

Preface

For dust you are and to dust you will return

Genesis 3:19

Despite the fact that dust makes up only a small part of the Universe by mass, it has been the most abundant solid object ever since the Big Bang. Dust is an essential ingredient of molecular clouds, from which stars, planets, comets, and asteroids form, while it acts as a catalyst for formation of complex molecules. By natural consequences, it holds the building blocks of life and, therefore, may have played a vital role in the origin and evolution of life. A new generation of cosmic dust is continuously produced and processed through the evolution of stars and planetary systems, as observed in stellar atmospheres, debris disks, and the solar system. Cosmic dust is omnipresent, but kaleidoscopic. As a result, the universe contains a variety of cosmic dust and the field of cosmic dust research is manifold: intergalactic dust, interstellar dust, circumstellar dust, cometary dust, asteroidal dust, interplanetary dust, circumplanetary dust, stellar nebular condensates, presolar grains, micrometeorites, meteoroids, and meteors. The research field of cosmic dust has been well established in Western Europe and USA with various objectives and methods including in-situ measurements, astronomical remote observations, genuine-sample analyses, laboratory and numerical analogue simulations, and theoretical modeling. We know beyond a shadow of a doubt that dust is one of the indispensable celestial bodies for astronomical communities.

To find a consensus among experts as to where cosmic dust comes from and where it goes was the primary goal of the session “Cosmic Dust: Its Formation and Evolution” at the planetary science section of Asia Oceania Geosciences Society 5th Annual Meeting (AOGS 2008) held in Busan, South Korea, between June 16–20, 2008. Besides the scientific goal, the main mission in this session at past AOGS meetings has been to expand the field of cosmic dust research into Asia and Oceania and to establish a scientific community of cosmic dust researchers in this region. The “Cosmic Dust” session at AOGS 2008 consisted of 56 presentations, the speakers of which are affiliated with institutions in Japan, China, Taiwan, South Korea, Germany, France, Finland, and USA. It turned out that the “Cosmic Dust” session was the largest of all scientific sessions in AOGS 2008. A steady increase in interest to the AOGS “Cosmic Dust” session was clearly demonstrated by the fact that the number of presentations doubled in two years. In spite of its youth, the latest large attendance from the great parts of the world indicates that the AOGS “Cosmic Dust” session becomes an extraordinary important meeting for scientists in the field of cosmic dust research worldwide. We wish future prospects for cosmic dust research to flourish in Asia and Oceania.

This special issue of *Earth, Planets and Space* (EPS) is devoted to the AOGS 2008 session “Cosmic Dust: Its Formation and Evolution”, where all kinds of cosmic dust were the subject of discussion. It is meant primarily to contain papers presented at this particular session of AOGS 2008 as its proceedings. All articles in the special issue were peer-reviewed by two or more experts prior to publication. The special issue contains 16 articles, most of which were in fact presented at the AOGS “Cosmic Dust” session in 2008. As a result, the table of contents partly reflects the scientific session program along with a great variety of articles for dust in cometary comae, interplanetary space, protoplanetary disks, debris disks, interstellar space, intergalactic space, et cetera. The readers might glance through the articles to find out about the interrelation between different types of cosmic dust with perceptions of its alteration through a variety of processing.

We thank all authors and reviewers as well as the editorial board of EPS and Terra Scientific Publishing Company (TERRAPUB) for their efforts into this EPS special issue, entitled “Cosmic Dust: Its Formation and Evolution”. Thanks to the untiring support of Taishi Nakamoto, we came to an agreement with the editorial board of EPS to publish this proceedings of the AOGS “Cosmic Dust” session. We will be glad if this special issue as well as the “Cosmic Dust” session could help the field of cosmic dust research take root in Asia and Oceania.

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