

## Introduction, SI of Synthese “The collective dimension of science”

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Scientists are not isolated agents: they collaborate in laboratories, research networks and large-scale international projects. Apart from direct collaboration, scientists interact with each other in various ways: they follow entrenched research programs, trust their peers, embed their work into an existing paradigm, exchange concepts, methods and results, compete for grants or prestige, etc.

The collective dimension of science has been discussed by philosophers of science in various ways, but until recently, the use of formal methods has been restricted to some particular areas, such as the treatment of the division of scientific labor, the study of reward schemes or the effects of network structures on the production of scientific knowledge. Given the great promise of these methods for modeling and understanding of the dynamics of scientific research, this blind spot struck us as surprising. At the same time, social aspects of the production and diffusion of knowledge have been

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investigated in related fields like social epistemology, economics, and distributed cognition; but within these approaches, there is not always a focus on the unique properties of scientific communities and scientific knowledge. Overall, the study of science as a collective phenomenon is an active field of investigation, but scattered across different sub-disciplines, leading to insufficient integration of results and cross-fertilization.

In this context, the need was felt to integrate results and insights from epistemology, philosophy of science, formal approaches and empirical studies in order to analyze science and its collective dimension.

This was the subject of a conference held in Nancy, France, at the MSH Lorraine, in December 2011. The papers in this special issue were presented at this conference. The conference was made possible by generous support of MSH Lorraine (research project COLEXIA) and Archives Poincaré (UMR 7117, CNRS, Université de Lorraine).

This special issue is an effort to further the discussion that we began in Nancy. The papers in this issue rely on a variety of methods, but provide complementary views into the collective dimensions of science. We see this as a step on the way towards a more unified set of questions and methods of investigating them.

We would like to thank authors and referees for their work, as well as participants to the conference for their contributions and stimulating discussions, all of which contributed to the quality of the present papers.

Finally, we are grateful to the Synthese editors, Otavio Bueno, Vincent F. Hendricks, Gila Sher and Wiebe van der Hoek for their trust and support of the project of a special issue within this journal about the topic of the conference. We hope this special issue will contribute to the advancement and integrated treatment of the investigated questions and the development of formal methods to tackle them.