Letters

writeback!

***IIT Magazine* welcomes all signed letters to the editor and edits letters for content and clarity. Please send correspondence to:**

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Psychology Story Harkened Memories

Thanks for sending me the spring issue of *IIT Magazine*. It was one of the best, if not the best, that I have received.

I especially liked the "Psychology in the Workplace" article. I had a minor in psychology and the article brought back many memories.

One memory was working with a Dr. Kerr on an empathy test for hiring sales engineers (don't know what they are called now) at RCA.

I also enjoyed the story about the Main Building renovation project. I have had a picture of "Old Main" on the house wall for many years.

—Ronald A. Dickman (BE '67)

More to the Story of IIT Computer Science

Page 21 of your spring 2008 issue could have presented a stronger and even more favorable picture in the "Notable Dates: Computer Science at IIT" sidebar. An earlier date, such as 1953, could look more impressive than 1959 as the earliest date. Also, some fill in between 1953 and 1959 could have added strength.

In 1953, IIT offered for the first and only time a graduate seminar on computers. As an IIT graduate student at the time, I registered for the course because I already knew a little about computers and was interested in learning more. My fellow classmates in the seminar included some personnel from firms in the Chicago area. At the end of the summer, the instructor said that the seminar would not be repeated in subsequent terms because computers appeared to be a dead end. I told the instructor I disagreed and saw an important future for them, and urged that the seminar be repeated. He responded with "then you teach it!" and that he was not interested. From having talked with the classmates, I knew they had felt some dissatisfaction with the content of the seminar. I knew if I presented a course on computers it should be more directed to a business/industry audience.

IIT agreed to try my take on computers as a night course with me teaching it. I taught the course regularly thereafter at IIT at night until I went off campus in the summer of 1956 to accept employment at the Stanford Research Institute. Nearly all of the course's students were employees of business or industrial organizations in the Chicago area. Since there was no suitable text for such a course, I wrote one, and it became the second general-purpose commercially published book in the computer field (Richard G. Canning's book on electronic data processing was the first one).

In your 1976 entry, you mention Carma McClure. I was the person who secured a publisher for Carma and encouraged her to become a published author.

It seems to be that you have good grounds to show that IIT was more of a leading pioneer than your sidebar presents.

Yours truly,
Ned Chapin (Ph.D. BE '59)

Editor's Note: Thank you for alerting us about the 1953 seminar. In researching the article, we culled the university's archives for details of the origins of computer science at IIT. While the intent of the sidebar was to tell an abridged story, there was no record of this seminar in our archives. We often find that information from the early years of IIT was undocumented. We are happy to know that IIT's history in computer science dates back even further—and to have an update to record in our archives.

Photo Recalls Personal Story

Your magazine was loaned to me by one of your alumni. It was so interesting to see a picture of the Engineering Research Building ["UTP Watch," spring 2008] on which my late father, Willard P. Carr, president of Dahl-Stedman Co. Builders, was project manager. He accomplished the construction of that building with Mies Van der Rohe as architect. Dad also built, under Mies Van der Rohe, the Navy Building, the Mechanical Engineering Building, the Chemistry Building, and the (1948) new power plant—lots of work during the late 1940s. He was always so proud of the work he did for your university. I believe that he was also party to the discussions that lead to the retention of Old Main, even after the fire.

Professionally yours,
James R. Carr

Newly renovated Engineering Research Building (now the Incubator)

Photo: Bonnie Robinson

Norman and Judith Lederman

IIT Launches Public Charter School

IIT Professor Norman Lederman candidly admits how he and his wife, Judith, feel about the opening of a Chicago public charter school whose mathematics and science curriculum the couple has spent a lifetime researching, developing, and refining. "We're excited—and scared," says Lederman, adding with a laugh, "but it's a good scared."

Students enrolled in the Perspectives/IIT Mathematics and Science Academy, which opened this fall, are being taught biology, chemistry, and physics through inquiry-oriented instruction, which emphasizes an active style of learning rather than a passive style composed of largely rote memorization. In the active learning process, students are engaged in investigation and experimentation, sustained reasoning and evaluation, and analysis and problem solving. Norman Lederman, who is also chair of the IIT Department of Mathematics and Science Education, and Judith, director of teacher education, are internationally recognized for their work in inquiry-based education.

Perspectives Charter Schools (PCS), a network of four other charter schools in the city, contacted the couple about the possibility of a Perspectives-IIT partnership at the recommendation of Mary Cummane (M.S. SED '05), longtime PCS educator, doctoral candidate in the Ledermans' science-education program, and principal of the new school. Besides Cummane, seven academy mathematics and science faculty members received their education at IIT.

The only PCS facility to focus on science and mathematics, the academy is located at the site of the former Benjamin W. Raymond School, a few blocks south of IIT's Main Campus, and is supported by the Chicago Public Schools (CPS) and a $500,000 grant from the Motorola Foundation in partnership with the Renaissance Schools Fund.

The Ledermans developed the biology and chemistry component of the curriculum, which has already been field tested at 11 academic institutions through the Chicago Public High School Transformation Project, offered jointly by IIT, The Field Museum, and Glencoe Publishing. The program aims to improve students' science learning and achievement by building critical-thinking skills and conceptual understanding through the concept of "learning by doing."

A second IIT program—the National Science Foundation-funded Project ICAN (Inquiry, Context, and Nature of Science)—is the source for many of the activities in the academy's science curriculum. This five-year teacher-enhancement project, which ended in 2005, focused on the nature of science and scientific inquiry, and reached out to more than 235 teachers from the Chicago area as well as over 23,000 students.

> **"Good science instruction should be offered to, and learned, appreciated, and experienced by all children."** Judith Lederman

Making a difference in the lives of students at all academic and socioeconomic levels is important to the Ledermans. "This is a school for all children; it's not a selective enrollment school," explains Judith Lederman. "Many people say that they can do inquiry with a top-notch group of math and science students. We say that good science instruction should be offered to, and learned, appreciated, and experienced by all children. That's what also makes this a very exciting endeavor for us. This is really a wonderful opportunity to work with children with an array of abilities and interests."

The Ledermans acknowledge that some of the academy's students may not want to pursue careers in mathematics and science. What is important is that students learn to make rational and informed decisions about their futures instead of relying solely upon the opinions of others. "We want them all to succeed, and we also want them to have the opportunity to make choices to do whatever it is they want to do in life," says Norman Lederman. "All students will achieve well enough to have the choice to go to college. However, we fully recognize that all students will not choose to go to college, but we want them to have the choice."

Now with 270 students in grades 6, 7, and 9, the academy will expand to its capacity of 700 students in grades 6–12 over the next four years. In preparing its students to be global citizens, the academy has the distinction of being the first charter facility in Chicago to offer a four-year program in the most widely spoken language in the world: Mandarin Chinese. "Knowledge of Chinese language and culture will give our students a competitive edge, whether they are working for Motorola in China, facilitating communication with newly wealthy Chinese tourists, or smoothing bilateral trade relations," explains Cummane.

Fueled by the desire to build a school of high standards in an intimate and safe environment conducive to learning, former Chicago Public Schools teachers Kim Day and Diana Shulla-Cose founded the first PCS institution in 1993. Their latest addition to the PCS family may be their most inspiring.

Says Shulla-Cose, "We are excited to build a model of a successful collaboration between an institution of higher education and a public charter school. Most importantly, we are excited to impact so many young lives with the amazing opportunities this partnership will provide."

The MTCC Turns 5

This September marks the five-year anniversary of the dedication of The McCormick Tribune Campus Center (MTCC) on IIT's Main Campus.

The MTCC opened in 2003 following the Richard H. Driehaus Foundation International Design Competition to select the building's architect. Designed by Dutch architect Rem Koolhaas, the 110,000-square-foot structure was Koolhaas' first building in North America. In his review of the new building, the late Herbert Muschamp of *The New York Times* described it as a "masterwork for the young and curious."

"This building was designed to be a pathway," says Kelly Schaefer, director of IIT Campus and Conference Centers. "Our focus is on keeping students in. We've seen a big jump in programming for student events."

Home to offices for student groups, IIT's radio station (WIIT, http://radio.iit.edu), a full-service restaurant, cafeteria, café, bookstore, and more, the MTCC has hosted thousands of tourists since its opening, including visitors from throughout western Europe, Asia, and North and South America. In academic year 2007–08, it held 8,156 events, a more than 16 percent jump from the previous year.

The building has been the site for the FIRST Robotics Competition, performances by IIT's 33rd Street Productions student theater group, and even a LAN party, where students were "kept in," literally, holding a lock-in and playing games via linked computers in the ballroom.

Recent updates to the facility include renaming the northern entrance the Collens Welcome Center, new furniture in the southeast lounge, and a new patio outside the cafeteria, Center Court. The radio station is currently being updated to include a lounge.

MTCC Anniversary Events

To celebrate the five-year anniversary of both the MTCC and IIT's State Street Village student residence, the Mies van der Rohe Society is hosting special tours of IIT Main Campus and the nearby Prairie Avenue Historic District and Bronzeville neighborhood, in addition to a panel discussion about upcoming developments on campus and in the surrounding area. Tours will be held on Saturday, September 20 from 10 a.m.–2:30 p.m. For more information about this free event, visit www.mies.iit.edu.

IIT is presenting Constructing Center: Framing the MTCC in Black and White as part of the art@IIT series. The exhibit features black-and-white photography by John Stamets that documents the opening of the MTCC. The exhibit runs through September 27, 2008 in Paul V. Galvin Library on IIT's Main Campus. For more information, visit www.iit.edu/art.

Commencement2008

Photo: Mindy Sherman

After years held at off-campus venues, IIT Commencement returned to Main Campus in 2008. President John Anderson presided over the May 17 event, which featured Segway inventor Dean Kamen as keynote speaker. More than 1,000 graduates along with their families and friends filled Stuart Soccer Field for the graduation, now being held once-yearly.

Carr Chapel Undergoing Restoration

That it is the only religious structure Ludwig Mies van der Rohe ever built is reason enough to save the Robert F. Carr Memorial Chapel of Saint Savior on IIT's Main Campus from further deterioration. Another, perhaps equally compelling, reason is inherent in one of Mies' reflections on the chapel: "It was meant to be simple; and, in fact, it is simple. But in its simplicity it is not primitive, but noble, and in its smallness it is great, in fact, monumental."

In a 2001 assessment, T. Gunny Harboe, a restoration architect who has served as a preservation consultant on S. R. Crown Hall and other campus buildings, determined that the 56-year-old chapel was in need of roof work, as well as complete restoration of the interior and exterior of the building. The imminent project served as the inspiration for a seminar on historic preservation using Carr Chapel as a model for teaching best practices and better understanding the challenges and issues associated with restoration. The Restoration of Carr Memorial Chapel, co-taught by Donna Robertson, IIT College of Architecture dean and professor, and Harboe ran for three semesters beginning in fall 2007.

Each student completed an independent research project related to class discussions, such as determining the needs of current and future chapel users, accommodating users with disabilities, and evaluating whether structural changes or modifications to the chapel would be necessary. Students were also involved with marketing efforts, designing a brochure for a chapel fundraising campaign run by the Mies van der Rohe Society

"The students were great," says Harboe, noting that while the plan of action determined for the chapel—to restore it to look as it did when it was first built—remained largely unchanged, the students "certainly reinforced the approach and attitude we developed about it." In restoring the look of the chapel, a curtain behind the altar and chairs more sensitive to Mies' original intent will replace what is being used now. Other renovations will include the installation of an accessible toilet and removal of exterior lighting.

Justine Jentes, Mies Society director, says that just over $443,000 has been raised toward the $1 million goal for restoration work and an endowment fund for maintenance of the building. "The Mies Society chooses its projects carefully, restoring those Mies buildings at IIT with the greatest historic and architectural merit, as well as the most significant impact on IIT's students," explains Jentes. "The chapel is a key part of Mies' modernist vision at IIT, but its simple design also provides an example of top-notch restoration to delight the many scholars who study the building, the thousands of tourists who come from around the world to see it, and the IIT students who use it every day." Work on the chapel is anticipated to begin sometime in the fall.

All groups on campus are welcome to use the chapel for services or events, although it has been almost exclusively used by traditional Christian and nondenominational religious organizations. "Restoration of the chapel is an indication that the university has a commitment not only to the preservation of an architectural gem," says Lynne Meyer, director of IIT Spiritual Life, "but to the nurturing of our students, faculty, and staff as whole persons."

'Wholeness' is a concept that extends to the chapel itself. Nathaniel Woods (ARCH '08), a student who took the Carr Chapel seminar and who now works at Adrian Smith + Gordon Gill Architects, believes that the philosophical challenges of preservation are the most interesting when deciding what to do—or not to do.

"The understanding that the building itself isn't just what we're trying to save but the story of its life is what makes it special," explains Woods about the deeper significance of Carr Chapel. "The dirt on the walls, the water marks left by a leaky unresolved detail, the wear marks where a minister always rested his hand. Cleaning or repairing any of these erases a story but may prolong the life of the building and enhance its ability to tell other stories of its life."

www.mies.iit.edu

What I Did Last Summer

Diabetes Research Program Offers Students Learning Opportunities

Third-year IIT biology major Jessica Martinez's summer break had all the makings of a memorable and satisfying vacation: new experiences, learning opportunities, field trips, even like-minded roommates. To enjoy this, Martinez didn't travel far from her home in Chicago's Bridgeport neighborhood. She simply stayed on campus and joined a team of diabetes investigators who are at work developing a culture preparation they hope will become a new standard in beta cell research.

Martinez was a participant in Engineering Research in Diabetes: Summer Research Experience for Undergraduates, a 10-week program that gives students from IIT and across the country the opportunity to work with engineers, basic scientists, and clinicians on projects that increase the understanding and treatment of diabetes and its complications. Now in its third year, the program is coordinated by IIT's Department of Biomedical Engineering in collaboration with the IIT Engineering Center for Diabetes Research and Education.

According to Eric Brey, assistant dean of the Office of Undergraduate Research and principal investigator of the National Science Foundation-funded program, the IIT opportunity is unique among academic summer programs. "It is the only one that is centered on engineering studies related to diabetes," he explains. Martinez was one of 13 students selected from this year's competitive applicant pool of more than 120 candidates. The unique program focus is what influenced Martinez to apply. "A lot of my family members have diabetes—it's something that hits close to home," she says. "It's increasing so rapidly in the country and around the world. We need to find new ways to treat diabetes, or even prevent it."

Martinez worked with a group—composed of Brey, an assistant professor in IIT's Department of Biomedical Engineering (BME); Shiri Wallach, BME doctoral candidate; and researchers from the University of Chicago (U of C)—seeking to develop alternatives to commercially available extracellular matrices (ECM) that have been investigated for growing beta cells, the insulin producers of the pancreas. According to Wallach, current products are limited largely because beta cells do not function normally on these materials. "Hopefully, we will find natural and more efficient ways to produce insulin," says Martinez.

After preparing a six-page proposal outlining her research objectives, laboratory procedures, and a timeline for accomplishing her goals, Martinez got to work extracting tissue ECM—a mixture of gel polysaccharides and fibrous proteins secreted by and surrounding cells. She prepared ECM into hydrogels to serve as culture scaffolds and observed how the various ECM environments supported the growth and differentiation of beta cells. After reviewing a current laboratory procedure with Wallach and discussing new directions for the procedure, Martinez was responsible for conducting the experiment and analyzing the data.

The summer program was especially exciting for Martinez because it was her first opportunity to do research. A member of the Medical Honors Society, she thought she would apply to medical school but after working with Brey and Wallach, is considering a career as a research scientist a distinct possibility. "The door on that is definitely opening more and more as my experience at IIT goes on," she says, finding the task of developing new processes in a new field to be a challenge she relishes.

Students also participated in weekly ethics seminars and presentations made by IIT faculty and U of C clinicians, and were given tours of the U of C transplant center, dialysis unit, and ophthalmology clinic, providing them with a first-hand look at the bodily effects of diabetes. In addition to being funded for the program, each student received a stipend for room and board, as well as travel expenses for the trip to and from Chicago.

With the fall semester underway, Martinez is looking forward to the possibility of continuing the work she did over the summer in Brey's laboratory. "It is impressive how quickly Jessica has progressed in her research abilities," says Brey. "We look forward to her building on these results during the fall." It is her new-found interest in research and a deeper desire that influences her decision this time around.

"What I find most exciting is to have the opportunity to really make a difference in trying to find a better treatment or cure for diabetes," she says. "Knowing that you have a hand in helping hundreds of thousands of people is something that is very rewarding."

www.undergradresearch.iit.edu

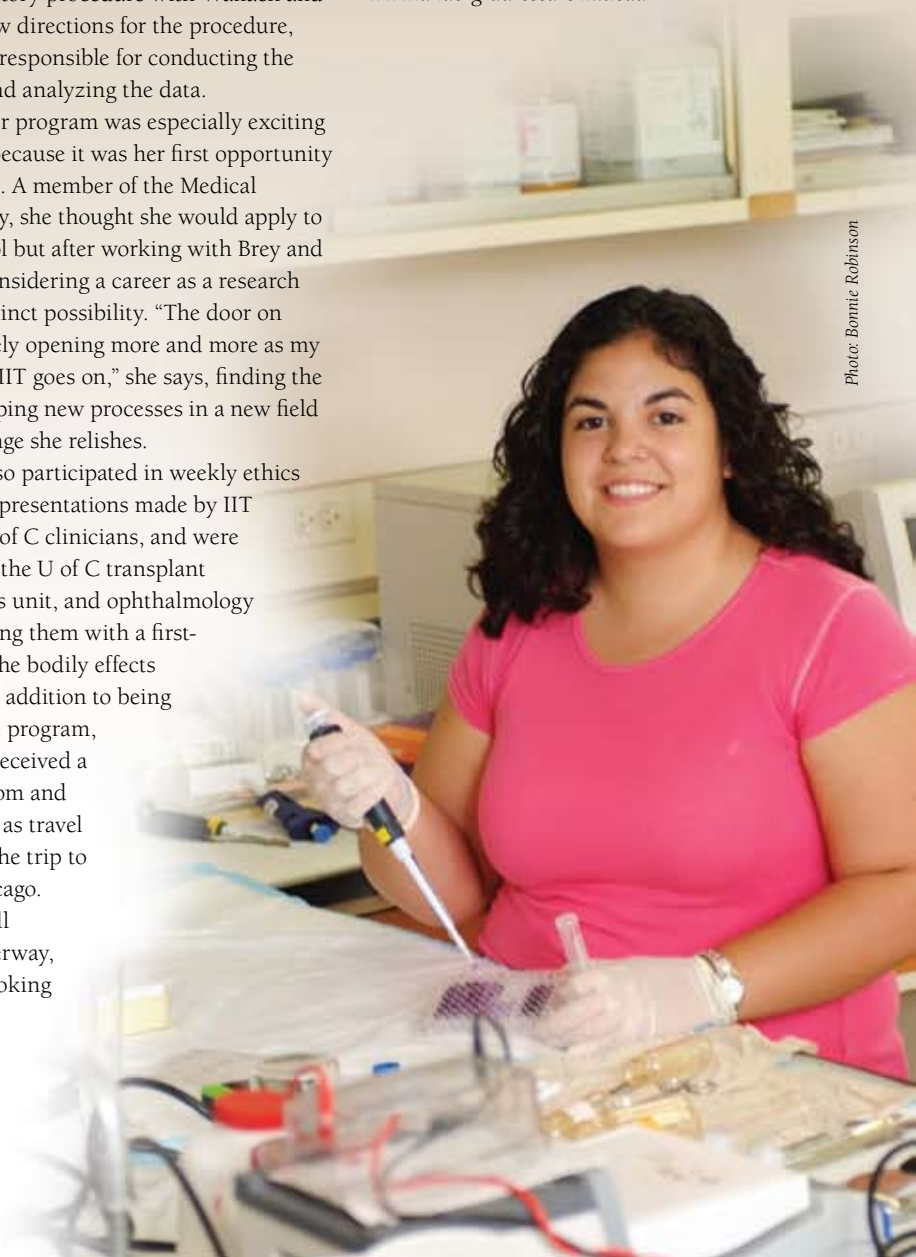

Photo: Bonnie Robinson

Aram Apyan arrived in the United States five years ago from Armenia after his father, Armen Apyan, was hired as a visiting scholar in the Department of Physics and Astronomy at Northwestern University. As a student in a new country, Aram soon became immersed in the study of two new languages: English and theoretical physics.

"I had a lot of free time here. I didn't go to high school at first," Aram says. "So I started studying science and mathematics independently." Encouraged by his father, the younger Apyan soon developed a keen interest in physics. "That was the turning point for me."

Weighing His Options: Aram Apyan's Auspicious Beginning

Today, Aram is a second-year undergraduate in the IIT Department of Physics. Though just 20 years old, he comes to the program with impressive accomplishments, having recently appeared as lead author of a paper published in the *Physical Review D* (1 Feb 2008, 77 037901).

The paper, co-authored with Aram's father and Michael Schmitt, professor of physics at Northwestern, is entitled "Detecting Neutrino Magnetic Moments with Conducting Loops." Its conclusions rely on detailed calculations Aram labored over during his last two years at Evanston Township High School. The trio's work offers a fresh approach to establishing the mass of the neutrino, a crucial (and notoriously vexing) problem for physics.

Neutrinos are high-energy particles of wraithlike character. Unlike protons and electrons, they are electrically neutral and react very weakly with other matter, yet have the capacity to pierce through dense objects with little effect on their trajectory. Hundreds of trillions of neutrinos pass through our fingers and penetrate the Earth every instant.

Mass measurements for elementary particles differ dramatically from measurements of more familiar matter. No scale sensitive enough to accurately weigh such particles exists. Instead, these tiny masses must be inferred through mathematical relationships observed in experiments. Using such methods, the mass of the diminutive electron was found to be about 10^{-30} kg.

Determining the mass of the neutrino presents even more extravagant demands for the experimenter. Compared with the heftier electron, neutrinos are downright anorexic, with an estimated mass roughly one millionth that of the electron.

The collaboration began when Schmitt proposed a new technique for measuring neutrino mass to Apyan senior. The younger Apyan, meanwhile, was auditing Schmitt's physics class at Northwestern. The group soon agreed to investigate the concept further, with Aram carrying out much of the mathematical calculation.

Their approach relies on Faraday's Law of Induction. It states that a particle moving through a conducting ring acts like a tiny bar magnet, inducing an electromotive force—a current, in the ring. Measuring this current allows one to determine the neutrino's magnetic moment, a quantity proportional to the mass.

The theoretical results gathered describe the size and shape of the electrical pulse produced by a neutrino's passage through a magnetic loop. Unsurprisingly, it was found that the neutrino's magnetic moment would be exceedingly small. Adding to the difficulties of measuring this tiny quantity by direct experiment was the calculated time frame: the event would be over in about 10^{-21} seconds—faster than a typical lightning strike.

Nevertheless, the team is hopeful that some innovative experimenter may find a way to make use of their results to propose a practical means of conducting such a direct measurement of neutrino mass.

Aram attends IIT on a Camras Scholarship, which provides full-tuition scholarships to students of exceptional promise. Most excitingly, the award guarantees Aram hands-on research experience; he plans to do work at either Fermilab or Argonne National Laboratory, likely in his junior or senior year. Later, he hopes to pursue cosmology, quantum gravity, and other areas of theoretical physics.

Aram also savors the prospect of future partnerships with his father: "It is very interesting to work with your own father and basically to see that you have the same ideas and the same interests, and can collaborate and contribute something."

—*Richard Harth*

utpwatch

UTP is home to several of IIT's academic and contract research centers. The most recent addition is the National Center for Food Safety and Technology's Clinical Nutrition Research Center at IIT. This center supports food-based solutions for improving public health, with a new 5,000-square-foot human nutrition research facility for studying biochemical and functional endpoints of health and chronic disease. The center is dedicated to delivering science validating the impact of foods and ingredients with health-promoting properties on clinically relevant end points. *www.ncfst.iit.edu/platforms/foods.html*

This center complements the growing cluster of food-related companies at UTP including:

- Altervia Fuels: corn protein production from pre-ethanol corn processing
- Sarmas Group: intelligent packaging for food safety and preservation
- Chromatin: gene stacking for agricultural crops.

On the construction front, Wexford Science + Technology recently completed four wet labs (approximately 2,000 square feet each) for post-incubation of small companies. The Technology Suites are designed to get emerging companies up and running fast. These suites are a collection of pre-built wet and dry lab spaces within the Technology Business Center that are readily available on a short-term basis. The Technology Suites are fully equipped with case work, chemical fume hoods, and sinks also in the wet labs. *www.universitytechnologypark.com*

UniversityTechnologyPark

The Scarlet Hawks—and IIT—Have a National Champion

Branden Toro may be an above-average mechanical engineering student, but as far as his performance in the swimming pool goes, he's winning with straight "C's"—that is, confidence, consistency, and coachability. These qualities, in part, are what helped the third-year student win first place in the one-meter dive at the National Association of Intercollegiate Athletics (NAIA) Swimming and Diving National Championships held this year. It is the first time in four years that IIT has produced a national-champion diver.

"After hearing my name announced as the national champion, it was almost too much to take in at once," says Toro, who scored a second-place win in the three-meter dive the day before, while breaking IIT's record for 11 dives. "For a moment, I felt as though my team was more excited for me than I was, because I was in complete shock. I knew I had a good meet but didn't know it was enough to take first."

While Toro's one-meter dive score of 488.45 merited first place, it also broke IIT's record in that event, brought Toro a fourth NAIA All-American recognition, and was the fourth-highest one-meter dive score in the history of the NAIA national championships. The dive that won Toro such acclaim happens to be his favorite, the back 1½ with 1½ twists.

"Branden is a naturally gifted diver and athlete," says Scarlet Hawks Diving Coach Ryan Nelson, a recognized coach and former diver, as he lists what accounts for Toro's success in the water. "But aside from that, he's extremely coachable. He listens to instructions and is able to make the necessary adjustments. He's willing to put in the extra effort outside the pool to keep himself in great shape. He has the right attitude about it as well. He keeps it fun and doesn't beat himself up if he misses a dive in competition. His confidence in his ability and his consistency are what keep him above the competition."

Although Toro was very comfortable in the pool even as a child, he quickly learned that swimming wasn't his forte. The joy he felt flipping on trampolines and diving off springboards during his grade-school years coupled with the excitement of watching divers perform at the 2000 Summer Olympics motivated Toro to think about his own aspirations. When he learned that his future high school in Brunswick, Ohio, had a diving team, he joined a local gymnastics facility and trained his body on land for the techniques he would perform the following year as a freshman dive member. That first year at Brunswick, Toro accomplished 11 different dives, enough to allow him to compete in postseason meets. He served as captain of the dive team for three years and still holds both the six-dive and 11-dive records at Brunswick High School.

Toro's engineering interests led him to IIT, where he is on an athletic scholarship. His studies, his new role as a campus resident advisor, and his diving schedule keep his days full. The IIT dive season begins in mid-September with five days per week of practice sessions and weekend meets that begin in October and culminate with the nationals in March. Nelson would like to see him win both the one-meter and three-meter events in the 2009 nationals and has a game plan for Toro to increase the likelihood of that happening. "We'd like to add some more difficulty to his diving list," says Nelson. "More difficult dives and performing them with consistency will make him very difficult to beat."

> **"Branden is a naturally gifted diver and athlete....His confidence in his ability and his consistency are what keep him above the competition."**
>
> **Diving Coach Ryan Nelson**

As much as the Olympics have inspired Toro to pursue his diving dream, he instead prefers to contemplate the direction an engineering career might take him, be it in teaching, research, or business. Toro has discovered that hard work and the ability to focus on the moment makes for a winning combination, in or out of the pool.

"During a dive, I usually find myself thinking just about the dive. I think about keeping my legs together, my toes pointed, and what to spot so that I can move out of the dive at the correct time, to go in as straight as possible," explains Toro. "I try to clear my head of everything else so that I can concentrate only on the dive right then and there. I don't like to think about what's to come or what I just finished doing."

www.illinoistechathletics.com/sport/6/5.php