

サブミリ波観測で拓く氷天体の固体惑星科学：惑星形成と宇宙化学 Sub-millimeter observations of icy bodies toward understanding of planetary formation and cosmochemistry

関根 康人^{1*}; 笠井 康子²; 佐川 英夫²; 黒田 剛史³; 兒玉 賢哉¹; 堀 安範⁴; 生駒 大洋¹; 倉本 圭⁵; 坂本 尚義⁵
SEKINE, Yasuhito^{1*}; KASAI, Yasuko²; SAGAWA, Hideo²; KURODA, Takeshi³; KODAMA, Kenya¹; HORI, Yasunori⁴; IKOMA, Masahiro¹; KURAMOTO, Kiyoshi⁵; YURIMOTO, Hisayoshi⁵

¹ 東京大学, ²NICT, ³ 東北大学, ⁴ 国立天文台, ⁵ 北海道大学

¹University of Tokyo, ²NICT, ³Tohoku University, ⁴NAOJ, ⁵Hokkaido University

The present-day composition of regular icy satellites consists of combinations of initial conditions and subsequent evolution. These icy satellites are considered to have been formed in a circumplanetary disk associated with giant planet formation. Thus, icy satellites that are not geologically active, such as Callisto, would serve as solar system fossils, which may preserve the information of the protoplanetary disk and planetary formation. On the other hand, geologically active satellites, such as Europa and Enceladus, would provide particular geological processes and consequent products of geochemical reaction. Sub-millimeter observations are capable of providing unique isotopic and chemical compositions of gas molecules in atmospheres and plumes of the icy satellites. In this paper, we discuss key observational targets and their importance for planetary formation theory and geo/cosmochemistry, especially focusing on sub-millimeter observations of Galilean satellites by the Jupiter Icy moons Explorer mission, JUICE.

キーワード: サブミリ波観測, 氷衛星, 惑星形成, 宇宙化学

Keywords: sub-millimeter observation, icy satellite, planetary formation, cosmochemistry