University of Houston Clear Lake

The University of Houston-Clear Lake is a Hispanic-serving Institution with research laboratories that meet standard safety requirements and are equipped to conduct research in a diverse range of sciences.

Environmental Institute of Houston

The mission of the Environmental Institute of Houston is to advance understanding of the environment through interdisciplinary research, education, and outreach.

Cyber Security Institute

The Cyber Security Institute serves as a focal point of collaborations between the academia, the federal agencies, and the local governmental and business organizations in the greater Houston area. The UHCL-CSI has three primary missions: Research & Development, Education, and Services.

Research Capabilities

UHCL faculty engage in a wide array of research interests. Examples include:

- I/O Processing for Cyber Physical System Using Scratchpad Memory
- Virtual Reality for Cyber-Controlled Physical Training of Individuals with Disabilities
- Criteria for Establishing Optimal Chemical Resistance of Chemical Protective Gloves
- Exploiting Tet-Off Advanced Inducible Gene Expression System to Analyze Protein-Protein Interaction
- Numerical Simulation of the Effectiveness of Phytoremediation using HydrusID
- The Impact of Training on the Effective Use of Automation in Noisy Environments
- Construction of Novel Tubular Polymers
- Effects of Weak Electromagnetic Fields on Bacterial Response to Antibiotics
- Models of New Physics at the Large Hadron Collider
- Implementation of a new datamining technique to generate rules for minority classes
- IoT System Assisted Home-based Exercise Evaluation
- Computational Biology and Bioinformatics
- Permutation Arrays for multiple transitivity
- Topologically protected quantum bits based on multi-component superconductor Josephson junctions
- Laser Ablation ICP-MS to Study the Metal Behavior at the Solid Interface
- Coupled Use of LA-ICP-MS and HPLC-ICP-MS to Study Arsenic Speciation from Dietary Exposure
- Formation of Melamine and Its Decomposition
- Aryne Annulation Chemistry

Equipment

Physics Laboratory

- HPC cluster composed of 4 custom-built compute nodes utilizing 3.8Ghz quad core AMD A10-5800K APUs with 32 GB or RAM each.
- Computational Lab capable of dual booting into Windows and Linux.

Computer Science and Engineering Laboratory

- Baxter the Robot - a two-armed robot.
- Various mobile robots such as the National Instruments NI robot and several TurtleBot robots
- EshedScorbot-ER VII robot arm with a vision system.
- Workstations with latest development systems for microcontroller-based system design
- Lab benches and test equipment for fabrication and verification of designs

Chemistry Laboratory

- HP 5890 GC system with FID detector
- Vortex mixer
- Buchi rotatory evaporators
- Ultrasound cleaner
- Haake K20 coolers connected to rotatory evaporators and Neslab CC100 Immersion Cooler
- Photo-reaction system
- Biotage microwave synthesizer
- Labconco freeze-drying system

Equipment

Biology Laboratory

- -80°C freezers
- Shaker/Incubators
- Imaging Systems:
  - Fotodyne digital photo-documentation system
  - BioRad Chemidoc XRS+Imaging System
- Plate readers (UV & Fluorescence):
  - UV: Molecular Devices SpectraMAX-plus cuvette/microplate spectrophotometer reader with SoftMAX pro computer software
  - UV/Fluorescence: TECAN Infinite M200 Plate Reader/Microdrop Analyzer
- Nanodrop spectrometer
- DNA Sequencer:
  - ABI 3500XL Genetic Analyzer
  - LiCor Model 4300L DNA analyzer with Sequencing and AFLP package
- Thermocyclers (including qPCR capabilities):
  - Various Cycler
  - Real Time PCR Systems
- Fluorescence/Epifluorescence/Light Microscope and Imaging System:
  - Nikon Eclipse 80i Advance Research Microscope with CF160 optics for Fluorescence and Brightfield Microscopy plus Two Nikon Digital Imaging Systems with NIS ElementsImaging
  - A Nikon Optiphot-2 microscope equipped for normal and epifluorescence microscopy (including a DAPI filter), 10-40X Nikon Fluor objectives, and DXM 1200 digital camera
- Mutation detection system:
  - BioRad DCode Universal Mutation Detection System for DGGE
- High Speed Refrigerated Centrifuge (Thermo Scientific)
- Certified Forma Scientific Biosafety II hoods
- CO_2 incubators:
  - Forma Scientific dual chambered water-jacketed incubator
  - VWR single chambered water-jacketed incubator
- Electroporator:
  - BioRad Gene Pulser XCell DNA Electroporator
- Scintillation and Luminescence Counter:
- Packard Topcount NXT Scintillation and Luminescence Counter

Contact information

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Key Partnerships

- NASA Johnson Space Center
- Tietronix
- AdAstra Rocket Co.
- Flow Cal Inc.
- Pearland Chamber of Commerce
- BayTech
- ExxonMobil
- Simmons Foundation
- United Space Alliance
- Lyondell Chemical Co.
- Bay Area Houston Economic Partnership

Research Sponsors

- NASA
- National Science Foundation
- US Department of Education
- NIH/NIDA
- DARPA
- Texas Parks and Wildlife
- EPA/Texas Commission on Environmental Quality
- US Fish and Wildlife Service

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