Abstract:
In this talk I will first describe some of our recent work on producing nanostructured silicon surfaces that exhibit quantum confinement properties, including anomalous optical absorption in the infrared. These nanowires (which we call silicon quantum walls) are produced from single crystal silicon via a chemical etching process. Visually these appear black in color (similar to black-silicon), but contain columns of nanostructures with aspect ratios as large as 5,000. The fabrication process is highly scalable, and presents an interesting opportunity for continued exploitation of silicon.

In the second part of the talk, I will describe a novel multispectral imaging technique using broad band sinusoidal filters, known as Fourier spectral filters. We designed and built these Fourier spectral filters and hybridized them with visible image sensors, and demonstrated that spectral features such as transmission and absorption peaks are preserved with this technique. This makes it a versatile technique than narrow band filters for a wide range of multispectral imaging applications.

Biography:
Andrew Sarangan is a Professor and Associate Director of the Electro-Optics Graduate Program at the University of Dayton. After graduating from the University of Waterloo (Canada), he spent 3 years as a Research Assistant Professor at UNM-CHTM on high-power distributed feedback semiconductor lasers, and then joined the University of Dayton in 2000. At UD he has attracted over $5M in research grants and has authored or co-authored over 100 articles and conference proceedings. He independently established a nanofabrication cleanroom laboratory at Dayton from his own sponsored research funds. He is a senior life member of SPIE and senior member of IEEE.