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Models and Reality

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The author will discuss the role of theoretical investigation, versus observation of natural phenomena, in the advancement of science. The progressively deeper understanding of our solar system from Aristotle to Einstein will be used as a paradigm for the scientific investigation process. Models are needed to create new and more powerful frameworks for understanding nature. Observational facts or data are needed first to validate and eventually to falsify the accepted models, so that new theoretical ideas could take form. The rapid progress of computing machines has ushered a new age of fast scientific advances (?) based mostly or solely upon numerical modeling products that may or may not stand upon an adequate factual basis. The author will use the example of climate modeling to discuss the opportunities and risks of these new developments.