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# Contents

<b>Preface</b> . . . . .	vii
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<b>List of Reviewers</b> . . . . .	viii
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## Meteors

<b>Meteor Showers from Broken Comets</b>	
P. Jenniskens . . . . .	3
<b>Preparing for the Meteoritic Return of STARDUST</b>	
P. Jenniskens et al. . . . .	7
<b>The Meteoroid Environment: Shower and Sporadic Meteors</b>	
M. Campbell-Brown (Invited) . . . . .	11
<b>A CCD Search for the Dust Trail of the Draconid Parent Comet 21P/Giacobini-Zinner</b>	
N. Miura et al. . . . .	23
<b>Interstellar Meteors</b>	
W. J. Baggaley et al. (Invited) . . . . .	27

## Cometary Dust

<b>Stardust Wild 2 Dust Measurements</b>	
S. F. Green et al. (Invited) . . . . .	35
<b>Mid-Infrared Observation of the Dust Plume from Comet 9P/Tempel 1 Generated by the Deep Impact Collision Using Subaru/Comics</b>	
T. Ootsubo et al. . . . .	45
<b>Imaging the Dust Trail and Neckline of 67P/Churyumov-Gerasimenko</b>	
J. Agarwal et al. . . . .	51
<b>Dust Production and Nucleus Evolution</b>	
Y. V. Skorov et al. . . . .	55

## Interplanetary Dust

<b>New Observations and Models of the Kinematics of the Zodiacal Dust Cloud</b> G. J. Madsen et al. . . . .	61
<b>Preliminary Results on Analysis of the Cosmic Dust Analyzer Data Between Jupiter and Saturn</b> N. Altobelli et al. (Invited) . . . . .	65
<b>Dust Measurements During Ulysses' 2<sup>nd</sup> Jupiter Encounter</b> H. Krüger and E. Grün . . . . .	69
<b>Approaching Interplanetary Dust Physical Properties from Light Scattering and Thermal Observations and Simulations</b> J. Lasue and A. C. Levasseur-Regourd . . . . .	73
<b>Size-Frequency Distributions of Dust - Size Debris from the Impact Disruption of Chondritic Meteorites</b> D. D. Durda et al. . . . .	77
<b>The Effect of Inter-Particle Collisions on the Dynamical Evolution of Asteroidal Dust and the Structure of the Zodiacal Cloud</b> T. J. J. Kehoe et al. . . . .	81
<b>Solar Wind Modulation of Jupiter Dust Stream Detection</b> A. Flandes and H. Krüger . . . . .	87
<b>Migration of Dust Particles to the Terrestrial Planets</b> S. I. Ipatov and J. C. Mather . . . . .	91

## Circumplanetary Dust

<b>GEO Debris and Interplanetary Dust: Fluxes and Charging Behavior</b> A. L. Graps et al. . . . .	97
<b>A Local Source for the Pioneer 10 and 11 Circumjovian Dust Detections</b> D. B. Zeehandelaar and D. P. Hamilton . . . . .	103
<b>Cassini Cosmic Dust Analyser: Composition of Dust at Saturn</b> N. McBride et al. . . . .	107

## Debris Disks

<b>Signatures of Planets in Debris Disks</b> A. Moro-Martín et al. (Invited) . . . . .	113
<b>Physics of Debris Disks</b> A. V. Krivov (Invited) . . . . .	123

<b>Carbonaceous Dust in Planetary Systems: Origin and Astrobiological Significance</b>	
G. M. Muñoz Caro and J. Martínez-Frías . . . . .	133

### Laboratory Dust Analyses

<b>Densities and Mineralogy of Cometary and Asteroidal Interplanetary Dust Particles Collected in the Stratosphere</b>	
D. J. Joswiak et al. . . . .	141
<b>Size Distribution of Antarctic Micrometeorites</b>	
S. Taylor et al. . . . .	145
<b>Combined Micro-Infrared (IR) and Micro-Raman Measurements on Stratospheric Interplanetary Dust Particles</b>	
A. Rotundi et al. . . . .	149

### Dust Processes and Properties

<b>Optical Properties of Large Aggregates</b>	
T. Mukai and Y. Okada . . . . .	157
<b>Radiation Pressure on Single Graphite Aggregates</b>	
O. Krauss and G. Wurm . . . . .	161
<b>Measurements of Photoelectric Yields of Individual Lunar Dust Grains</b>	
M.M. Abbas et al. . . . .	165
<b>Behavior of Charged Dust in Plasma and Photoelectron Sheaths</b>	
J. E. Colwell et al. . . . .	171
<b>Computed Electric Charges of Grains with Highly Irregular Shapes</b>	
S. Auer et al. . . . .	177
<b>Lunar Surface Charging: A Global Perspective Using Lunar Prospector Data</b>	
T. J. Stubbs et al. . . . .	181
<b>A Dynamic Fountain Model for Dust in the Lunar Exosphere</b>	
T. J. Stubbs et al. . . . .	185
<b>The Fundamental Role of Photophoresis for Dust in Planetary Systems</b>	
G. Wurm and O. Krauss . . . . .	191

### Dust Instrumentation and Future Missions

<b>Wizard - A New Observation System of Zodiacal Light</b>	
M. Ueno et al. . . . .	197
<b>Thin Films as Dust Detectors</b>	
J. Carpenter et al. . . . .	201

<b>The Large Area Mass Analyzer (LAMA) for In-Situ Chemical Analysis of Interstellar Dust Particles</b>	
Z. Sternovsky et al. . . . .	205
<b>Laboratory Tests of the Large Mass Analyzer</b>	
R. Srama et al. . . . .	209
<b>A Trajectory Sensor for Sub-Micron Sized Dust</b>	
R. Srama et al. . . . .	213
<b>Large Area Dust Collection - On the International Space Station</b>	
R. Tsou et al. . . . .	219
<b>LAD-C: A Large Area Cosmic Dust and Orbital Debris Collector on the International Space Station</b>	
J.-C. Liou et al. . . . .	227
<b>Low-Noise Amplifier for Measuring Dust Charges in the Presence of Plasma and UV Radiation</b>	
S. Auer . . . . .	231
<b>Continuous Large-Area Micrometeoroid Flux Measuring Instrument</b>	
R. Corsaro et al. . . . .	235
<b>Impact of Dust on Lunar Exploration</b>	
T. J. Stubbs et al. . . . .	239
<b>Prospects of Dust Astronomy Missions</b>	
E. Grün et al. . . . .	245
<b>Index . . . . .</b>	<b>253</b>
<b>List of Participants . . . . .</b>	<b>261</b>

## Preface

The workshop 'Dust in Planetary Systems' was held in Kauai'i/Hawaii from September 26 to 30, 2005, following the tradition of holding meetings in the field of Interplanetary Dust Research at regular intervals of a few years. The series of meetings started in Honolulu, Hawaii (USA) in 1967, followed by Heidelberg (Germany) in 1975, Ottawa (Canada) in 1979, Marseilles (France) in 1984, Kyoto (Japan) in 1990, Gainesville, Florida (USA) in 1995, with the last being held in Canterbury, (U.K.) in 2000. The Kauai'i workshop in 2005 was attended by 150 scientists from 20 countries who actively discussed recent progress made through remote observations from the ground and from space, in-situ measurements, as well as from theory and laboratory experiments.

Since the last meeting in Canterbury, numerous space missions provided significant progress in various fields of cosmic dust research. For studies of comet nuclei, scientists in our field were involved in three space missions. In 2001, the Deep Space 1 spacecraft flew by comet Borely. In 2004, Stardust flew by comet Wild 2, with many exciting results from the Stardust return capsule still to come. In 2005, the Deep Impact probe collided with comet Tempel 1. In addition, the comet dust community made large strides forward when Rosetta was launched to begin its 10-year voyage towards comet Churyumov-Gerasimenkov.

Saturn's environment also provides a natural laboratory for cosmic dust researchers. The Saturn ring system with its spokes has been the prime motivator for dusty plasma studies since the time of the Voyager spacecraft twenty years ago. The Cassini spacecraft in orbit around Saturn since 2004 is well-placed to not only continue those studies, but to start new studies provided by Saturn's enigmatic moon Enceladus.

Jupiter's dusty environment has not been neglected by spacecraft in these last five years either. While the Galileo mission was terminated in 2003 after the spacecraft's 7-year orbital tour about Jupiter, analysis of the Galileo data is still ongoing. Other space missions such as Ulysses experienced its 2nd flyby at Jupiter in 2004 and the New Horizons mission Jupiter flyby is coming up.

The recent years saw significant improvements of dust detection techniques. Most notably, the development of large-area mass analyzers combined with trajectory sensors has been a major step forward towards dedicated dust astronomy missions.

Moving outside our solar system, with over 200 detected extrasolar planets, the dusty debris disk research is a rapidly expanding field. Dusty debris disks can serve as detailed tracers of extrasolar planetary systems. Even though the planets are obscured, they are nevertheless dynamically imprinted in the surrounding dust to provide our best clue to study solar systems like our own. Is our system dustier or rockier than the average? Is the timing of our late heavy bombardment typical? Improvements in models comparing with improving observational data for extrasolar debris disks are reaching the point to answer these questions. Significant progress has also been made in the laboratory with investigations of 'dusty' processes and material analyses of collected samples.

The Scientific Organizing Committee defined the scientific content and selected the invited reviews. These proceedings contain 6 invited papers and 39 contributed papers. The papers reflect the scientific content of the meeting, covering the areas of cosmic dust research described here. Each paper was peer-reviewed. After each review, each paper was modified by the authors, accordingly.

The workshop was sponsored by National Aeronautics and Space Administration, European Space Agency, Lunar and Planetary Institute and the Hawaii Institute of Geophysics and Planetology, University of Hawaii at Manoa. It is a pleasure to thank Mary Cloud and all individuals who worked so hard behind the scenes to make this workshop a success. The generous help of all manuscript reviewers is gratefully acknowledged. Finally, we thank Manuel Mielenz for assistance with preparation of these proceedings.

Harald Krüger / Amara L. Graps

Katlenburg-Lindau / Rome

December 4, 2006

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