Low-Mass Stars and the Transition Stars/Brown Dwarfs – EES2011
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Foreword

Low-mass stars are the dominant stellar component of the Galaxy (M-dwarfs account for 75% of the stars) and make up the main part of baryonic matter. Our understanding of the Galaxy therefore relies upon the description of these faint objects. Moreover, an increasing number of M dwarfs are now known to host exoplanets, including super-Earth exoplanets.

The prolongation of the M-dwarf sequence towards cooler dwarfs leads to the L spectral type region, shared by stellar and substellar objects. This transition is not very well known and new processes occur at these low temperatures, such as the condensation of solids in clouds. Even cooler atmospheres are dominated by methane bands (T dwarfs), ammonium bands (Y dwarfs) and silicate clouds are formed deeper in the atmosphere.

On the theoretical side, this field is rapidly evolving with the improvement of models, from classical ones (static, 1D) to hydrodynamical models. On the observational side, the technical progresses during the last decade allow to construct statistically large sample to start statistic studies, to collect more and more detailed (spectroscopic) data, and to discover ultra-cool brown-dwarfs filling the gap between stars and giant planets.

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, held in Septembre 2011 in Roscoff, France. It gives the status of our understanding of the cool dwarfs physics on the theoretical and observational sides. The latest results are reviewed and discussed extensively. Therefore we trust this book will be a valuable reference for researchers and students in the coming years.

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