

**Jain Lab Facilities** (Email [jainlabs@googlegroups.com](mailto:jainlabs@googlegroups.com) to get access)

### **Wetlab (CLSL A231)**

- ✦ Vacuum Atmospheres OMNI-Lab Argon glovebox
- ✦ Two fume hoods, one with operational Schlenk line
- ✦ Barnstead Nanopure deionized water purification system
- ✦ Eppendorf Centrifuge 5804
- ✦ Shimadzu UV-3600 UV-VIS-NIR Spectrophotometer (190–3300 nm) with variable temperature (0–100 °C) achieved by a Cole-Parmer Polystat constant temperature circulator
- ✦ Cary Eclipse fluorescence spectrometer (200-800 nm)
- ✦ MTI Corporation VTC-100 Vacuum spin coater
- ✦ Hotpack furnace (0–800 °C) and VWR gravity oven (0–300 °C)
- ✦ UVP UVGL-15 Compact UV Lamp (254/365 nm, split tube, 4 W)
- ✦ Bio-Logic SP-200 Potentiostat with VMP-300 multi potentiostat supporting currents between 10 nA and 1 A and Controlled Environment Sample Holder (CESH) temperature-controlled sample chamber
- ✦ Temperature-dependent X-ray diffraction (XRD) sample stage
- ✦ Ohaus PA153, 1 mg resolution balance
- ✦ Branson 3510 ultrasonication bath
- ✦ Glas-Col Mantle-Minder thermocouple and heating unit attached to a vacuum hotplate for cleaning substrate-coated samples by baking

### **Optics Lab (CLSL A233)**

- ✦ Two large (4'x8' and 5'x10') with semi-active vibration isolation optics tables and one Small (4'x2') optics table
- ✦ Two diode-pumped solid-state lasers for lasing at 532 nm
  - UltraLasers CST-HV-532nm-2W
  - UltraLasers CST-H-532nm-1.5W
- ✦ Two diode lasers for lasing at 445 nm
  - UltraLasers CST-H-445nm-1W (max around 200 mW now)
  - UltraLasers MDL-III-445nm-1W
- ✦ Olympus IX-71 inverted microscope equipped for epi-fluorescence and prism-based TIRF imaging with Andor iXon 897 CCD
- ✦ Olympus IX-51 inverted microscope for spectro-microscopies (dark field, transmission optical absorbance, epi-fluorescence, and Raman scattering) with a Princeton Instruments SP2300 spectrograph and Pylon100B CCD. Equipped with Raman filter for 532 nm excitation.
- ✦ Setup for visible-light photocatalytic studies compatible with irradiation by one of the lasers listed above or a Stryker X6000 300 W Xenon white-light source, coupled to a Fiber Optic of 5 mm to 10 ft (Stryker 233-050-084), and a linear variable visible wavelength range filter.
- ✦ Quartz spectroelectrochemical cell for spectroelectrochemistry and photoelectrochemical cyclic voltammetry measurements. The cell is equipped with a Pt working electrode, a glassy carbon counter electrode, and Ag/AgCl (aqueous and organic) reference electrodes and driven by potentiostat.

- ✦ Three photoelectrochemistry-compatible cells with a Nafion separation (H-type cell). The cells are equipped with two quartz windows for studies with light and each cell can employ either a two or three-electrode system using a working electrode (L-Shaped GCE, GCE, or AuE), a counter electrode (Pt mesh, graphite rod 99%), and a reference (Hg/HgO or Ag/AgCl with three different chloride solutions) electrode.
- ✦ DY2100 Digi-Ivy potentiostat, supporting currents between 20 nA to 2 mA with a potential interval of  $\pm 2$  V.
- ✦ CH Instruments (CHI 650a Potentiostat/Galvanostat) electrochemical work station, supporting currents between 10 pA to 250 mA with a potential interval of  $\pm 10$  V.
- ✦ Agilent 6850 gas chromatograph with split/splitless inlet and flame ionization detector for small-molecule detection
- ✦ Agilent 7820A gas chromatograph with purged packed inlet and thermal conductivity detector