

# JOINT DISCUSSIONS

JD1

Atomic and Molecular Data For Astrophysics:  
New Developments, Case Studies and  
Future Needs

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## Joint Discussion 1: Foreword

The past few years have seen tremendous advances in observational techniques, both in space and on the ground. In the near future, several new ambitious and expensive spaceborne and ground based instruments will become available and provide a wealth of high quality observations in an extended range of wavelengths. The reduction, analysis, interpretation and modelling of the observational results requires at each stage increasingly extensive sets of atomic and molecular data, especially since the objects studied are often in extreme physical conditions which cannot be reproduced in the laboratory and can be studied only by modelling.

In the past, a large part of the data needed has been spontaneously provided by the Atomic and Molecular Physics community in the course of its own development. However, more and more specific needs are appearing in connection with space and ground based observations. These specific needs have to be covered through concerted efforts and at least partially funded by the Astronomy and Space budgets.

In this respect, it is the function of Commission 14, first to help keep the astronomers informed of the available data and of the programs undertaken in other communities, second, to favour the exchange of information in order to make the Atomic and Molecular Physics community aware of the needs of Astronomy for new data and, finally, to make the program agencies aware of the needs for specific studies and funding in these areas.

With these objectives in mind, the Joint Discussion was organized around topics chosen either because they correspond to future or recent space missions or because they are fast moving and are particularly in need of new laboratory data. In addition, case studies were included in which a particular species or process was studied from several angles, in order to illustrate its contribution to the interpretation of astronomical observations and the construction of models.

The present proceedings comprise short reports written by the invited speakers, the titles of the poster contributions and a list of contributors with addresses. Unfortunately, the abstracts of the poster contributions could not be accommodated within the space allotted to the proceedings, they can be obtained on the commission's website [1]. We hope this material will constitute an introduction to current problems at the interface of Astrophysics and Atomic and Molecular Physics as well as a useful reference base for further reading and contacts. More information can be obtained from the triennial report of Commission 14 [2].

It is my pleasure to acknowledge the contribution of the IAU Secretariat and Executive Committee, particularly through the attribution of travel grants which helped a number of speakers and participants to attend the General Assembly. Thanks are due also to the Scientific Organising Committee members and especially to the session organizers (T. Henning, E. van Dishoeck, T. Millar, K. Berrington and S. Atreya). The Joint Discussion greatly benefitted from the

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[1] <http://www.obspm.fr/IAU14/>

[2] *Reports on Astronomy*, Vol. XXIVA, J. Andersen (ed.) 1999 IAU