Yang **Dai**

Instrumentation · Surface Science · Engineering

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Education

University of Utah *Salt Lake City, Utah*

Ph.D. in Physical Chemistry *Jun. 2011 - May. 2017*

- Thesis: Electronic Characterization Of Size-Selected Platinum Clusters and Modification Through Atomic Layer Deposition.

Experience

Massachusetts Institute of Technology *Cambridge, Massachusetts*

Postdoctoral Fellow *Jun. 2017 - Exp. Jun. 2019*

- Currently using various surface characterization techniques, such as Mass Spectrometry, Auger Electron Spectroscopy, and Electron Energy Loss Spectroscopy, to explore whether modification of the Nickel electronic structure by formation of a surface alloy with Au will result in un-activated dissociative adsorption of molecular hydrogen.
- Transitioned data analysis method from conventional Excel-like spreadsheet to Python Scripting for improved automation and result reproducibility.
- Increased the accuracy of experimental results by introducing new algorithm and data modeling method to our previous analysis techniques.

University of Utah *Salt Lake City, Utah*

Research Assistant *Aug. 2011 - May. 2017*

- Designed and fabricated a sophisticated cluster deposition apparatus with the capability of depositing mass-selected noble metal clusters. The mass selection was accomplished by a custom built quadrupole mass filter. Click here for more information.
- Upgraded an old VG ESCALAB MKII surface science instrument with functioning XPS, QMS, and sputter gun. Added metal evaporators for growing alumina and Tin thin film, a sample stage for ALD, and a sample heating/cooling stage on the manipulator to conduct TPD in front of a differentially pumped mass spectrometer.
- Wrote LabView programs for data acquisition and system control.

Side Projects

Python Package for Research Data Processing and Analysis

www.github.com/superyang713/LabCode

- Wrote a Python Library for preprocessing, modeling, and visualizing data collected from various surface science instruments.

Personal Tech Blog

www.yangdai.info/lab/pressure_monitor

- Built a remote pressure monitor web app for lab instruments to increase lab safety and productivity.

Core Skills

Instrumentation	UHV Instrument Design, Mass Spectrometry, Thin Film Coating
Characterization	XPS, EELS, AES, MS, XANES
Programming	Python, C++, labview
Tools	AutoCAD, Jupyter Notebook, Shell, SQL, LaTex
Languages	English, Chinese, Japanese (intermediate)