
Argonne, University of Chicago Partnership Advances Science and Technology

The University of Chicago has managed Argonne National Laboratory since before it was designated a national laboratory.

More than 100 researchers hold joint appointments as University faculty and Argonne staff.

Notable examples of Argonne-University collaboration include:

Creation of “The Argonne Lab”

University professor Enrico Fermi’s first reactor moved to “Argonne Forest” in Cook County to become the centerpiece of “The Argonne Lab.”

Scanning Transmission Electron Microscope

University professor and former Argonne Director Albert Crewe developed modern scanning transmission electron microscopy. This work culminated in the first visualization of single heavy atoms in an electron microscope.

The Computation Institute

The University and Argonne created the Computation Institute in recognition of the increasingly central role that computation plays in many disciplines of the sciences, medicine, law, arts and the humanities. More than 120 researchers at Argonne and the University belong to the Computation Institute. Together, they are leading the next stage in the evolution of large-scale cyber-infrastructure for enabling high-end computational research to address the most challenging computational problems using the integrated resources, data collections, instruments and visualization capabilities of nine resource partners. Among the Institute’s projects is the National Microbial Pathogen Data Resource Center, which supports the development of new vaccines, therapeutics and diagnostics for emerging and re-emerging infectious diseases.

Center for Environmental Science

Atmospheric chemists and physicists at Argonne collaborated with University statisticians and geophysicists to model atmospheric dispersion in urban canyons. These software tools will help determine the impacts of energy-related emissions on urban air quality and help predict the dispersion of airborne agents from terrorist attacks in urban areas.

Dynamic Environments: Modeling and Simulation

University social scientists are collaborating with Argonne to develop a capability for holistic, multidisciplinary simulation of life that explicitly represents fine-scale interactions among diverse natural processes and societal processes on a daily basis across multi-generational time scales. While first applied in the ancient Near East, creating a “virtual ancient Mesopotamia,” these tools and research methods are now being used to address agro-economic, social, and environmental sustainability issues in modern Thailand. Future applications being planned range from a project that seeks to better characterize environmental and socioeconomic impacts of glacier change and glacier hazards to a study designed to address robustness and sustainability issues for *extraterrestrial* (e.g., Mars) colonies.

Ice Slurry Can Save Stroke, Heart Attack Victims

Researchers at Argonne and at the University are developing a technology to save stroke and cardiac arrest victims by using a specially engineered ice slurry to cool their organs. Quickly lowering the temperature of targeted organs greatly reduces cell death and can give doctors and paramedics more time to revive victims.

Collaborative Nanoscience

Collaborations between Argonne and University scientists are instrumental in developing new research directions to design materials with revolutionary properties and with physical or chemical behavior dramatically different from anything fabricated with current technology. Beyond miniaturization techniques inspired by the semiconductor industry, these new approaches, based on self-assembly and bio-chemical recognition, are expected to revolutionize information storage, lead to novel functional materials, and transform medical treatments and environmental diagnostics.

Joint Threat Anticipation Center

Argonne and University researchers are working to understand and anticipate threats to U.S. national security. Together, they bring an appreciation of social, cultural and psychological processes, grounding in regional and historical contexts and complex modeling that can advance efficacy in both decision and policy making. Projects include studies to understand the strategic, economic, religious, and cultural factors that influence the causes, conduct, and consequences of terrorism and responses to it; exploration of how lawless areas come to exist, and the ways in which they are being exploited by terrorist organizations to produce global threats as well as language research focused on understanding poorly studied languages, such as many of the modern dialects of Arabic, through the use of automatic machine translation.

Joint Theory Institute

This new, multi-disciplinary joint research institution is dedicated to tackling the toughest scientific problems. The Joint Theory Institute (JTI) will embrace problems in theory of condensed matter, chemistry, high energy physics, nuclear physics and interdisciplinary topics involving nanoscience, biology, economics, engineering and computing. The JTI also will enhance theory-related activities, create collaborative research opportunities and promote the integration of this work with experimental activity at both institutions.

October 2006



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