Foreword

Star formation is one of the major problems of contemporary astrophysics, at the crossroads between galaxy formation and planet formation. Recent instrumental progress in resolution and sensitivity, for telescopes both on the ground and in space, allows to observe star formation farther and deeper, not only in distant regions of our Galaxy, but also in relatively close galaxies like the Local Group, or even farther in the case of the spectacular star formation occurring in colliding galaxies. One can speak here of "resolved" star formation.

On theoretical grounds, the increasing power of modern computers allows sophisticated modeling and numerical simulations to be confronted to ever more precise observations. This leads to a much improved understanding of three decisive factors controlling star formation: *(i)* interstellar turbulence, which can be a determining factor in regulating stellar formation and mass distribution; *(ii)* magnetic fields, which determine the timescale for gravitational collapse in molecular clouds; *(iii)* metallicity, which regulates the radiative transfer and cooling of collapsing material.

This volume offers lectures given by world experts in this field during the *Evry Schatzman School on Stellar Physics (EES)* of the Programme National de Physique Stellaire (PNPS/INSU/CNRS), held in September 2010 in the French Alps. The latest results – observational, theoretical, and numerical – are reviewed and discussed extensively. Therefore, we trust this book will be a valuable reference for researchers and students in physics and astrophysics in the coming years.

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