

# Seminar

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## Institute for Plasma Research

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**Title:** Kirkendall porosity assisted densification during spark plasma sintering of nanocrystalline tungsten-based alloys

**Speaker:** Dr. Ajeet K. Srivastav

Visvesvaraya National Institute of Technology, Nagpur

**Date:** 29<sup>th</sup> April 2026 (Wednesday)

**Time:** 10:30 AM

**Venue:** Seminar Hall, IPR

**Join the talk online:** URL: <https://bharatvc.nic.in/viewer/5992138016>

*(Conference ID: 5992138016; Password: 232142)*

### Abstract

Tungsten alloys are critical materials for fusion reactors, offering exceptional heat resistance and durability under extreme conditions, making them ideal for components like the reactor's first wall. The present work reports the role of alloying elements on densification and microstructure evolution during spark plasma sintering of nanocrystalline tungsten. Nanocrystalline tungsten/tungsten alloy powders were synthesized using mechanical milling/alloying. X-ray diffraction line profile analysis was employed for further characterization of the nanocrystalline powders. The nanocrystalline powders were consolidated through non-isothermal and spark plasma sintering processes. Non-isothermal sintering results in expansion unlike densification during spark plasma sintering. The different shrinkage behaviour during these two different processes were understood in view of the dynamically evolved porous structure during the sintering process. Kirkendall porosity was realized to play an important role in densification during spark plasma sintering of such nanocrystalline alloy powders.

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