Abstract Submitted
for the SES05 Meeting of
The American Physical Society

**Evanescent Wave Excitation and Raman Spectroscopy of Bacteriorhodopsin on Gallium Nitride Waveguides** ALFRED KELLER, YU GUO, SONYA ORTIZ, APRIL POPE, HEIDI HOCKEL, ERIC JOHNSON, LEONID CHERNYAK, ALFONS SCHULTE, University of Central Florida — Waveguides fabricated by nano-lithography can serve as substrates for thin protein films. In the composite structure the waveguide provides the guiding layer, and the thin film is the material whose Raman spectrum is desired. The top molecular layer is accessible through the decaying evanescent field of a mode propagating in the waveguide. Thin layers of bacteriorhodopsin were deposited on GaN waveguides created by standard lithography and inductively coupled etching processes. A 488 nm beam from an Argon ion laser was coupled into the gallium nitride waveguide and the evanescent field was employed to initiate the photocycle and excite Raman scattering in the bacteriorhodopsin film. Under stationary conditions the Raman spectrum in the fingerprint region shows the presence of the light-adapted state and the M intermediate. This suggests that the protein is in its native state and that optical switching of bacteriorhodopsin can be achieved and probed by evanescent wave excitation.

Alfons Schulte
University of Central Florida

Date submitted: 09 Aug 2005 Electronic form version 1.4