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Panel Report on Explorations for Small Solar System Bodies

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The small body panel performed interviews on the opinions on future exploration plans (as an activity for future ten years of planetary explorations) through the explanation of the aim and the hearing to parties concerned to the researcher group (material analysis, collision experiments, observations, and celestial mechanics etc.) that relates widely, and 12 proposals have been discussed. A panel meeting, including the secretariat of the JSPS was held in National Astronomical Observatory and Mitaka on September 1, 2010, and the consolidated opinion was made public in the forum (Kobe University) on September 10. The subcommittee meeting was held in National Astronomical Observatory Mitaka on December 10 after the forum, and then, the intelligence sharing of the explanation of aim and the meaning of the inquiry proposal was aimed at from a main proposer of each proposal. For searching for a top science out of the proposals through the series of discussions, we tried to classify the proposals along two axes of the science targets. One axis is a primitive degree of the material that composes the small celestial body. There is a vague part in the definition, but it is based here on the content of the organism and the ice that conflicts with silicates. Another axis is a structure of the body, that is, the size of the body or a differentiation degree. In addition, the proposals were classified into three categories with the exploration methods. ;(a) sample return or in-site analysis, (b) a geophysical exploration technique like the achievement of the collision experiments etc. , and (c) remote sensing. The graph with two science target axes was made respectively of three categories, and we examined where each proposal locates and how they were distributed. As for the science target examined there, if the different proposals proposed by a different proposer has the same science target distribution, it is important together for a lot of researchers, and, therefore, the effect to the entire planetary science must be also high. As a result, the inquiry of the exploration (if it was possible, sample return) to the primitive and undifferentiating bodies stood out. We enumerate directionality of the exploration to such primitive and undifferentiating bodies as one of the "Top science" targets such as cometary nuclei and D type planetoids. In addition, we arrived at the common view that the understanding obtained from the re-visit often considered was able to become extremely deep, compared with a single visit of the exploration. The re-visit done in a large bodies wants to strike a note of warning in tending the oversight of going of eyes only to the diversity of the bodies probably because of in the case small bodies. Therefore the importance proceeded from the discovery stage to the understanding step because of "Revisit" inquiry that visits the same body two or more times as the means to achieve "Top science" target will be enumerated as this panel. In this presentation, we introduce two directionality and the concrete examples of the top science.

Keywords: Planetary Exploration, Future Plan, Top Science