

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Microbial Nanowire Electronic Structure Probed by Scanning Tunneling Microscopy¹ JOSHUA P. VEAZEY, Dept. of Physics and Astronomy, Michigan State University, SANELA LAMPA-PASTIRK, GEMMA REGUERA, Dept. of Microbiology and Molecular Genetics, Michigan State University, STUART H. TESSMER, Dept. of Physics and Astronomy, Michigan State University — Complex molecules produced by living organisms provide laboratories for interesting physical properties. The study of such interesting physics, likewise, gives new insight into intriguing biological processes. We have studied the pilus nanowires expressed by the bacterium, *Geobacter sulfurreducens*, using high resolution scanning tunneling microscopy (STM). *G. sulfurreducens* is a metal reducing bacterium that has evolved electrically conductive pili to efficiently transfer electrons across large distances.² Here we employ the electronic sensitivity of STM to resolve the molecular substructure and the local electronic density of states (LDOS) along the nanowire, in an effort to elucidate the mechanism of conduction. We observe LDOS dependent upon the location of the tip above the nanowire.

¹Supported in part by a Strategic Partnership Grant from the Michigan State University Foundation.

²G. Reguera, K.D. McCarthy, T. Mehta, J.S. Nicoll, M.T. Tuominen, and D.R. Lovley, *Nature* **435**, 1098 (2005)

Joshua Veazey
Dept. of Physics and Astronomy, Michigan State University

Date submitted: 23 Nov 2009

Electronic form version 1.4