

# ANNALES DE L'I. H. P., SECTION A

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## Préface

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## PRÉFACE

*Jean-Pierre Vigier has been for forty years one of the most active members of the Laboratoire de Physique Théorique of the Institut Henri Poincaré. From the time he spent studying under Louis de Broglie until the present—and we hope for many years to come—his driving personality, his communicative enthusiasm for new and sometimes unconventional ideas, his unshakable belief in the rationality of the Universe have marked all these who, in great numbers and from all around the world, have worked with him, collaborated, or even argued with him.*

*This special issue of the « Annales de l'Institut H. Poincaré » is therefore a tribute to him and completes a one-day conference held in his honour at the Institut Henri Poincaré in February 1988.*

*Instead, however, of trying to cover the numerous areas of theoretical physics to which Vigier contributed—they range from Cosmology to Astrophysics and Quantum Field Theory, as the accompanying selected list of his publications witnesses—we decided to concentrate on the particular theme which has lately been the main focus of his interests, namely the nagging question of finding a coherent and intelligible interpretation of Quantum Mechanics.*

*This problem is not new. Indeed the famous Einstein-Podolski-Rosen paper, which did so much to clarify the issues at stake, is now over fifty years old, and everyone interested in the history of thought knows of the efflorescence of ideas and the sometimes raging controversies that this problem triggered.*

*We therefore certainly did not attempt to review this question thoroughly in this volume of the « Annales ». Rather, we tried to emphasize two of its aspects that are relatively new.*

*First, the fact that some of these subtle problems of interpretation are now framed in terms of contradictory predictions that can be tested experimentally; and in this area the contribution of Vigier and his school is undoubtedly prominent. Second, the fact that the interpretation of Quantum Mechanics has become a crucial issue in the setting of theories that aim at unifying gravity with the other, quantized, interactions. Indeed questions about the reconciliation of the concept of a quantum particle, which is global, with Einstein's principle of equivalence, which relies on the local geometry of space-time, or questions, in Quantum Cosmology, about the meaning of the concept of the « wave-function of the universe » are now being asked and answers attempted.*

*The title given to this volume « Quantum non locality and the Global Structure of Space-Time » hence summarises our scope, which still falls short of rendering justice to the numerous facets of Jean-Pierre Vigier's talents. Let us hope that he will long continue to astound us with new and challenging ideas.*

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