

IMPACT

MMXII

ANNUAL REPORT



Northeastern University
Center for Research Innovation



Our Mission

Northeastern University's Center for Research Innovation (**CRI**) is an impact-driven initiative bridging the gap between laboratory research and need-based solutions. The CRI serves as the University-wide portal between industry and leading-edge innovations from Northeastern's use-inspired research portfolio. A majority of the CRI staff has prior entrepreneurial experience, creating an agile and responsive team focused on the translation of University innovations into tangible solutions through licenses, spin outs and collaboration. The CRI's dedication to establishing ongoing dialogue with industry informs Northeastern's progressive research, enabling a productive balance between exploration and implementation.

With a generous gift from alumnus Richard D'Amore ('76), the Center for Research Innovation was formed in 2011, based on D'Amore's vision of accelerating impact from Northeastern innovations. With innovation as the catalyst, and entrepreneurship as a mindset, the Northeastern landscape is rich with opportunities for manifesting D'Amore's vision.

It seems hard to believe that a year has passed since the start of the Center for Research Innovation (CRI). It was a busy year of reorganizing, establishing relationships, and creating a plan to optimize the effect of CRI resources. In its first year of operation, CRI focused its efforts on restructuring the technology transfer operation to provide a high level of service and developed pilot programs and events to fulfill our mission of accelerating impact from Northeastern's innovations.

In the following pages you will see a snapshot of what has been achieved together in the CRI's first year of operation within the Northeastern community. Whether it is faculty members with a desire to see their innovations to market, successful alumni entrepreneurs mentoring the next generation of Northeastern entrepreneurs, or students whose passion for new ventures reaches every corner of the campus, the CRI facilitates connections for value-creation around commercialization. As such, the CRI cannot claim its successes as purely its own; the achievements we are celebrating are a direct result of the collective drive, vision and determination of our University's community as a whole.

This year was only the beginning. We approach FY13 with great excitement as we launch new programs, continuing to grow our CRI services. Northeastern University continues to build momentum and the Center for Research Innovation team is inspired in its mission, energized to accelerate the advancement of University innovations into applied solutions.



Tracey Dodenhoff
Director





Commercialization Process

Commercialization is the process of translating innovative research into high-impact solutions through industry relationships and/or spin out vehicles.

Research



Scouting



Invention Disclosure Form



Assessment



Protection



Marketing



License to Existing Business
or Assist Formation of a
Spin Out Business



Commercialization



Revenue



Reinvest in
Commercialization



Our Team

Over the course of the past year, the CRI has established key operating milestones, including: a **fully-staffed office** with a combination of entrepreneurial and intellectual property experience, a **patent database**, electronically archiving historical intellectual property files as well as establishing **processes for ensuring data integrity** with new intellectual property filings, a **re-branded website** with resources and connections to innovations available to license, and an **operations manual** to ensure continuity of service for the Northeastern community.



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SUCCESSFUL SPIN OUTS IN 2012

For the first time in 2012, the CRI benchmarked the technology spin outs from Northeastern. Spin out companies are a key element for manifesting innovations in the marketplace. The programs that the CRI is spearheading are engineered to accelerate the pace of spin out activity, involving partnerships across the colleges and alumni and student organizations.

A total of 13 Northeastern spin outs have been recorded in the last 5 years, 38% formed during the first year of CRI operations.



SPIN OUT SPOTLIGHTS

3-Spark

Embedded Electronics Lead Assembly (EELA) technology gives 3D print users the unique ability to design and fabricate parts with custom sensors and electronics embedded inside. The technology can be delivered as a stand-alone add-on unit or integrated into future 3D printers.

- Easily add intelligence to devices
- Sense deflection inside small or thin shapes
 - Medical braces and orthotics
 - Hydraulic impellers
 - UAV circuitry in wings
 - Small mobile robots
- Build custom devices with sensors
 - Custom medical rehab tools
 - Computer-interface devices
 - Consumer home products and toys
 - Defense
 - Educational tools for engineering and science

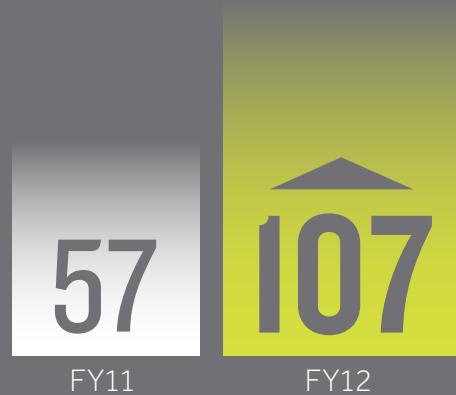
Zephyr Energy Corp.

Develop and commercialize a non-rotating wind energy generator (NRWEG). The NRWEG system uses wind energy to induce oscillations in a suspended horizontal beam. This reciprocating motion is used to generate electricity via magnetic induction.

This device has numerous advantages over traditional wind generators, including its lower wind speed requirement, compact design, and safe operation. The NRWEG's radical design is also less visually obtrusive, easier to deploy and maintain, and less susceptible to airborne threats (e.g. bird debris) than rotating wind turbines.

Invention Disclosures

Invention disclosures are where the glimmer of impact begins. They represent the identification of a new approach to a problem, and are the lifeblood of any innovative and entrepreneurial ecosystem. The CRI has made a dedicated effort to ensure that the disclosure process is transparent for inventors, and the effort has manifested in a dramatic increase in disclosure rates. This is important to the CRI, as we are beginning to properly address the needs of the research community at the University. It is important to the broader Northeastern community, as it increases our ability to accelerate the pace of innovation.



880%
INCREASE

Patent Applications Filed

A patent application is the first "line in the sand" regarding inventorship. Our new staff includes a licensed patent attorney, making the cost of filing an initial "Provisional Patent Application"* low enough that it can be incorporated as part of our standard intake routine. This means that inventors have more options early on regarding publications, collaborations, and discussions around their inventions without the risk of losing intellectual property.

*For details on the types of filings, please visit the Intellectual Property Glossary on the CRI website at www.northeastern.edu/research/cri/tech-transfer/ip-glossary

FY12

105

78

FY11

35%
INCREASE ▲

NORTHEASTERN UNIVERSITY



Quality Patents

CRI has established a robust patent analysis and commercialization review process as standard operating procedure. The number of patent applications that continue through the process * will be focused on those having the greatest chance of defensible patent protection and commercial viability, optimizing the value for both the inventor and the University.



Congratulations to our
Northeastern Inventors!

FY12 Issued Patents

- 9/13/2011 Patent No. 8,016,893 **Gear Bearing Drive**
- 9/27/2011 Patent No. 8,025,607 **Instrumented Handle and Pedal Systems for Use in Rehabilitation, Exercise and Training Equipment**
- 10/4/2011 Patent No. 8,031,514 **Bistable Nanoswitch**
- 10/4/2011 Patent No. 8,031,927 **Medical Image Processing**
- 12/13/2011 Patent No. 8,076,151 **Ultra-Sensitive Temperature Sensing and Calorimetry**
- 3/27/2012 Patent No. 8,142,370 **Electro-Rheological Fluid Brake and Actuator Devices Using the Same**
- 5/8/2012 Patent No. 8,172,577 **System and Method for Knowledge Transfer with a Game**
- 5/8/2012 Patent No. 8,173,628 **Steroidal Antiestrogens and Antiandrogens and Uses Thereof**
- 6/26/2012 Patent No. 8,206,267 **Virtual Ankle and Balance Trainer System**
- 6/26/2012 Patent No. 8,206,773 **Nanoloom for Controlling Polymer Assembly**

*For details on the patent application process, please visit the Intellectual Property Glossary on the CRI website at www.northeastern.edu/research/cri/tech-transfer/tech-transfer-process



FY12 License
Revenue

\$251,451

FIVE

Of active licenses, nearly 20% have been executed in FY12.

Licenses & Options

Whether an innovation is commercialized through a spin out or an existing company, a license is the vehicle that enables the business to invest, develop and monetize the invention. An option is a short period of time set aside for the negotiation of a license agreement, generally resulting in a license agreement. Tracking the license and option agreements are an important part of monitoring the success of the CRI over time. We begin this year with a benchmark in order to better see the results of our commercialization efforts as they manifest. Like tending a garden, the result of a well-managed license portfolio should start to generate an uptick in license revenues within the next few years as licensees develop and launch in the commercial markets.

Inter-Institutional Agreement (IIA)

An Inter-Institutional Agreement, or IIA, is a critical underpinning to effectively manage the budgetary and ownership aspects of intellectual property. Universities and hospitals enter into an IIA when they collaborate on research that produces intellectual property. The details of the IIA lay out who will lead patent acquisition, the allocation of costs, confidentiality provisions, and who will share in any revenue. Failure to execute an IIA leaves Northeastern University vulnerable to the prospect of co-collaborators licensing the invention out from under the University.

X6

INCREASE FROM FY11 to FY12

FY11 - 0 | FY12 - 6





GLOBAL ENTREPRENEURSHIP WEEK

GEW 2011

Global Entrepreneurship Week (GEW) is the world's largest celebration of the innovators and job creators who launch startups that bring ideas to life, drive economic growth and expand human welfare. The initiative kicked off in 2008, launched by former UK Prime Minister Gordon Brown and Carl Schramm, the president and CEO of the Ewing Marion Kauffman Foundation. Since then, it has grown to 115 countries—with nearly 24,000 partner organizations planning more than 37,000 activities that directly engage more than 7 million people.

The Center for Research Innovation not only hosts events during **GEW**, but aggregates the entrepreneurial activity on campus to create one united event.

Global Entrepreneurship Week 2011 included 14 events across the week, nine of which were hosted by CRI. The CRI events included breakfast learning sessions and lunch workshops in topics such as venture funding, prototyping and intellectual property strategies. The week was capped off with an internal kickoff event to introduce the Northeastern community to the CRI, featuring a panel of successful entrepreneurs including a faculty member, two alumni and a current student. In addition, the Founder and CEO of Quirky (a crowd-sourcing consumer products firm with \$40M in venture funding), Ben Kaufman, provided the keynote address and participated in the panel discussion. With approximately 250 people attending the CRI events over the course of the week, **GEW** set the tone for the CRI as a resource and catalyst for entrepreneurship around University innovations.

14

NORTHEASTERN
EVENTS

9

CRI HOSTED EVENTS

250

ATTENDEES AT
CRI EVENTS

BEN KAUFMAN

CEO, QUIRKY
WWW.QUIRKY.COM

316%

INCREASE IN JUDGES

50%

INDUSTRY JUDGES

30%

INCREASE IN ABSTRACTS

2000+

ATTENDEES

RISE:2 12

RESEARCH, INNOVATION AND SCHOLARSHIP EXPO

RISE 2012

With a focus on the integration of innovation and entrepreneurship, the former Research and Scholarship Expo provided a unique opportunity for rebranding and expansion. Renaming the event to the **Research, Innovation and Scholarship Expo**, or **RISE**, the CRI expanded the event to include an annual showcase for Northeastern researchers and scholars to celebrate their scholarly achievements and highlight innovations with commercial potential, catalyzing the integrating entrepreneurial thinking into the presentation and review.

RISE:2012 broke new ground with the participation of industry judges (50% of the judges were investors, entrepreneurs and executives), the total number of judges participating (up to 75 from 18 the previous year), the addition of "pitch" training for the presenters, an online judging portal for the judges, the standard poster format, and the sheer number of participants – a 30% increase from the previous year with over 400 abstracts submitted. The presence of industry judges motivated students to refine and polish their presentations, as evidenced in the quality of their **RISE** pitches and high scores. This same attention to quality carried over into all aspects of the event and has set a new standard for the University, paving the path for accelerating commercialization activity from student and faculty research innovations.

The event culminated in a separate awards ceremony, replacing printed certificates with display-worthy trophies, and recognizing outstanding work with \$1,000 prizes for excellence in Research, Innovation, Scholarship and Entrepreneurial Potential.





Industry Engagement

The CRI has been actively positioning Northeastern as a resource for companies looking for external expertise and innovations. Companies we have hosted for capability reviews include **Johnson & Johnson, Parker Hannifin, Northrop Grumann, P&G and Novartis**. We have also raised Northeastern's visibility by attending industry events, such as BIO2012, the world's leading biotech event with **over 20,000 attendees**. Events like BIO can be very fruitful if managed well; Northeastern left the show with **50 leads**, and was the only university to have a video interview circulated to the **24,000 members of BIO**. We were also the only university **featured on Astra Zeneca's website** highlighting the events at BIO. As with licenses, these relationships take time to develop into engagements, but the CRI is well on its way toward realizing value from these connections.

Entrepreneurial Culture

The CRI is testing and piloting programs, many times acting as the catalyst to initiate a new program with a partner entity. The following programs were piloted in FY12, and have realized measurable success. They are providing the foundation for new programs that are being developed in FY13, which promise to continue to demonstrate tangible outcomes.

Prototype Fund

Partner

IDEA and Entrepreneurs Club

Description

Awarded Prototype Fund gifts of up to \$2,500 to an individual or group to aid in making a prototype.

Outcome

CRI funded six awards, established the program and passed the baton to IDEA to continue within the Center for Entrepreneurial Education. Supporting funds were given to IDEA to fund the program for three additional rounds (nine awards).

Entrepreneurial Support

Partner

Various Student Organizations

Description

CRI provided funding to student run programs to promote events and broaden entrepreneurial awareness on campus, including Entrepreneurs Club and Husky Startup Challenge.

Outcome

CRI funded two Audience Favorite Awards given to students at HSC and provided basic programmatic expense support for student organizations throughout the fiscal year.



Venture Catalyst Pilot Award

Partner

Provost

Description

CRI funded industry relevant proof-of-concept, coming from Northeastern laboratories.

Outcome

As a result of the pilot Venture Catalyst funding, a spin out company was formed and went on to win an i-Corps award as well as an SBIR award. This success provided the model for a broader Venture Catalyst Program being piloted with the individual Colleges.

Commercialization Co-ops

Partner

Various Colleges

Description

CRI funded cooperative education students to help with commercialization of concept from Northeastern laboratories.

Outcome

Two pilot commercialization co-ops helped move technologies closer to an industry relevant proof-of-concept. This contributed to value creation and tangible commercialization progress, including recruitment of a spin out CEO, recruitment of mentoring teams, and further validation of the technology's relevance in the market.





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Center for Research Innovation
Northeastern University
900 Renaissance Park
360 Huntington Avenue
Boston, MA 02115
617 373 8810
cri@neu.edu
www.northeastern.edu/cri