GREETINGS

Russell Betts
Dean, Illinois Tech College of Science
Distinguished Professor of Physics

One of the pleasurable challenges of being Dean of the College of Science is to write a thought-provoking introductory piece to our annual newsletter. This year, we have chosen to focus the newsletter on the phrase “Consequential Science,” which has fascinating and perhaps very significant possible interpretations. I have to admit that this has proved sufficiently thought-provoking on my part that it largely accounts for the delay in getting this issue to print.

The word “consequential” has a couple of different interpretations. The first of these is simply that one thing follows another—cause and effect—with an implicit logical connection between each step. The other sense of consequence, weight or significance, implies what we would all, as scientists, like to believe—that our work is indeed significant and has impact beyond the science itself.

The implication of the first meaning of consequential is that science is a logical construct of a set of facts (truths) based on observation with an inescapable conclusion (proof)—namely, a theory. As such, it appears to parallel mathematical proof. Even in mathematics, however, this progression to proof may not necessarily be the case. The famous work of the German mathematician Kurt Gödel—his Incompleteness Theorem—shows that any mathematical system (axioms) can be used to construct statements (conclusions) that cannot be proved within the system. Science based on experimental observation has the additional weakness that the observations themselves are necessarily imperfect, and one therefore has the sense that any theory based on these observations may be like a house of cards whereby the removal of any one card may collapse the whole structure.

It is within this weakness that science is saved. The Austrian-British philosopher Sir Karl Popper asserted that all scientific theories must be “falsifiable,” i.e., they must allow a clear statement of what would bring the house of cards tumbling down. The most famous statement of this kind is based on the observation of white swans, which leads to the statement (theory) that “all swans are white”—immediately falsifiable by the observation of a single black swan. According to Popper, constructs that do not admit this are not science, and statements along the lines of “prove that this is not so” are not scientific. More on this later.

Lest we think that all science is fragile and unreliable, it is actually much more resilient than might be imagined. The discoveries of relativity and quantum physics did not bring the world of Newtonian mechanics to an end. They merely refined our understanding of the areas in which classical science applied and that technologies based on this science were still to be trusted. Bridges and buildings did not fall down, aircraft still flew, and cars still moved. For most scientists and engineers, “if it worked it had to be correct” was a useful mantra. On the other hand, it is essential that we are continually aware of the conditions under which our understanding applies, and we
may ignore them at our peril.

One area where caution is the watchword is where we work with complexity. Such problems—planetary motions, weather, climate, economics, etc.—often do not lend themselves to deterministic analysis, and yet our understanding and ability to account for observations and make predictions are, in many cases, to say the least, highly consequential for all of us. The classic example of this comes from the sequential numerical computation of seemingly simple functions where the final outcome depends sensitively and significantly on the precise initial conditions, leading to what is known as chaos. Recall the famous example of the butterfly that flapped its wings somewhere near the equator and caused a hurricane in Florida. Thus, in many cases even when the underlying science is well known and when the governing equations are precisely defined, the output of computational solutions to specific applications is uncertain. Hence the limitation, for example, in our ability to predict the weather—see the different tracks shown for hurricanes all originating off the coast of West Africa as they approach the USA.

So, yes. Science is consequential. But, is it consequential enough? It may be that science is, like democracy, “the worst form of government except all those other forms that have been tried from time to time.” It is the best we have. We should be honest about its shortcomings. It has tremendous but limited and constrained power, which must be applied judiciously. So, when critics say, “It’s only a theory” or “It’s not proven,” we should agree, point out the carefully defined uncertainties in the scientific results, and then take square aim at the alternatives based on assertions or beliefs which do not even rise to the level of science. This distinction is too consequential to ignore.
Assistant Professor of Computer Science Dong “Kevin” Jin received a Young Investigator Research Program (YIP) grant from the Air Force Office of Scientific Research. Similar to the National Science Foundation CAREER Award, the YIP is a prestigious award given to junior scientists and engineers at research institutions across the United States who show exceptional ability and promise for conducting basic research.

Jin’s research is concerned with the study of dynamic data-driven application systems (DDDAS) methodology to meet challenges in cyber-secure and cyber-resilient critical energy infrastructures for the Air Force of the future. Jin and his team are developing a DDDAS-based Cyber-Resilient and Attack-Secure Framework for Trustworthy Industrial Control Systems (DDDAS-CRAFTS). The core components of DDDAS-CRAFTS include the novel underlying Software-Defined Networking (SDN)-based communication infrastructure with several DDDAS-based modules to enable a secure and resilient power system.
Researchers Find New Clues in 100-Year-Old Mystery of Frank-Starling Law of the Heart

Researchers at Illinois Institute of Technology and Loyola University discovered new clues in the 100-year-old mystery of the Frank-Starling law of the heart: What makes the heart contract more strongly at longer lengths given the same level of calcium activation?

Writing in the Proceedings of the National Academy of Sciences (PNAS), Biology Professor Thomas Irving of Illinois Tech and Pieter de Tombe of the Loyola University Stritch School of Medicine demonstrated that the muscle protein titin plays a key role in the Frank-Starling mechanism. The findings will enable researchers to develop more realistic models of cardiac function and improve their understanding of cardiac dysfunction in heart failure.

NIH Awards $6.3 Million to Illinois Tech’s BioCAT Facility for Biomedical Research

The National Institutes of Health has awarded $6.3 million to continue to operate Illinois Tech’s Biophysics Collaborative Access Team (BioCAT) facility for biomedical research at the Advanced Photon Source, Argonne National Laboratory. This is one of the largest grants for any research at Illinois Tech.

Led by Thomas Irving, chair and professor of biology and a biophysics researcher, BioCAT is one of the foremost facilities in the world for basic, applied, or translational research using synchrotron radiation that may be relevant to medical advances. Illinois Tech’s position as operator of the facility gives university faculty and students access to one of the most powerful X-ray beam sources in the world to do basic biomedical research on non-crystalline biological materials. In addition, BioCAT serves a national and international community of scientists—including researchers from many universities across the country and around the world, as well as pharmaceutical companies such as AbbVie and Novartis.

Minh Developing New Computer-Aided Drug Discovery Tools

Assistant Professor David Minh received a grant for $337,373 from the National Institutes of Health (NIH) for his project “Sound-stage Virtual Screening Based on Implicit Ligand Theory.” He is developing new computational tools that will make faster and more accurate predictions about interactions between proteins and small molecules. The tools will be useful for drug discovery and understanding how chemicals influence human biology.

Virtual screening of chemical libraries is a common starting point for discovering ligands, such as drug leads. The primary tool for virtual screening is molecular docking, which is fast but makes a number of serious approximations about how small molecules interact with proteins. Methods based on rigorous statistical physics are much slower and more accurate. Minh has derived a new statistical physics theory for binding that is based on multiple rigid structures of a receptor: implicit ligand theory. Computational methods based on this theory have the potential to carefully compromise between the speed of docking and the accuracy of other rigorous methods.
Terry Receives DOE Award for Advanced Nuclear Materials Research

Physics Professor Jeff Terry is part of a team that has been awarded $489,135 by the U.S. Department of Energy (DOE) for advanced nuclear materials research.

With Yong Yang (PI), University of Florida, and Yiren Chen, Argonne National Laboratory, he received the award for “Understand the phase transformation of thermally aged and neutron irradiated duplex stainless steels used in light-water reactors (LWRs).”

Terry’s research interests including developing new ways to ensure safer nuclear reactors. This project falls under that broad category. Terry and his team will take a deep structural look at duplex stainless steel used in LWRs to see how it weakens under extreme heat and neutron radiation conditions. To do so, they will in part use X-ray diffraction, Extended X-ray Absorption Fine structure spectroscopy and other methods at Argonne. Their ultimate goal is to develop materials whose use minimizes the risk of major accidents.

The DOE announced recently that it will spend more than $82 million for advanced nuclear energy research, with 93 projects in 28 states. That includes almost $36 million for DOE’s Nuclear Energy University Program (NEUP) to support 49 advanced nuclear energy projects in universities in 24 states. Terry’s project falls under this NEUP program.

Illinois Tech’s Stark and Sanny Receive Patent for Method to Genetically Engineer Bacteria and Yeast to Increase Bioethanol Production

Scientists from Illinois Institute of Technology received a patent for a method to genetically engineer bacteria and yeast to increase bioethanol production, especially from cellulosic material in biomass twigs, branches, plant stalks and husks, and woodchips.

Ben Stark, professor of biology (now emeritus), and former Ph.D. student Tony Sanny, now a partner with law firm Swanson & Bratschun, developed a method to genetically engineer Escherichia coli and Zymomonas mobilis, two bacterial ethanol producers, and yeast, a eukaryotic ethanol producer, to express Vitreoscilla hemoglobin (VHb). Engineering of microorganisms with VHb has been shown to enhance the production of many useful bioproducts as well as improve microbial degradation of certain toxic chemicals. Physical addition of small amounts of oxygen to ethanol-producing cultures has been shown by others to enhance bioethanol production; the IIT (VHb) approach is a biological correlate of the physical method, and so works on its own without the need for an oxygen feed to the growth chamber.

Bioethanol is a liquid fuel that comprises about 10 percent of the gasoline at the pump. It is made by microorganisms by fermentation of sugars. The sugars come from various sources, including starch from plants like corn; sugar from sugar cane and sugar beets; or cellulose and hemicellulose, polymers of various sugars that are among the main structural components in wood and plants in general that give them their strength.

Cellulosic and hemicellulosic–based bioethanols are the least common right now, because these polymers are fairly difficult to break down into their component sugars, and this factor makes it difficult to produce enough fuel-grade ethanol cost effectively. On the other hand, bioethanol from these feedstocks promises to be much more cost effective and sustainable, producing less greenhouse gas and having a less direct impact on the food supply than using corn starch as a source of sugar. Work in recent years has focused on genetically modifying yeast and other materials used in producing bioethanol from cellulose and hemicellulose to speed the breakdown process, improve yields, and lower costs.

This patent is Stark’s and Sanny’s third since 2014 for increasing bioethanol production by genetic engineering of microorganisms to express Vitreoscilla hemoglobin.
Influit Energy Awarded $225,000 for Nanoelectrofuel Flow Battery

A company founded by Illinois Tech scientists has received $225,000 to build an innovative nanoelectrofuel (NEF) flow battery that will store 1.5 times the energy of lithium ion batteries or three times the energy of lead acid batteries in the same volume. It also will offer the option of rapid charge replenishment, because the user can pump out discharged electrolyte and refill with charged electrolyte. The total cost for the NEF flow battery will be about half the cost per kWh of competing lithium-ion batteries, and the NEF flow battery will be safer, nonflammable, and more environmentally friendly.

The company, Influit Energy, was awarded a Phase I Small Business Innovation Research (SBIR) grant by the National Science Foundation to develop a full cell for the NEF flow battery. Carlo Segre, Duchossois Leadership Professor of Physics; John Katsoudas (PHYS '96, M.S. '03), senior research associate of physics; and Elena Timofeeva, research professor of chemistry, founded Influit in 2014 after initially working on the NEF flow battery under an Advanced Research Projects Agency-Energy (ARPA-E) grant.

In a traditional flow battery, positive and negative liquid electrolytes contain dissolved redox (reduction oxidation reaction) salts and are pumped through an electrochemical device (cell stack) that has current collectors separated by a membrane. The liquid electrolytes exchange electrons with the current collectors, generating electrical energy in the circuit. Unlike a traditional flow battery, NEF flow batteries use suspended nanoparticles instead of dissolved redox salts to store the charge, permitting more energy density per volume than other types of flow batteries. To recharge them, you simply plug into the grid or replace the spent nanoelectrofuels with charged ones, just as in a gasoline engine, minimizing the recharging time for the customer.

The first NEF battery prototype is designed as a drop-in replacement for the lead-acid battery packs currently used in electric utility vehicles (EUVs). In the same shape factor the battery will store three times the energy of lead acid batteries at comparable cost. The Influit NEF battery uses water-based electrolytes and battery active nanoparticles made out of abundant and nontoxic earth elements. The water-based nanofluids will not react with the atmosphere, and the battery cannot overheat because of the superior cooling properties of the nanofluids.

The SBIR program is a highly competitive program that encourages domestic small businesses to engage in federal research that has the potential for commercialization. Phase I grants establish the technical merit, feasibility, and commercial potential of the proposed research efforts and organization performance.
Graduate Students Checchin and Martinello Produce Breakthrough Technology for Particle Accelerators

Physics graduate students Mattia Checchin and Martina Martinello have been working at nearby Fermi National Accelerator Laboratory (FNAL) on a breakthrough technology for particle accelerators using superconducting radiofrequency (SRF) cavities. Their Ph.D. research on the electromagnetic and thermal properties of these cavities has led to multiple invited talks at international conferences as well as prizes and other recognition.

SRF cavities, typically using superconducting niobium (Nb), have orders of magnitude lower RF impedances than normal metals such as copper and are thus an enabling device for large-scale accelerators such as the Large Hadron Collider, where the Higgs boson was discovered. The performance metric for SRF cavities is the quality factor, Q, a measure of the stored energy that can be transferred to the electron or proton beam. However, using the standard processing recipe for Nb developed over the past 40 years, it is found that the value of Q, while initially high, tends to decrease with increasing accelerating fields. A new nitrogen processing technique developed by FNAL physicists Anna Grassellino and Alex Romanenko shows a stunning reversal of this trend; the Q actually increases with accelerating fields, to record high values at fields near 20 MV/m. This has opened the door to new applications of such SRF cavities, including a new, ultrabright X-ray light source, a free electron laser, which will be built at the Stanford Linear Accelerator (SLAC).

Transferring the new technology to real accelerator modules has been the focus of Checchin and Martinello’s research at FNAL. Checchin has studied new ways to remove unwanted trapped magnetic flux, and Martinello has developed the proper cooling steps and use of thermal gradients to maximize performance. Checchin presented his work as an invited talk at the international SRF conference in Whistler, B.C., in 2015, where he also won top prize in the student poster competition. Martinello will give an invited talk at the April meeting of the American Physical Society and is on the short list for the Mark Oliphant Prize at the International Particle Accelerator Conference (IPAC) in Busan, Korea. Checchin has received a travel award to IPAC. Both will be giving invited talks at the upcoming Linear Accelerator conference in 2016.

John Zasadzinski, Paul and Suzi Schutt Endowed Chair of Science and Checchin and Martinello’s Illinois Tech advisor, commented, “It is safe to say that nearly all future particle accelerators will take advantage of some aspect of the research that these two students are doing. It is rare for graduate students to give even one invited talk at an international conference. For Martina and Mattia to do this multiple times, plus win, or be nominated for, other awards and grants, is truly remarkable. It is a testament to their hard work and diligence, as well as the expert guidance given by Anna and Alex at FNAL.”
PROSPECT Collaboration Awarded $3 Million by Department of Energy

Illinois Tech physics researchers are part of the Precision Oscillation and Spectrum Experiment (PROSPECT) awarded $3 million by the U.S. Department of Energy to search for sterile neutrinos.

The Illinois Tech PROSPECT team includes Christopher White, vice provost for academic affairs and research and professor of physics; Bryce Littlejohn, assistant professor of physics; postdoctoral researchers Karin Gilje and David Martinez; and graduate students Pranava Surukuchi and Xiangyi Zhang.

Some scientists have hypothesized that sterile neutrinos, even-more-mysterious cousins of the ghostly neutrino, may exist, but so far have no definitive proof. The IceCube experiment in Antarctica conducted a search for sterile neutrinos and in August 2016 announced it found no evidence of them.

PROSPECT will use the $3 million award to construct a detector that can be used very close to the core of a nuclear reactor to try to catch a hint of the elusive particles. This first of its kind short-distance detection device will be used at the High Flux Isotope Reactor at Oak Ridge National Laboratory in Tennessee.
Computer Science Highlights Role in Chicago’s Tech Ecosystem

In April 2016, Computer Science held “CS2050: Shaping Chicago’s Tech Ecosystem,” a daylong event to celebrate 45 years as a department, the $7.6 million gift from Chris Gladwin, new chair Eunice Santos, and the latest department research. The celebration also called attention to Illinois Tech computer science grads’ roles in shaping Chicago’s technology ecosystem, from Motorola to Avant. More than 5,000 computer science alums live and work in the Chicago area.

Faculty, students, representatives from industry, and alumni gathered to hear speakers and panels on venture capital, cybersecurity, computation across the sciences, data science, cloud computing and storage, computational medicine and bioinformatics, and diversity in technology. A luncheon honored Martha Evens, professor emerita; Ron Hochsprung (CS ’72), who endowed the department’s first chair last year; and Gladwin, whose transformative gift will help move the department to new levels of accomplishment.

Speakers and panelists included:

Venture Capital Fireside Chat
• Chris Gladwin, Cleversafe, Ocient
• Bailey Moore, Wintrust Ventures
• Mark Achler, MATH Venture Partners
• Peter Barris, New Enterprise Associates

Cybersecurity
• Kevin Jin, Illinois Tech—Computer Science (Moderator)
• Linda Goldstein (PTC ’10), Breadcrumb
• Andrew Hoog, NowSecure
• Jason Resch (CS ’06), Cleversafe

Computation Across the Sciences
• Aron Culotta, Illinois Tech—Computer Science (Moderator)
• David Minh, Illinois Tech—Chemistry
• Sonja Petrovic, Illinois Tech—Applied Mathematics
• Jean-Francois Pombert, Illinois Tech—Biology
• Katherine Riley, Argonne
• Jeff Wereszczynski, Illinois Tech—Physics

Data Science
• Mustafa Bilgic, Illinois Tech—Computer Science (Moderator)
• Cindy Hood, Illinois Tech—Computer Science
• Joe Jablonski, Acumence
• Adam McElhinney, Uptake
• Sairam Rangachari (M.S. CS ’02), VISANOW

Cloud Computing and Storage
• Boris Glavic, Illinois Tech—Computer Science (Moderator)
• Emmanuel Klu (CS ’13), Google
• Daniel Murphy–Olson, Argonne
• Reza Rooholamini, CCC Information Services
• Dennis Wisnosky, Enterprise Data Management Council

Computational Medicine and Bioinformatics
• Gady Agam, Illinois Tech—Computer Science
• Steven Collens, MATTER
• John Korah, Illinois Tech—Computer Science (Moderator)
• Frank Naeymi–Rad (Ph.D. CS ’90), Intelligent Medical Objects

Diversity in Technology
• Andrea Berry (CS ’84), FOX
• Cindy Hood, Illinois Tech—Computer Science (Moderator)
• Zhiling Lan, Illinois Tech—Computer Science
• Linsey Rubenstein, Boeing
• Ernest Sanders, COMEMUNITY Based Solutions
• Neelansha Singh, Grainger

Clockwise from top left: 1. Hochsprung, Santos 2. Peter Greene, professor of computer science emeritus; Dennis Sundin (CS ’90); Evens 3. Bailey Moore, Mark Achler 4. Roy Coleman (PHYS ’64), Dianna Uchida (M.S. CS ’82), Dennis Roberson, research professor in computer science and former vice provost (red tie), clockwise from Roberson: Vicente Cano (M.S. CS ’10), Jason Resch (CS ’06), Manish Motwani (CPE ’03, M.S. CS ’06), Gladwin 6. Andrea Berry (CS ’84) and Bridget Vaughn, senior major gift officer 7. Roberson, Emmanuel Klu (CS ’13), former Illinois Tech president John Anderson, Gladwin 8. Linda Goldstein (PTC ’10), Frank Naeymi-Rad (Ph.D. CS ’90)
Undergraduates Get Taste of Research Work with Summer Research Stipends

Last summer, College of Science students researched topics from muscular dystrophy to accident tolerance in nuclear reactors under the college’s Undergraduate Summer Research Stipend program.

Anthony Fleck (CS 2nd year) with Xian–He Sun, Distinguished Professor of Computer Science, expanded on Sun’s NASA–funded research to determine whether Open Ethernet Drives can be as effective as single nodes in a cluster at performing common computing tasks and more cost effective than other common systems. Using this research experience, Fleck built a simulator that will allow others to test the capabilities of OEDs, as well as allow configuration of different processors with more cores, more random access memory, and more storage.

Adam Kiolbassa (PHYS 3rd year) was part of an Illinois Tech team working to make nanoelectrofuel flow batteries for electric vehicles a reality. In the lab of Carlo Segre, Duchossois Leadership Professor of Physics, Kiolbassa studied the optimal reaction conditions to prepare nanoparticles of manganese dioxide. The goal was to attempt a new way to produce these nanoparticles for flow batteries, which could revolutionize the electric vehicle business.

Sydney Lamerand (BCHM/PSYC 1st year) worked alongside Jialing Xiang, professor of biology, to expand Xiang’s ongoing research into anti-cancer proteins. Their project this summer aims to study preliminary information about the newly discovered BaxΔ2 function in neurons—primarily special neurons like Purkinje neurons, which are the source of output for the entire cerebellar cortex.

William Limestall (PHYS/MHP 3rd year), with Jeff Terry, professor of physics, worked with a team that is developing fuel claddings that can tolerate the kind of accident that led to the Fukushima nuclear disaster. The goal of the project was to provide detailed information regarding the interaction of fission products with silicon carbide in tri-structural isotropic fuel particles, i.e., they checked the properties of radioactive elements in silicon carbide under loss of coolant accident conditions.

Shreyas Moudgalya (CS 2nd year) and Ioan Raicu, assistant professor of computer science, explored a new scalable distributed graph processing system, Graph/Z, in an attempt to simplify the
Ben Stark Retires After 33 Years at Illinois Tech

Ben Stark, professor of biology and associate dean for research in the College of Science, has retired from Illinois Tech after 33 years of service. Stark earned a Ph.D. and an M.Ph. at Yale University and a B.S. from the University of Michigan. He discovered that the tRNA precursor processing enzyme RNase P contains an RNA component that is required for its catalytic activity, in the laboratory of his doctoral advisor at Yale, Sidney Altman, who shared the 1989 Nobel Prize in Chemistry for research on the catalytic properties of RNA. Stark and others described how genetic engineering of bacteria with Vitreoscilla hemoglobin (VHb) can enhance production of useful bioproducts as well as degradation of toxic chemicals, and has also investigated many aspects of the protein’s structure and function. One aspect of the work may lead to enhanced production of ethanol from biomass. He helped create the Dale Webster Lecture, honoring the accomplishments of the lecture’s namesake, who worked with him on this research.

Throughout his career, Stark has been the recipient of many awards, several for his excellence in teaching. He won the Teaching Excellence Award, and he was chosen as a “Person of the Millennium” by students in the IIT Millennium Project. As a testament to his award-winning teaching, many of Stark’s students have gone on to do great things after working in his lab. They have worked at Kraft, the National Institutes of Health (NIH), and Stanford, to name a few, and have had titles ranging from CEO to crystallographer to program director for pregnancy and perinatology. In addition to working with college students, Stark has also done science demonstrations for grade school students in Oak Park, Ill., for more than 20 years. He was elected as a fellow of the American Association for the Advancement of Science (AAAS) for his many accomplishments in teaching and research.

More than 200 Brazilian students did research with College of Science faculty last summer as part of the Brazil Scientific Mobility Program.

Akalanka Tennekoon (CHEM/CHE 2nd year) worked on a project with Adam Hock, associate professor of chemistry and chemist, Argonne National Laboratory. Tennekoon, who has been working in Hock’s lab for the past year, designed a reactor for performing catalytic testing at Illinois Tech. This summer, he used his reactor to test catalysts he has prepared and characterized for butane dehydrogenation activity.

Evelyn Thomas (BCHM 3rd year) did her summer research in the lab of Nick Menhart, associate professor of biology. Thomas’ interest in orthopedics led her to Menhart, who does research on Duchenne muscular dystrophy, a debilitating disease affecting muscles. This summer, Thomas determined the role and clinical relevance of exon skipped motifs of the dystrophin rod, which is the protein defective in DMD.
Computer Science’s Peng-Jun Wan Elected 2016 IEEE Fellow

Peng-Jun Wan, professor of computer science, was elected a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) for contributions to scheduling and resource allocation in wireless networks. Wan’s areas of expertise include wireless networks, optical networks, and algorithm design and analysis.

Wan received his Ph.D. in computer and information science from the University of Minnesota, M.S. in applied mathematics from the Chinese Academy of Sciences, and B.S. in applied mathematics from Tsinghua University. He has been a senior research fellow at the City University of Hong Kong, visiting associate professor at Tsinghua University, and associate professor at City University of Hong Kong. He has written more than 200 research articles, has been cited more than 9,000 times, and holds four patents.

Physics’ Jeff Wereszczynski Wins NSF CAREER Award

Jeff Wereszczynski, assistant professor of physics, won a Faculty Early Career Development (CAREER) Award from the National Science Foundation for his proposal “The Effects of Post-translational Modifications and Histone Variants on Chromatin Fiber Dynamics.” Wereszczynski’s group develops and uses computational biophysics techniques to understand how the function of biological molecules is linked to their structure and dynamics. To do this, they perform intensive simulations of large biomolecular complexes that model their motions at the atomic level based upon rigorous statistical mechanical techniques. One system of particular interest is chromatin, which is the complex of DNA and protein molecules that stabilize the genome and dynamically controls gene expression in cells.

For his NSF CAREER Award-winning project, Wereszczynski and his group are addressing the effects of two major classes of chromatin remodeling factors with state-of-the-art computer simulations. These studies will reveal the physical basis by which cells modulate the structure and dynamics of chromosomes, and how this affects the vital process of gene expression.

Illinois Tech Physics Shares in 2016 Breakthrough Prize in Fundamental Physics

Illinois Tech physics faculty and students were named among the winners of the 2016 Breakthrough Prize in Fundamental Physics, which was awarded to five global teams that conduct neutrino oscillation experiments. The teams shared a $3 million prize for “the fundamental discovery and exploration of neutrino oscillations, revealing a new frontier beyond, and possibly far beyond, the standard model of particle physics.”

In October 2015, Takaaki Kajita of Tokyo University and Arthur McDonald of Queen’s University in Ontario won the Nobel Prize in Physics for discovering neutrino oscillations. The Breakthrough Prize in Physics honored Kajita’s and McDonald’s full teams (Super-Kamiokande Collaboration and Sudbury Neutrino Observatory) plus three others that have done supporting work in this area: Daya Bay, KamLAND Collaboration, and K2K/T2K.

Those from Illinois Tech included:
• Christopher White, vice provost for research and academic affairs and professor of physics.
• Yagmur Torun, associate professor of physics.
• Bryce Littlejohn, assistant professor of physics.
• Emily Draeger (Ph.D. PHYS ’14), now a postdoctoral fellow at the University of Maryland School of Medicine.
• Brandon Seilhan (Ph.D. PHYS ’11), a staff scientist at Lawrence Livermore Laboratory.
• Karin Gilje, currently a postdoctoral student of Littlejohn’s.

The Breakthrough Prizes were created by Mark Zuckerberg of Facebook, Jack Ma of Alibaba, Sergei Brin of Google, and others as a kind of “Oscars of Science.”
Monte Carlo methods use random numbers to solve a wide variety of problems in science, engineering, and finance. Hickernell has served on the steering committee of this conference series since 2006.

During the conference, Hickernell was awarded the 2016 Joseph F. Traub Prize for Achievement in Information-Based Complexity. This field of computational mathematics and theoretical computer science endeavors to determine the lowest possible computational cost of algorithms for solving numerical problems to a given accuracy, and also tries to construct practical algorithms with minimal computational cost.

Santos Named to Crain’s “Tech 50” List

Eunice Santos, the Ron Hochsprung Endowed Chair and Professor of Computer Science, was named to the Crain’s Chicago Business “Tech 50” list of people to know in Chicago’s tech ecosystem. Other winners included people like Eric Lefkofsky, founder of Groupon; J.B. Pritzker, managing partner of Pritzker Group Venture Capital; and Rishi Shah, founder and CEO of ContextMedia. Santos was one of only four academics named to the list, and the only computer science department chair.

Santos joined Illinois Tech in 2015. Crain’s notes that with more than 1,000 computer science students, Illinois Tech “has long been one of the best-kept secrets in Chicago technology” and that Santos is helping to bring the computer science department to the next level in terms of national reputation and recognition. It also notes her expertise in cybersecurity, cloud computing, and computational modeling. Chris Gladwin, founder of Cleversafe and an Illinois Tech trustee, is quoted as saying of Santos, “She’s ridiculously smart, but she’s also really good at building a community. She has an infectious energy and enthusiasm.”
College of Science Faculty Win University Teaching Awards

Jialing Xiang, professor of biology, received the John W. Rowe Excellence in Teaching Award. Xiang earned her B.S. and M.D. degrees from Xuzhou University, China, and Ph.D. from the University of Alabama, Birmingham. She joined Illinois Tech in 2003 as an assistant professor of biology and was promoted to full professor in 2014. Her research concerns the study of genetic markers of breast and colon cancer. She is an outstanding, successful classroom teacher who believes passionately in the whole scholar. This translates to her mentoring and supervision of all her students—both graduates and undergraduates, inside and outside the classroom and in the laboratory. She motivates and leads her students to achieve their full potential.

Kathryn Spink, senior lecturer of biology, chief health professions advisor, and chair of the university premedical advisory committee, received the 2016 Illinois Tech Board of Trustees Outstanding Undergraduate Teaching Award. Spink received her B.S. from Michigan Tech and Ph.D. from Michigan State University. She is committed to the success of her students and expects similar commitment from them. Her engagement with the students continues outside the classroom in her role as health professions advisor and as advisor and participant in the annual MEDLIFE service trip to South America. She also spearheads curriculum development in biology and chairs the Undergraduate Studies Committee.

Jon Hanrath, senior instructor, computer science, was named the top College of Science teacher of 2016. He teaches introductory computer science courses for non-majors and CS majors, and he consistently receives among the highest student evaluations in the department.

Elizabeth Friedman Wins NPSMA Board of Directors Award

Elizabeth Friedman, director, professional master’s programs, College of Science, was awarded the National Professional Science Master’s Association (NPSMA) Board of Directors Award at the NPSMA 6th National Conference in Arlington, Va. The award honors a PSM program director, faculty member, staff person alumnus/alumna, or student for outstanding contributions to a PSM program.

Elizabeth Friedman, director, professional master’s programs, College of Science, was awarded the National Professional Science Master’s Association (NPSMA) Board of Directors Award. The award honors a PSM program director, faculty member, staff person alumnus/alumna, or student for outstanding contributions to a PSM program.

Elizabeth Friedman, director, professional master’s programs, College of Science, was awarded the National Professional Science Master’s Association (NPSMA) Board of Directors Award. The award honors a PSM program director, faculty member, staff person alumnus/alumna, or student for outstanding contributions to a PSM program.

Additionally, at the conference, Friedman gave a talk, “The Long Term Outlook of PSM Programs—Evolution in a Conservative Culture,” with Dagmar Beck from Rice University. Their talk focused on the evolution of longstanding professional master’s programs. The competition was part of Seibert’s 10-week summer internship with ORNL’s Nuclear Engineering Science Laboratory Synthesis (NESLS) program. She worked with Kurt Terrani, staff scientist and Weinberg fellow, who is an expert in nuclear fuel development and testing. Her adviser at Illinois Tech is Jeff Terry, professor of physics.

**Physics Ph.D. Candidate Rachel Seibert Wins Second Place in ORNL Research Competition for Study of SiC Layers in TRISO Fuels**

Rachel Seibert, a Ph.D. candidate in condensed matter physics, won second place in a research poster competition at Oak Ridge National Laboratory (ORNL) for her work on the silicon carbide (SiC) layers in tri-structural isotropic (TRISO) fuels. Seibert analyzed the integrity of TRISO nuclear fuel particles under normal and accident conditions, contributing new knowledge about how to modify the SiC layers in order to make them safe under all reactor conditions.

TRISO consists of a spherical uranium carbide kernel coated with a carbon buffer layer, two pyrolytic carbon layers, and the SiC layer. The coating layers create a closed environment so that each particle acts like its own pressure vessel to keep fission products contained during irradiation. The SiC layer is the structural backbone and main barrier to fission product release. Scientists are interested in TRISO fuels for next-generation nuclear reactors. But certain metallic fission products diffuse through these layers and out into the reactor, which is potentially hazardous to workers during maintenance. Others such as palladium may locally corrode the SiC. Scientists need to determine the reaction mechanism for these interactions under normal operation and at elevated temperatures to simulate nuclear reactor accidents.

To do this, Seibert used high-resolution transmission electron microscopy (TEM) and scanning TEM to study how these fission products interact with SiC isolated from irradiated TRISO particles, getting detailed images about the microstructure and dispersion of fission products in SiC. Simultaneously, she also used energy dispersive X-ray spectroscopy (EDS) for elemental mapping and identification at the same location the images were taken.

“If we know where and how fission products are grouped in the irradiated SiC, we can use this information, in addition to information from other ongoing studies, to gather a big picture of what happens during irradiation and safety testing,” Seibert said. “It will help us to understand how to modify the SiC layers in order to make them inherently safe under all hypothesized reactor conditions.”

**Computer Science Undergraduate Emily Warman Wins Wells Fargo Campus Analytics Challenge**

Emily Warman (CS 4th year) was named one of five winners of the Wells Fargo Campus Analytics Challenge. Warman received $2,000 and a trip to San Francisco for a two-day analytics summit.

Warman successfully analyzed a set of social media data and developed a repeatable process to identify, classify, and extract underlying drivers of consumer financial conversations and comments in social media. Her work was graded on analytic and quantitative insights, methodology and approach, documented code, data discussion, and more.

“Emily put together a winning project on a tight deadline and facing competition from some of the top CS departments in the country,” said Aron Culotta, assistant professor of computer science. “I’m impressed at how quickly she has refined her data science skills, and I believe she is on her way to a rewarding career.”

Warman does research with Culotta, working to improve the demographic classification of Twitter users who feel positively or negatively about e-cigarettes.
Adnan Haider (CS 3rd year) won first place (gold) for undergraduate research at an ACM/IEEE high-performance computing conference.

Haider’s research, “Lessons from Post-Processing Climate Data on Modern Flash-Based HPC Systems,” was selected as the best of all undergraduate research presented at the ACM/IEEE International Conference for High-Performance Computing, Networking, Storage, and Analysis, held in Austin, Texas. The SC conference is the largest and most prestigious in high-end computing. The event attracted more than 12,000 people.

Haider addressed how the latest supercomputers differ in performance when running post-processing climate data software. The ideas from this research can be applied to accelerate the speed of many other scientific applications that are integral for expanding scientific frontiers. His advisor was Xian-He Sun, Distinguished Professor of Computer Science, and his supervisors were Sheri Mickelson and John Dennis of the National Center for Atmospheric Research.

Haider also was selected as a finalist for a 2016 Outstanding Undergraduate Researcher Award by the Computing Research Association. The awards recognize undergraduate students in North American universities who show outstanding potential in an area of computing research.

**Physics’ Limestall Wins Civic Tech Challenge, Part of ThinkChicago: Lollapalooza 2016**

Student William Limestall (PHYS/MHP 4th year) and his team won the Civic Tech Challenge during ThinkChicago: Lollapalooza 2016. Each received an invitation to the ThinkChicago: Ideas Week event in October, a four-day pass to Lollapalooza 2017, and a “totally rad Limited Edition Lollapalooza 25th Anniversary Perry Farrell skate board deck,” Limestall reported.

Limestall’s team won for an idea to introduce Chicago’s neighborhoods to Lollapalooza festival-goers using the Lollapalooza app and website. They had to pitch the idea on stage, in front of judges. “My experiences in IPRO and as a Navy recruiter come in handy!” Limestall said. IPRO training in particular helped him give the winning pitch, Limestall said, and he thanked Jeremy Alexis, a senior lecturer at the Institute of Design and director of IPRO.

ThinkChicago was a three-day program for university students to explore the Chicago tech ecosystem and attend Lollapalooza. More than 700 students applied; 200 were chosen, including 15 from Illinois Institute of Technology. The Civic Tech Challenge was a pitch competition to propose ways in which the City of Chicago can use technology to address challenges related to urban sustainability, transportation and civic engagement.

**Illinois Tech Places Fourth in International 48-Hour Supercomputing Competition**

A team of computer science undergraduates, plus area high school students, fielded by Illinois Tech won fourth place in an international supercomputing competition for students. The competition was held during the IEEE/ACM Supercomputing/SC Conference in New Orleans, attended by more than 13,000 people.

For 48 hours straight, the Illinois Tech team ran five applications on the five-node, $250,000 computer cluster they designed and built from commercial hardware.

It had four Intel Xeon CPUs with 16-cores at 2.5GHz each, 1.7TB Intel NVMe PCIe SSD, 512GB of DDR4 RAM per node, and quad port 100Gb/s full-duplex EDR Infiniband network, which all fit within the 3,120-watt power budget limit.

This year’s applications were MILC, Repast HPC, Trinity, WRF, and Linpack, as well as a mystery app revealed before the competition, HPCG.

The students got into the competition through a competitive proposal and review. Argonne National Laboratory and Intel Corporation provided technical and financial support through the 10 months that the team trained.

The Illinois Tech team included:

- Ben Walters (CS 3rd year), team captain, system administrator, and the WRF application
- Alexander Ballmer (CS 2nd year), system administration and the HPC Repast application
- Adnan Haider (CS 2nd year), the Trinity application and the parallel filesystem
- Andrei Dumitru (CS 2nd year), the MILC application
- Calin Segarceau (CS 1st year), the Linpack and HPCG benchmarks, and backup duties system administration
- Keshav Kapoor, 11th grade student at Naperville Central High School. He focused on system resource monitoring and scientific visualization
- Ioan Raicu, associate professor of computer science and guest research faculty at MCS and Argonne, team coach

**Illinois Tech Programming Team Makes World Finals**

The IIT–A Team advanced to the World Finals of the Association for Computing Machinery (ACM) International Collegiate Programming Contest in May in Thailand. Andrei Dumitru (CS 2nd year), Benjamin Grimmer (CS 4th year), and Keshav Kapoor (11th grade student at Naperville Central High School) represented Illinois Tech.

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Todor Markov (AMAT 4th year) competed against 127 other teams, “the best of the great universities from six continents,” as contest sponsors put it. Teams get eight or more complex, real-world problems to solve in five hours. They must rank the difficulty of each problem, determine the requirements, design test beds, and build a software solution under the watch of the judges. Their coach is Gruia Calinescu, associate professor of computer science.

The IIT-B Team, consisting of Jia Hao He (CS 4th year), Calin Segarceanu (CS 2nd year), and Adam Sumner (ECE 4th year), also did well, solving five problems and finishing 21st out of almost 150 teams.

**Students Win Honors at 2016 Mathematical Modeling Contest**

Tianci Zhu (AMAT 4th year), Meng Wang (BIOL 3rd year), and Xintong Li (AMAT 3rd year) were named “Meritorious Winners” in the 2016 Mathematical Modeling Contest.

MCM is a top international mathematical modeling contest. It is organized and supported by the leading U.S. mathematical societies, including the Consortium for Mathematics and Its Applications, Mathematical Association of America, Society for Industrial and Applied Mathematics, and Institute for Operations Research and the Management Sciences. In all, 7,421 teams from universities all around the world participated this year, and Zhu, Wang, and Xintong placed among the top nine percent, with only 35 teams ranking above them.

**Health Physics Student Ian Lake Wins Dade Moeller Scholarship Award**

Master of Health Physics student Ian Lake was awarded the 2016 Dade Moeller Scholarship Award for graduate studies in Health Physics. His scholarship included $3,500 for academic expenditures and $1,500 for travel to the 2016 Health Physics Society meeting in Spokane, Wash., where he was honored at an awards banquet. Lake is founding president of the Health Physics Society student chapter at Illinois Tech and is employed full time at ChemStaff, a Chicago-area startup consulting firm, working on commercial nuclear power plant projects.

Dade Moeller & Associates sponsors the HPS Dade Moeller Scholarship program through funds donated to the Society’s Dade Moeller Fund. The late Dade W. Moeller, the company’s founder, was an active member of the HPS and served as its president in 1971. The Dade Moeller Fund was established by the company in 2009 to honor Moeller’s belief that continued education, sharing of knowledge, exposure to new ideas, and strong professional relationships are essential to an individual’s career success. In addition to the scholarship, the fund sponsors the HPS Dade Moeller Lecture Series.
Nearly 30 Donors Help To Endow Martha Evens Lecture in Computer Science

With contributions from 29 donors, we have raised $100,000 to endow the Martha Evens Lecture Series in Computer Science. We began the effort to recognize Professor Evens’ contribution to computer science in 2015 and completed it during Illinois Tech’s 2016 Giving Day. There were three lead gifts of $25,000 each, as well as 13 gifts of $1,000–$5,000.

The Department of Computer Science anticipates holding the first Evens Lecture this fall—during Illinois Tech’s homecoming weekend. This also may be the date of the computer science department’s next CS2050 reunion. Stay tuned for more details soon!


Robert A. Pritzker Science Center Dedication

On September 21, family and friends of Robert A. Pritzker, alumni, and other members of the university community gathered in front of the Life Sciences building to formally dedicate it as the Robert A. Pritzker Science Center.

Pritzker (IE ’46, Hon. Ph.D. ’84) was one of the university’s most generous alumni benefactors. At the ceremony, university officials unveiled a tribute display to him in the building’s west entrance.

Nearly $7 million was raised to begin needed repairs and renovations on the first floor. To date, crews have completed work on the west entrance and patio, restrooms, coffee room, auditorium, classrooms, and the south entrance. They also resealed and painted the building exterior.

A $2.5 million challenge grant from COL (IL) J.N. Pritzker, IL ARNG (retired) through the Tawani Foundation was matched by gifts from alumni and other friends. This included $750,000 from Robert (Bob) Frey (CHEM ’65) to remodel the chemistry suite and $150,000 from Ron Hochsprung (CS ’72) for classroom renovations. Pritzker gave an additional $500,000 gift, and the State of Illinois gave a $1.8 million grant.

Robert A. Pritzker was associated with Illinois Tech on many levels: as an alumnus, teacher, benefactor, chair of the Board of Trustees, and University Regent. In 1996 he and fellow trustee Robert W. Galvin each made a $60 million pledge to initiate the successful $250 million IIT Challenge Campaign.
College Making Progress on Raising Money for Leon Lederman Lecture Series in Physics

We are more than 40 percent of the way to establishing the Leon Lederman Lecture Series in Physics. Among others, six members of the physics faculty pledged $30,000 to endow the fund.

At 94, Lederman still goes out on walks with his dog. He lives in Idaho with his wife, Ellen. If you would like to send him a card or letter to wish him well, or if you would like to donate to the Leon Lederman Lecture Series, contact Bridget Vaughn, 312-567-5118 or bvaughn@iit.edu.

Lederman joined the physics faculty at Illinois Tech in 1992 and held the position of Pritzker Professor of Science until he retired. Lederman is a particle physicist who won the Nobel Prize in Physics in 1988 with Melvin Schwartz and Jack Steinberger. Endowing the lecture in his name ensures that the Department of Physics can continue to attract prominent experts in physics.

Burroughs Wellcome Awards Illinois Tech $10,000

The Burroughs Wellcome Fund (BWF) has awarded Illinois Institute of Technology a $10,000 grant directed by BWF Board Member George Langford (M.S. BIOL ’69, Ph.D. ’71). The grant is intended to provide support for undergraduate research internships for underrepresented minority students in the College of Science. COS will distribute the grant as part of the annual College of Science Undergraduate Summer Research Stipend program.

Langford is a distinguished cell biologist and neuroscientist who studies cellular mechanisms of learning and memory. He served on the National Science Board, the governing board of the National Science Foundation, from 1998 to 2004. Langford is dean emeritus of the College of Arts and Sciences and a professor of biology at Syracuse University. Before that, he was dean of the College of Natural Sciences and Mathematics and distinguished professor of biology at the University of Massachusetts-Amherst. He previously held leadership positions at Dartmouth College, Dartmouth Medical Center, the University of North Carolina at Chapel Hill, Howard University, University of Massachusetts-Boston, and the National Science Foundation.

The Burroughs Wellcome Fund is an independent private foundation dedicated to advancing the biomedical sciences.

From left: Leon Lederman, George Langford (M.S. BIOL ’69, Ph.D. ’71)
Timothy Topole (CS ’75)

After 40 years in a computer science career, I decided to retire and pursue other interests. I have worked for many companies large and small, too many to enumerate. What I can say is that I have learned something from every one of them.

I am heavily involved in the craft beer scene in Northern California and working with nonprofits. I love anything to do with yeast. Just asking me about the yeast lifecycle will make my day. It is funny that I usually end up in a software position for the nonprofits.

Have been married to my lovely wife Cynthia for 25 years and have a 21-year-old daughter, Paige, who is a senior and an Industrial Technology major at Cal Poly San Louis Obispo. Live in Mountain View, California.

Paul Litteau (MATH ’64)

Dean Betts visited with Jenny Dewar, daughter of Robert B.K. Dewar, in December. Robert Dewar largely developed Illinois Tech’s first computer science degree programs, invented direct addressing in compiling/language translation, and with his student Ed Schonberg compiled ADA.
Ron Hochsprung (CS ’72) received the Collens Merit Award. Hochsprung is retired from Apple after 33 years of service as a distinguished engineer. At Apple, Hochsprung worked on the Lisa and Macintosh computers and was the system architect of the Mac II. Most recently he was on the team that developed Thunderbolt input–output technology. “Whenever we got a new machine or computer chip, I was the first to go at it—making sure it ran and debugging it,” he says. “I got to play with a new toy every day.”

Prior to his work at Apple, Hochsprung worked for Illinois Tech in the computer center and as an instructor teaching operating systems and computer hardware courses. He co–developed the IITRAN coding language, which was later used to support a computer programming class for high school students, and he implemented the IITROS system that provided remote access into the IIT computer system for those students. He holds more than 20 patents.

After attending a computer science reunion at Illinois Tech in 2011, Hochsprung established an expendable scholarship fund for Illinois Tech students. “My wife and I are big believers in paying it forward,” he says, “and we wanted to help young people with their educations.” Hochsprung was a scholarship recipient himself.

In 2013 he established the Ron Hochsprung Endowed Chair in Computer Science—the department’s first endowed chair. College of Science Dean and Distinguished Professor of Physics Russell Betts says, “[Ron’s] gift is an important milestone in the life of the department, a thank you from one of the department’s first graduates—from one of the country’s most prestigious tech companies—and a model for others.”

Ted A. Erikson (CHE ’52, M.S. CHEM ’59) received the John J. Schommer Honor I Award. The Schommer Award is for alumni who excelled in both leadership and performance as student athletes at Illinois Institute of Technology and who also went on to achieve significant success after graduation.

Erikson embarked on his professional swimming career in 1961, when he became the first person to swim across Lake Michigan. He went on to set the world record for the fastest round–trip swim of the English Channel in 1965, and later became the first individual to swim from the Farallon Islands off the California coast to the Golden Gate Bridge. He has competed in a total of 31 professional swim marathons. Erikson began swimming competitively during his U.S. Navy service in Key West, Florida, and as an Illinois Tech student, he set six swim team records while also serving as team captain. After completing his master’s degree in 1960, he was the university’s swim coach for two years.

Erikson spent the first 20 years of his career as a senior chemist at IIT Research Institute (IITRI). During this time, he won a highly sought-after government contract to study ozone stabilization and also contracted with the Federal Aviation Administration to measure levels of ozone in high–altitude aircraft. In 1975 he left IITRI to be a high school science teacher in the Hammond, Indiana, public school system, where he formed lifetime bonds with his students. In 1991 he left teaching to pursue business ventures in scientific toys, jewelry and, ultimately, video production. He now swims regularly at Illinois Tech’s Ekko Pool and with the Promontory Point Open Swimmers of Hyde Park.

In 2014 Erikson joined the annual Alumni Swim Meet at Illinois Tech. Head Swimming and Diving Coach Kyllian Griffin notes, “Ted was first to arrive and far more enthusiastic about getting in the pool than younger alumni.” The swim team decided to name their 2015 invitational swim meet for Erikson. He responded by designing team swim caps commemorating both the invitational and his son, Jon, who passed away in 2014.

James U. Lemke (PHYS ’59) received a Professional Achievement Award. Lemke is a serial entrepreneur and inventor with 114 patents. He is founder and chief scientist at Achates Power, Inc., a company that produces lightweight automotive engines that are 20 percent more fuel–efficient than current engines. He is also chairman of the medical imaging device company Scan Physics. In 1968 he founded his first company, Spin Physics, Inc., which manufactured magnetic recording heads that were used in up to 50 percent of all television recordings and 90 percent of National Security Agency recordings. Lemke sold Spin Physics to Eastman Kodak and served as chief executive officer of Eastman Technologies. He has founded several other companies and has licensed his patents to IBM, RCA, 3M, and many others.

“I knew from day one I wanted to be a scientist,” Lemke recalls. “I just had a large scientific curiosity, and every time I learned something new…I would find ways to apply it.”

Lemke was working as a magnetic recording engineer when IIT Research Institute (IITRI) approached him with a position setting up their patent department. Lemke explained that he had not finished his bachelor’s degree, so IITRI offered to fund his education at Illinois Tech. Lemke recalls that physics professor Bill Bennet was a “spellbinder…you would leave his lectures almost in a trance,” and that John Neuberger and Bill Mahavier “taught me the beauty of mathematical proofs.”
Illinois Tech Men’s Basketball Team Gets “Moneyball Assist” from Data Science

Denis Bajic and Larry Layne, two students in the Master of Data Science program, provided player and other analyses to the Illinois Tech men's basketball team as their practicum last summer. In part because of their assist, the team, which was 0–23 in 2013, ended its regular season with a 20–5 record including 12 straight wins at the end of the season and competed in the USCAA Division 1 National Championship for the first time in program history. The Scarlet Hawks fell to #2 seed Concordia Alabama 61–51 in that game but plan to use data science again next season.

Save the Dates

Homecoming – September 15–16, 2017
Inaugural Martha Evens Lecture – Fall 2017

Give to the college: science.iit.edu/about/giving