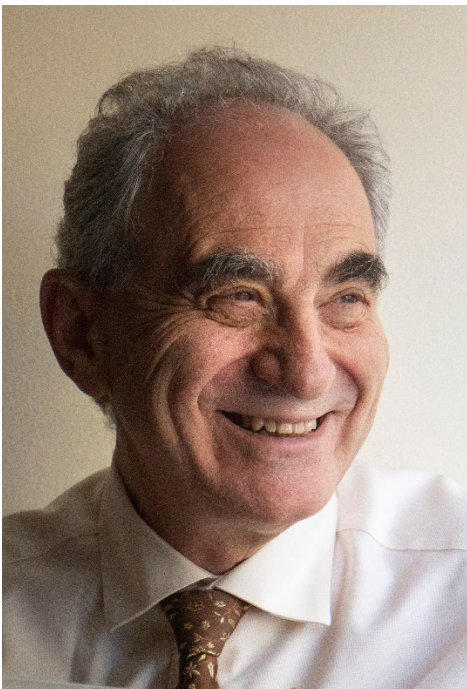


**Physics does Optimization (for Free);
A New Approach Toward Computation****Eli Yablonovitch**Professor Emeritus
EECS - University of California, Berkeley**Date: Thursday, November 16, 2023**
2:00pm – 3:30pm, EEB 132
Refreshments will be served<https://usc.zoom.us/j/96220203431?pwd=S2NScmhnZjFpS3ZNBURkUEtStk51Zz09>

Meeting ID: 962 2020 3431

Passcode: 949129

Abstract: "Optimization is vital to science, engineering, and artificial intelligence. It is usually done digitally, but every physics inequality performs optimization in the normal course of dynamical evolution—for free. In driven systems we have Onsager's principle of minimum heat generation. Physics-based optimization usually relies upon this inequality. Optical Onsager machines can run 10^7 times faster than conventional machines, while consuming far less power."



Biography: Prof. Yablonovitch introduced the idea that strained semiconductor lasers could have superior performance due to reduced valence band (hole) effective mass. With almost every human interaction with the internet, optical telecommunication occurs by strained semiconductor lasers.

He is regarded as a Father of the Photonic BandGap concept, and he coined the term "Photonic Crystal". The geometrical structure of the first experimentally realized Photonic bandgap, is sometimes called "*Yablonovite*".

In his photovoltaic research, Yablonovitch introduced the $4(n^2)$ ("*Yablonovitch Limit*") light-trapping factor that is in worldwide use, for almost all commercial solar panels.

His mantra that "a great solar cell also needs to be a great LED", is the basis of the world record solar cells: single-junction 29.1% efficiency; dual-junction 31.5%; quadruple-junction 38.8% efficiency; all at 1 sun.

His cellphone antenna company, Ethertronics Inc., shipped over 2×10^9 antennas. He was also a co-Founder of Luxtera Inc., the pioneer in Silicon Photonics, now part of Cisco.

He co-Founded Luminescent Inc., the company that originated "Inverse Lithography Technology".