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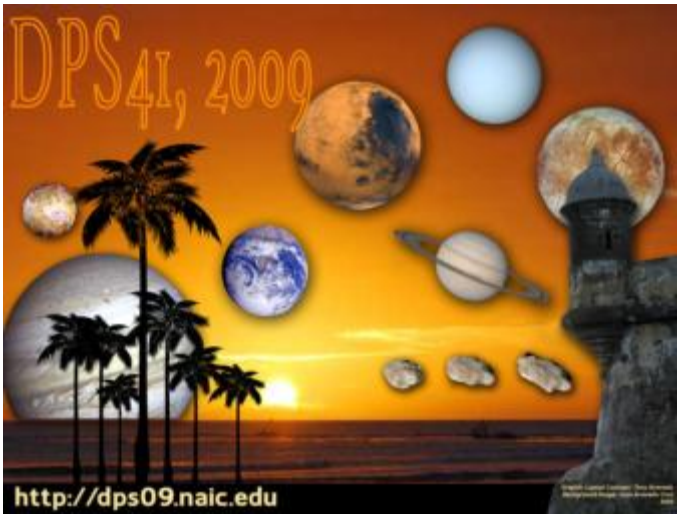


Presentation Abstract

Title **Cathodoluminescence Study of Meteoritic Pre-Solar Nanodiamonds: An Implication for Origin of Diamond Particles in NGC 7027 Planetary Nebula**

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Abstract Primitive meteorites contain abundant (up to 1500 ppm) amounts of nanodiamonds. At least some subpopulation must be of pre-solar (stardust?) origin, as indicated by the isotopic composition of trace elements the diamonds carry, in particular noble gases and tellurium. On the other hand, the isotopic composition of the major element, carbon, is unremarkable, i.e. within the range reasonably expected for Solar System materials. As a consequence many workers believe that the majority of the diamonds is of local, i.e. Solar System origin and that the fraction that is pre-solar is relatively small. Two main theories exist for the formation process of the meteoritic nanodiamonds: (1) Chemical vapour deposition (CVD), and (2) shock origin. In this study, we present results of the study of meteoritic nanodiamonds from different primitive chondritic meteorites the by means of the Scanning Electron Microscope-Cathodoluminescence (SEM-CL) measurements in an attempt to obtain further constraints with regard to the formation process and their application to astrophysics.
Planetary nebula NGC 7027 is C-rich object indicating that the presence of of nanodiamond dust particles in the dust matter of this nebula is highly possible. K2 (Ultradispersed Detonation Diamonds-UDD) and meteoritic (i.e., Boronisko, Efremovka, etc.) nanodiamond samples were selected to the cathodoluminescence microscopical and spectroscopical studies. They show characteristic CL spectral features at around 388 (3.1 eV; A-center), 452 (2.69 eV; N-center) and 483 nm, which are in a good agreement with spectral properties (at 463.8 nm) of planetary

nebula NGC7027.
In a conclusion, according to this preliminary laboratory experiment, diamond particles in nebula NGC7027 may be originated due to ejection of the outer parts of the Red Giants during planetary nebula formation.