

TABLE OF CONTENTS

LECTURES

Opening Lecture on the Plans of the European Space Research Organization by R. LÜST, <i>COPERS and Max-Planck-Institut für Physik und Astrophysik, München</i>	1
---	---

PART I / SOLAR PHYSICS

1. The Solar Photosphere by C. DE JAGER, <i>Sterrewacht 'Sonnenborgh', Utrecht</i>	13
2. The Quiet Chromosphere and Corona by C. DE JAGER, <i>Sterrewacht 'Sonnenborgh', Utrecht</i>	26
3. The Solar Center of Activity by C. DE JAGER, <i>Sterrewacht 'Sonnenborgh', Utrecht</i>	55
4. Optical Solar Flares by C. DE JAGER, <i>Sterrewacht 'Sonnenborgh', Utrecht</i>	78
5. Radio and X-Ray Emission Associated with Solar Flares by C. DE JAGER, <i>Sterrewacht 'Sonnenborgh', Utrecht</i>	86
6. Particle Emission Associated with Solar Flares. Model of Flare Events by C. DE JAGER, <i>Sterrewacht 'Sonnenborgh', Utrecht</i>	96
7. The Hydrogen Convective Zone of the Sun by E. SCHATZMAN, <i>Institut d'Astrophysique, Paris</i>	105
8. Wave Propagation in the Photosphere, Chromosphere and Corona by E. SCHATZMAN, <i>Institut d'Astrophysique, Paris</i>	112
9. Coronal Heating and Solar Wind by E. SCHATZMAN, <i>Institut d'Astrophysique, Paris</i>	122
10. The Solar Magnetic Field and the Solar Activity by E. SCHATZMAN, <i>Institut d'Astrophysique, Paris</i>	133

PART II / INTERPLANETARY MEDIUM

11. Interplanetary Medium by H. ELSÄSSER, <i>Landessternwarte, Königstuhl–Heidelberg</i>	149
12. Introduction to Plasma Physics by R. LÜST, <i>COPERS and Max-Planck-Institut für Physik und Astrophysik, München</i>	167
13. Interplanetary Plasma by R. LÜST, <i>COPERS and Max-Planck-Institut für Physik und Astrophysik, München</i>	181

PART III / IONOSPHERE AND HIGH LATITUDE PHENOMENA

14. Radio Aurora	213
by B. HULTQVIST, <i>Kiruna Geophysical Observatory, Kiruna</i>	
15. Disturbance Effects in the Lowest Ionosphere	228
by B. HULTQVIST, <i>Kiruna Geophysical Observatory, Kiruna</i>	
16. Irregularities in the Ionospheric Electron Density Distribution Causing Radio Wave Scintillation	247
by B. HULTQVIST, <i>Kiruna Geophysical Observatory, Kiruna</i>	
17. Theories of Aurora and of Magnetic Storms	257
by B. HULTQVIST, <i>Kiruna Geophysical Observatory, Kiruna</i>	
18. Magnetic Disturbances and Visual Aurorae	270
by A. OMHOLT, <i>Institute of Physics, University of Oslo</i>	
19. Auroral Effects on the Ionospheric E-Layer	284
by A. OMHOLT, <i>Institute of Physics, University of Oslo</i>	
20. Interpretation of Visual Aurora	293
by A. OMHOLT, <i>Institute of Physics, University of Oslo</i>	

PART IV / SPACE INSTRUMENTATION

21. The Space Environment	309
by A. P. WILLMORE, <i>University College, London</i>	
22. Rocket and Satellite Systems	317
by A. P. WILLMORE, <i>University College, London</i>	
23. Some Experimental Techniques of Space Research – Ionospheric Measurements	324
by A. P. WILLMORE, <i>University College, London</i>	
24. Some Experimental Techniques of Space Research – Measurements of Solar Electromagnetic Radiation	335
by A. P. WILLMORE, <i>University College, London</i>	

PART V / RETROSPECT

25. The Alpbach Discussions in Retrospect	347
by N. HERLOFSON, <i>The Royal Institute of Technology, Stockholm</i>	

SEMINARS

PART VI / SOLAR PHYSICS

26. A Rocket Experiment for Measuring Soft X-Rays From the Sun	355
by H. MASELAND, <i>Sterrewacht 'Sonnenborgh', Utrecht</i>	
27. High Resolution Solar Spectroscopy at the Jungfraujoch Scientific Station	357
by N. GREVESSE, <i>Institut d'Astrophysique, Cointe-Sclessin/Liège</i>	

PART VII / INTERPLANETARY MEDIUM

28. Scientific Results of the Mariner II Voyage to Venus by Leverett DAVIS, Jr. <i>California Institute of Technology, Pasadena, Calif.</i>	363
29. On the Penetration of Interplanetary Plasma into the Magnetosphere by H. ALFVÉN, <i>The Royal Institute of Technology, Stockholm</i>	369
30. Geomagnetically Trapped Protons by A. M. LENCHEK, <i>Observatoire de Paris, Meudon</i>	370
31. Cometary and Auroral Studies at Liège by L. REMY-BATTIAU, <i>Institut d'Astrophysique, Cointe-Sclessin/Liège</i>	387
32. Rocket Experiments, Laboratory Work and Equipment at the Astrophysical Institute of the University of Liège by F. REMY, <i>Institute d'Astrophysique, Cointe-Sclessin/Liège</i>	393

PART VIII / SOLAR COSMIC RAYS

33. Some Examples of Energy and Nature Measurements of Solar Particles by L. KOCH, <i>Centre d'Etudes Nucléaires, Saclay</i>	401
34. Some Comments About Diffusion of Solar Particles in Interplanetary Space by G. WIBBERENZ, <i>Institut für Reine und Angewandte Kernphysik, Kiel</i>	411
35. On the Relationship Between Zone X-Ray Bursts and Polar Magnetic Substorms by G. KREMSER, <i>Max-Planck-Institut für Aeronomie, Lindau/Harz</i>	415

PART IX / IONOSPHERE AND PLANETARY ATMOSPHERE

36. Positive Ion Reactions and Productions in the Ionosphere by M. NICOLET, <i>Centre National de Recherches de l'Espace, Brussels</i>	425
37. The Atmospheres of Mars and Venus by S. I. RASOOL, <i>Goddard Space Flight Center, Greenbelt, Md.</i>	435
38. An Introduction to Langmuir Probes for Space Research by R. L. F. BOYD, <i>Department of Physics, University College, London</i>	455
39. The Ionospheric Measurements from Ariel I by A. WILLMORE, <i>University College, London</i>	466
40. Simultaneous Measurement of Plasma Density by Three Different Methods by J. BÜCHAU, K. G. JACOBS, P. KAISER and K. RAWER, <i>Ionosphären Institut, Breisach</i>	472
41. Rocket Measurements of Electron Density and Collision Frequency in the Lower D-Region by O. E. PETERSEN, <i>Technical University of Denmark, København</i>	479
42. Electron Energy Spectrum Measurements During Auroral Absorption by J. ORTNER, <i>European Space Research Organisation, Paris</i>	488
Index of Subjects	491
Index of Names	501