[JJ] Evening Poster | P (Space and Planetary Sciences) | P-CG Complex & General

[P-CG22]New Developments of Planetary Sciences with ALMA

convener:Takayuki Muto(Division of Liberal Arts, Kogakuin University), Munetake Momose(The College of Science, Ibaraki University), Hideo Sagawa(京都産業大学理学部, 共同), Masumi Shimojo(National Astronomical Observatory of Japan)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

The Atacama Large Millimeter/Submillimeter Array (ALMA) starated its science operation in 2011, and long-baseline observations have become available since 2014. ALMA, with its high sensitivity and resolution, has provided us with qualitatively new information on star and planet formation and small bodies in our Solar System. For example, the discovery of narrow gap structures in the protoplanetary disks around young stars HL Tan and TW Hya enabled us to actually compare the long-standing theoretical models of planet formation with real observations. In our solar system, 60km pixel-scale non-uniform brightness distribution and the rotation of the asteroid Juno are detected. Spatially-resolved thermal mapping of Europa icy surface enables us to search for thermal anomaly in possible plume source regions. As of Cycle 4, Solar observations are available, enabling us, for example, to determine the physical parameters of plasmoid quantitatively. In this session, we overview the latest results of ALMA observations in the field of planetary sciences. We also accept any theoretical and experimental works that are closely related to the observations and discuss the impact on the planetary science community.

[PCG22-P07]Observations of fresh sublimates in FU Ori disks

*Yuri Aikawa[1], Yoko Oya[2], Jeong-Eun Lee[3], Lucas Cieza[4] (1.Department of Astronomy, Graduate School of Science, University of Tokyo, 2.Department of Physics, Graduate School of Science, University of Tokyo, 3.Kyung Hee University, 4.Universidad Diego Portales)

Keywords:protoplanetary disks, planetary system formation

Molecular line observations of protoplanetary disks have been intensively performed at ALMA. Detection of complex organic molecules (COMs) is of special interest, since the comparison of their abundances in disks with the cometary material could tell us a chemical link between the interstellar matter and planetary-system (Solar system) material. Although CH_3OH and CH_3CN have already been detected, COMs observation in disks are challenging, because the sublimation temperature of COMs are rather high. Another problem is that the molecular abundances in gas and ice should be basically different. Since comets are made from ices rather than gas, it is better to observe, if possible, the ice composition in disks. In this presentation, we propose to observe FU Ori disks to derive ice composition in protoplanetary disks. FU Ori objects are in temporal luminosity outburst, which is caused by temporal increase in accretion rate. The disk temperature rises, and the snow line moves outward in the disk. Since the sublimation temperature of COMs are often similar to that of water ice, COMs are sublimated inside the water snow line. Once sublimated, COMs are destroyed by the gas-phase reactions. The destruction timescale is, however, longer than a typical duration of the outburst. Therefore, FU Ori disks are an ideal target to observe the fresh sublimates to derive the ice composition in the quiescent phase of the disk. We will also present preliminary results of the analysis of ALMA archive data.