Foreword

MANY THEORETICAL AND EXPERIMENTAL INVESTIGATIONS conducted during the past two decades have involved as offshoot research topics the understanding of the nature and characteristics of interstellar grains. The formation and interaction processes of interstellar grains are very complex, and the problem of chemical identification of these grains has puzzled astronomers for many years. Information on interstellar grains has been obtained from observations of space reddening, from studies concerning the dependence of interstellar grain extinction on wavelength, and from interstellar polarizations.

The importance of this information to the physics and astronomy programs of the National Aeronautics and Space Administration may be fairly obvious. Thus when the National Science Foundation, under the auspices of Commission 34 of the International Astronomical Union, announced its sponsorship of an international Colloquium on Interstellar Grains in a dual effort to consolidate existing information and to stimulate new research, NASA extended support to the colloquium through a grant (NGR 32–018–050) and by publication of these proceedings. Because of the many similarities of the scientific problems encountered in the study of aerosols and interstellar grains, the New York State Atmospheric Sciences Research Center also contributed to the support of the meeting.

The colloquium was held August 24–26, 1965, at Rensselaer Polytechnic Institute in Troy, New York. The members of the organizing committee were Alfred Behr, Göttingen University Observatory, Göttingen, Germany; Jan Borgman, Kapteyn Observatory, Roden, The Netherlands; Bertram Donn, NASA Goddard Space Flight Center, Greenbelt, Maryland; J. Mayo Greenberg, Rensselaer Polytechnic Institute, Troy, New York; H. C. van de Hulst, Leiden University, Leiden, The Netherlands; and Bengt Strömgren, Princeton, New Jersey. Engineers actively engaged in studying the problems of interstellar grains or related fields were invited to participate.

Among the topics discussed were granular extinction; polarization and its dependence on wavelength and spatial distribution; scattering properties of grains; physics and chemistry of the formation and growth of interstellar grains; and the interactions of grains with the interstellar medium.

The presentation of many of the papers was followed by a brief discussion period; the remarks are included in this compilation. Some of the papers presented here have been modified or enlarged in response to the suggestions and contributions made during these discussion periods.

Several of the papers have appeared previously in part or in slightly modified versions in various scientific journals. These papers are identified, and footnotes give information concerning previous publication. This publication is, however, the only collection under one cover of the information presented at the colloquium and is expected to serve as a useful reference volume on interstellar grains.

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