

# Tuesday Morning, May 23, 2023

## Exhibitors Keynote Lecture

Room Town & Country A - Session EX-TuM

## Exhibition Keynote Lecture

Moderator: Samir Aouadi, University of North Texas, USA

11:00am EX-TuM-1 **Future Requirements for Advanced Surface Modification and Coatings Technologies for Turbine Engine Applications,**  
**David Furrer,** Pratt and Whitney, USA **INVITED**

Evolution of engineered product designs and associated system requirements have given rise to increased challenges for materials and components. These challenges are in part being overcome through the development and application of surface related technologies. Surfaces are critical features that drive the ultimate behavior, capabilities and value of highly engineered components and systems. Surfaces provide for a means of protection for structural materials from extreme environmental conditions, such as elevated temperatures, corrosive and reactive materials, interfacial contact and loading, and erosion and wear. Turbine engine designs are continuing to evolve to meet the need for ever increasing energy efficiency and reduced environmental impact. Traditional efforts of increasing turbine engine efficiency are aimed at increased core temperatures and increased thermodynamic efficiency. Architecture changes for future turbine engines are bringing new challenges from the introduction of new thermodynamic cycles, hybrid energy systems and alternate fuels. These system-level design changes are increasing the need to advance surfaces to mitigate these new challenges and to support required component durability. A review of potential future system design changes and their potential impact on various materials and components will be reviewed. The requirements for advanced surface modification and coating technologies will be discussed in terms of future product-level requirements. In addition to the requirements for the surface modification or coating of components, the requirements for the manufacturing processes also need to be considered as we embrace and implement Industry-4.0 technologies.

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