

## **Title: "Condensation and Radial Transport of Filamentary Enstatite Crystals from Interplanetary Dust"**

### **Abstract:**

Filamentary enstatite crystals, formed by gas-solid condensation in the solar nebula, are found in chondritic porous interplanetary dust particles of probable cometary origin. We measured the oxygen isotopic composition of five filamentary enstatite grains from the giant cluster interplanetary dust particle U2-20 GCP. These grains sample both the  $^{16}\text{O}$ -rich solar ( $\delta^{16}\text{O} = +30$  per mil) and  $^{16}\text{O}$ -poor planetary ( $\delta^{16}\text{O} = 0$  per mil) isotope reservoirs. Our measurements provide evidence for very early vaporization of dust-poor and dust-rich regions of the solar nebula, followed by condensation and outward transport of crystalline dust to the comet-forming region very far from the Sun. Similar processes are likely responsible for the crystalline silicates observed in the outer regions of protoplanetary disks elsewhere in the Galaxy.