

---

# TcSUH Special Seminar

## Program Overview: Probe Development for Optogenetics

### PROF. JACK WOLFE

Electrical and Computer Engineering  
Department, and TcSUH  
University of Houston

---

**Thursday, June 30, 2016**

**HSC 102 • 12:00 noon – 1:00 p.m.**

#### ABSTRACT:

Optogenetics uses genetic manipulation to create light-sensitive neurons. Light flashes can then be used to stimulate or suppress electrical activity (spiking) in a targeted neuronal population with millisecond precision. There is now a critical need for integrated probes (*optrodes*) that can both deliver light and detect the spiking-response of the stimulated neurons. Our optrode designs incorporate a fine optical fiber with high-precision, thin film electrodes on its surface. The fiber substrate enables lossless light delivery for optical stimulation while the use of thin film conductors enables high electrode counts with essentially no increase in probe diameter. In this talk, I will discuss a simple, manufacturing process for 4-channel optrodes, its extension to 50-100 channel devices, and the fabrication of linear and 2-D probe arrays.

#### BIO:

Dr. Jack Wolfe received a Ph.D. in Physics at the University of Rochester in 1973. He holds a Hugh Roy and Lillie Cranz Cullen Distinguished University Professorship in the Electrical and Computer Engineering Department. His research interests include semiconductor processing, charge particle optics, and nanolithography.

Jack Wolfe and Wei-Chuan Shih, *Electrical and Computer Engineering Department, University of Houston, Houston, TX 77025*

G. Purushothaman, *Parallon (HCA, Inc), Franklin, TN 37067*

J. A. Dani, *Department of Neuroscience, University of Pennsylvania, Philadelphia, PA*

Valentin Dragoi, *Dept. of Neurobiology and Anatomy, Univ. of Texas-Houston Medical School, Houston, TX 77030*

Acknowledgements: NIH Award 1R21NS084301-01A1, Cullen Foundation, and the Texas Center for Superconductivity at the University of Houston.

*Persons with disabilities who require special accommodations in attending this lecture should call (713) 743-8213.*

---