Advanced Surface Engineering Division
Room 317 - Session SE+MN+PS-FrM

Nanostructured and Multifunctional Thin Films and Coatings II

Moderators: Jyh-Wei Lee, Ming Chi University of Technology, Taiwan , **Filippo Mangolini**, The University of Texas at Austin

8:20am **SE+MN+PS-FrM-1 New Challenges and Opportunities for Hard and Superhard Coatings*, Aharon Inspektor,*** Carnegie Mellon University**INVITED**
Many hard, superhard and lubricious coatings with superior mechanical properties, thermal stability and chemical resistance are being developed and applied for surface protection in harsh and demanding applications. In this paper we will discuss the status and foreseen trends in PVD hard, superhard and lubricious films.

First, we will review the design of current multifunctional hard coatings and their applications in metal cutting, in automotive and in aerospace industries. Next, we will examine how the Forth Industrial Revolution, a multi-level connectivity of sensors and systems, with "Smart Manufacturing", computer controlled automated facility system, will affect future usage of multifunctional coatings. The talk will conclude with a critical discussion of the resultant challenges and opportunities for next generation of hard, superhard and lubricious coatings.

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