**MATERIALS ENGINEERING**

**SEMINAR**

# "The Origin of Dirty White Spots"

**By**

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**Purdue MSE Preliminary Exam**

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**ABSTRACT**

Dirty White Spots (DWS) are a defect associated with the Vacuum Arc Remelting (VAR) of superalloys. DWS have a severely deleterious effect on fatigue performance of critical components. In the aerospace industry, they have been known to cause sudden, uncontained jet engine failures due to rupture of turbine disks. As such, they pose a significant risk to the flying public. Understanding their origins is critical to mitigating their impact, but unfortunately, they remain an enigma to the engineering and scientific community. These defects are typically a few millimeters in size, solute lean, with an oxide stringer on their surface. DWS do not occur frequently, they are often located deep in the interior of an ingot and are difficult to detect using non-destructive examination techniques. Additionally, experimentally probing the VAR process to better understand DWS origins is expensive and technically challenging. This work will review what is known about DWS, what has been hypothesized about their origins, and propose possible future experimental work that could be done to further understand them.

**Date: Friday, May 6, 2022**
**Time: 9:00 AM**
**Place: ARMS 1028 or via WebEx** https://purdue.webex.com/meet/krane

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