Foreword

This book is the sixth in a series of lectures of the *Séminaire Poincaré*, which is directed towards a large audience of physicists and of mathematicians.

The goal of this seminar is to provide up-to-date information about general topics of great interest in physics. Both the theoretical and experimental aspects are covered, with some historical background. Inspired by the Bourbaki seminar in mathematics in its organization, hence nicknamed "Bourbaphi", the Poincaré Seminar is held twice a year at the Institut Henri Poincaré in Paris, with contributions prepared in advance. Particular care is devoted to the pedagogical nature of the presentations so as to fulfill the goal of being readable by a large audience of scientists.

This volume contains the eighth such Seminar, held in 2005. It is devoted to Quantum Decoherence. A broad perspective on the subject is provided by the contributions of W.H. Zurek (introductory), H.D. Zeh and E. Joos (historical), together with clear (precise) up-to-date presentations of the recent experiments on decoherence both in the mesoscopic systems of atomic physics, by J.M. Raimond and S. Haroche, and in the "quantronic" or condensed matter context, by D. Esteve et al. Finally the question of quantum codes and error corrections is discussed in the contribution of J. Kempe.

We hope that the publication of this series will serve the community of physicists and mathematicians at graduate student or professional level.

We thank the Commissariat à l'Énergie Atomique (Division des Sciences de la Matière), the Centre National de la Recherche Scientifique (Sciences Physique et Mathématiques), and the Daniel Iagolnitzer Foundation for sponsoring the Seminar. Special thanks are due to Chantal Delongeas for the preparation of the manuscript.

Bertrand Duplantier
Jean-Michel Raimond
Vincent Rivasseau