



### Weekly Seminar

## Electrified liquid interfaces studied by sum-frequency vibrational spectroscopy

**Wei-Tao Liu**

*Department of Physics, Fudan University*

Time: 4:00pm, Nov. 15, 2014 (Saturday)

时间: 2014年11月15日 (周六) 下午4:00

Venue: Room 607, Conference Room A, Science Building 5

地点: 理科五号楼607会议室

### Abstract

The question of how interfacial electric field affects molecular structures is critical to many electrochemical reactions, as well as the numerous chemical, biological, and industrial applications derived from them. Vibrational spectroscopy is a powerful tool to identify molecules and to study their structures and reactions, yet it generally has no surface specificity. The sum-frequency vibrational spectroscopy is a second order nonlinear optical technique, which has sub-monolayer surface sensitivity and become indispensable to the field of surface science in recent decades. Being purely optical, it can monitor many systems hardly accessible to conventional surface probes, such as surfaces with high vapor pressures, highly insulating surfaces, and buried interfaces, etc. In the talk I will introduce our recent study on electrochemical reactions by sum-frequency vibrational spectroscopy. Assisted by the surface plasmon excitation, spectra from such interfaces can be monitored *in situ* and simultaneously with electrochemical reactions, revealing molecular-level information that helps us to understand the microscopic reaction mechanism. Recent progress on other electrified interfaces will also be discussed.

### About the Speaker

#### **Weitao Liu**

#### **Education**

2001.8-2008.5	Ph.D. degree in Physics	University of California at Berkeley, USA
1997.9-2001.6	B.S. degree in Physics	Fudan University, China

#### **Employment**

2011.2-now	Professor	Department of Physics	Fudan University, China
2008.6-2011.1	Postdoc fellow	Department of Physics	University of California
		at Berkeley, USA	Lawrence Berkeley National Lab, USA

#### **Research interests**

Oxide and insulating surfaces;  
Electrochemical interfaces.

Optical spectroscopy and ultrafast dynamics of low dimensional materials:

Nano-crystals of complex oxides;

Two-dimensional materials.

General nonlinear optics and techniques for condensed matter physics.