Coronae of stars and accretion disks

Bonn, 12-13 December 2006

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FOREWORD

The conference ”Coronae of Stars and Accretion Disks” was held on 12-13 December 2006 at the Max Planck Institute for Radio Astronomy in Bonn, Germany. The aim of the conference was to review the current status of the knowledge about coronae in various environments, to spotlight existing analogies and differences, and to develop cross-disciplinary collaborations between scientists working on different aspects of coronal physics.

Coronae are an ubiquitous phenomenon among a wide variety of objects. Observations of the solar corona, the best studied case, revealed a magnetic field with an extremely complex structure consisting of widely different scales, which confines hot plasma and relativistic particles. X-ray and radio observations provide clear evidence that coronae exist not only in solar-like late-type stars, but also among fully convective, very low-mass stars. Furthermore, young stellar objects generally show highly elevated levels of coronal activity. Finally, also accretion disks, which exist around very different classes of objects such as protostars, degenerate stellar objects, and supermassive black holes, can be surrounded by coronae. Whereas significant progress in our understanding of coronal physics has been made during the last years, many aspects like the generation of magnetic fields in MHD dynamos, the heating of the coronal plasma, the acceleration of particles, the complexity of coronal plasma structures and their interactions still continue to pose big challenges to observers and theoreticians. Coronal physics is a multi-wavelength science by definition; observations from radio wavelengths to gamma-rays are needed to describe the whole range of coronal features. It is also essential to exchange ideas and results from coronae in the different environments. Scientists working on the many different facets of coronal physics have to be brought together, and the conference in Bonn has been a first step in this direction.

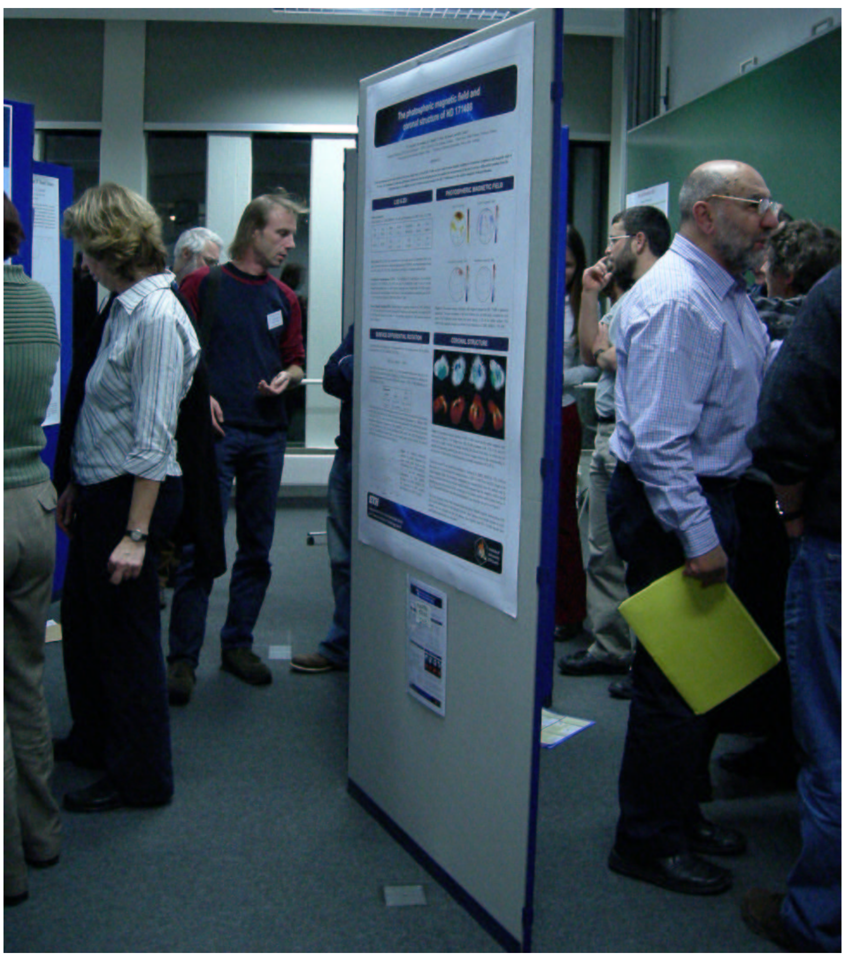
Observational results as well as theoretical aspects of coronae were discussed in four scientific sessions. The first session was focused on the basic physical process of magnetic reconnection, common to all studied environments. The solar and stellar coronae were the topic of the second session, while the third session was dedicated to coronae in young stellar objects. In the last session, the environment in microquasars and AGNs and flares in accretion disk coronae were addressed. The essential aspects of coronae were highlighted in fourteen invited review talks (35 minutes each) given by leading experts in these fields. The topics were further explored in 29 contributed talks, each of them accompanied by a poster. Ample time was also assigned for discussions and poster sessions.

A better understanding of coronae needs a close co-operation between solar, stellar, and disk astronomers, and also between theory, 3D MHD simulations, and observations. The very positive feedback we received from many participants during and after the meeting in Bonn shows that our conference has provided a good starting point in developing such cooperations.

Finally, we would like to thank the sponsors of the conference, the EU Consortium RadioNet and the Max-Planck-Institute for Radioastronomy. It was through their generosity that the local expenses could be covered and that the meeting was so well attended.

Maria Massi and Thomas Preibisch

S.V. Berdyugina and E. Rieger



Poster Session