UCI Samueli School of Engineering

Department of Materials Science and Engineering UCI

UNIVERSITY OF CALIFORNIA, IRVINE

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

IS PROUD TO HOST A SEMINAR BY

"THE ROLE OF A DOCTORAL MATERIALS ENGINEER IN THE AEROSPACE INDUSTRY – A BRIEF REVIEW OF THE TRANSITION FROM GRADUATE SCHOOL TO SPACEX"

CALVIN BELCHER

MATERIALS ENGINEER
SPACEX
HAWTHORNE, CA

Thursday, February 13, 2024

2:00 PM - 3:20 PM

McDonnell Douglas Engineering Auditorium

Abstract: During a doctoral program, students will face the decision to choose a career while constantly striving to advance their field on a deeply technical level. During my doctorate, I studied the development of refractory complex concentrated alloys (RCCAs) for industrial applications. RCCAs were first discovered in 2010 and showed promise due to their exceptionally high strengths at elevated temperatures. However, RCCAs are influenced relatively easily by interstitial impurities, such as oxygen and nitrogen, which can embrittle the alloys, prohibiting their industrial-scale adoption. With a deeper understanding of the influence of interstitial impurities on the mechanical behavior of RCCAs, design guidelines for RCCAs were outlined for continued development of RCCAs. As my studies into refractory alloys approached an outline of a doctoral dissertation, I was faced with the challenge of choosing a career for myself and following it. Today, I am a materials engineer at SpaceX where I develop metallurgical processes and structural alloys which enable the flight and reuse of Starship and Super Heavy Booster. This talk is a brief summary of my major works as a PhD student, the process of stepping into a role in industry, and the day-to-day work of a materials engineer at SpaceX. My goal is for this presentation to provide students a glimpse of being a professional engineer to design their own career.

Bio: Calvin Belcher earned his PhD at UC Irvine studying interstitial impurities in refractory alloys. Last year, in July of 2024, he defended his PhD. The following week he started his role at SpaceX as a materials engineer in their Materials Processing R&D lab. He now develops processing techniques and structural alloys for the Starship vehicle.

calvinhbelcher@gmail.com