



WEBINARS

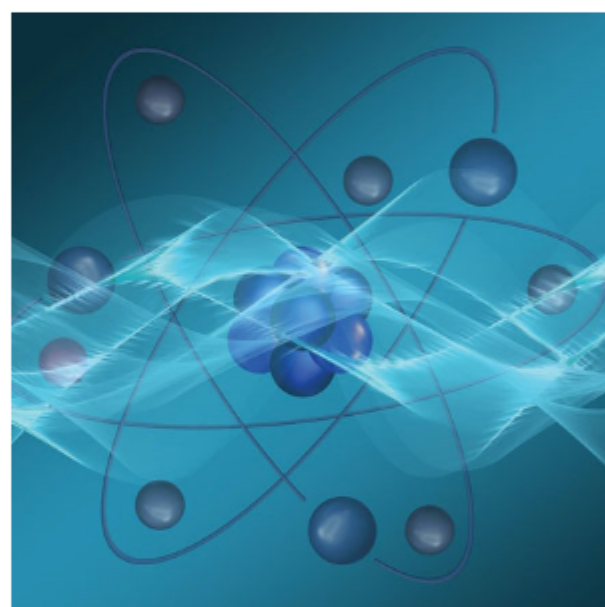
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Advancing Quantum and Nano-Photonics with Machine Learning

Wednesday, November 1, 2023 1:00 PM - 2:00 PM EDT

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The discovery of unconventional optical designs via machine learning promises to advance on-chip circuitry, imaging, sensing, energy, and quantum information technology. In this talk, Alexandra Boltasseva of Purdue University discusses photonic design approaches and emerging material platforms for showcasing machine learning-assisted topology optimization for optical metasurface designs with applications in thermophotovoltaics, reflective optics, quantum photonic circuitry, and lightsail technology. She demonstrates the effectiveness of autoencoders for compressing the vast design space of metasurfaces into a smaller search space. By employing global optimization via adjoint methods or quantum annealing, one can find the optimal metasurface designs within the smaller space constructed by the autoencoder. The techniques employed in this work extend well beyond the metasurface optimization space and into many inverse design problems for engineering and physics. Machine learning approaches are also applied to advance quantum measurements and superresolution imaging.



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