

TABLE OF CONTENTS

1 Zodiacal Light

<u>1.1 Observations from Space</u>	1
1.1.1 Space Observations of the Zodiacal Light Invited Paper J.L. Weinberg	3
1.1.2 Helios Zodiacal Light Experiment E. Pitz, C. Leinert, H. Link, and N. Salm	19
1.1.3 Preliminary Results of the Helios A Zodiacal Light Experiment H. Link, C. Leinert, E. Pitz, and N. Salm	24
1.1.4 Pioneer 10 Observations of Zodiacal Light Brightness Near the Ecliptic: Changes with Heliocentric Distance M.S. Hanner, J.G. Sparrow, J.L. Weinberg, and D.E. Beeson	29
1.1.5 Star Counts in the Background Sky Observed from Pioneer 10 H. Tanabe, and K. Mori	36
1.1.6 The $S_{10}(V)$ Unit of Surface Brightness J.G. Sparrow, and J.L. Weinberg	41
1.1.7 Polarization of the Zodiacal Light: First Results from Skylab J.G. Sparrow, J.L. Weinberg, and R.C. Hahn	45
1.1.8 Photometry of the Zodiacal Light with the Balloon-Borne Telescope THISBE A. Frey, W. Hofmann, D. Lemke, and C. Thum	52
1.1.9 OSO-5 Zodiacal Light Measurements G.B. Burnett	53
1.1.10 Evidence for Scattering Particles in Meteor Streams A.C. Levasseur, and J. Blamont	58
1.1.11 The Ultraviolet Scattering Efficiency of Interplanetary Dust Grains Ch.F. Lillie	63
1.1.12 Summary of Observations of the Solar Corona/ Inner Zodiacal Light from Apollo 15, 16, and 17 C.L. Ross	64
1.1.13 A Temporal Study of the Radiance of the F-Corona Close to the Sun R.H. Munro	65
1.1.14 Measurements of the F-Corona from Daily OSO-7 Observations R.A. Howard, and M.J. Koomen	66

1.1.15	The Thermal Emission of the Dust Corona during the Eclipse of June 30, 1973 P. Lena, Y. Viala, D. Hall, and A. Soufflot	67
1.1.16	The Color Characteristics of the Earth-Moon Libration Clouds J.R. Roach	68
1.1.17	A Search for Forward Scattering of Sunlight from the Lunar Libration Clouds C.L. Ross	73
1.1.18	Presentation of Zodiacal Light Instrument Aboard the D2B Astronomical Satellite M. Maucherat, and P. Cruvellier	74
1.1.19	Visible and UV Photometry of the Gegenschein and the Milky Way A. Llebaria	78
1.2	<u>Groundbased Observations</u>	83
1.2.1	Ground-Based Observations of the Zodiacal Light Invited Paper R. Dumont	85
1.2.2	Polarimetry of the Zodiacal Light and Milky Way from Hawaii R.D. Wolstencroft, and L.W. Bandermann	101
1.2.3	Scattering in the Earth's Atmosphere: Calcula- tions for Milky Way and Zodiacal Light as Extended Sources H.J. Staude	106
1.2.4	Scattering Layer of Interplanetary Dust in the Upper Atmosphere F. Link	107
1.3	<u>Models and Interpretation</u>	113
1.3.1	Some Formulae to Interpret Zodiacal Light Photopolarimetric Data in the Ecliptic from Ground or Space R. Dumont	115
1.3.2	Discussion of the Rocket Photometry of the Zodiacal Light C. Leinert, H. Link, and E. Pitz	120
1.3.3	Consequences of the Inclination of the Zodiacal Cloud on the Ecliptic R. Robley	121
1.3.4	Method for the Determination of the Intensity of Scattered Sunlight per Unit-Volume of the Interplanetary Medium A. Mujica, and F. Sánchez	122
1.3.5	On the Visibility of the Libration Clouds S. Röser	124
1.3.6	Scattering Functions of Dielectric and Absorbing Irregular Particles R. Zerull	130

1.3.7	The Compatibility of Recent Micrometeoroid Flux Curves with Observations and Models of the Zodiacal Light R.H. Giese, and E. Grün	135
-------	--	-----

2 In Situ Measurements of Interplanetary Dust

2.1 Measurements from Satellites and Space Probes 141

2.1.1	In-Situ Records of Interplanetary Dust Particles - Methods and Results Invited Paper H. Fechtig	143
2.1.2	Preliminary Results of Micrometeoroid Experiment on Board Helios A E. Grün, J. Kissel, H. Fechtig, P. Gammelin, and H.-J. Hoffmann	159
2.1.3	Composition of Impact-Plasma Measured by a Helios-Micrometeoroid-Detector B.-K. Dalmann, E. Grün, and J. Kissel	164
2.1.4	Orbital Elements of Dust Particles Intercepted by Pioneers 8 and 9 H. Wolf, J.W. Rhee, and O.E. Berg	165
2.1.5	Flux of Hyperbolic Micrometeoroids J.S. Dohnanyi	170
2.1.6	The Cosmic Dust Environment at Earth, Jupiter and Interplanetary Space: Results from Langley Experiments on MTS, Pioneer 10, and Pioneer 11 J.M. Alvarez	181
2.1.7	Dust in the Outer Solar System - Review of Early Results from Pioneers 10 and 11 R. Soberman, J.M. Alvarez, and J.L. Weinberg	182
2.1.8	Sources of Interplanetary Dust: Asteroids Invited Paper J.S. Dohnanyi	187

2.2 Lunar Studies and Simulation Experiments 207

2.2.1	Lunar Microcraters and Interplanetary Dust Fluxes Invited Paper J.B. Hartung	209
2.2.2	The Size Frequency Distribution and Rate of Production of Microcraters D.A. Morrison, and E. Zinner	227
2.2.3	The Long Term Population of Interplanetary Micrometeoroids G. Poupeau, R.M. Walker, and E. Zinner	232
2.2.4	Lunar Soil Movement Registered by the Apollo 17 Cosmic Dust Experiment O.E. Berg, H. Wolf, and J. Rhee	233

2.2.5	Electrostatic Disruption of Lunar Dust Particles J.W. Rhee	238
2.2.6	Microcraters Produced by Oblique Incidence of Projectiles V. Stähle, K. Nagel, and E. Schneider	241
2.2.7	Measurements of Impact Ejecta Parameters in Crater Simulation Experiments E. Schneider	242
2.2.8	Impact Light Flash Studies: Temperature, Ejecta, Vaporization G. Eichhorn	243
2.3	Particle Collection Experiments and Their Interpretation	249
2.3.1	Submicron Particles from the Sun Invited Paper C.L. Hemenway	251
2.3.2	Analysis of Impact Craters from the S-149 Skylab Experiment D.S. Hallgren, and C.L. Hemenway	270
2.3.3	Micrometeorite Impact Craters on Skylab Experiment S-149 K. Nagel, H. Fechtig, E. Schneider, and G. Neukum	275
2.3.4	Extraterrestrial Particles in the Stratosphere D.E. Brownlee, D. Tomandl, and P.W. Hodge	279
2.3.5	Magellan Collections of Large Cosmic Dust Particles D.S. Hallgren, C.L. Hemenway, and R. Wlochowicz	284
2.3.6	Specific Sources of Extraterrestrial Particles J. Rosinski	289
2.3.7	Near-Earth Fragmentation of Cosmic Dust H. Fechtig, and C.L. Hemenway	290
Cometary Dust		297
3.1	Dust in Comets and Interplanetary Matter Invited Paper V. Vanysek	299
3.2	The Production Rate of Dust by Comets A.H. Delsemme	314
3.3	Can Short Period Comets Maintain the Zodiacal Cloud? S. Röser	319
3.4	Optical Properties of Cometary Dust S. Hayakawa, T. Matsumoto, and T. Ono	323
3.5	The Dust Coma of Comets K.W. Michel, and T. Nishimura	328

3.6	Dust Emission from Comet Kohoutek (1973f) at Large Distances from the Sun E. Grün, J. Kissel, and H.-J. Hoffmann	334
3.7	Predicted Favorable Visibility Conditions for Anomalous Tails of Comets Z. Sekanina	339
3.8	Study of the Anti-Tail of Comet Kohoutek from an Observation on 17 January 1974 Ph.L. Lamy, and S. Koutchmy	343
3.9	Condensation Processes at High Temperature Clouds B. Donn	345
3.10	Mariner Mission to Encke 1980 C.M. Yeates, K.T. Nock, and R.L. Newburn	346
4	Meteors and Their Relation to Interplanetary Dust	356
4.1	Meteors and Interplanetary Dust Invited Paper P.M. Millman	359
4.2	Meteoroid Densities B.A. Lindblad	373
4.3	Possible Evidence of Meteoroid Fragmentation in Interplanetary Space from Grouping of Particles in Meteor Streams V. Porubčan	379
4.4	The Heliocentric Distribution of the Meteor Bodies at the Vicinity of the Earth's Orbit V.V. Andreev, O.I. Belkovich, and V.S. Tokhtas'ev	383
4.5	Fireballs as an Atmospheric Source of Meteoritic Dust Z. Ceplecha	385
4.6	Interplanetary Dust in the Vicinity of the Earth G.M. Teptin	389
4.7	Meteor Radar Rates and the Solar Cycle B.A. Lindblad	390
4.8	Evolution and Detectability of Interplanetary Dust Streams L. Kresák	391
4.9	On the Structure of Hyperbolic Interplanetary Dust Streams L. Kresák, and E.M. Pittich	396
4.10	Expected Distribution of Some Orbital Elements of Interstellar Particles in the Solar System O.I. Belkovich, and I.N. Potapov	400
5	Dynamics and Evolution	401
5.1	Sources of Interplanetary Dust Invited Paper F.L. Whipple	403

5.2	Dynamics of Interplanetary Dust and Related Topics Invited Paper J. Trulsen	416
5.3	Modeling of the Orbital Evolution of Vaporizing Dust Particles Near the Sun Z. Sekanina	434
5.4	Orbital Evolution of Circum-Solar Dust Grains Ph. Lamy	437
5.5	Temperature Distribution and Lifetime of Interplanetary Ice Grains Ph. Lamy, and M.F. Jousselme	443
5.6	Radial Distribution of Meteoric Particles in Interplanetary Space J.W. Rhee	448
5.7	Rotational Bursting of Interplanetary Dust Particles S.J. Paddock, and J.W. Rhee	453
5.8	Lunar Ejecta in Heliocentric Space W.M. Alexander, and M.A. Richards	458
5.9	Radiation Pressure on Interplanetary Dust Particles G. Schwehm	459
5.10	Are Interplanetary Grains Crystalline? S. Drapatz, and K.W. Michel	464
5.11	A Technique for Measuring the Interstellar Component of Cosmic Dust D.A. Tomandl	469
<u>6</u>	<u>Concluding Summaries</u>	<u>473</u>
6.1	The Zodiacal Light H. Elsässer	475
6.2	In Situ Measurements of Dust O.E. Berg	478
6.3	Can Comets be the Only Source of Interplanetary Dust? A.H. Delsemme	481
6.4	Meteors Z. Ceplecha	485
6.5	Final Remarks F.L. Whipple	489
Authors Index		494

