HHS R&D EXPENDITURES, FY2018

UIC: $151.4 MILLION | URBANA-CHAMPAIGN: $63.5 MILLION
*Source: FY2018 NSF HERD Survey

HHS-Supported Projects at UIC

NATIONAL INSTITUTES OF HEALTH (NIH)

• The University of Illinois Hospital and Health Sciences System (UI Health) is playing a leadership role in the “All of Us” initiative, a $45M effort to enroll 150,000 Illinoisans in the national Precision Medicine Initiative Cohort Program.

• In 2017, the University of Illinois Cancer Center was awarded $6.75M from NIH to establish a specialized Center of Excellence in minority health and health disparities research. The Center for Health Equity Research (CHER) will investigate how social structures and determinants contribute to the health of marginalized groups.

• In 2016, UIC’s Center for Clinical and Translational Science (CCTS) was awarded a four-year, $17.7M grant from NIH to improve health disparities, particularly among minorities and underserved populations across the life span.

• With funding from NIH, UIC’s School of Public Health leads an Occupational and Environmental Health and Safety Education and Research Center, which addresses occupational safety and health training needs regionally, nationally, and internationally.

• The University of Illinois College of Medicine is leading an NIH-funded project—the Hispanic Community Health Study/Study of Latinos—to collect data on chronic diseases that are prevalent in Hispanics/Latinos. UIC recently received a $12M contract from NIH to continue its role as the Chicago field center of this study.

• A new $3M, five-year grant from NIH will allow researchers to study the impact of a program designed to educate ER visitors with uncontrolled high blood pressure.

HEALTH RESOURCES AND SERVICES ADMINISTRATION (HRSA)

• Mile Square, UI Health’s Federally Qualified Health Centers network, has received several supplemental grants from HRSA aimed at growing and improving mental health and addiction services. In addition, the Mile Square Humboldt Park Clinic received a three-year $1.5M Collaborative Care HRSA grant to develop an interdisciplinary collaborative practice model.

• In 2015, UIC’s School of Public Health was awarded a five-year, $1.75M grant from HRSA to fund a Center of Excellence in Maternal and Child Health. The Center is designed to develop local and global leaders who support the health of women, children, and families.

• In 2017, UIC’s College of Social Work was awarded a four-year, $1.9M grant from HRSA to fund an Integrated Evidence-based Behavioral Health Care Social Work Training Program targeting children, adolescents, and transitional age youth in the Chicago metropolitan area.

• UIC has received funding from Title VII (nursing workforce development programs) for the Geriatrics Workforce Enhancement Program, Graduate Psychology Education Programs, Health Careers Opportunity Program, Centers of Excellence Program and Primary Care Training and Enhancement Program. Title VII funding also supports the Area Health Education Center Program at UIC.
**CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)**

- UIC is one of 26 academic research institutions nationwide designated as a [Prevention Research Center](#) by CDC to work with vulnerable communities on new ways to promote health and prevent disease. The Illinois PRC conducts research to promote behaviors that improve physical activity and nutrition or reduce tobacco use.

**SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION (SAMSHA)**

- UIC’s [Urban Youth Trauma Center](#) received a five-year, $3M grant from SAMSHA to provide training and support services for those who serve youth and families experiencing psychological trauma and community violence in low-income urban neighborhoods.

**AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ)**

- AHRQ funding supports efforts to obtain evidence and information that will help ensure safe and high-quality healthcare. UIC currently has five active AHRQ awards.

**HHS-Supported Projects at Urbana-Champaign**

Urbana supports NIH’s mission through the Beckman Institute, the Carl R. Woese Institute for Genomic Biology, and the Carver Biotechnology Center. In July 2018, the inaugural class of 32 future physician-innovators began their education at the world’s first engineering-based college of medicine, the new [Carle Illinois College of Medicine](#). Through their advanced medical training, they will harness engineering and innovation to improve the human condition. Also new to campus, the [Cancer Center at Illinois](#) uses technology to address cancer across the human lifespan. With approximately 70 members with $31M in research funding, the center is designed to leverage the campus’s strength in engineering, sciences and computing.

- Urbana continues to train biomedical researchers in innovative approaches. With an NIH T32 grant, the [Tissue Microenvironment Training Program](#) is preparing the next generation of interdisciplinary leaders capable of undertaking fundamental research and enabling translational advances.

- Urbana is a leader in engineering-based translational research with NIH/NCI funded projects like the [Polarization-Sensitive OCT for Assessing Breast Tumor Margins](#). With partners Carle Foundation Hospital and start-up company Diagnostic Photonics, this intraoperative optical imaging technology finds positive breast tumor margins in real time.

- Urbana’s transdisciplinary, NIDDK-supported [Dietary and Microbial Predictors of Childhood Obesity Risk Project](#) will determine how dietary prebiotics influence host-microbe interactions and infant growth trajectory and weight/body composition.

- The NIH Biotechnology Research Center for Macromolecular Modeling and Bioinformatics has been developing leading software for computational biology and molecular simulation and visualization for nearly three decades. Through its evolving programs, comprehensive dissemination, range of collaborative biomedical projects, and extensive training program, the Center serves more than 120,000 biomedical researchers across the nation and in the world.

- Urbana leads the [Children’s Environmental Health Research Center](#), a NIEHS/EPA-funded center that studies the effects of exposure to bisphenol A (BPA), phthalates and other chemicals found in plastics and personal care products on neurological and reproductive development and function.

- In October 2015, Urbana received a five-year, $8M grant from the NIH Common Fund to lead a study on nuclear structure as part of the [4D Nucleome Program](#).

- Urbana is a partner in the [Upper Midwestern Center of Excellence for Vector-borne Diseases](#), a group that recently received $10M from the CDC to fight diseases spread by insect vectors.
The U of I System has had a longstanding and successful partnership with the National Science Foundation (NSF), the only federal agency charged with the promotion of scientific progress across all scientific and engineering disciplines. NSF is the cornerstone of America’s basic research enterprise. The U of I System supports NSF’s drive to invest in their proposed “Ten Big Ideas.”

**NSF-Supported Projects at Urbana-Champaign**

Urbana is regularly among the top recipients of NSF funding in the nation. The NSF Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) program is critical to Urbana's Research Park, particularly its tech incubator EnterpriseWorks. There have been 80 SBIR/STTR awards from NSF to EnterpriseWorks/Research Park startup companies totaling $22.5M from 2001-2018. Several NSF-funded startup companies have gone on to raise hundreds of millions of dollars in venture capital and private investments.

**NSF-SUPPORTED INFRASTRUCTURE FOR THE NATION’S RESEARCH COMMUNITY**

- **XSEDE**: NSF selected the National Center for Supercomputing Applications (NCSA) at Urbana to lead a five-year, $110M project to expand the Extreme Science and Engineering Discovery Environment, which accelerates scientific discovery by integrating advanced computational resources into powerful and easy-to-use services.
- NSF awarded NCSA $5M to bring together the Clowder community. Clowder, an open source data management tool based on active curation, was developed at NCSA.

**NSF-SUPPORTED RESEARCH TO ADDRESS GRAND CHALLENGES OF OUR TIME**

- **POETS**, an Urbana-led Engineering Research Center (ERC), addresses thermal and electrical challenges surrounding mobile electronics and vehicle design.
- **I-MRSEC**, a new $15.6M Urbana-led Materials Research Science and Engineering Center (MRSEC), performs fundamental, innovative materials research and supports interdisciplinary education and training of students.
- Urbana researchers have been awarded grants under the NSF Innovations at the Nexus of Food, Energy and Water Systems (INFEWS) program, which aims to address the complex interdependencies associated with food, energy, and water systems.

**PROGRAMS TO LEVERAGE NSF INVESTMENT**

- **Innovation Corps (I-Corps)**: Urbana has been a site for the I-Corps program since 2013. The 150+ teams participating in this entrepreneurial program have raised $71M, including $51M in venture capital and $16M in SBIR funding. In 2016, NSF announced a $3.5M Midwest I-Corps node, and Urbana plays a central role.
- **Industry/University Cooperative Research Centers (I/UCRCs)**: Urbana participates in university research to meet industry needs that transfer research results and
technological advances to the U.S. marketplace.

Faculty Career Development

• 21 faculty were awarded NSF CAREER awards in 2018, which provide funding to launch research programs for promising early-career faculty.

• Researchers are leading an Engineering Frontiers and Multidisciplinary Activities project that applies the science of teamwork to spark research collaborations across disciplines and institutions. The project seeks innovation by engaging a variety of scholars and researchers from the American Indian Higher Education Council, the Hispanic Association of Colleges and Universities, and the National Association for Equal Opportunity in Higher Education.

• Three faculty members will use Major Research Instrumentation (MRI), awarded by NSF, to purchase and develop instruments for cutting-edge advances in battery technology, biomaterials, and deep learning. The NSF allowed three MRI proposals per university and all three of Illinois’ submissions were accepted.

Education and Graduate Training

• NSF funded an innovative NSF research traineeship program (NRT) to study miniature brain machinery.

• A $2.4M NSF STEM+C award will fund a project integrating computational thinking into elementary school mathematics.

NSF-Supported Projects at UIC

26 UIC faculty currently have Faculty Early Career Development awards from NSF.

Cave2: NSF supports big data and visualization research at the Electronic Visualization Laboratory (EVL), which is home to CAVE2, a renowned interdisciplinary research laboratory that pioneered the development of the CAVE virtual-reality system.

The Learning Sciences Research Institute (LSRI), a campus-wide, multidisciplinary unit focused on improving instruction and learning, has enabled faculty to be successful in receiving funding from the Education and Human Resources Directorate at NSF. Among currently funded projects are three focused on developing the capacity of teachers to engage in instruction and assessment aligned with the vision of multi-dimensional science proficiency represented in the National Research Council’s Framework for K-12 Science Education and the Next Generation Science Standards. The three projects span grades 3-5 through the middle school and up into high school. All three involve collaborations with teachers from the Chicago Public Schools and surrounding districts. In addition to developing teacher capacity to design high quality instruction aligned with the standards, two of the projects are producing resources that are freely available via a technology portal and designed to support classroom formative assessment practices.

Dynamic social-network analysis reveals animal social behaviors: a computational ecologist is leading an NSF-supported project that uses IBEIS (Image-Based Ecological Information System)—the software design takes collections of images from field scientists, tourists, and incidental photographers and analyzes and stores the information to improve management and conservation of animals.

Discovering new 2D materials that can be used to manufacture better and cheaper batteries: In 2017, UIC received a $1.44M grant from NSF to discover new 2D materials to be used to manufacture better and cheaper batteries.
The Department of Energy (DOE) is the largest federal funding agency for research in the physical sciences. Within DOE, the Office of Science provides approximately 47 percent of total federal funding for basic physical sciences research. The U of I System is very competitive when it comes to DOE funding. Urbana is regularly among the nation’s leaders in DOE funding—year in and year out, they are among the top ten in research expenditures. Our universities partner with DOE national laboratories and with industry to respond to funding opportunities.

DOE-Supported Projects at Urbana-Champaign

The Urbana campus has been one of DOE’s top university funding partners. It is involved in three of the nation’s 36 DOE-funded Energy Frontier Research Centers.

ENSURING THE RELIABILITY AND SECURITY OF THE NATION’S POWER GRID

With support from DOE’s Office of Cybersecurity, Energy Security, and Emergency Response and DHS’s Security Science & Technology Directorate, the Cyber Resilient Energy Delivery Consortium (CREDC) is conducting cutting edge research to bolster the resiliency of the nation’s energy delivery systems.

ADVANCING THE NEXT-GENERATION USE OF FOSSIL FUELS

The Prairie Research Institute is a global leader in demonstrating technologies for capture and storage of carbon dioxide to balance our nation’s growing energy needs and climate concerns. DOE is funding multiple CarbonSAFE geologic storage projects to define and develop regional carbon storage infrastructure. A post-combustion Carbon Dioxide Capture project enables the commercial-scale capture of CO$_2$ from coal-fired power plants.

DEVELOPING TOOLS AND TECHNIQUES TO ENABLE BIOENERGY SOLUTIONS

In 2017, DOE awarded a five-year, $115M Bioenergy Research Center grant, one of four in the U.S., to Urbana’s Institute for Sustainability, Energy, and Environment, the Carl R. Woese Institute for Genomic Biology, and 17 partner institutions to establish the Center for Advanced Bioenergy and Bioproducts Innovation (CABBI). Using thematic research into feedstock production, conversion, and sustainability, CABBI will provide sustainable, cost-effective biofuels and bioproducts.

A $10.6M project funded by DOE’s Office of Science, Renewable Oil Generated with Ultra-productive Energycane (ROGUE) uses computer models to guide the engineering of energycane to produce the oil used to create biodiesel and biojet fuel. The Transportation Energy Resource from Renewable Agriculture (TERRA)/Mobile Energy-Crop Phenotyping Platform (MEPP) is developing a low-cost, autonomous robot that analyzes biofuel crops during the growing season to pinpoint plants with desirable yield and sustainability traits.
THE NEXT GENERATION OF MATERIALS FOR ENERGY
DOE is funding multiple projects to advance the synthesis, characterization, and understanding of Materials for Energy. This work includes radiation damage in metals, soft materials with programmed energy-centric properties, and advanced catalyst synthesis.

Urbana is a Tier 1 member of the REMADE Institute, focusing on driving down the cost of technologies needed to reuse, recycle, and remanufacture materials such as metals, fibers, polymers, and electronic waste.

ENERGY SOLUTIONS IN EXASCALE COMPUTING
The Center for Exascale Simulation of Plasma-Coupled Combustion (XPACC) has a five-year $15.7M grant from the DOE National Nuclear Security Administration’s Predictive Science Academic Alliance Program. XPACC is paving the way for cleaner-burning combustors, more reliable and high-performance jet engines, and the development of technologies and workforce to advance extreme-scale computing.

CONSOLIDATED INNOVATIVE NUCLEAR RESEARCH
The DOE’s Office of Nuclear Energy funds R&D projects, infrastructure upgrade grants, fellowships and scholarships under the Consolidated Innovative Nuclear Research program. DOE-supported nuclear energy research at Illinois includes enterprise risk management, irradiation assistance for stress in weldments, computer code validation for nuclear power plants, advanced structural materials tolerance, and accident-tolerant nuclear fuels.

ADVANCING COMMERCIAL APPLICATIONS
DOE funded over $5.87M of Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grants to Research Park and EnterpriseWorks (incubator) companies and graduates in Illinois in FY2018.

DOE-Supported Projects at UIC

IMPROVING ENERGY EFFICIENCY
With a five-year, $4.2M grant from the DOE Office of Energy Efficiency & Renewable Energy, UIC is helping industrial, commercial, institutional and utility entities evaluate and install highly efficient combined heat and power (CHP) technologies. CHP, also known as cogeneration, is a single system that produces both thermal energy and electricity. CHP has typical operating efficiencies of 65-75% or greater while more conventional and separate systems for electricity and heat operate at approximately 50% efficiency.

SOIL STABILITY
The DOE-National Energy Technology Laboratory awarded a grant which supported five graduate students, two postdoctoral researchers and more than a dozen undergraduate students to investigate the stability of soils in the Arctic circle. Their research has shown rapid changes in soil stability and soil nutrient dynamics.

DEVELOPING BREAKTHROUGH ENERGY STORAGE TECHNOLOGY
UIC and Urbana are partners in the Joint Center for Energy Storage Research (JCESR), a DOE Energy Innovation Hub. JCESR is a major research partnership that integrates fourteen national laboratories, universities, and private companies with the mission of overcoming scientific and technical barriers and developing breakthrough energy storage technologies for transportation and the electricity grid.
The U of I System is the state's leading recipient of DOD research funds. The University is prepared to support DOD's research, development, test and evaluation (RDT&E) portfolio at the highest levels, thanks to the construction of a Sensitive Compartmented Information Facility (SCIF), an enclosed area within the Research Park to process classified information.

It is imperative that DOD—even in a constrained funding environment—invests in the foundational science and technologies to confront looming challenges. The U of I System encourages Congress to support sustained and robust funding for the 6.1, 6.2, 6.3 science and technology accounts across services.

**U.S. Army Research Laboratory**

The U of I System has been strengthening its partnership with the Army Research Laboratory (ARL). Both UIC and Urbana are significantly involved in ARL's Open Campus Initiative, specifically the establishment of ARL Central.

Both universities were recently selected to receive awards from ARL through its "Internet of Battlefield Things" (IoBT) program. Urbana was selected to lead a $25M initiative to develop the scientific foundations of next-generation IoBTs, designed to enable predictive battlefield analytics and services. The IoBTs will connect soldiers with smart technology in armor, radios, weapons and more to give troops a better understanding of battlefield situations and help assess risks.

ARL awarded a grant to UIC in 2016 to develop a set of tools to validate experimental data that simulates diesel engine operating conditions of in-field ignition delays and excessive harmful pre-mixed burning. The Army Research Office (ARO) sponsors diverse projects at Urbana in catalysis, surface science, and engineering the optical properties of materials.

**DOD-Supported Projects at Urbana-Champaign**

Urbana receives significant funding from the Air Force Office of Scientific Research (AFOSR). From 2013-2017, AFOSR awarded Urbana $34.4M for a wide range of projects including unmanned aviation systems, laser cooling, hypersonics, advanced computer architectures and optomechanical systems. In 2015, AFOSR awarded the campus $4.3M to create a national Center of Excellence in Self-healing, Regeneration, and Structural Remodeling. By developing new chemistries and ways to integrate microcapsules, researchers have created polymers that can re-fill minor damage in paints and coatings (self-protecting), change color when undergoing stress (self-reporting), and re-bond cracks or restore electrical conductivity (self-healing).

In DOD’s initial selection of 21 advanced science and engineering research projects for its FY2016 DOD Multidisciplinary University Research Initiative (MURI), U of I researchers were included as principal investigators (PIs) or co-PIs in one third of the projects proposed by the nation’s top research institutions. In 2017, Urbana’s Materials Research Laboratory (MRL) was part of a consortium that was funded under the MURI program for research centered on additive 3D self-assembly of responsive materials.

The Defense Advanced Research Projects Agency (DARPA) funded several cutting-edge U of I projects this year. Advanced wireless technology to support warfighter
communications is a major focus. Researchers are developing new low-power and ultra-compact radio technology to enable communications through soil, rock and water. Another project will empower individuals to exercise better control over the quality of information they are exposed to on social media. At a national level, the work will help fight adversarial propaganda and help maintain integrity of critical information from malicious manipulation. Methods are in development to safeguard the electrical power grid from attacks on its GPS synchronization system.

The Information Trust Institute at Urbana received an $18.7M grant from DARPA to develop a testbed that will enable validation of new technology for faster response and recovery following an attack on the electric grid. The project, called Cyber-Physical Experimentation Environment for RADICS, will leverage expertise, tools and data provided by industry collaborators.

Noteworthy materials science programs received over $1M in four DURIP instrumentation awards from the Office of Naval Research this year, including funding for a materials measurement system, an infrared microscopy systems, and an ion beam polishing and coating system.

**DOD-Supported Projects at UIC**

UIC researchers received a four-year, $5.25M grant from DOD to lead a multi-site clinical trial to test the efficacy of a stem cell-based treatment for eye injuries.

In 2018, UIC’s Cancer Center received a three-year $1.17M DOD grant to develop a new therapy to treat triple-negative breast cancer.

A new three-year grant totaling nearly $1M from the DOD will fund UIC research on the gene SELENOF and its role in the development of prostate cancer among black men.

Researchers from UIC and the University of Chicago have received a three-year, $900,000 DOD grant to investigate how the gut microbiome—the trillions of bacteria, viruses and other bugs that make our digestive systems their home—influences breast cancer.

UIC is currently leading a $3M project funded by DARPA to design, develop, and evaluate a system that will identify security vulnerabilities in web software.

AFOSR awarded a grant to UIC in 2015 to conduct a study to provide controlled concentrations of intermediate chemical products (pyrolysis and oxidation) of currently used military jet fuel as a function of temperature and pressure. In 2016, AFOSR awarded a grant to UIC to study heat and carrier transport in electronic devices and their effects in wide bandgap structures including AlGaN.
The College of Agricultural, Consumer and Environmental Sciences (ACES) at Urbana is home to the Illinois Agricultural Experiment Station, which supports research capacity and education infrastructure in Illinois. Hatch and other related formula funds support capacity for applied science to benefit Illinois in areas such as plant breeding, animal performance and health, and obesity prevention strategies. USDA's Agriculture and Food Research Initiative (AFRI) supports competitive research programs that are essential to the research portfolio in ACES and in other units on the campus.

NIFA also supports University of Illinois Extension, whose network of educators reaches all 102 counties of Illinois with evidenced-based outreach and engagement programs in five broad areas: energy and environmental stewardship; food safety and security; economic development and workforce preparedness; family health, financial security, and wellness; and youth development. NIFA provides capacity support to U of I Extension through Smith-Lever 3(b) & (c).

**USDA-Supported Projects at Urbana-Champaign**

**AGRICULTURAL ROBOTICS** | A $885,000 USDA project battles herbicide resistance in harmful agricultural weeds, mechanically identifying and destroying weeds without the need for chemical herbicides. A complementary project, supported by a $900,000 USDA grant, improves the dexterity of agricultural robots for greater functionality in multiple field applications.

**PRODUCER EDUCATION** | Urbana’s farmdoc team, in partnership with the National Center for Supercomputing Applications, is developing new, updated web-based educational tools to help farmers navigate program changes in the Agricultural Improvement Act of 2018. Funding for the initial stages of development were from the Gardner Agriculture Policy Program, with an additional $166,000 from USDA's Office of the Chief Economist.

**PERENNIAL CROPS** | AFRI is supporting a $1M project to develop better-adapted and higher-yielding Miscanthus cultivars with optimized composition for the biomass industry, thereby increasing potential adoption of perennial cropping systems across the U.S.

**ORGANIC CORN** | The first year of a $2M organic maize germplasm-testing project from the USDA-NIFA Organic Agriculture Research and Extension Initiative is complete, with farmers providing data and qualitative feedback from on-farm trials across the Midwest. Selections are being tested for nutritional quality in the $30M state-funded Integrated Bioprocessing Research Laboratory, which opened on the Urbana campus in 2018.

**BRAIN DEVELOPMENT** | A $1.6M project in the USDA-NIFA/National Institutes of Health Dual Purpose with Dual Benefit program aims to understand the effects of maternal infection on brain development in pigs from birth through puberty. Results from the multidisciplinary project have implications for both production agriculture and human health.
**CHILD NUTRITION** | A $500,000 USDA-NIFA project develops new, low-cost dehydration and fortification processes for apples that can be implemented on-farm, producing both a nutrient-rich snack food for children and a novel revenue stream for small and medium-sized farms in the Midwest.

**COVER CROPS** | USDA-NIFA supports a $1.2M project predicting the potential of cover crops to bolster resilience and sustainability of Midwest agriculture under current and future climate scenarios, and across large spatial scales.

**Impacts of the Illinois SNAP-Ed and EFNEP Investments**

University of Illinois Extension and UIC leveraged the $13.5M investment in Illinois’ 2018 Supplemental Nutrition Assistance Program Education (SNAP-Ed) to improve food access, promote healthy food choices, and help Illinois families save more money. In 2018, Illinois SNAP-Ed reached 1.6 million residents, with more than 700,000 adults and youth participating in educational sessions throughout the state. Children who participated preferred healthier foods and beverages, improved cooking skills, and were more physically active, and 6 in 10 adults who attended educational sessions said they would make a healthy change that week.

Using the $2.2M Expanded Food and Nutrition Education Program (EFNEP) investment, University of Illinois Extension taught 8,506 low-income Illinois residents to improve eating habits and food-related behaviors through evidence-based peer-education programming. After participating in programs, 93 percent of adults and 83 percent of youth made healthier food choices.

**Improving Animal Health**

Researchers within Urbana’s College of Veterinary Medicine and College of ACES are working to protect animal health. In 2016/2017, Urbana’s College of Veterinary Medicine was awarded almost $1M in competitive funding from USDA related to animal health (i.e. vaccine development, disease transmission, understanding disease mechanisms).
Pell Grant

Federal student aid expands access for the roughly 86,000 students attending the U of I System. Along with the Direct Loan program, the most important piece of federal aid is the Pell Grant, which provides critical financial aid to low-income students. U of I is also doing its part to make attendance more affordable. For FY 2019, the U of I System is expected to provide over $230 million in institutional aid to students with grants, scholarships, fellowships and waivers.

**PELL DISBURSEMENTS, RECIPIENTS (FY2018 / AY2017-2018):**

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<tr>
<th>Campus</th>
<th>Pell Amount Disbursed</th>
<th>Number of Pell Recipients</th>
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<tr>
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GEAR UP & TRIO

Many Pell-eligible students are able to attend U of I through the outreach performed by our GEAR UP and TRIO programs, which work to encourage and support access higher education for low-income and first-generation students to higher education. UIC and Urbana have had remarkable success with their TRIO programs in improving retention and graduation rates. In 2017, UIC received a continuation award for its TRIO Upward Bound program.

TITLE VI INTERNATIONAL AND FOREIGN LANGUAGE EDUCATION PROGRAMS

ED funds important international and foreign language research and outreach through the Title VI International and Foreign Language Education programs. Urbana operates four National Resource Centers (NRC) in the areas of East Asian and Pacific, Russian, East European and Eurasian, European Union, and Global study programs. These centers, which have more than 400 faculty affiliates, provide students with foreign language skills, support area/international studies teaching and research, and provide professional development and curriculum development for educators at the K-12, graduate, and postsecondary levels.

The Fulbright-Hays program supports international education, research, outreach, and foreign language studies, especially in the less commonly taught languages of U.S. strategic interest. Urbana continues to be named a top producer of U.S. Fulbright Students and Scholars by the State Department’s Bureau of Educational and Cultural Affairs.

TITLE III (INSTITUTIONAL AID)/TITLE V (DEVELOPING INSTITUTIONS)

In 2016, UIC received a five-year, $5.3M grant from ED’s Hispanic-Serving Institutions—Science, Technology, Engineering, or Mathematics (HSI-STEM) and Articulation Programs, to augment UIC’s efforts to increase the number of Latino and low-income students attaining degrees in STEM fields.

INSTITUTE FOR EDUCATION SCIENCES

The Learning Sciences Research Institute at UIC is directing a major project funded by the U. S. Institute for Education Sciences under its $100M Reading for Understanding initiative. Project Reading, Evidence and Argumentation in Disciplinary Instruction (READI)—a $19M multi-institution collaboration—is creating instructional interventions that provide opportunities for adolescents to engage in evidence-based argumentation using literature, history, and science.

Urbana has two grants from IES to help researchers, postsecondary institutions, and educators better identify and assist students struggling in gateway biology courses.

Questions? Contact:
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National Endowment for the Humanities (NEH)

NEH is the single most important source of federal funding for research and scholarship in the humanistic fields, including history, literature, and foreign languages. With a limited federal budget, NEH is able to expand cultural and historical scholarship into K-12 classrooms, sponsor humanistic research and scholarship, and support preservation and exhibition efforts at libraries and museums. Standing Together is an integral part of that initiative, with programs that promote understanding of the military experience and support returning veterans.

In the first 50 years since the founding of the NEH, institutions in the state of Illinois institutions have collectively received more funding than those of any other state in the midwest region.

NEH-Supported Projects at Urbana-Champaign

Urbana-Champaign currently has over $1.1M in active NEH awards. The campus has received over $28M in NEH support since 1965.

The Illinois Program for Research in the Humanities (IPRH) has been promoting interdisciplinary study in the humanities, arts, and social sciences since 1997.

In December 2017, it was announced that six Urbana scholars were awarded NEH Fellowships; this makes a total of eighteen Fellowships awarded over the past five years.

The NEH Digging into Data program funded two projects:

- **The Responsible Terrorism Coverage (ResTeCo) project** asks how journalists around the world can responsibly report on terror attacks in ways that give citizens the information they need without providing terrorists with the attention they seek.

- **Dig That Lick: Analysing Large-scale Data for Melodic Patterns in Jazz Performances** brings together scholars from music, African American Studies, and Anthropology to study influence and sharing among musicians through a computational analysis of jazz recordings and related resources.

The NEH budget includes crucial support for humanities scholarship that reaches outside the academy to educate and inform the general public—a direction Urbana has also taken through recent programming at IPRH.

A professor emeritus of history has received an NEH Public Scholar award, one of only 28 such awards given out in 2018. The Public Scholar Program was created to support books in the humanities aimed at a broad public audience.

NEH-Supported Projects at UIC

UIC’s Institute for the Humanities seeks to foster an intellectually vital, interdisciplinary community of scholars. As the hub of humanities scholarship on campus, the Institute provides a forum for intellectual exchange among faculty and students at UIC and other colleges and universities in the region.

In 2018, NEH awarded a $100,000 grant to UIC to establish a series of faculty development workshops to develop “health humanities portraits” for use in medical school curricula. The project will demonstrate the critical role of the humanities in understanding health and healthcare dilemmas and in training physicians.

Also in 2018, UIC’s Museum and Exhibition Studies program, in collaboration with the National Veterans Art Museum, received an $81,000 grant from NEH to establish a two-semester course focusing on war-related art from World War I to the present. The award is part of the NEH’s “Dialogues on the Experience of War,” which supports the study
and discussion of humanities-based expressions of war and military service. NEH has funded research on the *Papers of Abraham Lincoln* on our Springfield campus.

UIS has recently established a Center for Lincoln Studies that will grow into a national base for scholarship, teaching, and public history about Lincoln’s life, his leadership, and his legacy. As it reaches its full strength, the Center may include activities such as publishing scholarship, creating and facilitating online history interpretation, hosting visiting scholars, engaging broad campus and community audiences, and offering an interdisciplinary learning laboratory for students. In addition to being supported by private gifts, the Center will be interested in pursuing relevant federal funding opportunities at NEH to publish and disseminate materials, host additional events, and support additional research, travel, and programming.

**NATIONAL ENDOWMENT FOR THE ARTS (NEA)**

Funding from the NEA has helped ensure that our communities—especially underserved or rural communities—receive support to enhance their cultural, artistic, and innovative opportunities in the arts. The past ten years have seen nearly $500,000 of awards from the NEA to projects across the U of I System.

**NEA-SUPPORTED PROJECTS AT URBANA**

The Krannert Center for the Performing Arts—a university-based performing arts complex housed within the College of Fine and Applied Arts—has benefitted from NEA funds to advance sustainable creativity through culturally emblematic performances. The Krannert Center also receives support from NEA through Illinois Arts Council, Arts Midwest, and New England Foundation for the Arts.

In 2017, the Krannert Center received a $20,000 grant from NEA to sustain diverse artistry, and for exploring and expanding the impact of arts programs for youth.

**INSTITUTE FOR MUSEUM AND LIBRARY SCIENCES (IMLS)**

In 2018, the Illinois School of Information Sciences at Urbana was awarded a three-year Early Career Development grant from IMLS, under the Laura Bush 21st Century Librarian Program, which supports developing a diverse workforce of librarians to better meet the changing learning and information needs of the American public by enhancing the training and professional development of librarians, developing faculty and library leaders, and recruiting and educating the next generation of librarians.
DHS R&D EXPENDITURES, FY2018

URBANA-CHAMPAIGN: $5.551 MILLION   |   UIC: $0.230 MILLION

Science and Technology Directorate (S&T)

Urbana-Champaign is home to the Critical Infrastructure Resilience Institute (CIRI), a Center of Excellence funded under DHS S&T’s Office of University Programs through a five-year, $20M grant. The Center aims to strengthen the security and resilience of our nation’s critical infrastructures, such as the power grid, telecommunications networks, critical manufacturing, and transportation systems. The Institute’s research has already developed six compelling technologies that are being transitioned to critical infrastructure markets. New this year are research projects exploring the use of Artificial Intelligence and Machine Learning to improve disaster response and recover as well as research addressing the potentially catastrophic impacts of an Electro-Magnetic Pulse event.

CIRI has also extended its research collaboration with the United States Transportation Command (USTRANSCOM) focused on enhancing USTRANSCOM mission assurance by strengthening the cyber security and resilience of its vast global supply chain.

Also with DHS funding, an Urbana professor is researching ways to detect GPS spoofing, where an attacker mimics the authentic signal, causing the receiver to compute a different position or timing solution.

Federal Emergency Management Agency (FEMA)

The Illinois State Water Survey (ISWS) at Urbana’s Prairie Research Institute continues to receive grant funding from FEMA through the Risk MAP program to support the Illinois floodplain mapping program. ISWS is a Cooperating Technical Partner and produces flood risk identification maps that assist Illinois communities and citizens in understanding and taking measures to reduce flood risk. The project coordinates with Illinois Extension on extensive outreach to inform the public about flood hazards and alternatives.

FEMA also provides support to the Illinois Fire Service Institute (IFSI), the statutory State Fire Academy for Illinois, which is at Urbana-Champaign. In addition to providing training on campus, the Institute offers one-day hands-on classes for fire departments at Regional Training Centers and local fire stations across the State. IFSI is currently engaged with FEMA on studies of firefighter chemical exposure and cardiovascular risk, with a focus on translating findings into actionable strategies that can be disseminated across the U.S.
NASA-Supported Projects at Urbana-Champaign

SPACE
The goal of a Phase II NASA-funded project on Advanced Quantum Communication from the International Space Station (ISS) is to develop a quantum communication demonstration from the ISS to a ground station, as an initial step toward a satellite-based quantum network.

NASA Space Technology Research Fellowships (NSTRF) to students support graduate training in areas of national importance, including drone-based quantum cryptography.

Undergraduates benefit from NASA’s CAPSAT project, where we are responsible for one of three payloads on the ‘cubesat’ (a mini-satellite), which launched in fall 2018. Our payload will test techniques to reduce the deleterious effects of background space radiation on single-photon detector noise.

AVIATION
The Urbana campus is a partner in a $9.9M research center for aviation innovation, supported by NASA under its University Leadership Initiative. The goal of this research center is to mature a disruptive airfoil design concept, known as the Slotted Natural Laminar Flow Airfoil, aimed at producing low-drag wing configurations for commercial transport vehicles.

Urbana has been helping to break down technical barriers to hybrid electric propulsion for commercial transport aircraft. Multiple grants from NASA’s AATT and LEARN programs (~$4M over four years) have supported work on high power density electrical machines and drives and system level modeling and analyses.

As part of these efforts, the campus has been helping to bring together the broader electrical and aerospace communities. A NASA supported workshop on Large Electric Machines held in 2016 has now grown into a collaboration between AIAA and IEEE with a joint symposium held in July 2018 in Cincinnati.

NASA has also funded control research to address aviation safety challenges by developing a control reconfiguration architecture to prevent catastrophic crashes, and to integrate UAV’s into national airspace systems.

REMOTE SENSING
Urbana researchers provide critical ongoing support for instruments on NASA’s Terra satellite, the flagship of the Earth Observing System, providing data critical for understanding weather, air pollution, food security, the hydrological cycle, radiation budgets, and the link between aerosol pollutants and health problems. These include the Multi-Angle Imaging SpectroRadiometer and the Moderate Resolution Imaging Spectroradiometer, and will include the Multi-Angle Imager for Aerosols instrument, with a nominal launch date of 2021. Urbana is a key site for the ACCESS to Terra Data Fusion Products project, which aims to harmonize use of the 1.2 PB of data from instruments on the Terra satellite through the use of a common format and grid, and development of needed software tools and cyberinfrastructure.
NASA funds research in the use of novel sensing technology and satellite data to improve monitoring and predictability of the broader U.S. Midwest carbon budget and food productivity. Awards totaling over $1.2M focus on the integration of multi-source satellite data with improved land surface modeling to improve monitoring of the carbon budget for the U.S. Corn Belt, and the use of chlorophyll fluorescence measurement to improve crop modeling from both ground and space.

**SIGNAL PROCESSING**

NASA is funding the development of lithium niobate based photonic integrated circuits to support widely tunable and highly sensitive microwave and millimeter-wave radiometry. These circuits will improve technology for optical frequency data acquisition in NASA science missions, and have many potential applications in obtaining data to improve our understanding of Earth's atmosphere and global change.

**NASA-Supported Projects at UIC**

UIC has received a $1.1M, five-year grant from NASA's Astrobiology Institute to identify biosignatures of life on Titan — Saturn’s largest moon — from either currently living or long-extinct life.

UIC researchers, with funding from NASA, have shown how the bubbles that form on a heated surface create a tiny recoil when they leave it, like the kick from a gun firing blanks. This miniscule force can be harnessed to mix liquid coolant around high-power microelectronics in space or on Earth.

A researcher at UIC received the prestigious NASA Early Career Faculty grant in 2017, and is using the funding to create miniature systems for easy fluidic sampling in space.

NASA has also recently funded a project at UIC to develop a Piezoelectric Instrument for Precision Exploration Sampling (PIPES), a miniaturized liquid sample acquisition and handling system. The PIPES system seeks to fill a gap in NASA's current in-flight sensing capabilities.
The enactment of the Global Food Security Act of 2018 promotes inclusive, agriculture-led economic growth around the world as central to U.S. strategic and economic interests. Feed the Future is an important initiative to achieve national goals. Urbana is a key partner in Feed the Future programs for building higher education and extension capacity, as well as the Feed the Future Innovation Labs.

Under AgReach, Feed the Future programs led by Urbana aim to strengthen extension systems and agricultural higher education in the developing world, building institutions that enable food systems to work for smallholder farmers. Since 2011, nearly $40M of development work has enhanced extension systems in 339 institutions around the world; trained more than 2,900 Extension Officers, subject matter specialists, and policymakers; and improved the services received by over 12.8 million rural farmers, entrepreneurs, and consumers in developing countries.

FEED THE FUTURE INNOVATION LABS specifically focus on university-based applied research. In 2018, Urbana received a three-year $6M grant from USAID to build on its previous $25M investment in the Soybean Innovation Lab (SIL). The project helps African countries build soybean research infrastructure and address protein malnutrition. SIL is the only U.S. entity conducting basic research on soybeans for African settings.

As a partner in the Sustainable Intensification Innovation Lab and the Postharvest Loss Prevention Innovation Lab, the U of I also conducts over $5M in programs to develop appropriate scale mechanization and postharvest solutions so that smallholders in Africa and South Asia can adopt more sustainable and profitable farm practices.

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Soybean Innovation Lab
Feed the Future Innovation Lab for Soybean Value Chain Research