Journey to the Centre of the Milky Way

Free seven-minute mini-show in 4k resolution from ESO available as a series of fulldome frames for free download (lightly compressed jpegs, 98 GB).

Credit: ESO

Directed by: Lars Lindberg Christensen

Art Direction, Production Design: Luis Calçada

Producer: Luis Calçada

Written by: Georgia Bladon & Lars Lindberg Christensen

Editing: Luis Calçada

Narration: Sara Mendes da Costa

Soundtrack & Sound Effects: Michael Stearns Sacred Site (michaelstearns.com)

3D animations, footage and photos: Luis Calçada, Martin Kornmesser, Gas cloud simulation: ESO/S. Gillessen/MPE/Marc Schartmann, ALMA (ESO/NAOJ/NRAO), VISTA/J. Emerson, Digitized Sky Survey 2, N. Risinger (skysurvey.org), Stéphane Guisard (eso.org/~sguisard), Serge Brunier & B.Tafreshi (twanight.org)

Software: Domeview, Fulldome Plugin and WFCam4D (http://software.multimeios.pt)

Executive producer: Lars Lindberg Christensen.

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A red and rocky landscape. Similar to the surface of Mars. This is the Chilean Atacama Desert! Dry. Lifeless. Empty. But not everywhere.

On a mountain 2600 metres high, far away from city lights, ESO's Very Large Telescope has the best view of the night sky. Anywhere on Earth.

The telescopes encased in these gigantic domes are the most powerful and advanced ever built. They can see objects four billion times fainter than we can with the naked eye. And with them we can delve further into the depths of our Universe than ever before.

The glowing band of the Milky Way. Home to our Sun, to our Solar System and to billions of other stars and solar systems.

These are the constellations Scorpius and Sagittarius — the scorpion and the archer — just two of the 88 that creep across the night sky. Modern visible-light and infrared telescopes can peer deep into the veil of gas and dust that cloaks our view — letting us travel to the centre of our galaxy.

In the centre of the Milky Way, pregnant with gas and dust, the stars are on the move. Over more than 20 years a hundred stars have been followed by the Very Large Telescope and the Keck Telescopes. These stars have revealed the hiding place of a powerful monster at our galaxy's heart. A black hole 4 million times more massive than our Sun.

The exact nature of black holes is a mystery. They have baffled history's greatest scientists, and become the stuff of science fiction. Black holes will consume anything that strays into their path, and some of the most interesting stars in our galaxy are caught in our black hole's gravitational grip.

But this black hole will not be satisfied by the swirling of stars. A giant gas cloud — several times the mass of the Earth — is accelerating towards this invisible beast, and at more than 8 million kilometres an hour, it is doomed.

By studying the stars at the centre of the Milky Way we have discovered a mysterious force at its heart. But the journey does not end here. Retreating from the centre, the latest infrared observations let us unveil huge portions of the Milky Way.

The Very Large Telescope's neighbour VISTA is the world's most powerful infrared survey telescope. It has the power to transform our view…

Pierced by the infrared vision of VISTA, the veil of dust falls away. Now the dark dust clouds that once engulfed whole regions of the sky have all but disappeared. This infrared image is one of biggest astronomical images ever produced, showing 84 million stars. 84 million stars with 84 million mysteries waiting to be solved. Are there planets, moons, water. Life?

We have delved deeper into the Milky Way than ever before and found many answers and millions of questions left to ask.

ESO's telescopes will continue their mission to dig into the skies. Solving and discovering the mysteries of the Milky Way.