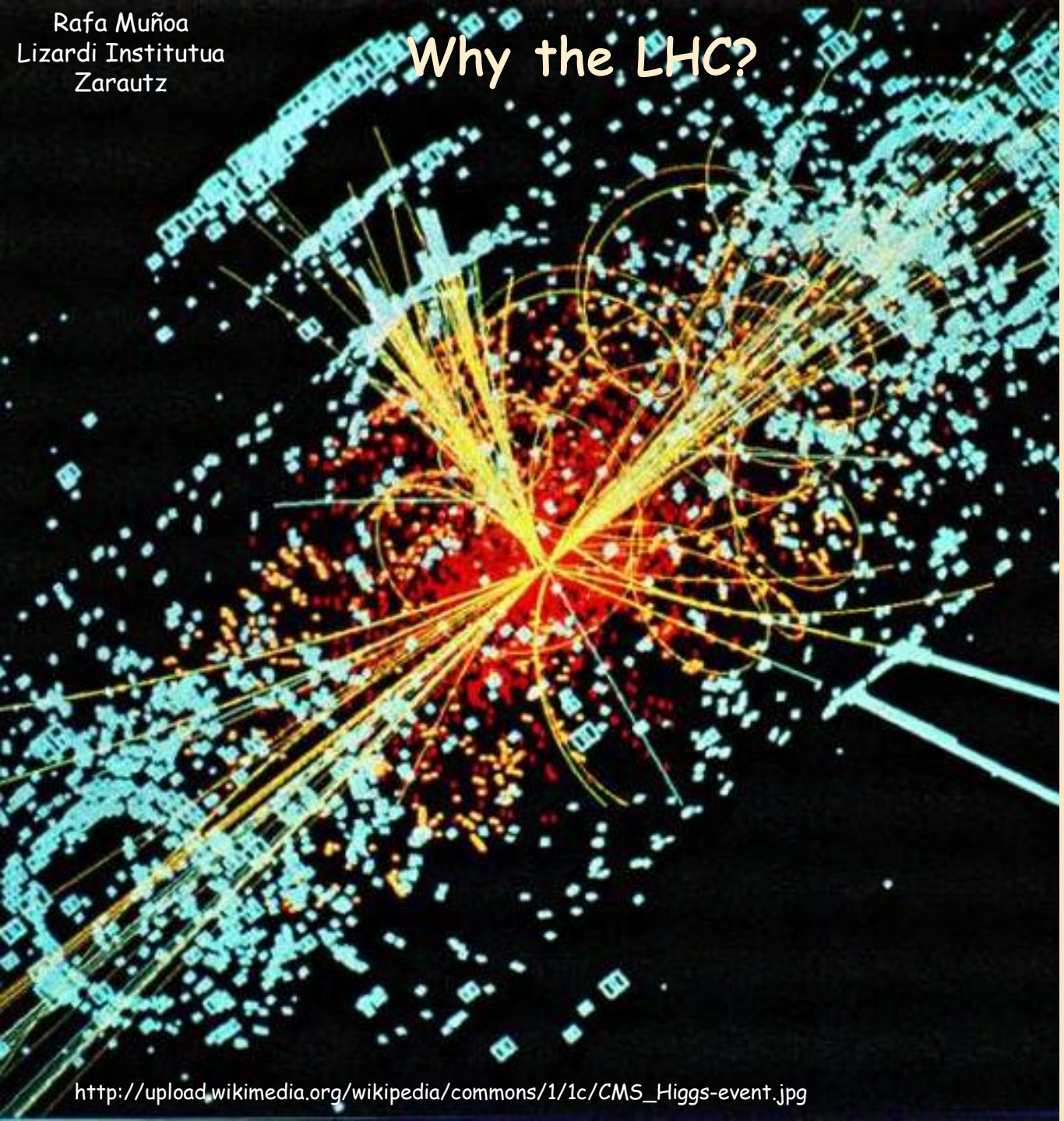

http://upload.wikimedia.org/wikipedia/commons/1/1c/CMS_Higgs-event.jpg

Knowledge and Value Claims

Physicists hope that the LHC will help answer many of the most fundamental questions in physics:

questions about the basic laws of forces and matter and the Universe

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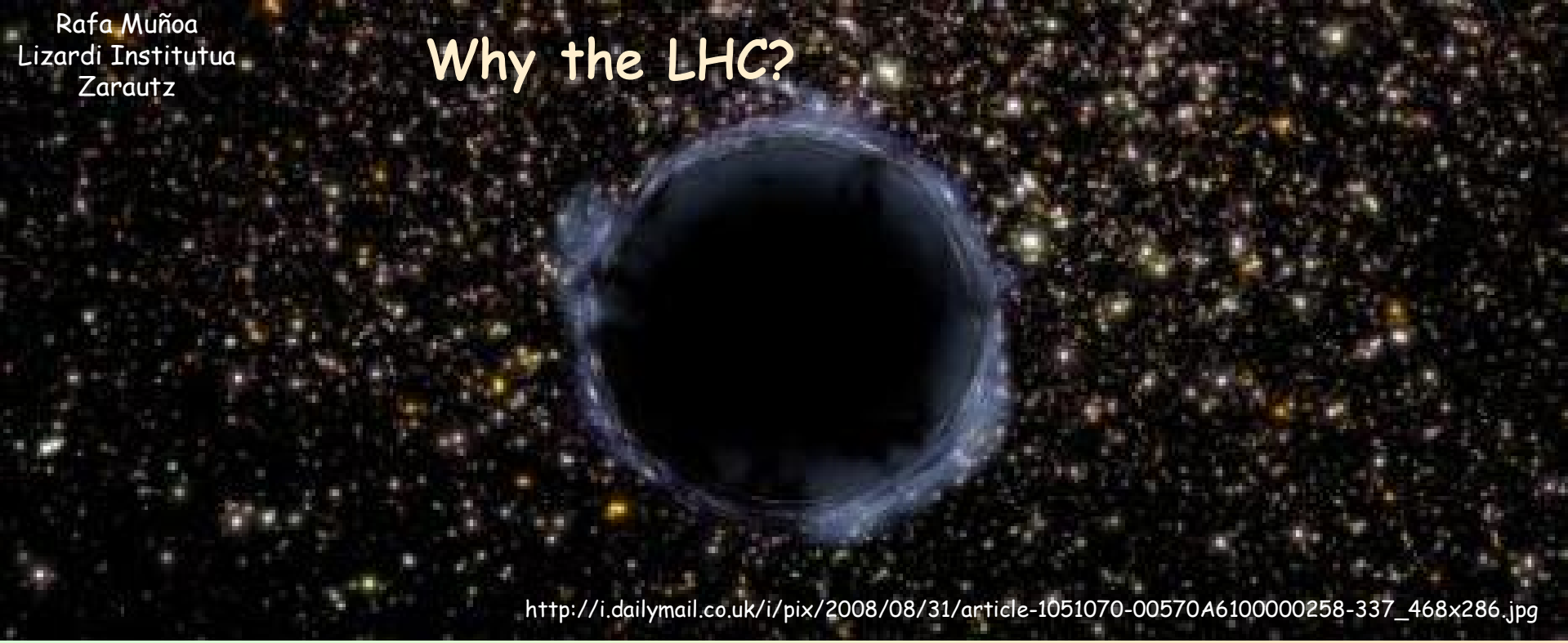

http://i.dailymail.co.uk/i/pix/2008/08/31/article-1051070-00570A6100000258-337_468x286.jpg

Risks

There is some controversy about the production of microscopic black holes during the experiment.

According to CERN if microscopic black holes were produced in the experiment, they would have no time to start accreting matter and to cause macroscopic effects.