

Foreword

This book, entitled “The CoRoT Legacy Book”, is dedicated to all the people interested in the CoRoT mission and the beautiful data that were delivered during its six-year duration. Either amateurs, professional, young or senior researchers find treasures not only at the time of this publication but also in twenty or thirty years ahead.

It presents the data in their final version, explains how they have been obtained, how to handle them, describes the tools necessary to understand them, and where to find them. It also highlights the most striking first results obtained up to now. CoRoT has opened several unexpected directions of research and certainly new ones still to be discovered.

The book consists in 5 Parts, divided into chapters which can be used and also downloaded separately.

Part I recalls the successive steps followed by the scientists and shows that it took a long time to promote this new domain of ultra-high precision and long-duration stellar photometry from space. As it was indeed rapidly understood that this type of research could only be done from space, this domain entered the wild competition of space mission selection. Fortunately, however, this long period of maturation brought about several selections in different countries and opened the way for future more ambitious projects, as described in Part V.

Part II is dedicated to the data themselves. Chapter 1 presents the observing program achieved over the 6 yr of operation, the choice of the regions to be observed, the target selection and the tunings of the instrumental settings, very important indeed to understand the data.

Chapters 2 and 3 describe the successive steps of correction necessary to get rid of the spurious instrumental perturbations, and to obtain the required precision, which has largely overpassed the requirements. Chapter 4 explains how to use the “Ready to use” N2 data, and Chapter 5 where to find them.

Parts III and IV enlighten several major results, in the main directions, addressed by CoRoT:

- the exoplanet-hunting program presented in Part IV with not only the detection of planetary transits, but also the deep characterization of the planets thanks to intensive complementary ground-based observations and their joined analysis;
- star-planet interaction: a new direction of research, initiated by CoRoT but still in its infancy;
- stellar physics: use of the seismology technique to obtain information on the internal structure of the stars under scrutiny but also on their rotation;
- stellar activity and environment: interpretation of the new information from the time-domain photometry;
- ensemble asteroseismology: an entirely new approach of the chemical evolution of our Galaxy.

Part V outlines the major lessons learned on technical as well as managerial domains, and how they have been used to define new projects, thanks to this mission.

The influence of the results of CoRoT on the scientific priorities of the exoplanet and stellar community has been very important, it is emphasized in Chapter 2, and finally Chapter 3 describes the projects of the immediate future.

Enjoy the CoRoT data!

Acknowledgements

The CoRoT adventure has been possible because it was a collective work, done by many different people, engineers, administrators, technicians, scientists. They all have devoted enormous efforts, their enthusiasm and their skills over the years for the success of this project.

The CoRoT world thanks all its supportive organizations:

The French space agency, CNES, who took the risk of this adventure, and supported it throughout its life. The European Space Agency and the Space agencies of Austria, Belgium, Brazil, Germany, Spain

Ministries of Research, Astronomical societies, academies. . . of the participating countries

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This book is the last collective publication of the CoRoT Team.

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