

PREFACE

Once upon a time . . . when Ludwig Boltzmann, who was Chair of the Theoretical Physics Department, had already had proposed his statistical thermodynamics – which explained macroscopic phenomena with *atoms* – one of Boltzmann’s students came to an experimental-physics exam by Ernst Mach, the Chair of the Experimental Physics Department, and proceeded to made extensive use of these new ideas involving atoms. Soon, Mach, the classical experimentator, became angry and finally yelled at the student “Have you ever seen one . . .?”.

Well, it’s similar with starspots and other features that we believe should exist on stellar surfaces. Up to the day that you hold this volume in your hands, we would have said “well, we haven’t seen a starspot or a bright granule or a prominence yet either, *but* . . .”. However, it seems – if the discovery holds – that we are now able to present the first direct image of a star’s surface other than the Sun’s, and it shows a huge bright granule!

It has been a long and arduous journey. In the past decade, indirect (Doppler) imaging techniques have opened up a whole new discipline in stellar astronomy, providing increasingly detailed photometric, magnetic, and chemical inhomogeneity images of stellar surfaces. This is where Bill Wehlau’s name is directly associated, and it is appropriate to dedicate this Symposium to his memory. Starting with Deutsch’s and Wehlau’s work, such indirect imaging techniques have now been employed – with various degrees of success – for chemically peculiar Ap stars since the sixties, for spotted G and K stars since the early eighties, and for accretion disks since the late eighties and the early nineties. Consequently, a significant part of the meeting was devoted to this research.

Furthermore, new optical interferometers like the U.S. Navy Prototype Optical Interferometer (NPOI) and the U.K. Cambridge Interferometer are already being used with sophisticated interferometer techniques to image stellar surface structures, and in the future the ESO VLT Interferometer and other instruments will extend these capabilities enormously. These de-

velopments were highlighted in a special session on “Direct Imaging: The Last Frontier”.

The large number of recent results, ground-based and space-based, and the lack of a generally accepted dynamo theory with predictive power for the stars *and* the Sun, result in an ever growing complexity of the interpretation of individual results. Partially because of this, the IAU General Assembly in 1994 decided that it is time to dedicate a whole IAU Symposium to this burgeoning field. We gratefully acknowledge this support and thank the following commissions and their presidents: 10 (V. Gaizauskas), 25 (A. T. Young), 27 (J. R. Percy), 36 (W. Kalkofen), 42 (Y. Kondo), and 44 (J. Trümper).

The Symposium, held at the University of Vienna in October 1995, was attended by over 200 participants from 30 different countries who presented 55 talks and 105 poster papers. The posters were published as a separate proceedings volume which is available from the Institute for Astronomy in Vienna (send mail to iau@astro.ast.univie.ac.at). This volume is an important appendix to the present book which contains only the oral papers.

The meeting wouldn't have run well without a hard core of dedicated people. We are especially indebted to our chairwoman of the meeting office, Frau Dr. Anneliese Schnell, and to our secretary, Jeannette Höfingner, as well as to a large number of our astronomy students in Vienna. Thanks indeed. We also deeply thank Amelia Wehlau and our Canadian colleagues David F. Gray and John Rice for putting together the obituary on Bill Wehlau.

It is also a great pleasure to thank the numerous businesses and institutions that sponsored this meeting. Most noticeably we thank the city of Vienna and its mayor, Dr. Michael Häupl, for the splendid evening at the Rathaus and the Government Department of Science, Research, and Culture for their grant to support the review speakers. Significant contributions were also received from the European Space Agency, the Austrian Academy of Sciences, the Kulturstadt of the city of Vienna, the Austrian National Bank, the Austrian Space Agency, SigmaPharm, Bank Austria, the Vienna Business Promotion Fund, the Ottakringer Brewery, the Haltmeyer Copyshop, Eduscho Coffee, Inter-Unfall Insurances, Digital Equipment Corporation, Austria Collegialität Insurances, die Erste Spar-Casse Bank, Wien Tourismus, Ritter Sport Schokolade, Manner Josef & Co KG and, last but not least, to our kitchen artists who produced all these delicious home-made cakes and cookies for the daily coffee breaks. Many thanks to them all.

Klaus G. Strassmeier

and

Jeffrey L. Linsky

Vienna, December 1995