

# AirUCI Summer 2007 Schedule

## Monday, June 25<sup>th</sup>

### 9 am to 11 am: Room Rowland Hall 390

- Overview of the AirUCI summer program by **Prof. Barbara Finlayson-Pitts**
- Introductions of all AirUCI faculty and associates
- Teachers introduce each other
- Lecture by **Prof. J. Mickey Laux**
  - Overview of the atmosphere
  - Regions (p. 7), pressure and temperature variations (p. 8), inversions (p. 8 & 19) and composition (p. 3, 4, 7–9, 67–70 & 187)
  - Overview of common public environmental concerns

### 11 am to 12 pm: Lunch with AirUCI faculty and researchers (provided)

### 12 pm to 2 pm: Room RH 390

- Lab safety issues (video)
- Form lab groups of 4 people (20 attendees divided into 5 experiments) and set up rotation schedule amongst the following 5 experiments
- Overview of wet labs by **Prof. S. Nizkorodov**
  1. HPLC of cigarette smoke
  2. GC/MS of gasoline vapor
  3. FTIR of ethanol content of vodka and mouthwash
  4. Ozone generation studies of common household items
  5. Contact angle measurements for water droplets on surfaces

### 2 pm to 4 pm: Room RH 481

- General tours of the analytical chemistry labs and AirUCI shared labs
- Common lab techniques and principles: pipetting, measuring volumes, mixing solvents, using syringes, etc.

## Tuesday, June 26<sup>th</sup>

### 9 am to 10 am: Room Rowland Hall 390

- Lecture by **Prof. Sergey Nizkorodov**
  - The use of light in analytical chemistry
  - Absorption of specific wavelengths by molecules; Beer's Law (p. 170–175, 185–187, 191 and 197–201)
  - Fluorescence, chemiluminescence (p. 299–301)
  - Fingerprints in IR, higher absorption cross sections in UV
  - Overview of the optical instrumentation used in the labs

### 10 am to 11 am: Room Rowland Hall 390

- Lecture by **Prof. J. Mickey Laux or Sergey Nizkorodov**
  - Fundamentals of Chromatography (p. 302–304 and 565–567)
  - An “inside view” of chromatographic instruments and a mass spectrometer

### 11 am to 12 pm: Lunch with AirUCI faculty and researchers (provided)

### 12 pm to 4 pm: Rooms RH 481, RH 315, RH 354, RH385

- Each team does their first wet lab experiment

## **Wednesday, June 27<sup>th</sup>**

### **9 am to 11 am: Room Rowland Hall 390**

- Lecture by **Prof. Barbara Finlayson-Pitts**
  - Interaction of light with matter and environmental photochemistry (p. 9–12, 15–18, 67, 70–72, 161–163, 167 & 168)
  - Applications to the Chapman reactions (p. 18–26), CFC's (p. 49–56), and Ozone Depletion (p. 1–6, 12–15, 19, 20 & 27–52)
  - Chemistry of NO<sub>x</sub> and Photochemical Smog (p. 66, 67, 72–82 and 149–156)

**11 am to 12 pm:** Lunch with AirUCI faculty and researchers (provided)

### **12 pm to 4 pm: Rooms RH 481, RH 315, RH 354, RH385**

- Continue with the second wet lab experiment

## **Thursday, June 28<sup>th</sup>**

### **9 am to 11 am: Room RH 390**

- Lecture by **Prof. Donald Dabdub**
  - Basics of computer modeling and simulations
  - Specific applications to LA basin (p. 72–78 and 149–156 on LA Smog)
  - Global Circulation Models and Predictions (p. 212, 213 & 220 – 226)

**11 am to 12 pm:** Lunch with AirUCI faculty and researchers (provided)

### **12 pm to 4 pm: Room MSTB 226B**

- Computer Lab: Simulations of air pollution in the LA basin

## **Friday, June 29<sup>th</sup>**

### **9 am to 11 am: Room Rowland Hall 390**

- Lecture by **Prof. Doug Tobias**
  - Molecular structure
  - Fundamentals of molecular dynamics
  - Review of computational chemistry

**11 am to 12 pm:** Lunch with AirUCI faculty and researchers (provided)

### **12 pm to 4 pm: Room MSTB 226B**

- Computer Lab: Chemistry on the computer

## **Monday, July 2<sup>nd</sup>**

**9 am to 11 am: Room Rowland Hall 390**

- Lecture by **Prof. Sergey Nizkorodov**
  - Particulate matter (PM10 and PM2.5) (p. 106–116)
  - Health risks of particulate matter (p. 116–127)
  - Light interaction with particulates (p. 202 & 203)
  - Aerosols: Composition and Effects on Global Warming (p. 107, & 203–206)
  - PAH (p. 393–402)
  - Combustion reactions and pollutant formation
  - Fuels: Hydrocarbons, Aromatics, H<sub>2</sub> (p. 283), Coal (p. 228 & 229), Petroleum and Gasoline (p. 229–231 & 267–271), Diesel (p. 267–269, 401 & 402)
  - Alcohols as Fuel (p. 272–280), MTBE (p. 280–282)
  - Leaded Fuel (p. 537–541)
  - Basic Organic Nomenclature (Appendix AP–1 through AP–14)

**11 am to 12 pm:** Lunch with AirUCI faculty and researchers (provided)

**12 pm to 4 pm: Rooms RH 481, RH 315, RH 354, RH385**

- Continue with the third wet lab experiment

## **Tuesday, July 3<sup>rd</sup>**

**9 am to 11 am: Room Rowland Hall 390**

- Special lecture by **Prof. Benny Gerber**
  - The Hydrogen Bond in Chemistry

**11 am to 12 pm:** Lunch discussion of applications of material to their teaching (provided)

**12 pm to 4 pm: Rooms RH 481, RH 315, RH 354, RH385**

- Continue with the fourth wet lab experiment

## **Wednesday, July 4<sup>th</sup>**

**Independence Day break – no classes**

## **Thursday, July 5<sup>th</sup>**

**9 am to 11 am: Room Rowland Hall 390**

- Lecture by **Prof. John Hemminger**
  - Fundamentals of surface science and environmental concerns at surface interfaces
  - Catalysts and catalytic converters (p. 83–88)
  - Seawater and sea salt aerosols (p. 452 & 453)
  - Heterogeneous SO<sub>2</sub> oxidation (p. 157–161) and PSC's (p. 36–39)

**11 am to 12 pm:** Lunch with AirUCI faculty, researchers, and AirUCI advisory committee (provided)

**12 pm to 4 pm: Rooms RH 481, RH 315, RH 354, RH385**

- Continue with the fifth wet lab experiment

## **Friday, July 6<sup>th</sup>**

**9 am to 12.30 pm: Room Rowland Hall 390 (initially)**

- Guided tours of research labs of AirUCI Professors (split into small groups of 5 people)

**12.30 pm to 2.30 pm:** Lunch with AirUCI faculty and researchers (provided)

- Pairing of teachers and researchers.
- Discussion on future lab experiments
- Applications of lab topics and skills to everyone's classes
- Discussion on applications to the middle and high school
- Discussion of possible future AirUCI projects and topics

Early dismissal at 2.30 pm.