The Office of the Vice President for Research (OVPR) advances the economic development mission of the University of Illinois by elevating ideas and innovations into sustainable technologies and businesses. Our innovation pipeline provides a process and platform for technology transfer, company formation, and, inevitably we hope, start-up and licensee success.

The Offices of Technology Management (OTMs) are responsible for protecting and managing the University’s ideas and intellectual property. Through the leadership of Nancy Sullivan and Jeremy Hollis in Chicago and Lesley Millar-Nicholson in Urbana, the OTMs continue to find innovative ways to help students and faculty advance their research discoveries, resulting in new technologies and start-up companies.

Demonstrating this, here are some highlights from Fiscal 2014:

- **Proof-of-Concept Award Programs** – The Chicago and Urbana campuses administered successful proof-of-concept award programs that are designed to help faculty increase their chances of commercialization and start-up success. More than $800,000 was awarded to help researchers across both campuses advance selected technologies. In addition to funding, award recipients receive commercialization support and access to other start-up resources.

- **Innovate@UIC** – OTM-Chicago, Illinois VENTURES, and EnterpriseWorks Chicago launched Innovate@UIC, a new initiative that supports innovation and technology commercialization on the UIC campus. By integrating these units and functions, the University can better serve the needs of UIC innovators.

- **Share the Vision Technology Showcase** – OTM-Urbana hosted its second technology showcase, a two-day event that highlights the extraordinary research, technology, and start-ups arising on the Urbana campus. This event helped facilitate new connections for more than 200 participants including University inventors and visiting entrepreneurs, corporate partners, and venture capitalists.

- **U.S. Utility Patent Ranking** – The University of Illinois was ranked #11 on the “Top 100 Worldwide Universities Granted U.S. Utility Patents” list. This ranking, compiled by the Intellectual Property Owner’s Association and the National Academy of Inventors, recognizes the global impact of U of I research and innovations.

More than ever, University research is acknowledged as critical to the U.S. economic ecosystem. It is a great privilege to work so closely with our brilliant researchers and talented OTM staff members as they engage to enhance research and innovation through the transfer of intellectual property, thus driving economic growth for the state of Illinois and beyond.

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**Fiscal 2014**

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### Five-Year History: Fiscal 2010 – Fiscal 2014

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Read more about new and existing start-ups on pages 18 and 20.
Dear Colleagues,

I am proud to present this Fiscal 2014 Annual Report, in which you will find highlights of the activities and accomplishments surrounding innovation and entrepreneurship on our campus.

Our report is organized to reflect the flow of technology commercialization from research to transfer to impact, and to show how our office is involved at virtually every point in supporting emerging technologies and new business ventures.

Research: The University’s world-class research enterprise is the foundation of our intellectual property portfolio. To help support faculty, we provide tools to facilitate research collaborations (page 11), we are involved in the IP negotiations in major sponsored research agreements and strategic engagements (page 10), and, whenever we have the opportunity, we showcase the University’s stellar researchers (pages 8-9).

Transfer: Protecting, marketing, and licensing the University’s intellectual property is the core of our mission (pages 12-17). In addition, and more than ever before, the OTM and the University community offer supporting programs and services for innovators and entrepreneurs (pages 12-13).

Impact: From new companies (page 18) to the achievements of our existing start-ups (page 19) to new licensing partnerships with existing corporations (page 20), the impact of transferring University IP into companies, products, and services is substantial.

As always, our successes would not have been possible without the support of our community of outstanding researchers, innovators, entrepreneurs and other partners.

We look forward to working with you this year.

Lesley Millar-Nicholson, Director
Office of Technology Management

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OTM is involved at virtually every point in supporting emerging technologies and new business ventures.

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Fiscal 2014 Summary

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Note: Due to the large amount of interdisciplinary research on campus, inventions are often associated with more than one college, department, or unit. As a result, the numbers reported in the table above may be counted multiple times, once for each associated college of unit. For the same reason, the totals for each college may be smaller than the sum of their departments.
Share the Vision 2013

Our 2nd Share the Vision research and start-up showcase, co-hosted by OTM and the Research Park, took place over 2 days in October 2013. Share the Vision helps connect University inventors, innovators, and entrepreneurs with corporate partners and venture capitalists. The goal is to create opportunities for further innovation and innovation transfer.

The event included presentations from 35 faculty and more than 30 start-up companies. There were also panel discussions and facility tours. Share the Vision drew more than 200 participants, with attendees coming from across the country.

Since Share the Vision has been such a success on campus, OTM is taking it on the road. The first regional event will be held in conjunction with the University of Illinois Foundation’s Silicon Valley Roundtable hosted by Chancellor Phyllis Wise on November 18, 2014.

PARTICIPATING COMPANIES

Corporations:
- Abbott
- Ameren Corporation
- Amgen Inc.
- ATSP Innovations
- BASF Corporation
- Beijing Ansheng
- Blakely Sokoloff Taylor & Zafman
- Caterpillar Inc.
- Dell
- Eli Lilly & Company
- EMD Millipore
- EpiWorks
- Force Diagnostics
- Google
- HelpHippo
- Hyde Park Angels
- IHI Corporation
- Illinois Partners
- INOAC Group
- INOS Technologies
- ISS, Inc.
- Janssen Research & Development
- Konica Minolta Laboratory USA
- Life Science Angels
- Life Technologies
- Marcus Law
- Mentor Management, LLC
- Merck & Co., Inc.
- MicroLink Devices
- Monsanto
- Motorola Solutions
- Neustar Inc.
- Parallel Worlds
- Plextronics
- Polsinelli PC
- Prairiefire Consulting, Inc.
- Rao Research and Consulting, LLC
- Riverbed
- Riverside Research
- Rogers Corporation
- Singleton Law Firm, P.C.
- Sony Biotechnology
- The Dow Chemical Company
- The HDF Group
- W.W. Grainger, Inc.
- Waterborne
- Woll Enterprises

Investors:
- Agile Equities
- Amgen Ventures
- Applied Ventures LLC
- Cultivian Sandbox Ventures
- Flavin Ventures
- Foundation Capital
- Hyde Park Angels
- IllinoisVENTURES
- Life Science Angels
- Merck Global Health Innovation Fund
- New Venture Partners
- New World Ventures
- OCA Ventures
- Oracle Ventures
- Osage University Partners
- Serra Ventures
- Silicon Pastures Angels Investment Network

Below: Scenes from Share the Vision 2013. (Photos: Jon Dessen, Illini Studio)
Innovation Celebration

Professor Stephen Boppart received the 2014 Innovation Transfer Award. The award was announced at the annual Innovation Celebration, a campus and community event that honors innovators and entrepreneurs.

The Innovation Transfer Award recognizes an individual or group from the University whose research has resulted in a discovery with the potential for significant societal impact. OTM received 17 nominations for the award.

Professor Boppart won for his work on medical imaging devices capable of delivering real-time microscopic imaging at the point of care. His research is being further developed in two start-up companies, Diagnostic Photonics and PhotoniCare.

Mark your calendars for next year’s 10 Year Anniversary of Innovation Celebration Awards: March 3, 2015, Krannert Center Lobby, 5:30 – 8:30 p.m.
Updates on Disclosures Resulting from Major Sponsored Research Agreements

Established centers:


**Advanced Digital Sciences Center (ADSC):** Established in 2009 with a grant from Singapore’s Agency for Science, Technology and Research (A*STAR) to address challenges in computer science and engineering. Eleven disclosures since inception, including five in 2013/2014.

New and emerging centers:

**Center for Nutrition, Learning and Memory (CNLM):** Established in 2011 with a five-year investment from Abbott, CNLM supports pioneering research in nutritional compound utilization and mechanisms that enhance learning and memory. Three disclosures in 2013/2014.

**Joint Center for Energy Storage Research (JCESR):** Established in 2012 to create new breakthroughs in energy storage technology and made possible by a $120 million investment by the Department of Energy. JCESR includes 14 partner institutions and is administered by Argonne National Lab. One disclosure in 2014.

Innovation and Economic Prosperity University

The Association of Public Land Grant Universities (APLU) has named the University of Illinois as one of its Innovation & Economic Prosperity Universities.

From the APLU’s press release (July 10, 2014): “The designation acknowledges universities working with public and private sector partners in their states and regions to support economic development through a variety of activities, including innovation and entrepreneurship, technology transfer, talent and workforce development, and community development.”

Lesley Millar-Nicholson was present at the University’s induction into the National Academy of Inventor’s College of Engineering professors Brian Cunningham and John Rogers were also inducted. (Photo courtesy: Aimee Blodgett)
Tools to Reduce Transaction Costs and Encourage Tech Transfer

The Office of Technology Management has agreements in place with two online marketplaces in order to make it easier for faculty to transfer research materials such as reagents and plasmids to colleagues.

- **KeraFast** connects laboratories producing unique research materials with laboratories that need those materials. More than 100 institutions are currently providing materials through KeraFast. **In fiscal 2014, KeraFast handled 30 transactions for UI.**

- **AddGene** operates a plasmid repository for the research community. More than 1,300 laboratories have contributed to their library, and AddGene handles packaging, shipping, and material transfer agreements. **In fiscal 2014, AddGene handled 309 transactions for UI.**

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</tbody>
</table>

**TOTAL: 517 AGREEMENTS**

The OTM manages many IP-related agreements in addition to licenses and options; these include confidentiality, material transfer, inter-institutional, and evaluation agreements. These agreements help facilitate research collaborations and lay the groundwork for future technology transfer activity.
OTM Launches a $500,000 Illinois Proof-of-Concept Program

The OTM launched the Illinois Proof-of-Concept Program (I-POC) in Spring 2014 to help address the funding gap between University innovations and the marketplace. I-POC helps “de-risk” technologies, making them more attractive to potential investors, funders, and licensing partners.

I-POC projects include a defined set of milestones that, if completed, help overcome specific hurdles to an innovation’s transfer outside of the University.

The I-POC Fund is currently made possible by contributions from colleges and units across campus and matching funds from the Office of the Vice Chancellor for Research. The Office of Technology Management is also working with campus advancement officers to try to create an ongoing and sustainable source of funding via alumni gifts.

Five faculty projects were chosen for the first round of I-POC awards ($195,000 awarded):

- **Kaustubh Bhalerao**, from the College of Agricultural, Consumer, and Environmental Sciences, for developing a Soybean Cyst Nematode (SCN) testing service that is faster and provides more precise data than existing solutions.

- **Stephen Boppart**, from the Beckman Institute for Advanced Science and Technology and the College of Engineering, for his Quantitative Pneumatic Otoscope, which uses optical coherence tomography (OCT) to visualize middle ear disease.

- **Martin D. Burke**, from the College of Liberal Arts and Sciences, for advancing a non-toxic amphotericin toward clinical candidacy by developing a compound with the potential to become a frontline antifungal therapy.

- **Andrew Singer**, College of Engineering professor and Director of the Technology Entrepreneur Center, for developing a high-speed underwater wireless communications system.

- **Heinrich Taube**, from the College of Fine and Applied Arts, for Harmonia, which aims to replace paper-based music theory instruction with a mobile app that allows musical content to be created, edited, searched, annotated, and automatically graded.

For more information: otm.illinois.edu/IPOC

**PROOF OF CONCEPT FUNDING WORKS**

Previous Proof-of-Concept projects on the Urbana campus have resulted in:

- **$4mil** raised in venture and angel funding
- **$1.1mil** in additional government funding support
- **FOUR START-UP COMPANIES FORMED**
- **MULTIPLE ONGOING DISCUSSIONS WITH LARGE CORPORATE PARTNERS**

“Valley of Death” Lack of Funding

FUNDING

Government Funding

Private Sector Funding

Basic scientific research → LEVEL OF DEVELOPMENT → Products demonstrated and scaled up

12 University of Illinois at Urbana-Champaign • The Office of Technology Management • Fiscal 2014 Annual Report
Update on Supporting Programs for Innovators & Entrepreneurs

The Office of Technology Management, the Research Park, the Technology Entrepreneur Center and IllinoisVENTURES all offer programs and services that facilitate and support new venture creation. Taken together, these programs offer a comprehensive set of resources addressing many of the challenges faced by new businesses.

On-Site Expertise through Entrepreneurs-in-Residence (EIR’s):
- Free individual mentoring and consulting for faculty, students, and staff
- Monthly training events
- More than 1,290 consultation meetings since the program began four years ago

Lean Start-Up Training through NSF I-Corps Site:
- UI is one of only 10 NSF I-Corps sites
- Thirty teams have completed the program already
- Teams have gone on to raise more than $4 million so far

Early Guidance through Chicago Innovation Mentors (CIM):
- Matches new technology-based ventures with experienced mentor teams
- Mentors help young companies understand their potential market and validate their value propositions
- Seven faculty from Urbana have presented at CIM; each has secured a mentor team

Hitting the Ground Running with ISTART:
- First-year start-up professional services for new companies including legal services, business planning, SBIR assistance, and financial services
- Twenty-five companies have received first round ISTART funding; 16 have become EnterpriseWorks tenants or affiliates
- Three first round ISTART companies have graduated from the incubator

Early and Seed Funding through IllinoisVENTURES (IV):
- IV has more than $65 million under management and investments in 75 companies
- IV companies have attracted more than $600 million in follow-on funding (13:1 leverage)

Improving the Odds for SBIR & STTR Funding through the Technical Assistance Program:
- Free individual consultations and workshops help identify solicitations, write grant proposals, draft budgets, and complete contracts
- EnterpriseWorks clients have received more than 193 SBIR & STTR awards, totaling more than $49 million

RESEARCH PARK EXPANSION
- Deere & Company is doubling the size of its innovation center to 13,500 square feet.
- Yahoo broke ground on a new building that will increase their space to 40,000 square feet.
- Silicon Valley advertising technology firm Turn opened an innovation center in the Park.

Top: Laura Frerichs, Director, Research Park (Photo: Justine Bursoni Photography) Middle: Jed Taylor, Operations Director, Technology Entrepreneur Center and Research Park Entrepreneur-in-Residence Bottom: Nancy Sullivan, CEO and Senior Managing Director, IllinoisVENTURES
Where We’re Going & Where We’ve Been: Conference, Meeting & Event Highlights from Fiscal 2014 & 2015

**JULY 2013**
- Association of University Technology Managers (AUTM) Central Region Meeting
  - Indianapolis, IN
- TTS North America
  - San Francisco, CA
- Farm Progress Show
  - Decatur, IL

**JANUARY 2014**
- Chicago Innovation Mentors
  - Chicago, IL
- Farmland Markets
  - Decatur, IL
- AUTM Annual Meeting
  - San Francisco, CA
- National Council of Entrepreneurial Tech Transfer Start-Up Conference
  - Washington, DC
- 118th Metalcasting Congress
  - Schaumburg, IL
- Entrepreneurship Forum
  - Campus

**Integrating Solar Storage into the Grid: A Joint UI & JCESR Symposium**
- October • Campus

**Share the Vision: San Francisco (co-located with the Silicon Valley Roundtable)**
- November • San Francisco, CA
IP Updates

UI ranks #11 in the World for Universities Granted U.S. Patents
The University of Illinois (all campuses) was #11 on the list of top 100 worldwide universities granted U.S. utility patents in 2013. The National Academy of Inventors and the Intellectual Property Owners Association compile the list.

An Active Term for the Supreme Court
The U.S. Supreme Court heard six patent cases in the term that ended June 30, 2014, weighing in on a variety of patent issues, including fee shifting, infringement, and patentable subject matter. This is the most patent cases the Supreme Court has heard in one term since the 1982 establishment of the Court of Appeals of the Federal Circuit (CAFC). The Supreme Court overruled the CAFC in five of the six cases this term, continuing a trend of high reversal rates that has been ongoing for several years.

OTM Director Takes A Stand on Patent Reform
Lesley-Millar Nicholson discussed the potential negative impact of the Innovation Act on university technology transfer in articles in Governing Magazine, the National Law Journal, and Corporate Counsel. The Act, which attempted to curb the abusive practices of patent trolls by targeting them as “non-practicing entities” (NPEs), raised the concern of many universities since universities can also be broadly categorized as NPE’s. Ultimately the Innovation Act did not have enough support for a vote in Congress.

After the Innovation Act, More Targeted Patent Reform
Unable to garner enough support for the broad reforms in the Innovation Act, the House has narrowed the scope of proposed legislation in the TROL Act (Targeting Rogue and Opaque Letters Act of 2014). TROL specifically seeks to curb the patent troll practice of sending abusive demand letters. This more focused bill has won support from organizations including the Association of American Universities, the American Counsel on Education, and the Association of Public and Land-grant Universities.

The average pendency of a U.S. patent issued to campus in Fiscal 2014 was approximately three years.
FY2014 ISSUED U.S. PATENTS BY CATEGORY

- Healthcare (Diagnostics & Therapeutics)
- Software
- Materials
- Agriculture

Engineering:
- Optics
- Energy
- Electronics

For a full list of U.S. patents issued in Fiscal 2014, please see the OTM’s website: otm.illinois.edu

46% of U.S. patents issued to campus in fiscal 2014 have been licensed or optioned.

PERCENT OF U.S. PATENTS LICENSED OR OPTIONED AT ISSUANCE

2014: 46%
2013: 36%
2012: 42%
2011: 36%
2010: 47%
Fiscal 2014 Start-Up Company Licenses

**Charmworks**
Charm software is a system for helping programmers write science and engineering applications for powerful computers, such as clusters. The software includes multiple components such as adaptive runtime libraries, performance analysis tools, debuggers, and visualization tools. Based on the research of founder *Laxmikant Kale* from the College of Engineering. The company is located in the University’s Research Park in Champaign, Illinois. atgsites.com/Charmworks_Inc

**ElectronInks**
Developing inks for printed electronics technologies. Their first product, the Circuit Scribe, is a rollerball pen filled with conductive silver ink that allows users to literally draw circuits. Based on the research of co-founders *Jennifer Lewis*, formerly in the College of Engineering, and *Brett Walker*. The company is located in the University’s Research Park in Champaign, Illinois. electroninks.com

**eText**
Delivering textbooks and other classroom materials with multimedia, notes, and assignments embedded directly in context. Based on the research of co-founder *Milind Basole* from the College of Agricultural, Consumer and Environmental Sciences. The company is located in Savoy, Illinois.

**Network Perception**
Developing the NP-View software tool designed to perform an automated and comprehensive network path analysis of firewall and router configurations. Based on the research of co-founders *David Nicol* and *William Sanders* from the College of Engineering. The company is located in the University’s Research Park in Champaign, Illinois. network-perception.com

**X-Celeprint**
Developing micro-transfer-printing technology as a manufacturing platform for integrating microscale devices such as lasers, LEDs or integrated circuits onto non-native substrates. Based on the research of *John Rogers* from the College of Engineering. The company is located in Cork, Ireland. x-celeprint.com

**Unmanned Dynamics**
Specializes in the simulation and implementation of control systems for autonomous vehicles. Based on the research of co-founder *Naira Hovakimyan* from the College of Engineering. The company is located in Champaign, Illinois. unmanned-dynamics.com
OTM Start-Ups and Licensees Across the Country

- More than 225 licenses and options (FY2010-2014)
- More than 55 Active Start-Ups
- Licensees in more than 15 countries outside the U.S.
Start-Up Company Milestones

• **aPriori**, provider of enterprise product cost management software, was selected as a finalist in the Big Data and Analytics Innovation category for the MITX What’s Next Awards.

• **ANDalyze** signed Hatch as an authorized distributor for their product line of devices to test for water contamination. ANDalyze was also profiled in *Forbes*.

• **ElectroInk** completed a Kickstarter campaign that raised more than $670,000 to begin manufacturing their first product, the Circuit Scribe, a rollerball pen filled with conductive ink. They were also named a National Innovation Awardee at the Tech Connect Expo in Washington, DC.

• **EP Purification**, developer of air and water purification devices, won the $100,000 grand prize in the Clean Energy Challenge, run by the Clean Energy Trust.

• **Glucosentient** received a Phase I NIH SBIR award and a Phase II NSF SBIR award to continue developing drug and disease monitoring technologies.

• **InstaRecon** was awarded a Phase II NIH SBIR award to continue work on their technology to increase the computational efficiency of CT image reconstruction.

• **mc10**, developing flexible electronics, was profiled in the *Boston Globe*. The Checklight, created by mc10 and Reebok, won the 2014 Red Dot Award, one of the highest honors for product design.

• **Multicoreware**, a leader in heterogeneous computing, ranked 3rd in ITEN’s Top Ten Start-Up Companies 2013 report.

• **Personify**, provider of immersive video conferencing services, was awarded a prestigious Globee Award as one of the Fastest Growing Companies in America in the category of Products and Services Growth.

• **Runtime Verification** received a Phase II NASA SBIR award to continue developing techniques to improve the safety and reliability of software systems.

• **Semprius**, working together with Solar Junction, has developed a solar cell with the best ever conversion efficiency for a photovoltaic technology.

• **Solarbridge Technologies** closed on a $42 million round of funding led by Constellation Technology Ventures. SolarBridge is a leading provider of microinverters and monitoring technology for solar systems.

• Naira Hovakimyan, founder of **Unmanned Dynamics**, was awarded the prestigious Humboldt Prize honoring career of research achievements.

• **Vanquish Oncology** received a $2 million investment to help advance its PAC-1 anti-cancer compound towards human trials.

(Photo: *Clean Energy Trust*)
Royalties and Royalty Distribution

Royalties Earned: $5,255,381
Non-University Share: $80,197
Patent Expense Reimbursement: $1,983,513
Net Available for Distribution: $3,451,040

Actual Distributions
Inventors’ Share: $616,052
University Share
Unit/College: $1,629,133
OTM Cost Recovery: $719,552

Note: “Actual Distributions” do not match the “Net Available for Distribution” in any one year because of the time lag between the date many are received and the date actual distributions are made.

Top Three Royalty Generating Technologies

<table>
<thead>
<tr>
<th>Native Oxide:</th>
<th>MarketMaker:</th>
<th>Soybean Germplasm:</th>
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<tr>
<td>A semiconductor technology used in laser printers, fiber optic communications, microelectronic devices, and more.</td>
<td>An interactive database of food industry marketing and business data that helps connect food producers with new markets.</td>
<td>A collection of soybean germplasm having a wide range of agronomic traits.</td>
</tr>
</tbody>
</table>
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Communication & Marketing Interns
Bailey Bryant, Drew Bollinger, Anna Hecht, Samantha Holt

After 27 years of leadership in technology transfer, Del Kranz retired from the OTM in May.