THE FRANKLIN INSTITUTE *Awards*

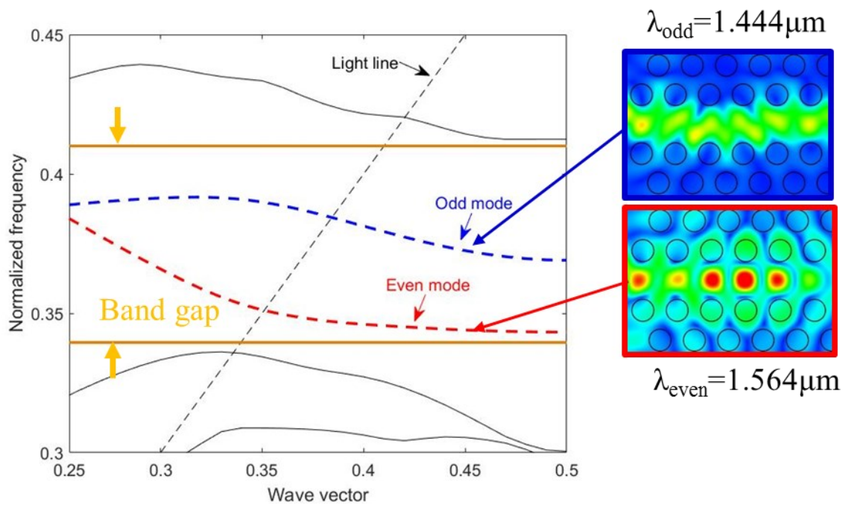
Novel Photonic and Electromagnetic Bandgap Engineering

Honoring Eli Yablonovitch,

Recipient of the 2019 Benjamin Franklin Medal in Electrical Engineering

Leading international scholars are assembled in a symposium dedicated to the technical contributions of Prof. Yablonovitch, Director of the NSF Center for Energy Efficient Electronics Science (E^3S), University of California-Berkeley, for his *pioneering work on the conceptualization and experimental demonstration of photonic and electromagnetic bandgap engineering and the confinement of electromagnetic waves, with applications to photonic, microwave, and antenna structures*. Photonic and electromagnetic bandgap engineering has revolutionized wireless and wired telecommunication systems and posed to impact efficient solar cells and nonlinear optics applied to medical imaging.

Periodic structures has been corner stone of filtering phenomena ever since periodic patterns of crystals were used to demonstrate acceptable exit angles known as Bragg angles. The analogy between electronic waves propagating in crystallographic pattern of solids and electromagnetic waves travelling in ordered media has been exploited by Prof. Yablonovitch for more efficient semiconductor lasers and higher absorption efficiency solar cells in addition to more efficient small antennas. This concept has been extended by various research groups to realize small size optical mode confinement required in integrated optics for temporal and spatial modulators in addition to manipulating effective indices of refraction in slow wave structures with ramifications in future telecommunications.



WEDNESDAY APRIL 10TH, 2019

8:30 AM to 12:30 PM

George D. Behrakis Grand Hall, Creese Student Center

3120 Chestnut Street, Drexel University

Philadelphia, Pennsylvania

Program:

9:00 - 9:15	**Welcoming Remarks** *Drexel University, Villanova University, Franklin Institute*
9:15 -9:30	**Introduction to Photonic and Electromagnmetic Bandgap Engineering** *Afshin S. Daryoush, Drexel University* *Ahmad Hoorfar, Villanova University*
9:30 - 9:45	**Congratulatory Videos and Memories** *Ahmad Hoorfar, Villanova University*
9:45 - 10:15	**Metamaterial Machines and 4D Metastructures** *Nader Engheta, University of Pennsylvania*
10:15 - 10:30	**Coffee Break**
10:30 - 11:00	**Photonics Band Gap Devices in Integrated Optical Circuits** *Alfredo de Rossi, Thales Research and Technology -France*
11:00 - 11:30	**Advancements in Wireless and Radar Technology Enabled by Electromagnetic Bandgap Metamaterials and Metasurfaces** *Kamal Sarabandi, University of Michigan*
11:30 - 12:00	**Photonic Crystal Textures for High-Efficiency Solar Cells** *Vidya Ganapati , Swarthmore College*
12:00 - 12:30	**2019 Franklin Medalist: Laureate Lecture** **The Electromagnetic Spectra of Ordinary Objects** *Eli Yablonovitch, University of California—Berkeley*

Registration: ***Free and open to the public***

www.drexel.edu/engineering/news-events/events/franklin-medal-in-electrical-engineering/

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For nearly two centuries, The Franklin Institute has honored pioneering achievements in science, engineering, and industry. The Franklin Institute Awards dates back to 1824 and is considered one of the most prestigious awards in science and engineering. This honor has been bestowed to likes of Guglielmo Marconi, Nikola Tesla, Thomas Edison, Lord Rayleigh (John William Strutt), Max Planck, William H. Bragg, Albert Einstein, Sir Chandrasekhara Venkata Raman, Sergei A. Schelkunoff, Jack S. Kilby and Robert N. Noyce, Arthur L. Schawlow, Zhores I. Alferov, Frederic Cappaso, and Daniel C. Tsui. Notably, Drexel University has recently celebrated Manijeh Razeghi (2018 Franklin Medal), Nick Holonyak (2017 Franklin Medal), Kenichi Iga (Bower Award 2013), and Drexel University's own Paul Baran (Bower Award in 2001) to name just a few.