CONFERENCE PROCEEDINGS

We have recently received (2000 March) copies of two conference proceedings published by the Astronomical Observatory of the Jagiellonian University in Cracow, Poland. The first is entitled Relativistic Jets in AGNs (edited by M. Ostrowski et al.) and it derived from a conference in 1997 May; the second, Plasma Turbulence and Energetic Particles in Astrophysics (edited by M. Ostrowski & R. Schlickeiser), reports a conference held in 1999 September, just six months before the book was received at the editorial office. Both proceedings are offered to interested parties without charge, provided that any shipping and handling costs are met. Requests should be sent to the Librarian, Astronomical Observatory, Jagiellonian University, PL 30-244 Krakow, Poland. This notice will not necessarily preclude reviews of these books.

THESIS ABSTRACT

EXTREME ULTRAVIOLET SPECTROSCOPY OF THE SOLAR CORONA

By G. Del Zanna

New Extreme Ultra-Violet (EUV) observations of the solar corona, obtained by the Coronal Diagnostic Spectrometer (CDS) instrument on board the NASA/ESA Solar and Heliospheric Observatory (SOHO) are presented. The CDS instrument for the first time has provided the opportunity of observing a large number of emission lines from a wide range of ions of different elements. The spectral and spatial resolution of the CDS instrument has allowed the simultaneous application of a wide range of spectroscopic diagnostic techniques to determine the temperature distribution, densities, and elemental abundances in the solar plasma. A differential emission measure (DEM) diagnostic technique has been used to infer the temperature structure and the element abundances. The importance of including DEM effects in the element abundance analysis is demonstrated. A complete in-flight cross-calibration between all the CDS detectors (NIS and GIS, 150–785 Å) is presented here for the first time.

The level of accuracy and completeness of the CHIANTI atomic database, used throughout this thesis, has allowed the identification of the many hundreds of spectral lines observed in the CDS spectra, resulting in several new line identifications. An assessment of the GIS solar spectra is presented, showing that, in spite of complexities, GIS spectra are useful for diagnostic analyses. Many discrepancies (in particular with the Li-like ions) between theory and CDS observations are highlighted. It is shown that some of these may be explained by inaccurate ionization-equilibrium calculations.

Coronal-hole densities, temperatures, DEMs, and relative element abundances from both off-limb (plume and inter-plume regions) and on-disc observations are derived and compared with quiet-Sun values. These included (1996 August) a large equatorial hole, the Elephant's Trunk, probably the best example of a coronal hole observed by SOHO. Coronal-hole densities in both coronal ($N_e \approx 1 \times 10^8$ cm$^{-3}$) and transition region ($N_e \approx 1 \times 10^{10}$ cm$^{-3}$) plasma were found to be about a factor of two lower than in the quiet Sun, with much lower emission measures at temperatures above $10^6$ K. Moreover, in the tran-
sition region, the cell-centres in both coronal holes and quiet-Sun regions show consistently higher densities (factor of two) compared to those in the network. Relative element abundances show approximately photospheric values for the coronal holes, with an indication of element abundance variation (neon in particular) with the supergranular structure.

On-disc EUV observations of coronal-hole plumes have been performed. These allowed a spectroscopic characterisation of plumes to be obtained for the first time, leading to the first identification of a low-latitude plume near the centre of the disc. Plumes are shown to be quasi-isothermal structures, with temperatures $T \approx 7-8 \times 10^5$ K. Abundance analyses (using transition-region lines) reveal a small first-ionisation-potential (FIP) effect in these plumes, together with a decreased Ne/O abundance ratio (compared to photospheric).

— University of Central Lancashire; accepted 1999 November.

**Here & There**

**POORLY DEFINED**

For the definition of $Rm_{\text{crit}}$ see Section?? — *Astron. Nachr.*, 320, 130, 1999.

**HISTORY LESSON**

GCSE astronomy course at the RGO. — *Newsletter of the Association for Astronomy Education*, 19, 2, 1999.

**TO WELCOME HUYGENS**

The ringed planet Saturn follows close behind Jupiter, although it is much less bright. Its moons are now almost fully open... — *Daily Telegraph*, 1999, October 30.

**CHECK THE SMALL PRINT**

... images of the contrast binaries ... have been studied. — *MNRAS*, 202, 1221, 1999.