



Press Release

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Dark matter riddle comes to light as scientists scan the galaxies

Astronomers are grappling with a puzzle that suggests dark matter is more evenly spread across the Universe than previously thought.

Maps of more than 30 million galaxies reveal a smoother sweep of the elusive material than predicted by the leading theory about the Universe's early expansion.

Invisible dark matter – which makes up one quarter of the Universe – is around 10 per cent less clumpy than expected, researchers say.

Their findings are not fully explained by a theory which can be used to predict how invisible parts of the Universe should appear today.

The theory – based on knowledge of the Universe's make-up right after the Big Bang – predicts that dark matter should be dotted around the Universe in denser clumps than the astronomers have observed.

An international team used a telescope at the European Southern Observatory in Chile to study the light emitted by millions of galaxies – some more than 10 billion light years away.

Analysing how the gravitational tug of dark matter altered the direction of emitted light enabled the team to map out the matter in the Universe.

Unidentified gaps in the Standard Model of Cosmology could explain why the team's findings about dark matter – which has never been directly detected – differed from predictions.

Further testing may reveal if fundamental changes to the model – which is underpinned by Einstein's theory of relativity – are required, researchers say.

The latest findings from the Kilo-Degree Survey (KiDS) appear in five articles submitted for publication in the journal *Astronomy & Astrophysics*. The work was co-led by scientists from the University of Edinburgh, University College London, the Ruhr-University Bochum in Germany and Leiden University in The Netherlands.

The research builds on previous work by the KiDS team to map 15 million galaxies.

Professor Catherine Heymans, of the University of Edinburgh's School of Physics and Astronomy, who led the research team, said: "The results are fascinating as we directly map out the mysterious dark side of our Universe. Our findings could be an early indication that the dark matter phenomenon is more complex than the current favourite dark matter theory for unseen, cold and inactive particles."

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