



## TABLE OF CONTENTS

Preface	ix
List of Participants	xi
Dedication	xv
Organizing Committees	xvi
I ZODIACAL LIGHT - MEASUREMENTS AND MODELS	
R.H. GIESE: Optical Investigation of Dust in the Solar System (INVITED)	1
C. LEINERT, I. RICHTER, E. PITZ, M.S. HANNER: Four Years of Zodiacal Light Observations from the Helios Space Probes	15
J.L. WEINBERG, R.C. HAHN: Brightness and Polarization of the Zodiacal Light: Results of Fixed-position Observations from Skylab	19
G.H. SCHWEHM: The ISPM Zodiacal Light - Background Starlight Experiment	23
J.L. WEINBERG, R.C. HAHN, F. GIOVANE, D.W. SCHUERMAN: Planned Observations of the Diffuse Sky Radiation During Shuttle Mission STS-4	25
E. PITZ: An Attempt to Observe Zodiacal Light at 5 $\mu$ with a Balloon Experiment	29
R. ROBLEY: Change in the Zodiacal Light with Solar Activity	33
P.L. LAMY, A. LLEBARIA, S. KOUTCHMY: Two-dimensional Photographic Photometry of the Zodiacal Light from Spatial Observations	37
R.C. HENRY, R.C. ANDERSON, W.G. FASTIE: Far-ultraviolet Studies. VIII. Apollo 17 Search for Zodiacal Light	41
H. TANABE, A. TAKECHI, A. MIYASHITA: Photometric Axis Measurements of the Zodiacal Light at Large Elongations	45
N.Y. MISCONI: The Symmetry Plane of the Zodiacal Cloud Near 1 AU	49
A. MUJICA, G. LOPEZ, F. SANCHEZ: Method for the Determination of Density and Phase Functions of Interplanetary Dust	55
J. BUITRAGO, P. ALVAREZ, G. LOPEZ, A. MUJICA, F. SANCHEZ: Method of Scattering Plane Scanning	61
R. DUMONT, A.-C. LEVASSEUR-REGOURD: Inversion of the Zodiacal Brightness Integral: a new Geometric Approach	67
D.W. SCHUERMAN: Evidence that the Properties of Interplanetary Dust Beyond 1 AU are Not Homogeneous	71
P.L. LAMY, J.M. PERRIN: Zodiacal Light Models with a Bimodal Population	75
H.J. STAUDE, S. RÖSER: Wavelength Dependent Models of the Zodiacal Light	81

## II METEORS AND METEORITES

W.J. BAGGALEY: Meteors and Atmospheres (INVITED)	85
W.G. ELFORD: The Influence of the Atmosphere on Radar Meteor Rates	101
B.A. LINDBLAD: Serial Correlation of Meteor Radar Rates	105
W.J. BAGGALEY: Analysis of Meteor Data	109
P.B. BABADZHANOV, V.S. GETMAN: Orbit, Chemical Composition and Atmospheric Fragmentation of a Meteoroid from Instantaneous Photographs	111
R.L. HAWKES, J. JONES: Two Station Television Meteor Studies	117
P.M. MILLMAN: One Hundred and Fifteen Years of Meteor Spectroscopy	121
J.A. RUSSELL: Correlation of Height and Forbidden Oxygen Line Strength for Perseid Meteors	129
J. DELCOURT: Experimental and Theoretical Study of Radiometeors	133
*D.J. KESSLER, P.M. LANDRY, J.R. GABBARD, J.L.T. MORAN: Ground Radar Detection of Meteoroids in Space	137
J. STOHL: On Time-dependent Models of the Meteoric Background Complex	141
*I.V. GALIBINA, A.K. TERENTJEVA: Evolution of Meteoroid Orbits Over Millenia	145
A. HAJDUK: The Core of the Meteor Stream Associated with Comet Halley	149
D.W. HUGHES, I.P. WILLIAMS, C.D. MURRAY: The Quadrantid Meteor Stream: Past, Present and Future	153
*P.B. BABADZHANOV, Y.V. OBRUBOV: Evolution of Orbits and Intersection Conditions with the Earth of the Geminid and Quadrantid Meteor Streams	157
B. LOKANADHAM: The Structure of the Taurid, Geminid and Quadrantid Meteor Streams	163
T. SARMA, J. JONES: Television Observations of the Delta-Aquarid Shower	167
Z. CEPLECHA: Observational and Theoretical Aspects of Fireballs (INVITED)	171
D.O. REVELLE: Interaction of Large Bodies with the Earth's Atmosphere (INVITED)	185
*E.N. KRAMER, V.I. MUSIY, E.A. TIMCHENKO-OSTROVERKHOVA, I.S. SHESTAKA: Probability of Collision with the Earth and Orbital Life-Time of Bodies of Asteroidal and Cometary Origin	199
*V.V. FEDYNSKY, A.I. DABIZHA, I.T. ZOTKIN: The Stream of Crater Forming Meteorites on the Earth	205
D.W. HUGHES: On the Mass Distribution of Meteorites and Their Influx Rate	207

\*Note: Not presented at the Symposium.

### III THE INTERPLANETARY DUST COMPLEX 1. SOURCES, EVOLUTION, AND DYNAMICS

Ľ. KRESAK: Sources of Interplanetary Dust (INVITED)	211
M.S. HANNER: Physical Characteristics of Cometary Dust from Optical Studies (INVITED)	223
Z. SEKANINA: Physical Characteristics of Cometary Dust from Dynamical Studies: A Review (INVITED)	237
Z. SEKANINA: On the Particle-Size Distribution Function of Cometary Dust	251
R. HELLMICH, H.U. KELLER: On the Dust Production Rates of Comets	255
*O.V. DOBROVOLSKY, N.N. KISELEV, G.P. CHERNOVA, F.A. TUPIEVA, N.V. NARIZHNAJA: Nature of Dust Grains in the Atmosphere of Comet Ashbrook	259
P.D. FELDMAN: Ultraviolet Albedo of Comet West (1976 VI)	263
Z. SEKANINA, J.A. FARRELL: Evidence for Fragmentation of Strongly Nonspherical Dust Particles in the Tail of Comet West 1976 VI	267
J. KISSEL, B.C. CLARK, D. CLAIR: Experiments on Dust Collection for a Cometary Mission	271
B.K. DALMANN, D. BAHR, H. FECHTIG, J. KISSEL: Dust Experiment for a Rendezvous Cometary Mission	273
G. BRAUN, E. GRUN, J. KISSEL, N. PAILER: An Impact Mass-Spectrometer for the Halley Probe	275
E. GRUN: In Situ Measurements of Interplanetary Dust in the Inner Solar System (INVITED)	277
*A.N. SIMONENKO, B.J. LEVIN: Circumsolar Motion of Dust Particles at the Stage of Increasing Solar Luminosity	279
J.A. BURNS, S. SOTER: A Simple Derivation of the Radiation Forces Felt by Scattering Particles	281
D.W. SCHUERMAN: Effect of Radiation Pressure on the Restricted Three-body Problem	285
L.B. LE SERGEANT, P.L. LAMY: Collisions Among Interplanetary Dust Grains	289
E. GRUN, H.A. ZOOK: Dynamics of Micrometeoroids	293
J. TRULSEN, A. WIKAN: Poynting-Robertson Effect and Collisions in the Interplanetary Dust Cloud	299
J.P.J. LAFON, P.L. LAMY, J.M. MILLET: The Electrostatic Potential of Interplanetary Grains	303
G.E. MORFILL, E. GRUN: Motion of Charged Dust Particles in Interplanetary Dust	309
E. GRUN, G.E. MORFILL: Electromagnetic Effects on the Zodiacal Dust Cloud	311
G.E. MORFILL, E. GRUN: Electromagnetic Effects on Hyperbolic Cosmic Dust Particles	313
O. HAVNES: A Two-Stream Instability in Streams of Charged Grains	315
G.H. SCHWEHM: Trajectories of Sublimating Interplanetary Dust Grains	319
K.D. SCHMIDT, E. GRUN: Orbital Elements of Micrometeoroids Detected by the Helios 1 Space Probe in the Inner Solar System	321
P.A. DANIELS, D.W. HUGHES: A Monte Carlo Simulation of the Mass Distribution in an Accreting System of Dust Particles	325
S.F. SINGER, J.E. STANLEY: Submicron Particles in Meteor Streams	329

IV	THE INTERPLANETARY DUST COMPLEX 2. PHYSICAL PROPERTIES	
	D.E. BROWNLEE, L. PILACHOWSKI, E. OLSZEWSKI, P.W. HODGE: Analysis of Interplanetary Dust Collections. (INVITED)	333
	J.M. GREENBERG: From Interstellar Dust to Comets to the Zodiacal Light (INVITED)	343
	W. KRATSCHMER: Laboratory Measurements on the Infrared Features of Interstellar Silicate Grains	351
	B.N. KHARE, C. SAGAN: Cosmic Dust Synthesized in Reducing Environments	355
	H. FECHTIG, K. NAGEL, N. PAILER, E. SCHNEIDER: Collisional Processes of Iron and Steel Projectiles on Targets of Different Densities	357
	N. PAILER, E. GRUN: Determination of Particle Densities by Penetration Studies	365
	B. LANG, N. PEKALA, E. KROL, A. NOWAKOWSKI, P. MARTIN, YU. STAKHEEV, G. BARYSHIKOVA: Thermomagnetic Study of Chondrules	371
	H. ZOOK: Evidence for Ice Meteoroids Beyond 2 AU	375
	*R. SMOLUCHOWSKI: Existence and Role of Amorphous Grains in the Solar System	381
	T. MUKAI: Grain Disruption by Collisions with Solar Energetic Particles	385
	K.F. RATCLIFF, N.Y. MISCONI, S.J. PADDACK: Radiation Induced Rotation of Interplanetary Dust Particles; a Feasibility Study for a Space Experiment	391
	J.C. MANDEVILLE, J.A.M. MCDONNELL: Micrometeoroid Multiple Foil Penetration and Particle Recovery Experiments on Board Space Shuttle's Long Duration Exposure Facility (LDEF)	395
V	PARTICLES AND PLANETS	
	A.F. COOK: Planetary Rings (INVITED)	401
	J.R. HILL, D.A. MENDIS: Charged Dust Rings in the Outer Planetary Magnetospheres	417
	J.D. CHAMBERLAIN, W.M. ALEXANDER, J.D. CORBIN: Orbits of Submicron Lunar Ejecta in the Earth-Moon System	421
	W.M. ALEXANDER, J.D. CORBIN: Interaction of Lunar Ejecta and the Magnetosphere of the Earth	425
VI	SUMMARY BY P.M. MILLMAN	429
	Index	433

