

# A new viewpoint on scientific progress

★ Scientific progress is based to a large degree on the search for truth, yet the history of science is also marked by significant conceptual revolutions that changed the way scientists view the natural world. We spoke about these issues with **Professor Michela Massimi**, PI on the ERC Consolidator Grant *Perspectival Realism. Science, Knowledge, and Truth from a Human Vantage Point*

The aim of much scientific endeavour is to search for objective truth, to develop theories that help researchers understand the way the world functions; yet the history of science has also been marked by radical conceptual changes that challenged accepted viewpoints. The Perspectival Realism project aims to develop a novel view in philosophy of science that combines perspectivism and realism. “The question I’m asking is: Can we be realists about science while also acknowledging that theories change, and that there have been major scientific revolutions over time?” explains Professor Michela Massimi, the project’s Principal Investigator.

The work of Thomas Kuhn is central to addressing this question. His 1962 book, *The Structure of Scientific Revolutions*, radically challenged the realist’s intuition that scientific progress is a linear accumulation of scientific discoveries that eventually take us closer to the final truth about nature. Instead, Kuhn regarded science as characterised by periods of what he called ‘normal science’, ‘crises’, and

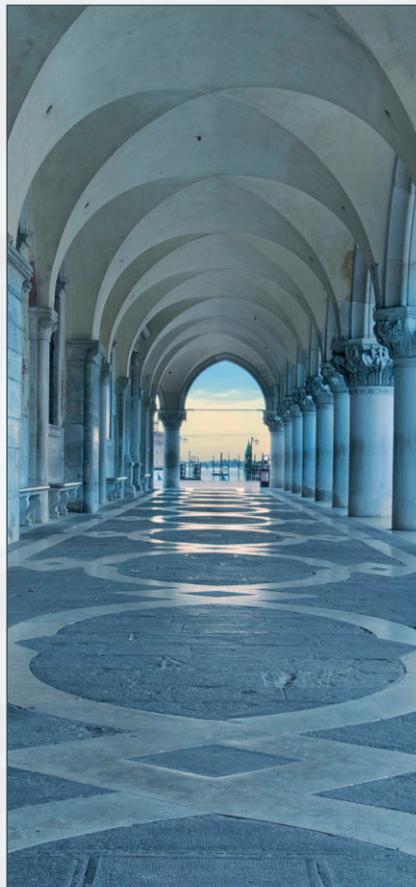
‘scientific revolutions’. “When there’s an increasing number of anomalies that cannot be explained by the accepted scientific paradigm, a period of crisis eventually leads to a scientific

matter, to a large degree – but we still lack a full understanding of the nature of dark matter and dark energy; nor have we yet found any direct experimental evidence for them.”

**Beyond Standard Model physics and the Dark Energy Survey**  
Researchers at CERN have been looking for evidence of supersymmetric particles and other possible BSM particles. The search for dark energy also continues in cosmology via large surveys, such as the DES (Dark Energy Survey). “How do scientists devise experiments and models to look for new physical entities, whose exact nature may be different from what their models suggest?” asks Professor Massimi.

This question forms an important part of the project’s overarching goal, with Professor Massimi and her team undertaking fieldwork at CERN and DES to understand the modelling challenges facing physicists. “We are trying to understand how scientists are coming up with new methods, assumptions and modelling techniques,” she outlines.

A prime motivation behind this project is defending the realist view that scientific truth matters, and there are good reasons for being realist about science despite the situated nature of scientific knowledge. The perspectival component of the project suggests that we can’t build an omniscient view of the natural world, precisely because we are limited human beings. “We have limited resources and our knowledge is always situated in a given scientific perspective,” says Professor Massimi. Hence, the project aims to combine perspectivism and realism: “My goal is to develop a fully-fledged philosophical view called ‘perspectival realism’ where we can spell out in detail how one can be a realist about science, while also taking on board lessons from the history of science and current scientific practice,” points out Professor Massimi.



## Perspectival Realism. Science, Knowledge and Truth from a Human Vantage Point

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W: <http://www.perspectivalrealism.org>

W: <http://www.perspectivalrealism.org/publications/>



Professor Michela Massimi  
Principal Investigator

E: [Michela.Massimi@ed.ac.uk](mailto:Michela.Massimi@ed.ac.uk)

W: <https://sites.google.com/site/philosophymassimi/>

Professor Michela Massimi is Professor of Philosophy of Science at the University of Edinburgh. She is the PI on ERC Consolidator Grant “Perspectival Realism”. From 2011 to 2016 she was Co-Editor in Chief of the *British Journal for the Philosophy of Science*. She is currently Vice-President of the European Philosophy of Science Association. She has authored numerous articles in history and philosophy of modern science.

revolution. A prominent example is the passage from Ptolemaic astronomy to Copernican astronomy,” says Professor Massimi.

The discovery of new physics Beyond the Standard Model (BSM) – if there is such physics, as some physicists believe – would represent another significant conceptual change, says Professor Massimi. “Scientists have been looking for the existence of BSM particles, some of which may include candidates for what we call dark matter,” she says. “Cosmological evidence suggests that our universe is made of dark energy and dark

