Tuesday Morning, May 13, 2025

Focused Topic Session
Room Town & Country B - Session FTS-TuM

Focused Topic Session I

7:00am **FTS-TuM-1 American Elements Focused Topic Session: Metal-Based Coatings and Alloys: Innovations, Challenges, and AI-Driven Advancements at American Elements***, Chad Lindner [chad.lindner@americanelements.com],* American Elements, USA

Metal-based coatings and alloy coatings play a critical role in enhancing durability, wear resistance, and corrosion protection across industries such as aerospace, automotive, and energy. This presentation explores the latest advancements at American Elements in metallurgical coatings, addressing key challenges and emerging solutions through materials science innovations and artificial intelligence (AI).

Key topics include high-performance alloy coatings, such as high-entropy alloys (HEAs) and NiCr-based thermal spray coatings, which exhibit superior oxidation resistance and longevity. Case studies highlight successful implementations, including HEA coatings in aerospace turbine components and AI-optimized electroplated alloys for automotive applications. The discussion extends to industry challenges such as corrosion resistance, adhesion issues, and sustainability concerns, which are driving the shift toward environmentally friendly alternatives to traditional chromium-based coatings.

At American Elements AI is revolutionizing the field by optimizing coating formulations, predicting material performance, and enhancing quality control. Machine learning algorithms improve electroplating consistency, while AI-driven process monitoring minimizes defects in thermal spray applications. These innovations are accelerating the development of our next-generation coatings with improved efficiency and reduced environmental impact.

By integrating advanced materials science with AI-driven approaches, the metallurgical coatings industry is poised for transformative growth. This presentation provides insights into cutting-edge research, industry trends, and future directions at American Elements in metal-based coatings, paving the way for more sustainable and high-performance solutions.

Focused Topic Session
Room Town & Country B - Session FTS-ThL

Focused Topic Session II

12:20pm **FTS-ThL-1 Elsevier Focused Topic Session: The World of Scientific Publishing: Perspective from an Author, Reviewer and Editor***, Marcus Hans [hans@mch.rwth-aachen.de],* RWTH Aachen University, Germany

Many people tend to associate scientists with fancy experiments, complicated equations as well as abstract computer models. However, also communication of the gained knowledge is of pivotal importance for researchers to create professional networks with academia as well as industry, acquire funding and attract talented staff for new projects. Publishing research articles in peer-reviewed, international journals is a cornerstone of effective communication.

Within this workshop, addressed to early career researchers, an introduction of the publication workflow will be provided and the different stages will be explained. Important aspects for authors will be covered such as storytelling, artwork and journal-specific guidelines. Different models of scientific publishing, including subscription and open access, will be presented and best practices for having a manuscript accepted will be provided. In addition, publishing ethics and the usage of artificial intelligence in publishing will be discussed.

Having an article published in a scientific journal, sooner or later authors become reviewers. Reviewing for a journal has multiple advantages such as being one of the first readers of innovative approaches, contributing to quality control of scientific publishing as well as thinking outside the box. The expectations of journal editors for high quality reviews will be discussed and in turn this knowledge helps authors to critically revisit their manuscript towards increasing the chances for acceptance in a scientific journal.

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