

UCSD NANOENGINEERING/CHEMICAL ENGINEERING
Virtual **SEMINAR SERIES**

Wednesday, October 28, 2020

Seminar Presentation: 11:00am - 12:00pm PT

Join Zoom Seminar: <https://ucsd.zoom.us/j/92877269591>

Meeting ID: 928 7726 9591

“Symmetry and topology in photonic nanostructures”



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Abstract: The quest for smaller, lighter, and more efficient optical components usually comes at the price of reduced functionalities. In this talk,

I will provide an overview of how topological approach to control light-matter interaction enable novel photonic devices with unique features and enhanced performance. I will discuss our recent breakthrough in demonstrating the first topological light source that unidirectionally outcouples to a waveguide from magnetic biased photonic crystal cavities of arbitrary shape.

I will also discuss the first observation of subwavelength scale Exceptional Points (EP) and their application in biology and healthcare by detecting attomolar concentrations of anti-immunoglobulin G. In the last part of the talk, I will present a premier achromatic broadband metalens that is strategically engineered to span an octave bandwidth with high efficiency. Such devices will be suitable for free space and integrated optics and pave the way towards more complex and versatile systems with applications in high-capacity classical and quantum communications, as well as sensing.

Biosketch: **Abdoulaye Ndao** is an assistant professor at Boston University in Electrical and Computer Engineering department. Prof. Ndao received his Ph.D. in Physics in Femto-ST institute at “Université Franche Comté” (Besancon, France), and was subsequently a postdoctoral researcher at UCSD and UC Berkeley from 2016 to 2020. His research interests span wide-ranging topics in photonics, material sciences and physics where his key contributions lie in the areas of topological light sources, non-Hermitian systems, metamaterials, as well as electro-optical sensors based on Lithium Niobate.