Solar and stellar magnetic fields

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Main content

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The study of stars was once the central topic of astrophysics. However, the advent of large telescopes with efficient detectors plus the ability to observe non-optical radiation have made the present time the golden age of extragalactic astrophysics. Now these same advances are being applied to stars, with the result that a renaissance of stellar research is under way and this field is one of the most rapidly growing in astrophysics.

The present volume is good indication of current research on the physics of stars, specifically on activity that is thought to be caused by magnetic fields generated within stars. The book is the proceedings of a symposium that was cosponsored by no fewer than six comissions of the International Astronomical Union. Such broad sponsorhip indicates the wide interest in the subject. The organizing committee of te symposium chose to limit oral presentations to 17 invited reviews, 36 papers selected from submitted abstracts, and five summaries. An additional 56 papers were presented as posters. The book follows this organization by including all of the oral presentations save one. Poster papers are listed by title and author only. The result is the first IAU symposium volume that includes only half of the contributions. One hopes this is not the start of the new trend. The value of the book would have been greatly enhanced if at least the abstracts of the other papers had been included. the papers that are included fairly represent the symposium as a whole with one major exception: only five papers on solar observations, of the some 29 such papers presented...

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Solar and stellar dynamos (SOLSTAR group). All activity phenomena in the Sun and stars originate from their magnetic fields, which arise due to a hydromagnetic dynamo that converts kinetic energy into magnetic form. Even the solar dynamo remains enigmatic due to the extreme complexity of phenomena related to it. Observations of other stars provide important constraints on the stellar dynamo mechanism(s). The work of the group aims at combining these observations with theory and models to gain better understanding of the

solar dynamo. In our work, we combine state-of-the-art numerical simulatio During solar minimum, the magnetic field of the Sun looks similar to Earth's magnetic field. It looks a bit like an ordinary bar magnet with closed lines close to the equator and open field lines near the poles. Scientist call those areas a dipole. The dipole field of the Sun is about as strong as a magnet on a refrigerator (around 50 gauss). The magnetic field of the Earth is about 100 times weaker. Around solar maximum, when the Sun reaches her maximum activity, many sunspots are visible on the visible solar disk. These sunspots are filled with magnetism and large magnetic field lines which