

# **Unlocking the Invisible: The Revolutionary Potential of Metamaterials**

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Metamaterials are a class of artificial materials engineered to have unique and often unprecedented properties that do not exist in nature. Recent advancements in roll-to-roll nano-imprint lithography (NIL) technology have opened up exciting new opportunities for the fabrication of metamaterials on a large scale. This keynote presentation will explore the revolutionary potential of metamaterials and the role that roll-to-roll NIL technology is playing in unlocking their capabilities.

The talk will focus on the diverse range of applications for metamaterials, including their use in 5G communication technologies, security foils for authentication, biosensors for medical diagnosis, solar energy harvesting, and even in the automotive and consumer electronics industries. The talk will highlight some of the recent breakthroughs in metamaterials research, such as the development of highly efficient, ultrathin absorbers for solar cells, and the creation of plasmonic nano-optics capable of capturing images with sub-wavelength resolution. The presentation will provide a deeper understanding of the transformative potential of metamaterials, the value in sustainability they offer and the important role that roll-to-roll NIL technology will continue to play in their development and commercialization.