Hannah L. Barks

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Education:

Ph. D candidate in Analytical Chemistry **Georgia Institute of Technology, Atlanta, GA**

- **Fall 2006-Present**
- **Related Coursework:** Quantum Mechanics, Thermodynamics, Mass Spectrometry, Biochemistry I, Scanning Probe Microscopy, Analytical I
- **Student Teacher Enhanced Placement (STEP) Fellowship:** Currently am working at Marietta High School as a STEP fellow. This program allows me to go to Marietta High School once a week to teach Environmental Science, Biology, CP Chemistry, and IB Chemistry along with working with various clubs at Marietta to get the students involved in learning. Another fellow and I are in charge of the Marietta High School Engineering Club, in which we are currently building an outdoor classroom that consists of teaching the students how to build bridges and boardwalks and identify terrain suitable for these projects. The Engineering Club is involved in a lot of different projects including service projects for the community and raising money and food for local charities.

Honors Bachelors of Science in Chemistry **Warren Wilson College, Asheville, NC**

- **Fall 2003-Spring 2006**
- **GPA:** 3.61
- **Minor:** Physics
- **Dean's List Recipient**
- **Related Undergrad Coursework:** General Chemistry I and II, Organic Chemistry I and II, Analytical Chemistry, Physical Chemistry, Quantum Chemistry and Chemical Dynamics, Forensics, Calculus I and II, and Physics I and II, Inorganic Chemistry, Biochemistry, and Differential Equations
- **Chemistry Crew (Spring 2005 –Fall 2006):** Conducted various research for different professors and determined the appropriateness of different experiments for classroom use. Teaching assistant for at least six hours a week in General Chemistry I and II, Analytical Chemistry, Inorganic Chemistry, Biochemistry, and Organic Chemistry I and II. In this time period I also tutored in General Chemistry I and II and Organic Chemistry I and II and ran different instruments for students in all areas listed above using instruments listed in the Instruments Section.

Instruments:

Warren Wilson College Chemistry Department **Fall 2003-Spring 2006**

- Proton nmr
- ^{12} Carbon nmr
- Infrared Spectrophotometer:
  Buck Scientific Model 500 Infrared Spectrophotometer
- Ultra Violet-Visible Spectrophotometer:
  Ocean Optics Inc. ISS-UV-Vis

- Flame Atomic Absorption / Emission Spectrophotometer:
  Buck Scientific Atomic Absorption / Emission Spectrophotometer 200
- High Pressure Liquid Chromatography:
  LC-10 AT VP Shimadzu Liquid Chromatograph
  DGU-14A Shimadzu Degasser
  RF – 10AXL Shimadzu Fluorescence Detector
  SPD 10AV VP Shimadzu UV-Vis Detector
- Gas Chromatograph / Mass Spectrophotometer(GC/MS)
  Gas Chromatograph:
  GC-17A Gas Chromatograph Shimadzu
  Mass Spectrophotometer: GCMS – QP5000 Gas Chromatograph Mass Spectrophotometer Shimadzu
- Gas Chromatograph / Electron Capture Detector (GC/ECD)
  Agilent Technologies 6890N Network GC System
- Gas Chromatograph / Flame Ionization Detector(GC/FID)
  Hewlett Packard HP 6890 Series GC System

Warren Wilson College Physics Department **Fall 2005-Spring 2006**

- Deep Sky Imager Pro (DSI-Pro)
- Telescope
  Celestron Ultima 2000

Georgia Institute of Technology (Thomas M. Orlando Research Lab) **Fall 2006-Spring 2008**

- Ultra-High Vacuum System equipped with quadrupole mass spectrometer, time-of-flight mass spectrometer, 2 dosers, electron-gun, molecular beam doser, helium cryohead
- Agilent Liquid Chromatography Mass Spectrometer(LCMS) from the Mass Spec Facility at the Georgia Institute of Technology.

Research:

Georgia Institute of Technology Fall 2006-Spring 2008

- **Rare Gas Project:** Determined the role of hole transfer via Auger decay and intermolecular Coulomb decay (ICD) in the electron stimulated desorption (ESD) of water cluster ions from water absorbed on rare gas over layers (Neon, Argon, Krypton, and Xenon) and rare gas layers absorbed on water clusters.
- **Origin of Life Project:** This project involves determining the role of ultra-violet light in the formation of nucleic acids from the reaction of formamide with different mineral "catalysts." The analysis of this data will be done with high pressure liquid chromatography and liquid chromatography mass spectrometry (LCMS).

Warren Wilson College Fall 2005-Spring 2006

- **Astrophysics:** Conducted research using basic astrophysics and astronomy techniques to determine the effectiveness of the DSI-Pro Camera for Classroom use and established a method to determine the relative ages of stars.

Swain County High School Fall 2002-Spring 2003

- **Aquaponics System:** In this project an aquaponics system was built. An aquaponics system is a combination of aquaculture and hydroponics. In the aquaponics system at Swain County High School I grew a variety of different herbs and Blue-Gill fish in the same system. The plants provided nutrients for the fish and the fish waste supplied a food source for the plants in this project.

Internships:

The Nature Conservancy – North Carolina Mountains District **Summer 2005**

Gave naturalist tours of Bat Cave North Carolina and worked with a GPS system to find Invasive plots in Bat Cave and Rumbling Bald in Hickory Nut Gorge and did extensive invasive exotic removal throughout hickory nut gorge. Conducted experiments with naturalists from Western North Carolina to monitor White Irisette abundances and did basic inventories of different Nature Conservancy Preserves. After the internship was over I created a nature trail guide for the Bat Cave trail with easy to use identifications of plants and different geologic formations that take place to create the different types of forests and caves along the Bat Cave trail to help future interns learn the plants so that they could teach the people that they gave tours to in the future.

Weeks Bay Reserve Foundation (Fairhope, Alabama) **Summer 2004**

Worked with biologists and economists to raise money and determine means of protecting the Weeks Bay area. Assisted Mike Shelton in conducting a study determining the amount of Mercury in fish and comparing the amount of mercury in the fish to the age of the fish determined by the otolith. There was also a lot of work put into preparing and conducting the Weeks Bay Reserve Foundations Photo Contest. The Weeks Bay Reserve Foundation also had a big push to gather signatures to induce the process of zoning of zone 14 of Baldwin County; therefore, I also helped with that. During my time at Weeks Bay Reserve Instructional Center I created a pitcher plant brochure for Kurt G. Wintermeyer Pitcher Plant Bog along with a nature trail guide for the nature trail beside the Weeks Bay Reserve interpretive center.

Awards:

Athletic Scholarship **Warren Wilson College, 2003-2004**

- From Swain County High School

Presidential Fellowship **Warren Wilson College, 2003-2006**

All American in Basketball **Warren Wilson College, 2004-2005**

- USCAA Women's Basketball Team Academic All American in Basketball

Sigma Xi Member **Warren Wilson College, Fall 2006-Spring 2008**

- Invitation into Sigma Xi. Sigma Xi is a research society "whose programs and activities promote the health of the scientific enterprise and honor scientific achievement."

American Chemical Society Award **Warren Wilson College, Spring 2006**

- Outstanding Senior Chemistry Major award

STEP Fellowship **Georgia Institute of Technology, 2007-2008**