MIP: PARADIM at Cornell University, DMR-1539918

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# Growth of Stoichiometric $B_4C$ Single Crystal by Laser Floating-Zone Method

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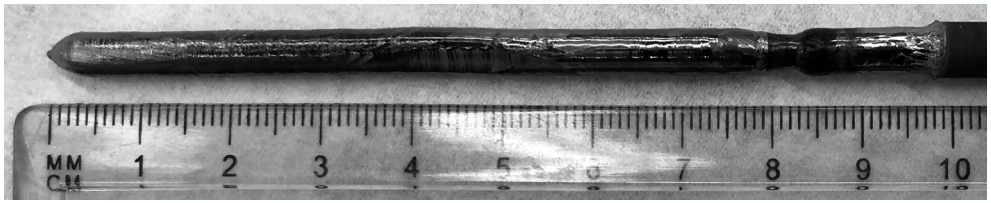
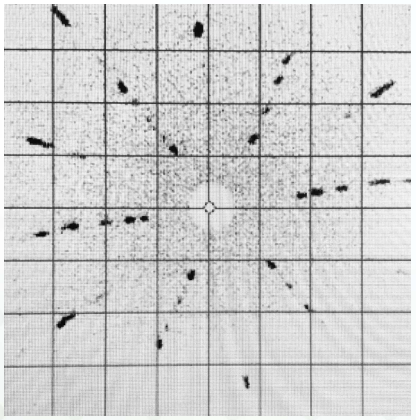
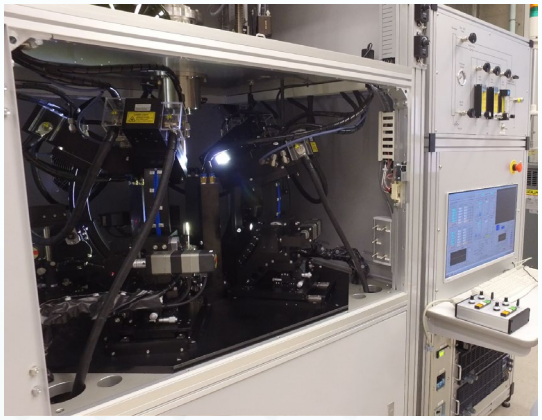
The first successful laser floating-zone growth of boron carbide ("$B_4C$") was carried out at PARADIM.

$B_4C$ is extremely hard, has $T_{melt}$ > 2000 °C, and harbors a rich array of electronic properties that vary with composition.

*In situ* monitoring of gas-phase species during growth allowed the underlying mechanisms by which the composition changes to be identified; this understanding enabled the successful growth of boron carbide single crystals with controlled stoichiometry. This newfound control over electronic properties in boron carbide is expected to enable new energy capture and detection technologies in radiation hard environments.





M.V.S. Chandrashekhar *et al.* MACH Conference, March 2019


**Other *User* Success Stories:**

New family of thermoelectrics

New electron emitter

New multiferroic

New Ruddlesden-Popper phase ($A_{n+1}B_nO_{3n+1}$) with high $n$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