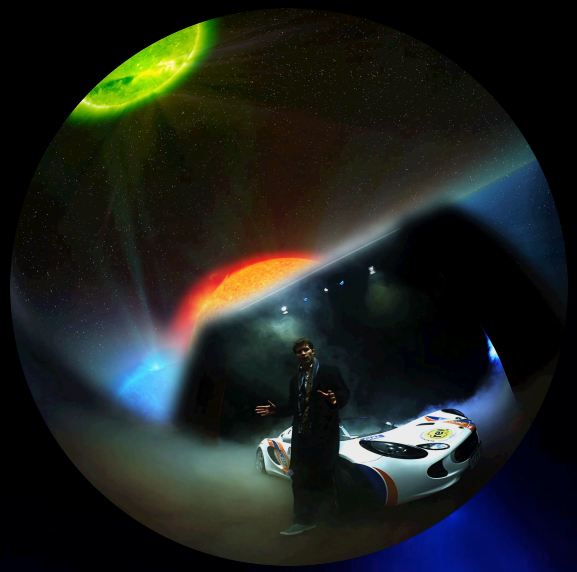

iVEC

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Credits:

Directed by Peter Morse
Produced by Peter Morse & Paul Bourke
Presented by Alan Duffy
Written by Alan Duffy & Peter Morse
Dark Matter Simulations: Alan Duffy and Robert Crain
Dark Matter Visualisations: Paul Bourke
Digital Sky Milky Way Animation: Carley Tillett
Music: Cathie Travers
Audio: Peter Morse & Trevor Hilton
Lighting: Peter Morse, Ákos Brúz & John Doyle
Fulldome Timelapse: Peter Morse & Chris Henderson
Parkes Panorama: Alex Cherney
Galaxy Animation: Paul Bourke
LadyBug-3 Video: Paul Bourke & Peter Morse
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Sally Hildred

www.darkthemovie.info

DARK

UNDERSTANDING DARK MATTER

DARK is a fulldome movie that explains and explores the nature of Dark Matter, the missing 80% of the mass of the Universe.

The search for Dark Matter is the most pressing astrophysical problem of our time – the solution to which will help us understand why the Universe is as it is, where it came from, and how it has evolved over billions of years – the unimaginable depths of deep time, of which a human life is but a flickering instant.

But in that instant, we can grasp its immensity and, through science, we can attempt to understand it.

DARK is presented by Dr Alan Duffy, a brilliant young astronomer from the International Centre for Radio Astronomy Research at the University of Western Australia – who creates simulations of the universe inside supercomputers - tracing the way in which Dark Matter evolves from the Big Bang to the galaxies we see around us today.

Alan introduces us to the idea of Dark Matter, why astronomers think it exists, and explains why Radio Astronomy is so well-suited to its discovery.

We explore why the new Australian Square Kilometre Array Pathfinder (ASKAP) Telescope, currently under construction in remote Western Australia, will be so important in this scientific quest.

But this is only the beginning.

We journey through completely immersive visualisations of Dark Matter evolution calculated upon some of the world's fastest supercomputers – cosmological visions on a truly vast scale, in which galaxies themselves are but points of light, distributed across far larger intergalactic structures of Dark Matter.

These visualisations demonstrate the cutting-edge of contemporary supercomputer visualisation of massive scientific datasets and astrophysical simulation.

It sounds like Science Fiction, but it's not. It's science fact. Cutting-edge research, seen in this way for the very first time.

DARK is an adventure to the very edges of contemporary cosmology and data visualisation, telling a complex scientific story with a touch of humanity.

DARK

UNDERSTANDING DARK MATTER

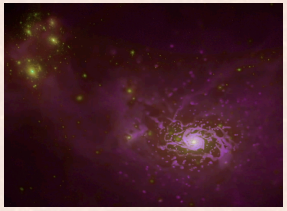
Dark Matter Visualisations

GIMIC

The formation of a dwarf galaxy from just after the Big Bang to the present day - within the larger Dark Matter structure of the Universe.

Gas falls within Dark Matter filaments, part of the larger Cosmic Web, that provides the gravitational backbone that shapes galaxies.

The gas spins up as it falls deeper into the Dark Matter halo, forming spiral arms and, eventually, stars - at the very centre of the densest, coldest gas.



GIMIC

GIMIC II

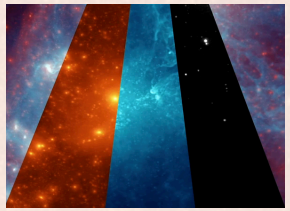
KINETIC

An enormously detailed region of the universe around a Dark Matter halo similar to that of our own galaxy, the Milky Way.

Galaxies and their satellites are caught mid-collapse as they fall along the Cosmic Web filaments to the centre of the simulation, forming a catastrophic collision that has all but destroyed the central galaxy.

A similar fate will befall our galaxy when we collide with our neighbour, the Andromeda galaxy, in approximately 4 billion years.

KINETIC

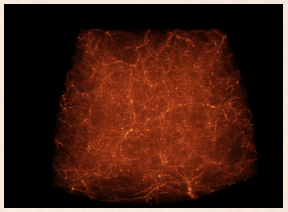


Dark Matter, Gas and Stars

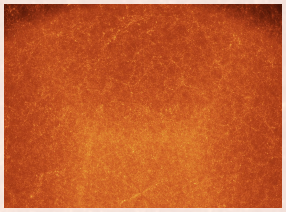
COSMOS

We see the formation of the very largest objects in the universe within a Dark Matter simulation that traces the emergence of structure from an almost perfectly smooth state - just after the Big Bang - to the present day.

Dark Matter structures contain thousands of galaxies like our own Milky Way - barely visible as bright knots of matter at these enormous scales.



COSMOS



COSMOS II