

**Nanotechnology Special Seminar, Wednesday 2.07.2014 , 12:00**

**IKI Auditorium, Building 51, room 015**

## **Part 1: Challenges in OLED Science & Technology**

**Joseph Shinar**

*Senior Physicist, Ames Laboratory - USDOE  
Professor, Department of Physics & Astronomy  
Professor, Department of Electrical and Computer Engineering  
Iowa State University*

### **Abstract:**

Commercialization of OLED displays is rapidly growing (see your Samsung Galaxy smartphone or tablet), and white OLED (WOLED) lighting panels are also making their first commercial baby steps. This talk will review the current challenges in OLED science and technology that focus on fundamental challenges in OLED efficiency and stability, and the various approaches in OLED materials and architecture to overcome these challenges.



*Acuity Brands Trilia WOLED  
luminaire, US Embassy, Helsinki*

## **Part 2: OLEDs and Organic Solar Cells in Optical (Bio) chemical Sensing**

**Ruth Shinar**

*Adjunct Professor of Electrical and Computer Engineering  
Iowa State University*

### **Abstract:**

As an example of organic electronics application, we describe an all-organic optical sensing platform, where an OLED pixel array, a sensing element, and a polymer or small-molecule organic photodetector are integrated to form a compact monitor. Sensing element design and monitoring of e.g., O<sub>2</sub>, pH, relative humidity, ethanol, lactate, and glucose, including detecting multiple bioanalytes using a lab-on-CD, will be described. Monitoring dissolved O<sub>2</sub> as a tool to study respiratory function and hence remediation of bacteria  
spectrophotometer on a chip using microcavity OLED



*Blue-to-red microcavity OLED  
pixels for analytical applications*