Photonics for Enhancing Interactions with Free Electrons, and AI for Photonics

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Abstract— I will present two topics that have been of particular interest for my group over the past few years. The first topic deals with exploring nanophotonics techniques to enhance light emission from free electrons. The second topic deals with intersections of AI with physics: some opportunities for photonics due to AI, as well as some topics in interpretable AI.

Marin Soljačić is a Professor of Physics at MIT. He is a founder of WiTricity Corporation (2007), LuxLabs (2017), as well as Lightelligence (2017). His main research interests are in artificial intelligence as well as electromagnetic phenomena, focusing on nanophotonics, non-linear optics, and wireless power transfer. He is a recipient of the Adolph Lomb medal from the Optical Society of America (2005), and the TR35 award of the Technology Review magazine (2006). In 2008, he was awarded a MacArthur fellowship "genius" grant. He is an international member of the Croatian Academy of Engineering since 2009. In 2011 he became a Young Global Leader (YGL) of the World Economic Forum. In 2014, he was awarded Blavatnik National Award, as well as Invented Here! (Boston Patent Law Association). In 2017, he was awarded "The Order of the Croatian Daystar, with the image of Ruder Bošković", the Croatian President's top medal for Science. In 2017, the Croatian President also awarded him with "The Order of the Croatian Interlace" medal. He was also Highly Cited Researcher according to WoS for 2019, 2020, 2021 & 2022. In 2023, he got Max Born award from Optica.