NAOJ ALMA Scientific Research Grant 2019

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Title

The Chemistry of Protoplanetary Disks

■ Summary

Dust and gas in protoplanetary disks are raw material of planetary systems. Volatile elements are either in solid or gas phase, depending on the molecular composition and temperature distribution in disks, while they play pivotal role in planetary system formation. Volatiles in solids could enhance the coagulation of dust particles and could also make atmosphere and ocean on rocky planets. Volatile elements in the disk gas are incorporate to gas giants, and could tell us the temperature environment in which the planets are formed. Molecular lines of volatiles are unique probe to observe disk mass, dispersal processes and kinetics. We investigate the spatial distribution and evolution of molecular abundances, isotope ratios, and gas/solid distributions of volatiles by observing disks around T Tuari stars, Herbig Ae stars, and FU Ors in ALMA cycle 6 Large Program "The Chemistry of Planet Formation", other regular programs, and archival data.

Two postdoctoral researchers or one project assistant professor will be hired by this grant (<u>https://jobregister.aas.org/ad/511fa868</u>). The successful applicants for these positions are expected to work mainly on the reduction and analysis of the observational data. The analysis includes some modeling, such as radiative transfer using a public code.