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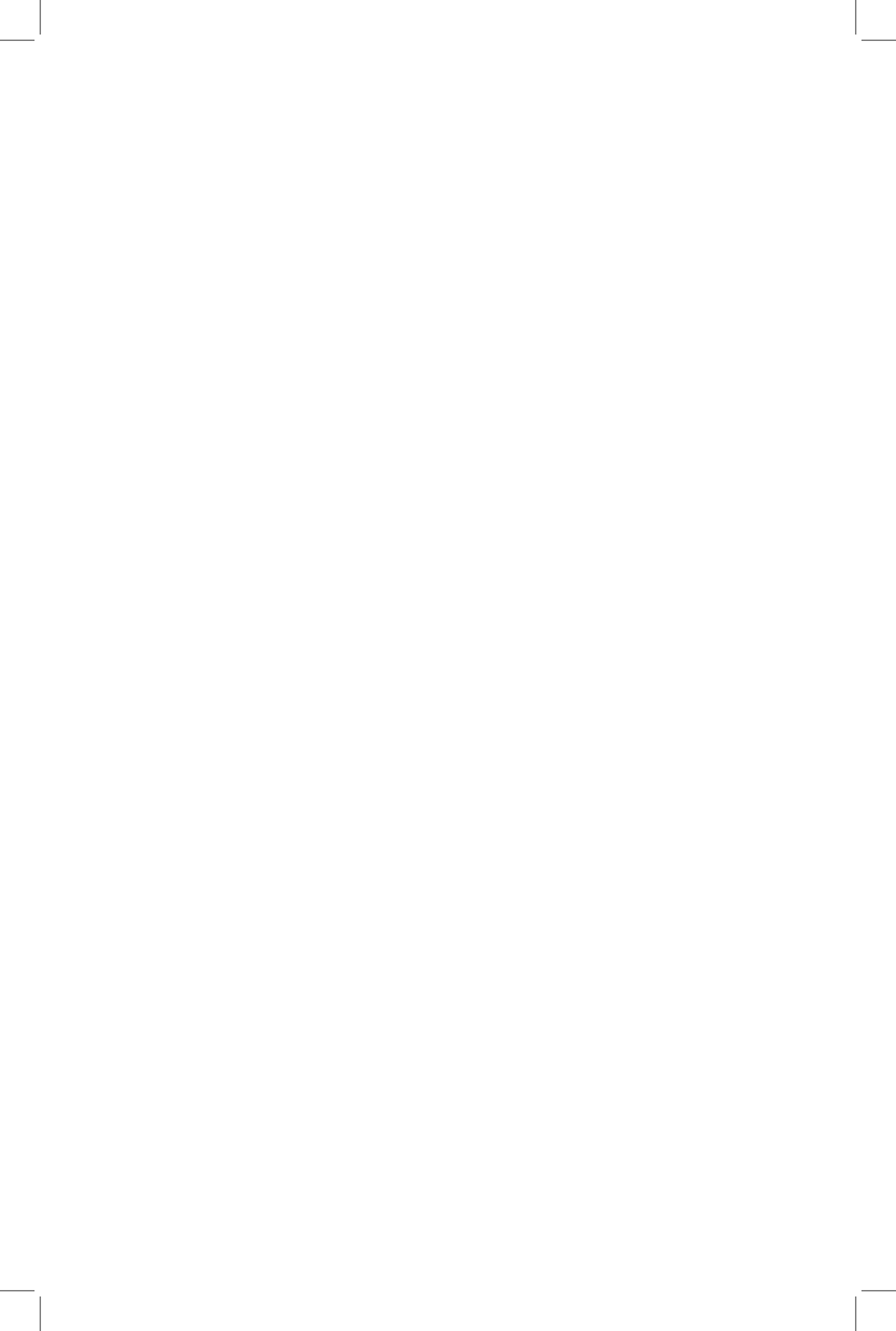
# Physics and Philosophy

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Philosophy

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## Foreword

The present book is a collection of eight texts which were presented in an abridged version at the meeting *Physics & Philosophy* organized by the University of Split on the July 8th and 9th 2013. The intention of the meeting was to establish and foster a dialogue between natural sciences and philosophy, something which is still in its seminal form in Croatia. The lack of a proper dialogue has negative consequences on mutual perception of natural scientists and philosophers alike. Often it is the case that not only students but also established natural scientists perceive philosophy as of no relevance on their own work and professional interests. On the other hand, philosophers and those interested in philosophy often see natural sciences as too technical, and of no use for their enquiries. The mutual lack of interest is in contradiction with the long tradition of European education in which natural sciences emanated from philosophy. Moreover, philosophical thinking is a never-ending effort to understand the world and the position of human beings in it. It was grounded in the belief that humans are able, by their rationality, to capture the essence of the world. The following steps were based on the conviction that only by observing the world and experimenting with it, we may understand its functioning. This approach was the basis of the modern science whose one of the most important element is the concept of causality.

One of the crucial moments in the development of natural sciences is the appearance of the quantum theory. Although existing for already more than hundred years, it is still to find its right place in the human adventure of understanding the world. Under the influence of the quantum theory, one of the main pillars of classical science, causality, has been put into question. Today most of the physicists agree with the statement that they do not understand the quantum world in its entirety. On the other hand, the interest of philosophers for it was quite limited, probably due to the intrinsic difficulties of the whole field. One of the principal obstacles was its high degree of mathematization. Mathematics is playing

the principal role in physics and it may be said that it is the only language in which the quantum theory may be correctly expressed, because any expression in an ordinary language is not more than a metaphor.

Although there is an immense progress in science in the last century, it was not followed by an adequate development in philosophy – inasmuch as it can be spoken about progress in philosophy. Some modern philosophers developed even an antiscientific attitude, which is quite common among students of philosophy. This situation may be changed by proposing curricula which combine humanistic and scientific subjects.

Could a common effort of physicists and philosophers help to do some progress in this domain? After a century of self-confidence in physical science, it is the moment when its critical analysis is needed, and as well as the judgment of its achievements and drawbacks. This is particularly true for its most outstanding theory, quantum mechanics, to which the meeting in Split in 2013 was principally dedicated. Meanwhile, there are ever louder voices coming from both sides advocating the necessity of mutual interest and understanding.

The papers collected in this book reflect some of the above-mentioned problems and thus aim at contributing to bridge the gap between natural scientists and philosophers.

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*Editors*