leading the field

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The College of Science (COS) is focused on exploration of our world from the smallest elements in the core of our earth to the farthest reaches of space. We are concerned with sustaining the future of our planet and the long-term viability of the species and ecosystems that we share this planet with. College of Science faculty work directly with our students in service and research endeavors. We pride ourselves on engaged teaching and learning strategies that capture students' imaginations while providing them with the skills and knowledge they need to be competitive in today's science and mathematics career markets. Inspired by the designs of successful university science buildings around the country, Tracy Hall Science Center is a state-of-the-art facility with features that are breathtaking, eco-friendly, and ingenious. Our modern laboratory and field equipment offers students additional training opportunities as they pursue their degree programs. Current research is diverse and ranges from the regeneration of the central nervous system in zebrafish (applications to human stem cell therapy) to taking air measurements for atmospheric physics, and from understanding microbial ecology of aging Cheddar to chemical microanalysis of a variety of solid materials. Please let us know if you have questions or would like to learn more about our research and/or the functionality of our equipment.

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College of Science playlist

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ZOOLOGY PHYSICS MICROBIOLOGY MATHEMATICS EARTH & ENVIRONMENTAL SCIENCES CHEMISTRY & BIOCHEMISTRY BOTANY

GREENHOUSE:
Used to support teaching through a varied collection of living plants and space for individual and class student projects

CONTROLLED ENVIRONMENT CHAMBERS:
Used to grow plants in soil or tissue culture for individual student and class projects and faculty research

HERBARIUM:
A collection of almost 30,000 specimens that is accessible through various online portals for student, faculty, and public research.

SPECTROSCOPY: NMR, UV-VIS, IR, Fluorescence, X-ray Fluorescence, Atomic Absorption/Emission, and Inductively Coupled Plasma
Used for substance identification and quantification, elemental analysis and thermodynamical analysis.
Rigaku SuperMini200 XRF, Anasazi EFT-90 with multi-nuclei probe (2009), HP 8453 (2000), HP 8452A (1990),Thermo Nicolet Nexis 470 with microscope (2009), Thermo Nicolet iS50 high resolution IF (2016), Thermo Nicolet Avatar 370DTGS (2005), Thermo Nicolet 380 (2010), Perkin Elmer LS50B (1994), Niton XLT 792HY (2007), Thermo iCE 3000 (2010), Thermo iCap 7000 ICP-OES, Thermo iCap-RQ ICP-MS

GAS & LIQUID CHROMATOGRAPHY: GC, GC-MS, HPLC, and UHPLC
Used for sample characterization and component identification.
HP 6890 (3) (2005), HP 5890 (3) (1990), Agilent 7890A/5975C MSD (2008), Waters Mod I (2) (2004), Agilent 1100, Waters 2690XE with RI Detector (2001), and Thermo with triple-quad mass spec (2016)

FEI QUANTA 250 ENVIRONMENTAL SEM:
Capable of imaging and analyzing samples under variable atmospheres and atmospheric pressures. Samples may be observed via backscattered and secondary electron imaging, via cathodoluminescence imaging, and via elemental mapping – all to magnifications greater than 100,000x for samples up to 50mm in diameter. The instrument was recently upgraded with state-of-the art imaging and elemental analysis hardware (Thermo UltraDry EDS) and software (Thermo Pathfinder Pinnacle), and can provide exceptional qualitative, semi-qualitative, and quantitative* chemical microanalysis of a variety of solid materials (*given the availability of appropriate standard materials).

LABORATORIES:
BS2-designated teaching and research including microscopy, culturing, immunology, molecular biology, and cell biology laboratories equipped with fume hoods, Nuaire NU-540-600 Class II Type A2 Biological Safety Cabinets , Leica DM750 phase contrast compound microscopes--some with integrated cameras, isotemp water baths, refrigerator/freezer units, Sorvall ST16 centrifuges, microcentrifuges, vortexers, MaxQ4450 benchtop incubator/shakers, heratherm microbiological incubators (held at 25°C, 30°C, 35°C, 37°C, 55°C), Heracell VIOS 160i CO2 incubators, Benchtop autoclave.

AJA SPUTTERING DEPOSITION SYSTEM:
A versatile system to deposit thin film layers of a variety of materials or multiple layers to create a simple device. We have collaborated with Engineering in EAST on projects recently.

SURFACE PROFILOMETER:
A system to measure thickness of deposited layers. A complementary piece to the sputtering tool.

ASTRONOMY FACILITIES:
We have a 60 seat planetarium, a public observatory with nine telescopes, and a research-grade Phcomputer-operated 16 inch telescope.

AIRBORNE GAS SENSORS (THE ATMOSNIFFER):
This is a product that is currently under development in our laboratory and is used for both ground level and high altitude flight measurements.

CONFOCAL MICROSCOPE:
Takes high quality fluorescent images in live and fixed tissue. Recently purchased and will be used by select trained undergraduates.

MICROINJECTION SYSTEM:
Perform gene editing in zebrafish. Allows injection of picoliter amounts of genetic material into zebrafish embryos.

DIRECT MERCURY ANALYZER (NIPPON MA-3000):
Analyzes total mercury concentrations in a variety of matrices (soil, biota, etc) using thermal decomposition and cold vapor atomic absorption which does not require chemical sample digestion.