

**Dr. Pierpaolo Carlone, FASM**  
**University of Salerno Salerno, Italy**  
**Trustee (2022-2025)**



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Pierpaolo Carlone is Full Professor of Manufacturing Technologies and Systems at the Department of Industrial Engineering of the University of Salerno (Italy). He is the head of Composite Materials Lab and of the Metrology Lab. He is member of the Doctoral Council in Industrial Engineering of the Didactic Council in Mechanical and Management Engineering and Delegate to International Mobility Programs for the Department. He coordinates collaborative research activities on materials science and engineering with several academic and industrial organizations worldwide.

His research interests are focused on advanced and light-weight materials. His most relevant contributions are in processing of fiber reinforced polymer matrix composites and solid state similar and dissimilar metal welding and heat treatment. He has authored more than 120 papers published in high reputation journals, conference proceedings, book chapters and one book. Additionally, he has authored two patents on non-metallic materials treatment. He has been/is principal investigator for several research projects on materials characterization, manufacturing and treatment, funded by government or private entities.

Pierpaolo Carlone serves as referee and *editorial board member* for different scientific journals published by reputed publishing houses such as Springer, T&F etc. He has delivered about 50 plenary/keynote/invited lectures and seminars. He received the *ASM-IIM Visiting Lectureship Award* in 2018. As an educator, Pierpaolo Carlone has supervised/mentored more than 230 project reports, master thesis, PhD thesis and post-docs. He served as external evaluator and member of the jury for numerous PhD candidates.

He is member of the Italian Association for Manufacturing (AITeM), Director of the European Scientific Association for Material Forming (ESAFORM), where he is in charge of promoting international cooperation, supporting future conference organization and formulating new initiatives. He is a lifetime member of the ASM International – Italy-Switzerland Chapter and participates in the DLM/MAR Selection Committee and JMEP Editorial Board Committee of ASM.

# Abstract: Lightweight Material Joining by Dissimilar Friction Stir Welding

## Trustee (2022-2025)



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### Abstract:

Lightweight materials are by far the targeted materials in several applications related to air and ground transportation. Several reports have addressed low-density metals, such as magnesium alloys, as future key development in the aerospace and automotive industries, even if some critical issues related to manufacturing, mechanical and chemical properties, and recyclability are not yet solved. Tailored blanks provide an interesting solution to manufacture Al alloys or steel based thin-walled components combining lightweight and high structural performance. AA2198 alloy is considered the most promising among the Al-Li alloys, due to its advantageous mechanical properties, mainly attributed to the precipitation of the T1 (Al<sub>2</sub>CuLi) phase, whereas the attendance of Li not only reduces the density but also enhances the elastic modulus and specific strength. Along with the development of new materials, a significant effort is directed toward the design and manufacturing of optimized structures, such as panels strengthened by stringers to further reduce the overall weight, obtained by welding different Al alloys in the lap joint configuration. In this context, solid-state welding processes, in primis friction stir welding (FSW), have demonstrated a huge potential if compared to fusion welding techniques, as comprehensively detailed in literature. The talk provides an overview of the dissimilar friction stir welding of aluminum alloys. Different materials pairs and joint configuration are discussed, highlighting processing issues and joint features and performance.

# **Abstract: Metallization of Polymers and Polymer Matrix Composites by Cold Spray: State of the Art and Future Perspectives**

## **Trustee (2022-2025)**



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### Abstract:

Polymers and polymer matrix composites are more and more used for designing structures in several aerospace, automotive, sport industries, among others, due to their lightweight, cost, and design and manufacturing opportunities. However, the surface of polymeric materials typically exhibits intrinsic deficiencies, in terms of wear resistance, thermal and electrical conductivity, bioactivity, and so on. Surface metallization treatments on polymer-based materials are increasingly applied to enhance mechanical and physical properties. Cold spray is a metallization technique that provides a viable solution to overcome the main drawbacks of conventional thermal spray processing techniques related to surface degradation at high temperatures. In this lecture, a critical overview on the metallization of polymers and polymer matrix composites using cold spray is provided, offering an informative analysis on different approaches, bonding mechanisms, spraying procedures and parameters that influence the deposition efficiency, and the features of the coating. At the end of the talk, potentially relevant areas for further developments are broadly highlighted with the idea of stimulating further research.

# **Abstract: Manufacturing of Polymer Matrix Composites by Pultrusion: Processing Aspects, Properties and Applications**

**Trustee (2022-2025)**



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Abstract:

At present, conventional materials (such as concrete, steel, aluminum, timber) are rapidly losing prevalence and giving way to highly efficient composite materials across many markets. As with all the other composites produced by various available techniques, pultruded profiles have also proved their ability to satisfy the cost, mechanical, physical, and environmentally resistant requirements while still demonstrating outstanding performance. Furthermore, expanding interest toward composite materials in general and pultruded materials in particular has led to the appearance and rapid development of large, medium, and even small production lines on the market.

The aim of this talk is to provide a detailed overview of composite production by pultrusion and to analyze the main application fields of pultruded elements: bridges and bridge decks, cooling towers, building elements and complete building systems, marine construction, transportation, and energy systems. Finally, future study possibilities and opportunities are given to the audience, providing researchers and practitioners the directions for deeper investigation of specific features and exploration of new ones concerning the mentioned aspects of pultruded fiber-reinforced polymer composites.