Preface

The Sun and heliosphere, the most accessible example of a magnetically variable star and its sphere of influence, are of renewed and increasing interest at the turn of the millennium. Recent space missions have provided startling, new insights into the physics of stellar interiors, atmospheres, and extended plasma and energetic particle interactions. An unprecedented array of such robot observatories, strategically located throughout the heliosphere and the geospace environment, has allowed us startling new insights into the Sun and its surroundings from solar minimum through the rise of cycle 23.

Many of these insights were obtained with instruments on the *Solar and Heliospheric Observatory (SOHO)*, a joint ESA/NASA mission, which, from its vantage point of an L1 halo orbit is able to obtain continuous observations of the Sun, the inner heliosphere, and the solar wind and energetic particles streaming toward the Earth. The SOHO helioseismology investigations have opened a new field in solar research, local area helioseismology, which, although still in its infancy, has already provided revolutionary views of the deep structure of large-scale convection and flows, emerging active regions and sunspots, which are important for understanding the dynamics of the convection zone and the origin of solar activity.

The six remote sensing instruments on board SOHO (EUV, UV and visible light imagers, spectrographs and coronagraphs), together with the X-ray instruments on the Japanese *Yohkoh* spacecraft and the high resolution EUV imager on the NASA TRACE spacecraft, have given us our first comprehensive view of the outer solar atmosphere. This new class of observations has led to substantial advances in our understanding of the dynamics, mass loss, and magnetic energy dissipation in the transition region and corona, results that are of fundamental importance for the study of cool star atmospheres and stellar winds.

Finally, the remote sensing observations are complemented by *in-situ* measurements by three SOHO particle and plasma instruments and numerous similar experiments and magnetometers on a fleet of other heliospheric space mission, among them the US missions Wind and ACE as well as the highly successful joint ESA/NASA *Ulysses* mission, which has provided the first out-of-ecliptic, in-situ measurements of the inner heliosphere. These new vantage points have literally added a new dimension to our understanding of the heliosphere. These and other missions have provided us with a wealth of new data, thereby increasing significantly our understanding of the composition and large scale structure of the solar wind, energetic particles and galactic cosmic rays, the interplanetary dust and interstellar gas, as well as plasma processes in the interplanetary medium.

The Symposium was held in Manchester, UK, 2000 August 7 – 11, the last day of which was shared with a stimulating Joint Discussion on "The Sun and Space Weather", during General Assembly XXIV. The Symposium, attended by more than 200 participants from 33 countries consisted of 182 presentations: 26 invited review papers, 31 contributed oral papers, and 125 contributed poster papers. The Symposium was sponsored by Commission 12, and co-sponsored by Commissions 10, 36, 44, and 49, as well as by SCOSTEP. We are grateful for travel support generously provided by the IAU, ESA, and NASA.

The Scientific Organizing Committee (SOC) consisted of B. Fleck (Co-Chair), P. Foukal, C. Fröhlich, A. Gabriel, J.B. Gurman (Co-Chair) R. Harrison, E. Marsch, V. Obridko, G. Poletto, P. Scherrer, K. Schrijver, G. Simnett, T. Watanabe, and L Woltjer. We are indebted to the SOC members for their support, to the Local Organizing Committee of the General Assembly for providing outstanding facilities for the Symposium at the University of Manchester, to the producers and distributors of the film SOLARMAX and the National Theatre of Film and Photography in Bradford for the special screening we enjoyed, and to all of our colleagues in attendance who made this such a memorable Symposium.

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