

## **Aurélie Vande Put, CIRIMAT - ENSIACET Toulouse**

**Title:** “Protective PVD coatings for improved high temperature oxidation resistance of titanium-based alloys”

### **Co-Authors:**

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### **Abstract:**

To increase engine efficiency and meet environmental norms, the aircraft industry has been looking for higher in-service temperatures and lighter structures for many years and even more nowadays. With their high specific strength at low or moderate temperatures (<650 °C), Ti-based alloys are good candidates for such applications. However, when exposed to oxidizing environments at high temperatures, they undergo a large oxygen dissolution while forming an oxide scale, which can greatly affect their mechanical properties. To maintain a high creep strength and ductility of these alloys while preventing large oxygen diffusion, the benefit of a thin protective PVD coating was assessed. In this aim, a few PVD coatings were deposited on two titanium-based alloys which were then subjected to high temperature oxidation test. The coated materials were characterized before and after oxidation to evaluate their influence on oxygen diffusion and any microstructure evolution at the coating/alloy interface.

### **Biography:**

After a PhD on the effect of Pt on the high temperature oxidation resistance of a TBC system composed of a NiCoCrAlYTa bond-coating, co-financed by CNRS and Safran Helicopter Engines, and after a short post-doctorate at Oak Ridge National Laboratory (TN, USA) on the resistance to metal dusting of alumina-forming austenitic stainless steels, Aurélie Vande Put became an assistant professor at Toulouse-INP in 2010. Since then, she carries out research activities on the resistance and protection to high temperature oxidation and corrosion of metallic alloys for different application domains (aeronautics and chemical industry). She has been working on the durability of materials such as TBC systems, nickel-based superalloys, titanium-based alloys, FeNiCr alloys and protective coatings under various oxidizing environments like dry air or H<sub>2</sub>O-rich air (resulting in the volatilization of the protective chromia layer) and more complex atmospheres leading to a degradation by metal dusting.