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Planetarium Show on Dark Matter

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Abstract

We describe a new planetarium show about Dark Matter entitled “*Phantom of the Universe*”. When completed in late 2014, it will feature the exciting story of dark matter, from the Big Bang to its anticipated discovery at the Large Hadron Collider.

Keywords: Dark matter; outreach; education; planetarium; film; big bang; galaxies; underground; LHC; Large Hadron Collider

1. A New Planetarium Show on Dark Matter



110 million people a year watch planetarium shows providing an enormous audience to expose to the marvels and mysteries of dark matter.

2. Introduction

Phantom of the Universe is the title of a new planetarium show that will showcase an exciting exploration of dark matter, from the Big Bang to its anticipated discovery at the Large Hadron Collider. The show will reveal the first hints of its existence through the eyes of Fritz Zwicky, the scientist who coined the term “dark matter.” It will show the astral choreography witnessed by Vera Rubin in the Andromeda galaxy and plummet deep underground to see the most sensitive dark matter detector on Earth, housed in a former gold mine.

From there, the journey continues across space and time at the Large Hadron Collider at CERN, speeding alongside particles before they collide in visually stunning explosions of light and sound, while learning how scientists around the world are collaborating to track down the constituent of dark matter. The show will be offered to planetariums worldwide free of charge in 2015. The main highlights are:

- Dark matter created in the Big Bang
- Evidence for dark matter in Galaxies, etc.
- Underground searches for dark matter
- The search for dark matter particles at the LHC.

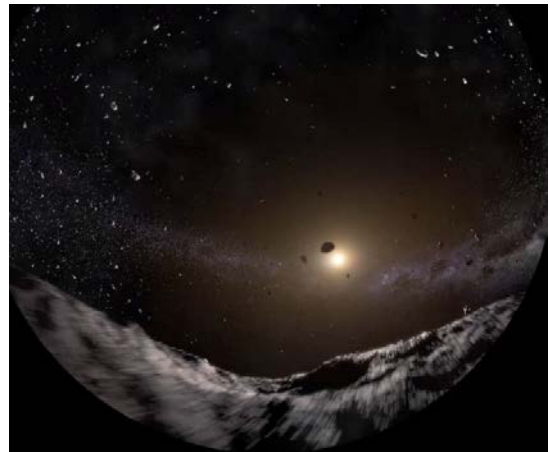
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3. Scenes from the Planetarium Show

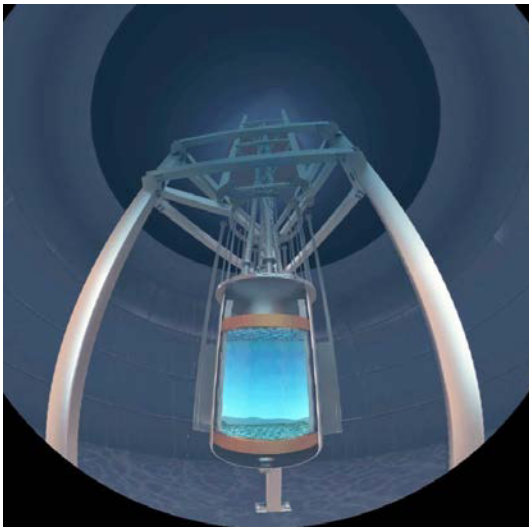
Distortions are the result of projecting the planetarium dome onto a flat surface.



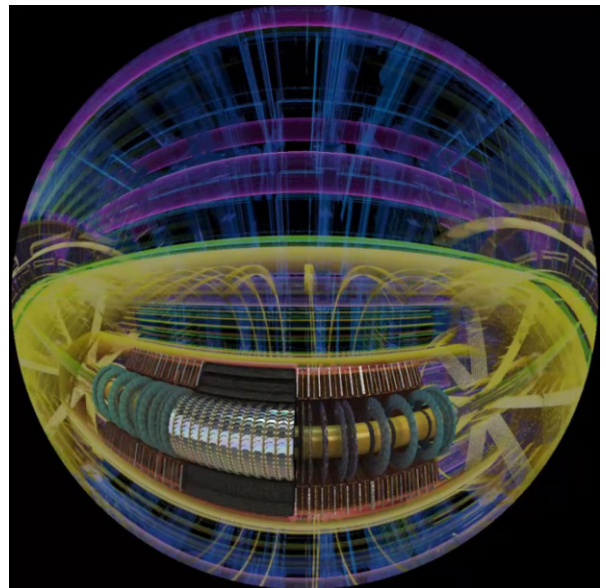
Dark Matter particles at SURF



Dark Matter particle flying through space



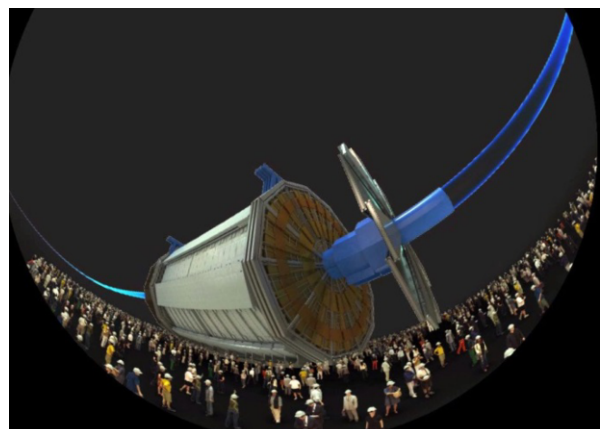
LUX Experiment at SURF



ATLAS experiment at CERN



CERN



People next to ATLAS Experiment

4. The Planetarium Show's Outstanding Team

The planetarium show crew includes many professionals from physics to cosmology to live-action filming, to animation to music composition, including the following:

- Academy Award-winning actress as narrator
- Hollywood scriptwriter
- Producer from Hollywood
- Outstanding Director and Lead Animator
- Famous band member as composer
- Nobel Prize-winning cosmologist
- Cameraman from the Adler Planetarium
- Experts from seven planetariums
- Team of professional animators
- Sound editor with substantial experience

The show's creators and executive producers are Michael Barnett, Lawrence Berkeley National Lab, Kaushik De of the University of Texas, Arlington and UT Planetarium, Reinhard Schwienhorst of Michigan State University and Abrams Planetarium, Carmen Garcia of the University of Valencia, Markus Nordberg of CERN and George Smoot of the University of California, Berkeley.

With music composed by Mickey Hart (Apocalypse Now, The Twilight Zone, The Grateful Dead) and narration by an acclaimed Academy-Award winning actress, Phantom of the Universe will showcase the creativity and directing prowess of Joao Pequeno of CERN's Media Lab and the writing and producing talents of award-winning filmmaker, Carey Ann Strelecki, PGA, WGA.

A talented team based at the Instituto de Física Corpuscular (IFIC) de la Universitat de València

produced the animated sequences of the show. Animation Technical Director Jesus Nuevo, with colleagues Jose Sanz, Raul Colomer, Jose Manuel Vega and Ivan Pulido gave life to the visuals.

The dynamic live-action scenes were filmed by Jose Francisco Salgado of the Adler Planetarium. Some of the cosmology simulations were produced by Ralf Kaehler and Tom Abel of KIPAC at the SLAC lab.

5. Summary

Phantom of the Universe: The Hunt for Dark Matter is a state-of-the-art planetarium show. A non-profit collaboration produced the show and will be offering the show for FREE to planetariums worldwide (the planetariums in general charge admission to their shows).

It is hoped that work on the show will be complete by December 2014, with the show available in very early 2015.

Find clips from the show (in circle format) and the latest updates at:

<http://PhantomOfTheUniverse.org>

Acknowledgments

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