The Epistemic Role of Scientific Idealization

Results in Brief

Scientific explanation of natural phenomena

EU-funded researchers are reviewing the most recent ideas on how to help people understand why observable events with a scientific basis occur the way they do.

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A natural phenomenon can be detected by the senses and is not man-made. Moreover, it's not manifest by intuition or reasoning. Classic examples are rainbows, thunder and, going to the biological, decomposition of fruit. However, problems arise when the phenomena involve an understanding of some of the concepts arising in physics such as infinity.

The IDEALIZATIONS (The epistemic role of scientific idealization) project has provided a critical evaluation of the current views regarding scientific idealisation. The researchers have also proposed a new position that overcomes the shortcomings of present-day idealisation.

Using a causal account, the IDEALIZATIONS team drew on recent views expounded by Michael Strevens and James Woodward. They also included the arguments of James Ladyman and Steven French that state that objective knowledge should not be variable. Building on the work by David Hilbert in maths and physics, some of it more than a century ago, the researchers explained how objective scientific

knowledge can be provided without using the causes of the phenomena.

IDEALIZATIONS research identified previously overlooked conflicts between the causal approach and the typical idealisation methods in physics. The work emphasised that idealisation procedures are widespread in the discipline. Analysis indicated that there is a need for a careful analysis of widespread idealisation procedures in physics. The researchers suggested that a new concept of scientific objectivity would overcome some of the limits of structural rigidity.

Project discussion and analysis led to a novel conception of scientific idealisation that can satisfy both objectivity and understanding. One means by which this can be achieved is through idealisation control from, for example, proof that deviation from expected results is due to experimental error.

IDEALIZATIONS discourse and analysis have sparked great interest in the world of science of philosophy. Internationally, the work has featured in more than 20 talks and contributed to presentations at conferences. Papers have been published in high-ranking journals and media including Synthese, History and Philosophy of Logic, Studies in the History and Philosophy of Modern Physics and HOPOS: The Journal of the International Society for the History of Philosophy of Science.

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