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Surface plasmon microscopy with low-cost metallic nanostructures for biosensing I NATHAN LINDQUIST, Bethel University, SANG-HYUN OH, University of Minnesota, LAUREN OTTO, Bethel University — The field of plasmonics aims to manipulate light over dimensions smaller than the optical wavelength by exploiting surface plasmon resonances in metallic films. Typically, surface plasmons are excited by illuminating metallic nanostructures. For meaningful research in this exciting area, the fabrication of high-quality nanostructures is critical, and in an undergraduate setting, low-cost methods are desirable. Careful optical characterization of the metallic nanostructures is also required. Here, we present the use of novel, inexpensive nanofabrication techniques and the development of a customized surface plasmon microscopy setup for interdisciplinary undergraduate experiments in biosensing, surface-enhanced Raman spectroscopy, and surface plasmon imaging. A Bethel undergraduate student performs the nanofabrication in collaboration with the University of Minnesota. The rewards of mentoring undergraduate students in cooperation with a large research university are numerous, exposing them to a wide variety of opportunities. This research also interacts with upper-level, open-ended laboratory projects, summer research, a semester-long senior research experience, and will enable a large range of experiments into the future.

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