Contribution ID: **1471** Type: **Oral**

# Laser Ablation of Boron Carbide for Nanofluids Synthesis and Enhanced Thermal Conductivity Properties

Nanofluids, characterized by the dispersion of nanoparticles in conventional heat transfer fluids, have gained significant attention in recent years for their potential to enhance thermal conductivity in various applications. Boron carbide stands out among these nanofluids due to its exceptional thermal stability and mechanical properties. This study explores a novel approach for the synthesis of Born carbide nanofluids with enhanced thermal conductivity properties using laser ablation.
The experimental setup involves a high-energy laser that ablates a solid boron carbide target submerged in a suitable base fluid. The ablation process will generate boron carbide nanoparticles with controlled size and dispersion. We investigate the influence of laser parameters such as energy density, pulse duration, and repetition rate on the characteristics of the synthesized boron carbide nanoparticles.
Characterization techniques including transmission electron microscopy (TEM), X-ray diffraction (XRD), and thermal conductivity measurements will be employed to assess the quality, structure, and thermal properties of the boron carbide nanofluids.
This research will not only contribute to the understanding of nanofluid synthesis using laser ablation but also opens new avenues for harnessing the exceptional properties of boron carbide in enhancing thermal conductivity, with various engineering applications, thereby addressing critical challenges in heat transfer and energy efficiency.

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**Session Classification:** Condensed Matter Physics

**Track Classification:** Condensed Matter Physics