

# Zernike Colloquium

May 7<sup>th</sup>, 2026

16:00h

NB4 5111.0080

**Linear and nonlinear light-matter interactions: from microns to nanometers**

by Eric Potma



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Advances in light focusing and confinement now allow us to probe materials at unprecedented spatial scales. In this presentation, I explore three regimes of light-matter interaction, each defined by a unique length scale. First, I highlight nonlinear optical experiments using tightly focused, freely propagating light for precise spectroscopic interrogation of materials at the sub-micrometer scale. Second, I discuss measurements at the sub-10-nanometer scale, where atomically sharp optical tips enable detailed investigations of excitation dynamics in nanostructured materials. Finally, I introduce a transformative effect at the 1-nanometer scale, where extreme confinement allows “forbidden” optical transitions to occur. I will demonstrate how this confinement fundamentally alters the excitation landscape of silicon, effectively turning a dark material into a bright emitter.

**Coffee from 15:30h**  
**Drinks & Snacks after**



**university of  
 groningen**  
 faculty of science  
 and engineering

