

## Preface

Most of the objects in the Universe are of fluid nature. Despite this evidence, it is only recently that astrophysical fluid dynamics has really known a rapid development. A reason for that is of course the increase of the power of computers which are an inescapable tool to deal with the partial differential equations of fluid mechanics.

Almost twenty years after a celebrated summer school in Les Houches (1987), two schools have been organized on Astrophysical Fluid Dynamics by the french astrophysicists: the first one was held in Aussois in September 2004 as part of a cycle devoted to stellar physics and initiated by Evry Schatzmann; the second one, held in Cargèse in May 2005, embraced almost all subjects of Astrophysical Fluid Dynamics and was organized in honour of Silvano Bonazzola and Jean-Paul Zahn on the occasion of their seventieth birthday. Both Jean-Paul and Silvano much contributed to the field but above all, they played a decisive role in the education of young scientists in this domain of Astrophysics. The variety of the subjects gathered in this volume reflects the wideness of their interests.

These lecture notes have been organized in three parts focussing respectively on some fundamental aspects of fluid dynamics, on the numerical tools and on the particular problems found in all types of stars, from the most familiar, the Sun, to the strangest, the neutron stars. Some of the lectures notes contain only a summary and references; in these cases the authors have indeed preferred not to repeat existing literature and they refer the reader to the texts mentioned in references.

We hope that these lecture notes will help researchers committed in the subject, and especially the youngest, to become more acquainted with the domain and to find there, like Jean-Paul and Silvano, an interesting and challenging playing field!

**The Editors**

**Michel Rieutord and Bérengère Dubrulle**

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Our dedicatees: Silvano Bonazzola (*left*) and Jean-Paul Zahn (*right*) in Meudon observatory.