



Phantom of the Universe: The Hunt for Dark Matter

Scientists around the world are searching for a phantom – Dark Matter – which constitutes 85% of the matter in the universe. A new planetarium show – being distributed to planetariums for free – is previewing the hoped for discovery of this phantom at the Sanford Underground Research Facility in the Homestake Mine in the Black Hills of South Dakota and at CERN’s Large Hadron Collider (LHC) in Geneva, Switzerland.

This new show stars Academy Award winner Tilda Swinton as narrator, with sound effects from an Academy Award winning team at Skywalker Sound, and guidance from Nobel Laureate George Smoot. The director is Joao Pequenao, head of the Media Lab at CERN.

The title “Phantom of the Universe” reflects dark matter’s invisible presence everywhere in the universe from galaxies to deep inside the earth. Dark matter is a “phantom,” because it emits and reflects no light, so cannot be seen, and was discovered only by its gravitational effects in the universe. Someday, it’s hoped, dark matter will be observed by its interaction through the feeble weak force.

The show reveals the first hints of dark matter’s existence through the eyes of the irascible Fritz Zwicky, the scientist who coined the term "dark matter." It describes the astral choreography witnessed by Vera Rubin in the Andromeda galaxy, as she measured the angular motion of galaxies, showing there is large invisible mass (dark matter).

We learn how scientists around the world are collaborating to track down the constituents of dark matter. The show plummets deep underground to see the LUX dark matter detector. The production includes camera footage taken at the Sanford Lab: a ride on a rail car through a tunnel 4,850 feet underground.

From there, it journeys across space to the LHC at CERN, speeding alongside particles before they collide in visually stunning explosions of light and sound.

The collaboration that created “Phantom of the Universe” included Lawrence Berkeley National Lab; Univ. of Texas Arlington; Michigan State Univ., and CERN. Production was supported by the Department of Energy, the National Science Foundation, the ATLAS Experiment, Berkeley Lab, MSU, UTA, CERN, and the Science & Technology Facilities Council (UK).

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