The MSU Innovation Center

The MSU Innovation Center combines technology commercialization, new company start-up support, and a portfolio of dedicated business and community partnerships to bring cutting-edge ideas to the marketplace. It is composed of Business-CONNECT, MSU’s corporate relations office; MSU Technologies, the University’s tech transfer office and Spartan Innovations, a company that starts companies.

The MSU Innovation Center stewards faculty, student and commercial partner ideas, bringing more than 150 discoveries annually into a pipeline of patents, products and start-up businesses. Together, these solutions help build a diversified economy and jobs for Michigan.

MSU Innovation Center Members

Left to Right, Front Row: Angelia VanWoert, Charlene Fortin, Lori Fischer, Dave Washburn, Charles Hasemann, Rich Chylla, Anne DiSante, Ed Kim, Guangming He, Ray DiVito

2nd Row: Christi Lilleboe, Karen Studer-Rabler, Jen Folger, Janelle’ Flores, Tana Boehm, Randy Sheets, Jeff Myers, Marta Sinclair, Jody Lancia, Sandy Clough, Ann Spalding

3rd Row: Randy Ramharack, Andy Newton, Amber Shinn, Tom Herlache, Paul Jaques, Reanee Unger, Brad Shaw, Ryan Jankovic, Jean Zwier

More than 150 years ago, our University was founded with a mission to create innovative solutions in agriculture, education and engineering, and to disseminate that knowledge to help advance the well-being and economic prosperity of the State of Michigan.

Our early land grant college advanced fundamental aspects of the way we eat, the way we learn, and the way we travel. This uncommon knowledge was propagated across the state and across the nation as students took what they learned back to farms, schools and industry, and collectively moved their communities forward. What began as a Michigan experiment became the national model for land grant universities—learning institutions that focus on translating knowledge to value for the United States and beyond.

The MSU Innovation Center is an important part of a 21st century implementation of that Land Grant heritage; we are dedicated to building strong research partnerships and fulfilling the challenge of finding practical and commercial applications for our scientific research and technological innovation. By helping to establish research partnerships with companies, patenting the innovations of our faculty, and licensing technologies to partners, we move the University’s intellectual capital into the able hands of entrepreneurs and major enterprises alike. The pages that follow share several examples from 2015, including a collaboration with Exxon Mobil to create sustainable fuels for our future (page 23); the third edition of the Connected Math Project teaching children across the country (page 15); and new ways to harness thermoelectric energy (page 22).

Moving great ideas from the laboratory to a patent office filing to a license to practice in the marketplace is a complex endeavor that may take years to complete. **2015 was a great year for MSU licensing activity, we enjoyed a 120% increase in revenue this year, earning $9.37M in FY15, up from $4.26 in FY14.** In the hands of the MSU Foundation, that revenue is used to fund research projects, professorships, and future commercialization efforts—a virtuous cycle. I congratulate our tech transfer staff and our innovative faculty and commercial partners for making this a very successful year.

Last, but not least, we celebrated the expansion of The Hatch this year, our student entrepreneurship and startup space. The Hatch is supported by a partnership among Michigan State University, MSU Federal Credit Union, and LEAP. The expansion allows us to serve more students, with deeper support. In the last year, we welcomed more than 180 student startup teams, and provided everything from business model assistance, to getting legal help, to a clever company name and web site, all in the fun and nurturing environment of The Hatch.

I invite you to read about our plans and progress in the following pages, and to join us as we work together to grow ideas into business success stories.

Charles A Hasemann, PhD
Assistant VP for Innovation & Economic Development
MSU Innovation Center & MSU Business-CONNECT, President, Spartan Innovations, L3C
MSU Innovation Center by the Numbers

- **3** departments: Business-CONNECT, MSU Technologies, Spartan Innovations
- **36** full-time staff
- **483** active licenses
- **120%** growth in licensing revenue
- **156 to 183** growth of student teams in Spartan Innovations/Hatch
- **423** inventors engaged
- **$1,524,034.76** royalties paid to MSU inventors and authors in the last year
- **149** community startup events hosted in the 300 room
- **15%** increase in disclosures (130 to 149)

**Since 2012**

- **376** inventions available for license on technologies.msu.edu
- **$4.3M** to **$9.4M**
- **10%** year-over-year growth in corporate partnerships
- **4** GreenLight-hosted startup events around the state: Detroit, Port Huron, Flint and East Lansing
- **See more at msu.technologypublisher.com**
Invention disclosures by departments

Human Medicine

Veterinary Medicine
Communication Arts & Sciences
Nursing
Social Science
Education
Business
MSU Extension, IT Services
and other groups

Osteopathic Medicine

Engineering

Natural Science

Agriculture & Natural Resources

DEPARTMENTAL DISCOVERY

Arts & Letters/Theater | Theatre2Film Project
Animal Science | Methods for Generating Induced Pluripotent Stem Cells
Entomology | Plant Based Biopesticides
Computer Science | Facial Recognition and Matching Technology, with Face Attribute Estimation
Computer Engineering | Plasma-Based 3-D Printer Technology
Environmental Engineering | Portable RGB Reflection Photoelasticity Using Smartphones/PDAs
Electrical Engineering | Wearable Brain-Sensing System for Early Neurological Disorder Detection
Mechanical Engineering | Liquid-Activated Biosensor Textiles and Platform
Human Medicine | Inhibition of Mycobacterium Tuberculosis Virulence
Horticulture | Day Neutral Strawberry
Physiology | Method for the Treatment of Fragile X Syndrome and Autism
Chemistry | Isolation and Purification of Shikimic Acid
Vet Medicine | A Dietary Supplement for Post-Exercise Recovery in Equine Athletes
This year marks the 50th anniversary of Cisplatin’s discovery as an anti-cancer drug here at Michigan State University. Cisplatin (and its updated form, carboplatin) is known to be the “penicillin of cancer drugs,” because it has been one of the first, most widely-prescribed, and most effective treatment for many cancer diagnoses.

When designing and evaluating new cancer treatments, current-day researchers use the Cisplatin model as a gold standard to compare new medicines. Cisplatin may be best known for its role in helping Tour de France winner Lance Armstrong fight testicular cancer.

Cisplatin interferes with the growth of cancer cells, slowing their advance in the body. It is used to treat many types of cancer, but it is most widely prescribed for testicular, ovarian, bladder, lung, and stomach cancers. Platinum drugs are now used in 40% of all chemotherapy treatments.

Cisplatin’s origins began well before 1965, in 1844, when it was first created by Italian chemist Michele Peyrone. For a long time it was known as Peyrone’s chloride. But the really important
event was its fortuitous discovery as a cancer treatment by Barnett Rosenberg, a biophysical chemist at Michigan State University.

At the time, Rosenberg was trying to study the effect of electric fields on bacterial growth. During his experiments, he found bacteria grew 300 times their normal size but never divided, a very unusual result, when he used platinum electrodes to generate the electric fields. It took a while to figure out what was going on, but in the end he discovered the platinum electrodes were corroding in the test solution, producing Cisplatin.

Rosenberg published his remarkable findings in the journal Nature in 1965, and three years later, published another paper showing Cisplatin could cure tumors in mice.

Cisplatin has been widely used as a treatment for cancer since its approval by the US Food and Drug Administration in 1978. And while five other platinum drugs based on the structure of Cisplatin have been developed since, it has never been replaced.

This has completely changed how some cancers are treated. For instance, before Cisplatin’s discovery the cure rate of testicular cancer was just 10%, but when combined with early detection the cure rate is now approaching 100%.

Rosenberg retired from Michigan State University in 1997 and continued research at his private laboratory, the Barros Research Institute in Holt, Michigan. Rosenberg passed away in the summer of 2009, but the royalties from Cisplatin and Carboplatin still provide great benefit to MSU.

All licensing royalties from MSU-owned innovations are transferred to the MSU Foundation, a non-profit corporation designed to support research at MSU. The MSU Foundation currently manages approximately $425M, mostly derived from the Cisplatin and Carboplatin royalties. Cooperation between the MSU Foundation and the MSU Innovation Center helps create a virtuous cycle of reinvestment in commercializing technologies that serve the greater good. Years after the expiration of the patents, the licensing revenue received from Cisplatin and Carboplatin continue to deliver benefits to the MSU enterprise.
Held in the Huntington Club at Spartan Stadium, the MSU Innovation Celebration is an annual spring event that brings together University and community to honor MSU innovators and showcase several of the many inventions and innovations developed at MSU.

Technologies on display represent discoveries and scholarship from a diverse range of academic fields and potential commercial applications. Some are available for evaluation by interested commercial partners or have already been licensed by industry, while others are in early stages of development, but all represent the faculty and student excellence and innovation taking place across campus, and illustrate the ways MSU is driving economic development in Michigan and beyond.

The MSU Innovation Center presented three awards recognizing creativity and achievement in technology commercialization, applauding 2014’s most exceptional innovator, and two exceptional innovations.

The MSU Innovation Center is pleased to pay tribute to the passion, creativity, and perseverance that have led to these examples of success. We look forward to moving even more innovations developed at MSU to the marketplace, to celebrating more world-changing ideas, and to advancing the common good in uncommon ways for many years to come.

# TECHNOLOGIES ON DISPLAY

- **Precision Agricultural Technology** | Bruno Basso
- **Phenometric Plant Growth Chamber** | David Kramer
- **UNRAVEL: A Cognitive Task for Measuring Human Performance** | Erik Altmann
- **Transparent Solar Technology** | Richard Lunt
- **Carbon Fiber Technology for Graphite & Composite Technology** | Larry Drzal
- **Variable Optical Control for Data Communication** | Nelson Sepúlveda-Alancastro
- **Purification Membrane for Protein Biotherapeutics** | Merlin Bruening
- **Osteoporosis Technologies** | Laura McCabe
- **MSU Startup: TreeBorn Products** | Brian Polowniak, CEO; Dennis Fulbright, CTO
- **MSU Student Startup: TheraB Medical** | Ryan Jankovic, CEO
- **MSU Student Startup: Tech Twurl** | Usman Majeed, Patrick Chouinard, Russell Schafer
- **MSU Student Startup: OneSound** | Adam Schoonmaker, Phil Prescher, Ryan Casler, Tanay Salpekar
Dr. Richard Lunt
Assistant Professor in the Department of Chemical Engineering & Material Science

Transparent solar concentrators can be deployed on existing infrastructure to discretely harvest solar energy. Former attempts at transparent photovoltaics have fallen short, coloring or dimming the light that passed through them. Now, new solar materials can be installed on nearly any transparent surface without affecting the incoming light. Small organic molecules within the concentrator can be tuned to absorb only non-visible wavelengths, allowing natural visible light to pass through. Solar power is converted to electricity by thin photovoltaic strips. Solar power is converted to electricity by thin photovoltaic strips. This technology is a flexible and inconspicuous means of harvesting solar energy that can be integrated onto building windows and mobile electronic displays.

Dr. Alvin Smucker
Professor of Soil Biophysics in the Department of Plant, Soil and Microbial Sciences

Dr. Smucker’s research focuses on water retention of soils, particularly the application of subsurface water retention technologies. Drawing on decades of research on plant root systems, Dr. Smucker filed seven invention disclosures with MSU since 1981, earning three patents to-date. His innovative method of improving water retention, especially for sandy soils in arid regions, reduces irrigation demands, and boosts the efficacy of traditional agricultural practices.

Dr. Merlin Bruening
Professor in the Department of Chemistry

The technology Dr. Bruening developed is a method of rapidly and elegantly generating a high density of functionalized membranes at controlled pH. These membranes are useful for an array of applications related to protein purification. The membrane generation process is easily implemented, scalable, inexpensive, and yields membranes with markedly improved surface areas. Increased surface area corresponds directly with an improved overall protein binding capacity of the membrane. All of these qualities combined make this an incredibly powerful tool for academic research and industry for the study and isolation of protein biotherapeutics.
Graphene Nanoplatelets for Multifunctional Composite and Energy Technology
Drzal and collaborators developed a suite of technologies focused on improving graphite production and applications for use in energy storage and conversion, photovoltaics and polymer nanocomposites.

UNRAVEL: A Cognitive Task for Measuring Human Performance
Developed with Kimberly M. Fenn and David Z. Hambrick, Altmann’s UNRAVEL task is a Python-based software technology that assesses placekeeping and other abilities and aptitudes.

Osteoporosis Treatment Technologies
This treatment for osteoporosis significantly enhances bone density in menopausal and colitis models, with qualities known to prevent gut inflammation. Treatment can be administered orally, so patients diagnosed with osteoporosis can avoid painful and inconvenient injections.

Variable Optical Control for Data Communication
This variable optical attenuator for infrared wavelengths features an integrated sensing system, and accommodates a large range of attenuation while only using a very small amount of power.
Michigan State University launches its own chapter of the National Academy of Inventors (NAI) on Wednesday April 23. Nineteen faculty members make up the inaugural Chapter, which includes MSU NAI National Fellows, Drs Stephen Hsu, Satish Udpa and Marcos Dantus.

This inaugural class includes the following members:

- **Evangelyn Alocilja**, Biosystems and Agricultural Engineering
- **Dean Aslam**, Electrical and Computer Engineering
- **Jes Asmussen**, Electrical and Computer Engineering
- **Bruce Dale**, Chemical Engineering and Materials Science
- **Christoph Benning**, Biochemistry and Molecular Biology
- **Marcos Dantus**, Chemistry
- **Larry Drzal**, Chemical Engineering and Materials Science
- **James Jackson**, Chemistry
- **Anil Jain**, Computer Science and Engineering
- **Dennis Miller**, Chemical Engineering and Materials Science
- **Norbert Mueller**, Mechanical Engineering
- **Muralee Nair**, Horticulture
- **Ramani Narayan**, Chemical Engineering and Materials Science
- **Donald Penner**, Plant, Soil and Microbial Sciences
- **Thomas Pinnavaia**, Chemistry
- **Robert Worden**, Chemical Engineering and Materials Science
- **Ning Xi**, Computer Science and Engineering
- **Stephen Hsu**, Physics
- **Satish Udpa**, Electrical and Computer Engineering
Inventors and Inventions

2015 Inventors

A–G
Robert Abramovitch
Christoph Adami
John Albrecht
Yasser Ahdahmen
Evangelin Alcolia
Erik Altmann
Andrea Amalfitano
Sunpreet Arora
Syed Hasn Arshad
Aaron Asher
Dean Aslam
Jes Asmussen
Senem Aykul
Safou Banaba-Hampton
Seungik Baek
Aparajita Banerjee
Ralph Randolph Beaudry
Andre Benard
Mohammed Ben-Idris
Christoph Benning
Subir Biswas
Gary Blanchard
Georg Boilen
Saiwata Bose
Brian Bowe
John Boyse
Andrea Bozoki
Merlin Bruening
Lena Brundin
C. Robin Buell
Tyson Burghardt
Nianan Cai
Kai Cao
Premjeet Chahal
Shantanu Chakrabarty
Mei-Wei Change
Kamal Chauhan
Jin Chen
Martin Chivers
Jongeun Choi
Andrew Christlieb
Jose Cibelli
Teresa Clark-Jones
Dirk Colby
Timothy Collier
Christopher Colvin
Li Cui
Marcos Dantus
Isabel David
Norica Daviamelendez
Nikolay Dimitrov
Cheryl Doane
Ke Dong
Jianan Dong
Bo Dong
Lawrence Drzal
Swarnavel Eswaran Pillai
Susan Ewart
Deborah Feltz
John Foss
Eric Freedman
John Frost
Karen Frost
Wenjiang Fu
Masanori Fujimoto
Ryan Gallant
Reginald Garavito
Matthew Gattinier
Barbars Given
Charles Given
Ankush Gokhale
Maria Elena Gonzalez-Munoz
Sherman Gorbis
Amelia Gotwals
Merrill Gould
Timothy Grotjohn
Yajun Gu
Cuihua Gu

H–L
Troy Hale
Raymond Hammerschmidt
James Hancock
Raza Haque
Salah Hassan
David Hodge
Tim Hogan
John Holloway
Samuel Hoole
Paul Hoole
Samuel Hoole
Alessandra Hunter
Amy Iezzoni
Janette Jacobs
Anil Jain
Paramsothy Jayakumar
Krishnamurthy Jayaraman
Sanghyup Jeong
Shaowen Ji
Ning Jiang
Benjamin Johnson
Shawn Kaeppeler
Nicholas Kanaan
Linzi Kaniszewski
Wilfried Karmas
Victor Karpstein
Amanpreet Kaur
Linda Kelman
James Kelly
Christopher Kemp
Niesa Kettler
Matti Kielop
David Kramer
Nicholas Kuwittila
Amy Lager
Jean Lakin
Scott Larson
Matthew Larson
Ilsoon Lee
Cheryl Leece
Hao Li
Wei Liao
Chae Young Lim
Jack Lipton
Yan (Gului) Liu
Weijing Liu
Eryun Liu
Xiang-Yang “Alex” Liu
Brenda Long
Vadim Losev
Xu Lu
Jing Lu
Jue Lu
Richard Lunt

M–S
Burra Madhukar
Tapabrata Maiti
Robert Maleczka
Fredric Manfredsson
Terence March
Victoria Marshall
Erik Martinez-Hackett
Laurent Matuana
Michael McIntyre
Collin Meierbachot
Rodrigo Menezes
Emmanuelle Mercier-Grafals
Kenneth Merz
Dennis Miller
Joydeep Mitra
Kevin Moran
Donald Morelli
Daniel Morris
Abdul Motin
Justin Movs
Norbert Mueller
Thomas Mullaney
Philip Myers
Shreya Nad
Rance Nault
Brian Neal
Zachary Neal
Richard Neubig
Bai Nie
Wenjing Ning
Suzan Nitzke
Janet Olsen
Randal Olson
Jossian Oppenheim
Elisabeth Ostendorf
Hasan Otu
Cory Outwater
Vidvuds Ozolins
Karen Pace
Pablo Parraga-Ramirez
Nicholas Pauter
Cyril Payen
Lars Peerbeoom
Fang Peng
Karim Pfeiffer
Jason Piwarski
Farhang Pourbohrat
Kamala Qalandar
Rahul Rane
Gavin Reid
Weijie Ren
Ken Resnicow
Ryan Ringle
Wanda Roberts
J. Alejandro Rojasflchras

T–Z
Deimante Tamkus
Volodymyr Tarabara
Jose Teixeira
Oliver Tessmer
Michael Thomas
Nicholas Thrower
Ravi Thayagarajan
Edward Timm
Erica Tobe
Eric Torng
Nathalie Trottier
Chia-Hong Tsai
Kimberly Turner
Laillia Udpa
Satisf Udpa
Christine VanderVoorst
Dechun Wang
Ryan Warner
Christopher Waters
Evan Wegener
Sinaan Wei
Salinda Wiij retain
Curtis Wilkerson
John Wise
Peng Xu
Lei Xu
Shuitao Yang
Chaofeng Ye
Soweon Yoon
Jing Yu
Mingquan Yuan
Jing Yu
Soweon Yoon
Zheng Zheng
Guoming Zhu
Ali Ziyab
<table>
<thead>
<tr>
<th>2015 Licensed Technologies (January 1–December 31, 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Method to Produce 3-acytelyl-1, 2-diacyl-sn-glycerols (ac-TAGs) by Expression of an Acetyltransferase Gene Isolated from Euonymus alatus</strong></td>
</tr>
<tr>
<td>Inventors: Timothy Durrett, John Ohirigoe, Michael Pollard</td>
</tr>
<tr>
<td>Licensee: WinnogGen, Inc.</td>
</tr>
<tr>
<td><strong>B10244 Black Bean “Zenith”</strong></td>
</tr>
<tr>
<td>Inventor: James Kelly</td>
</tr>
<tr>
<td>Licensee: Michigan Crop Improvement Association</td>
</tr>
<tr>
<td><strong>Be SAFE: Safe, Affirming and Fair Environments</strong></td>
</tr>
<tr>
<td>Inventors: Janet Olsen, Karen Pace</td>
</tr>
<tr>
<td>Licensee: National 4-H Council</td>
</tr>
<tr>
<td><strong>Biocatalytic Synthesis of Quinic Acid</strong></td>
</tr>
<tr>
<td>Inventors: John Frost, Karen Frost</td>
</tr>
<tr>
<td>Licensee: KeraFAST, Inc.</td>
</tr>
<tr>
<td><strong>Canine Serum</strong></td>
</tr>
<tr>
<td>Inventors: Niesa Kettler, Thomas Mullaney</td>
</tr>
<tr>
<td>Licensee: Zoetis LLC</td>
</tr>
<tr>
<td><strong>Conventional Soybean Varieties</strong></td>
</tr>
<tr>
<td>Inventor: Dechun Wang</td>
</tr>
<tr>
<td>Licensee: Michigan Soybean Promotion Committee</td>
</tr>
<tr>
<td><strong>Conventional Soybean Variety E07051</strong></td>
</tr>
<tr>
<td>Inventors: John Boyse, Cuihua Gu, Dechun Wang</td>
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<tr>
<td>Licensee: Michigan Soybean Promotion Committee</td>
</tr>
<tr>
<td><strong>Conventional Soybean Variety E01017A</strong></td>
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<tr>
<td>Inventors: John Boyse, Cuihua Gu, Dechun Wang</td>
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<tr>
<td>Licensee: Michigan Soybean Promotion Committee</td>
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<tr>
<td><strong>Conventional Soybean Variety E11399</strong></td>
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<tr>
<td>Inventors: John Boyse, Cuihua Gu, Dechun Wang</td>
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<tr>
<td>Licensee: Michigan Soybean Promotion Committee</td>
</tr>
<tr>
<td><strong>COSY Infinity (software)</strong></td>
</tr>
<tr>
<td>Inventors: Martin Berz, Georg Hofstaetter, Kaihui Wan, Kyoko Makino, Jens Hoefkens, Bela Erdelyi</td>
</tr>
<tr>
<td>Licensee: Battelle Energy Alliance, LLC</td>
</tr>
<tr>
<td><strong>Course Online Specialization—Game Design and Development</strong></td>
</tr>
<tr>
<td>Inventor: Casey O’Donnell, David Wheeler, Brian Winn</td>
</tr>
<tr>
<td>Licensee: Coursera, Inc.</td>
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<tr>
<td><strong>Dollar Spot-Resistant Creeping Bentgrass Strains “Flagstick”</strong></td>
</tr>
<tr>
<td>Inventors: A. Ronald Detweiler, Joseph Yargas</td>
</tr>
<tr>
<td>Licensee: DLF Pickseed USA</td>
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<tr>
<td><strong>E6012 Soft White Winter Wheat</strong></td>
</tr>
<tr>
<td>Inventors: Janet Lewis, Eric Olson, Lee Siler, Richard Ward</td>
</tr>
<tr>
<td>Licensee: Michigan Crop Improvement Association</td>
</tr>
<tr>
<td><strong>Enzymes and Genes to Produce Triacylglycerols, Including sn-3-Acetyl Triacylglycerols</strong></td>
</tr>
<tr>
<td>Inventors: Anne Milcamps, David Pan, Michael Pollard</td>
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<tr>
<td>Licensee: WinnowGen, Inc.</td>
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<tr>
<td><strong>Food-Grade Soybean Variety E07130-T</strong></td>
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<tr>
<td>Inventors: John Boyse, Cuihua Gu, Dechun Wang</td>
</tr>
<tr>
<td>Licensee: Michigan Soybean Promotion Committee</td>
</tr>
<tr>
<td><strong>GeoYelds (software)</strong></td>
</tr>
<tr>
<td>Inventor: Bruno Basso</td>
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<tr>
<td>Licensee: CiBO Technologies, Inc.</td>
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<tr>
<td><strong>Imported from China (film)</strong></td>
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<tr>
<td>Inventors: Troy Hale, Geraldine Zelkes</td>
</tr>
<tr>
<td>Licensee: University of Washington</td>
</tr>
<tr>
<td><strong>Improved Luminescent Solar Concentrator for Opaque, Semitransparent, and Transparent Applications</strong></td>
</tr>
<tr>
<td>Inventor: Richard Lunt</td>
</tr>
<tr>
<td>Licensee: Ubiquitous Energy, Inc.</td>
</tr>
<tr>
<td><strong>Insect Cell Lines for Use in Baculovirus Expression System (BEVS)</strong></td>
</tr>
<tr>
<td>Inventor: Suizanne Thiem</td>
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<tr>
<td>Licensee: BioMarin Pharmaceuticals Inc.</td>
</tr>
<tr>
<td><strong>iSleep: Unobtrusive Sleep Monitoring System Using Smartphones</strong></td>
</tr>
<tr>
<td>Inventors: Tian Hao, Guoliang Xing, Gang Zhou</td>
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<tr>
<td>Licensee: Hao Tech, LLC</td>
</tr>
<tr>
<td><strong>Isolation and Purification of Shikimic Acid</strong></td>
</tr>
<tr>
<td>Inventors: John Frost, Karen Frost</td>
</tr>
<tr>
<td>Licensee: KeraFAST, Inc.</td>
</tr>
<tr>
<td><strong>KECSA—Movable Type Implicit Solution Model (KMTISM)</strong></td>
</tr>
<tr>
<td>Inventors: Kenneth Merz, Zheng Zhong</td>
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<tr>
<td>Licensee: QuantumBio Inc.</td>
</tr>
<tr>
<td><strong>Laser Pulse Fidelity Measurement</strong></td>
</tr>
<tr>
<td>Inventors: Marcos Dantus, Vadim Loozsky, Bae Nie</td>
</tr>
<tr>
<td>Licensee: BioQuantonic Solutions, Inc.</td>
</tr>
<tr>
<td><strong>Manistee MSL292—A Potato Variety</strong></td>
</tr>
<tr>
<td>Inventors: Joseph Coombs, David Douches, Christopher Long</td>
</tr>
<tr>
<td>Licensee: Hanford Seed Potatoes, LLC</td>
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<tr>
<td><strong>Methods and Apparatus for Determining Arterial Pulse Wave Velocity</strong></td>
</tr>
<tr>
<td>Inventors: Mingwu Gao, Mohsen Moslehpour, Ramakrishna Mukkamala, Da Xu, Guanquan Zhang</td>
</tr>
<tr>
<td>Licensee: Retia Medical, LLC</td>
</tr>
<tr>
<td><strong>Methods and Systems for Cropland Evaluation and Crop Growth Management</strong></td>
</tr>
<tr>
<td>Inventor: Bruno Basso</td>
</tr>
<tr>
<td>Licensee: CiBO Technologies, Inc.</td>
</tr>
<tr>
<td><strong>Monitoring and Optimizing Breath and Footsteps During Exercise Using Smartphones</strong></td>
</tr>
<tr>
<td>Inventors: Tian Hao, Guoliang Xing, Gang Zhou</td>
</tr>
<tr>
<td>Licensee: Hao Tech, LLC</td>
</tr>
<tr>
<td><strong>Mothers In Motion (health and wellness intervention)</strong></td>
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<tr>
<td>Inventors: Mei-Wei Chang, Susan Nitzke, Ken Resnicow</td>
</tr>
<tr>
<td>Licensee: Michigan Department of Health and Human Services</td>
</tr>
<tr>
<td><strong>N11283 Navy Bean “Alpaca”</strong></td>
</tr>
<tr>
<td>Inventor: James Kelly</td>
</tr>
<tr>
<td>Licensee: Michigan Crop Improvement Association</td>
</tr>
<tr>
<td><strong>Natural Mineral Tetrahedrite as a Direct Source of Thermoelectric Materials</strong></td>
</tr>
<tr>
<td>Inventors: Xu Lu, Donald Morelli</td>
</tr>
<tr>
<td>Licensee: Alphabet Energy Inc.</td>
</tr>
<tr>
<td><strong>Near-Infrared Harvesting Transparent Luminescent Solar Concentrators</strong></td>
</tr>
<tr>
<td>Inventors: Richard Lunt, Yinu Zhao</td>
</tr>
<tr>
<td>Licensee: Ubiquitous Energy, Inc.</td>
</tr>
<tr>
<td><strong>Non-Tinted UV Luminescent Solar Concentrator Composed of Inorganic Phosphors for Opaque, Semitransparent, and Transparent Applications</strong></td>
</tr>
<tr>
<td>Inventors: Richard Lunt, Yinu Zhao</td>
</tr>
<tr>
<td>Licensee: Ubiquitous Energy, Inc.</td>
</tr>
<tr>
<td><strong>Novel Alkaline Synthesis of Biocompatible Gold Nanoparticles Using Dextrin as Reducing and Capping Agent</strong></td>
</tr>
<tr>
<td>Inventors: Evangelyn Alocija, Michael Anderson, Edith Torres-Chavolla</td>
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<tr>
<td>Licensee: Aquia Clara International, Inc.</td>
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<tr>
<td><strong>One-Pot Synthesis of Chitosan-Coated Iron Oxide Nanoparticles (ChION) and Extraction Assay of Bacteria and Proteins From Biological Matrices</strong></td>
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<tr>
<td>Inventor: Evangelyn Alocija</td>
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<td>Licensee: Aquia Clara International, Inc.</td>
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<tr>
<td><strong>PBS-125F Cells: An Immortalized Chick Cell Line for Production of Human and Veterinary Vaccines</strong></td>
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<tr>
<td>Inventors: Christopher Colvin, Paul Coussens, Patty Dickerson-Weber, Kristin Smith (Pabst)</td>
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<tr>
<td>Licensee: Boehringer Ingelheim Vetmedica GmbH</td>
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<tr>
<td><strong>SALUS (Systems Approach to Land Use Sustainability) Model</strong></td>
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<tr>
<td>Inventor: Bruno Basso, Joe Ritchie</td>
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<td>Licensee: CiBO Technologies, Inc.</td>
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<td><strong>Science Teacher Professional Development Materials for Improving Teachers’ Content Knowledge</strong></td>
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<tr>
<td>Inventors: Jan Eberhardt, Joyce Parker</td>
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<td>Licensee: National Science Teachers Association</td>
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<tr>
<td><strong>Several Elite Stevia Testing Lines</strong></td>
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<tr>
<td>Inventors: Randolph Beaudry, James Hancock, Ryan Warner</td>
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<tr>
<td><strong>Soybean Line E11431</strong></td>
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<tr>
<td>Inventors: John Boyse, Cuihua Gu, Dechun Wang</td>
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<tr>
<td>Licensee: Michigan Soybean Promotion Committee</td>
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<td><strong>Stable, High Potential Redox Shuttles for Overcharge Protection in Lithium Batteries</strong></td>
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<tr>
<td>Inventors: Nicholas Boersma, Matthew Gregory, Thomas Guarr, Nicholas Mortimer, Robert Polik</td>
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<td>Licensee: Jolt Energy Storage Technologies, LLC</td>
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<td><strong>Stevia Variety ‘10-43‘</strong></td>
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<td>Inventors: Randolph Beaudry, James Hancock, Ryan Warner</td>
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<td><strong>Stevia Variety ‘12-05-005’</strong></td>
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<td>Inventors: Randolph Beaudry, James Hancock, Ryan Warner</td>
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<td><strong>Stevia Variety ‘12-05-144’</strong></td>
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<tr>
<td>Inventors: Randolph Beaudry, James Hancock, Ryan Warner</td>
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<tr>
<td><strong>System for Large-Scale Face Retrieval</strong></td>
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<tr>
<td>Inventors: Anil Jain, Charles Otto, DaYong Wang</td>
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<td>Licensee: NEC Corporation of America</td>
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<td><strong>That Strange Summer (film)</strong></td>
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<td>Inventor: Geraldine Zeldes</td>
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<td>Licensees: Ann Arbor District Library, Comcast Cable Communications Management, LLC, Detroit Free Press, Filipino American National Historical Society—Michigan Chapter, Schoolcraft College</td>
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<td><strong>Thermoelectric Materials Based on Tetrahedrite Structure for the Thermoelectric Devices</strong></td>
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<tr>
<td>Inventors: Xu Lu, Donald Morelli, Vidvuds Ozoilns</td>
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<td>Licensee: Alphabet Energy Inc.</td>
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<tr>
<td><strong>Thermoelectric Materials Based on Tetrahedrite Structure with Modified Composition for Thermoelectric Devices</strong></td>
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<tr>
<td>Inventors: Xu Lu, Donald Morelli, Vidvuds Ozoilns</td>
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<td>Licensee: Alphabet Energy Inc.</td>
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<td><strong>Utilization of Waste Stillage from Existing Corn Ethanol Dry Mills as Synergistic Additive for Enzymatic Hydrolysis and Fermentation of Lignocellulosic Biomass</strong></td>
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<tr>
<td>Inventors: Venkatesh Balan, Shishir Chundawat, Bruce Dale, Leonardo da Costa Sousa</td>
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<td>Licensee: Valicor Separation Technologies, LLC</td>
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**INDEX**
MSU MTRAC Programs Define the Future of Bio-Based Products

Supported by the MSU Innovation Center, the Office of the Vice President for Research and Graduate Studies, the College of Natural Science, and the College of Engineering, the Michigan Translational Research and Commercialization (MTRAC) Program for the Bio-Economy was established through a grant from the MEDC 21st Century Jobs Trust Fund, with matching funds from MSU for a total of $2.4M. These funds are focused on one of the University’s core strengths: Ag/Bio-based materials science and technology.

Ideal candidates are MSU biotechnology and bioprocessing innovations that have the potential to create superior and sustainably-produced products and materials. Projects will have shown promise in the laboratory, but need further development in order to become successful in a competitive market. The following are examples of BioAg projects selected for grants to help make them broadly available for consumer use.

**Bruce Dale**
Commercialization of AFEX-Treated Biomass as an Animal Feed for Beef Cattle
In collaboration with Bernie Steele and Bryan Bals at MBI

MTRAC funding of this project has allowed Dr. Dale’s team to scale up ethanol production from AFEX pellets to a commercial scale of 3000L, and conduct animal feed trials with beef cattle, leading to FDA approval. FDA approval will enable large scale market tests and decrease the risk involved in market penetration. This is part of the long-term goal to build 200 ton/day AFEX depot facilities that will be capable of producing enough feed for approximately 50,000 cattle on multiple feedlots.

**Gemma Reguera**
Microbial Electrochemical Reactors (MERs)

The MER developed by Dr. Reguera provides a proof-of-concept that her reactor can produce high value chemicals without being inhibited by the waste byproducts that typically build up in similar processes. Dr. Reguera will work to produce the polymer precursor 1,3-propanediol (PDO) using glycerin as a substrate. 1,3-PDO can be formulated into a variety of industrial products including composites, adhesives, laminates, and polyesters.

**John Frost**
Synthesis of Biobased p-Hydroxybenzoic Acid (pHBA) at Kilogram Scale

Dr. Frost has developed an improved fermentation process to produce shikimic acid, most commonly used as the starting material in the manufacture of the anti-influenza drug Tamiflu. With MTRAC funding, his lab will be able to scale-up and further improve the microbial synthesis and purification of this specialty chemical for commercial production.
The Connected Math Project
Meeting middle school math needs in schools and online

In the early 1980s, MSU mathematics researchers Glenda Lappan and Elizabeth (Betty) Phillips were working with middle school students, seeking a new way to help students grasp math concepts at a pivotal point in their education.

The Connected Math Project was created to better assist students and teachers in developing mathematical knowledge, skills, understanding and an appreciation of the connection between mathematics and other disciplines.

The first units were published in 1985, and used by teachers to make a transition away from traditional “show and practice” methods of teaching. Each unit was focused on a different area of mathematics and encouraged students by illustrating math in “real world” problem-solving situations. CMP is designed to adapt to changing needs of students and instructors in the classroom.

In 1991, the National Science Foundation funded the first installment of CMP. Through this NSF funding, schools were able to create richer educational opportunities for students and teachers. A second revision was completed in 2000, and a third in 2010 reflected additional research and fully integrates Common Core State Standards for Mathematics.

The third edition of CMP is currently Michigan State University’s highest-grossing educational product, earning more than $4.8M in the last year alone. Built with robust online resources to support the millions of copies in middle schools across the country, CMP is published by Pearson Education, Inc.

We cannot tell the story of the Connected Math Project without also recognizing the contributions of MSU Technologies technology manager Kari Haldenwanger. Kari was instrumental in guiding the growth and evolution of CMP.

A Chemistry graduate of Lawrence Technological University, Kari worked in the automotive industry for more than 13 years before coming to MSUT. As a materials engineer, she was part of one of the first initiatives to use recycled plastics in new automobile construction and worked as a senior buyer of automobile safety systems and technologies.

When we lost Kari to cancer in April, 2015, the University lost a keen technology commercialization expert, researcher advocate, and friend.
TheraB Medical Inc. (TheraB) was originally developed by MSU biosystems engineering students Oliver Bloom, Vu Hoang, and Alexa Jones, and later launched with the help of $150,000 in pre-seed stage funding from Quantum Medical Concepts, a Michigan-based medical sector investment firm.

TheraB developed the SnugLit Portable Phototherapy Blanket, a wearable swaddle that treats newborn jaundice. Jaundice is caused by a high level of pigment in the blood called bilirubin, which causes the skin to look yellow. A newborn baby’s still-developing liver may not yet be able to remove this bilirubin from the blood. TheraB’s swaddle provides the blue light needed to help the newborn break down the bilirubin molecules as the liver develops.

The unique SnugLit swaddle design promotes parent-infant bonding while decreasing the stress to mother and baby, and allows for easier breastfeeding. Traditional treatments may include separating mother and infant treating the child on a light board, or the use of bulky non-portable blankets. The SnugLit swaddle design is a more intimate and more cost-effective method of treating jaundice.

TheraBMedical.com
**TreeBorn Products**

This startup company has found a way to apply Michigan’s role as first in chestnut production to the booming microbrew industry. Treeborn Products craft-roasts chestnuts to be used in the brewing process for both gluten-free and regular ales, stouts and porters. Their craft-roasting process helps maximize chestnuts’ naturally sweet, nutty flavor.

While chestnuts have been used extensively as a brewing ingredient in Europe, Treeborn’s product brings chestnuts to the American brewing market in the form of flavorful, easy-to-use chips that can be applied at all stages of brewing.

More than 40 breweries around the world partner with Treeborn to enhance their beers. In Michigan, Jolly Pumpkin Brewery in Dexter, MI uses chestnut chips to produce Fuego del Otono: The Fire of Autumn. Brewmasters from Short’s Brewing Company add chestnuts to their Bellaire Nut Brown Ale. Glutenberg Brewing Company in Montreal uses Treeborn chestnuts as the base of their award-winning gluten-free Red.

TreebornProducts.com

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**CiBO Technologies**

CiBO Technologies is an analytical software system that incorporates previous innovations in agricultural simulation alongside real-time weather monitoring, remotely sensed imagery, spatial yield data, and information gathered by Unmanned Aerial Systems (UAS). This comprehensive crop yield model system is founded on research conducted by Michigan State Professor Bruno Basso, and will give farmers and researchers greater control over field management.

CiBO Technologies’ drones are able to measure crop reactions to a variety of stresses including drought, pests and nutrient deficiencies. This knowledge allows farmers to address issues in their fields and specific problem locations, eliminating the guess and check method of field problem solving.

Building on decades of research in agricultural yield modeling, CiBO Technologies provides growers the ability to simulate an array of different growing parameters, including water balance, soil organic matter concentrations, nitrogen and phosphorous levels, drainage, root water uptake, soil evaporation, and transpiration. In combination with historic and real-time environmental data, CiBO Technologies allows growers to make critical decisions regarding input and cost, helps to increase yields, and decreases environmental impacts.

CiBOTechnologies.com
Tech Twurl is a web-based electronics buyback company, specializing in smartphones. Customers have the options of being paid through PayPal, check or Bitcoin.

In 2015 the Tech Twurl team developed a mobile application called Protection to give users instant access to the website offerings and additional features. Protection, introduced at 2015 Student Startup Madness at SXSW Interactive, allows users to buy, sell, and repair their current device as well as purchase a new or used device from Tech Twurl. Usman Majeed is Tech Twurl’s CEO, Patrick Chouinard is Chief Data Officer and supply chain major Russell Schafer is Chief Operating Officer.

TechTwurl.com

OneSound is a mobile app that allows everyone at an event be the DJ. Users can create synchronized playlists at your party that stream one sound to one device.

All members of the startup team are computer science majors, and the co-founders met in a computer programming club. While using a music program on the computer with properties similar to OneSound, they noticed areas where improvements could be made, particularly in regards to portability. It was something they all enjoyed using, but agreed should be available on their phones, so they created an app to support their idea. Team members include Adam Schoonmaker, Phil Prescher, Ryan Casler, and Tanay Salpekar.

OneSoundApp.com
LykeMe connects people who have similar social and professional interests within their area. Using this interest and skill profile, this platform is also used to refer users to new—and possibly unknown—events, activities and groups in their area.

LykeMe, founded by Josh Ogundu and Yoseph Radding, hope this platform will connect people of different social, racial, and socio-economic backgrounds. They aspire to show people around the world that everyone is similar, and they believe LykeMe will help people from various walks of life to connect through their similarities rather than focus on their differences.

lykeme.com

The York project is a streetwear company that specializes in shirts, hats, beanies, and other accessories. They operate with a simple mission: to help those in need, and help make the world a better place to live by donating some of their good fortune to those around them. For every product sold, the startup donates a needed article of clothing to a homeless man or woman in America.

Founded by Josh York, the York Project started as a basement project in Livonia, Michigan in February 2013, and quickly grew. They have since helped more than 8,000 individuals in need in every major region of the country, and work with local college student volunteers to hand out donations in cities around the United States. This socially-conscious startup has been featured in USA Today, the Huffington Post, FOX News and more.

yorkproject.com

Katie Reynard: Fashion for the Fire

In collaboration with the Firecracker Foundation, Raynard is the featured designer for “Fashion for the Fire,” an avant-garde fashion show at The Runway in downtown Lansing.

Pridgit

Nick Lazich talks at Detroit TechWeek about Pridgit, a global marketplace and network where customers can purchase, or create, 3D printable objects.
Entrepreneurship Ecosystem

Building an Entrepreneurship Ecosystem
While entrepreneurship is, at its core, about launching new businesses, we think about it as more than that. Entrepreneurship is a vital life skill that extends far beyond the ability to launch a venture, one that prepares individuals to deal with the rapid changes and complexity of our world. Michigan State University aspires to develop a deeper understanding of the entrepreneur experience, in order to help extend the entrepreneurial mindset to the many, not the few.

We are committed to growing an entrepreneurial ecosystem across the state of Michigan that integrates innovation, technology, business partnerships, and professional support for start-ups and hands-on experimentation.

The voice and experience of real-world entrepreneurs is a key component of our ongoing effort to design, develop and test new education and support solutions. This ecosystem helps move ideas from concept to market, and relies on strong relationships across university units, as well as with community partners and economic development agencies, venture and angel funders, regional accelerators and incubators, and local leaders to create a network of support and success.

GreenLight Business Model Competition
The GreenLight Business Model Competition is a startup event series that brings together entrepreneurs and small business supporters from all over the State of Michigan. In addition to networking with innovators and venture capital investors from across Michigan, participants pitch their new business ideas to a panel of esteemed judges for a chance at winning up to $50,000 in prizes.

East Lansing’s event marks the statewide conclusion of a series of regional pitch competitions designed to support entrepreneurial activity across the state of Michigan. Thanks to support from the Michigan Economic Development Corporation, Spartan Innovations held regional events in Flint, Port Huron and Detroit that culminated in a final event in East Lansing. Finalists from regional events won automatic entries in the final event.

Airway Innovations won the grand prize of $25,000, with their medical device that helps secure a patient’s breathing tube. Whirlpool Corporation partnered with Spartan Innovations and GreenLight Michigan to create the $5,000 Home & Housewares Award, promoting purposeful innovation that helps homes run smoothly. This was won by AutoMowticCo, “the Eco-friendly, financially dominant future of lawn care”
The Hatching
The Hatching is a monthly community business pitch event created by Spartan Innovations, the MSU Innovation Center and LEAP. This event is part of a community-wide effort to support local entrepreneurs and make the Lansing region a great place to start a business. The Hatching helps move new, local business ideas from concept to reality, and provides winners with funding, legal support, market research, office space and more.

Held in East Lansing on the fourth Thursday of each month, this casual, informal event awards $1,000 and a suite of support services to each monthly pitch winner. Competitors and startup enthusiasts use the event to network, recruit team members and cheer for their favorite ideas each month.

Lansing Maker Week
A team of more than a dozen community partners kicked off Michigan’s first Maker Week, and the Midwest’s first Startup Weekend: Maker Edition. Held October 6-12, the first five days are stacked with tours, projects and guest speakers in make subject areas like 3D printing, textiles, food and drink, electronics and programming, and the intersection of 21st century jobs and maker skills.

Startup Weekend: Maker Edition provided superior experiential education for technical and non-technical entrepreneurs. Beginning with Friday night pitches and continuing through brainstorming, business plan development, and basic prototype creation, Startup Weekends culminate in Sunday night demos and presentations. Participants create working startups during the event and collaborate with like-minded individuals outside of their daily networks.
Alphabet Energy entered an exclusive commercialization agreement with MSU on a breakthrough thermoelectric material tetrahedrite, for use in industrial and other thermoelectric systems. Alphabet is a leader in commercializing the first large-scale thermoelectric generators for waste-heat recovery.

Thermoelectric materials convert any waste heat source into electricity. While they have been studied for decades, only a few have reached commercial applications because of their low efficiency, high cost, and use of rare elements.

“In our search for efficient, abundant, and nontoxic thermoelectric materials, we were led to the tetrahedrites, a family of compounds of commonly occurring elements, by theoretical calculations of their properties,” said Don Morelli, a professor of materials science at MSU. “The fact that they are naturally-occurring minerals is an added bonus—one can either synthesize them in the lab, or use the natural mineral itself as a source thermoelectric material. The compounds are especially interesting because they combine very low thermal conductivity with unusually good electronic properties.”

Morelli, who led the research that was published in the journal *Advanced Energy Materials*, said the process is only the first step in creating a low-cost, widespread technology for converting heat to electricity.

MSU Partners with ExxonMobil to Advance Biofuel Research

A new $1 million collaboration between Michigan State University and ExxonMobil will expand research designed to advance the development and ultimately the production of algae-based fuels.

David Kramer, MSU’s John Hannah Distinguished Professor in Photosynthesis and Bioenergetics at the MSU-DOE Plant and Research Laboratory (PRL), says that the overall goal of the partnership is to improve the efficiency of photosynthesis in microalgae to economically produce biofuels and bioproducts.

“Photosynthesis is the biological process that plants and algae use to store solar energy in biomass. It is how all our food is made, and we would starve without it,” said Kramer, who is leading the grant with Ben Lucker with the PRL and Joe Weissman, Distinguished Scientific Associate at ExxonMobil. “What we want to know is: how can we improve the process so that algae can save enough energy to power our cars as well as make products like plastics?”

The key to bioenergy is the efficiency of photosynthesis, the process algae use to capture solar energy. Past research has shown that algae have efficient photosynthesis under optimal conditions in the laboratory. Under realistic growth conditions in algal production facilities however, their efficiency drops. We need to maintain and even improve photosynthesis under real production conditions.

One of these technologies, developed through a grant from the U.S. Department of Energy (Energy, Energy Efficiency and Renewable Energy program) is a matrix of specialized chambers, called the environmental PhotoBioReactor, that allow algae to be studied in detail under simulated production environments.

The potential of ePBRs led to a spin-off company, Phenometrics, launched by the MSU Innovation Center. The company is merely three years old, but steady orders for the bioreactors have the company already running in the black.

“We know certain types of algae produce bio-oils. The challenge is to find and develop algae that can produce bio-oils at scale on a cost-efficient basis, said Vijay Swarup, Vice President of ExxonMobil Research and Engineering Company, “Algae biofuels research and development is a long-term endeavor and we are partnering with the leading scientists in the fields to better understand the fundamental science and support their groundbreaking research.”
Innovation Center Events

August
**Hatch Expansion**—The Hatch, MSU’s student entrepreneurship incubator doubled in size last year, thanks to a gift from the Michigan State University Credit Union. The MSU Innovation Center held a ribbon cutting and opened the doors to the 300 Room, a community entrepreneurship space as well. This photo features partners Dr. Steven Hsu, MSU Vice Pres Research & Graduate Studies; Paul Jaques, Spartan Innovations; April Clobes, MSU Federal Credit Union; Dave Washburn, MSU Foundation; Bernie Esibrenner, MSU Entrepreneur Assoc.; Bob Trezise, LEAP.

September
**President Simon kicks off Student Startup Lunch**—MSU president Lou Anna K Simon meets with student CEOs every quarter to learn about new student companies formed, student needs, and to find ways the university can support and expand on student entrepreneurship efforts.

November
**Alumni Leaders Visit MSU Innovation Center**—Alumni met with students and staff in a day-long exploration of entrepreneurial activity at MSU, touring new spaces, meeting with student CEOs and company teams, and working through new ways to mentor and support student businesses.

December
**LAUNCHED**—Lansing-area business leaders gathered for the finale of the Hatching, a community business pitch event, and to toast the recent accomplishments of innovators and entrepreneurs in the Greater Lansing community. MSU Startup TheraB won the competition, and is pictured with the panel of expert judges.

March
**Students at SXSW with @MSUStartupBus**—Michigan State University student teams have been top-ten finalists at the Student Startup Madness Competition for the last three years. This event is held in Austin, Texas at South by Southwest Interactive. This year, students crowdfunded and built the MSU Startup Bus to help take more startup companies to support finalists Tech Twurl and represent MSU.

April
**Demo Day**—Eight MSU student startup companies talked with the public and potential investors about their products and services during the first-ever MSU Student Startup Demo Day.
Hatch Expansion

President Simon kicks off Student Startup Lunch

Alumni Leaders Visit MSU Innovation Center

LAUNCHED

Students at SXSW with @MSUStartupBus

Demo Day
“We are building an ecosystem to inspire and develop a community of self-motivated innovators and creators. At MSU, the definition of ‘entrepreneur’ is a person driven and capable of creating new opportunities in any context—launching a startup business, driving change as a corporate ‘intrapreneur,’ or inspiring positive changes in culture through social entrepreneurship.”

—Charles Hasemann, Assistant Vice President, Innovation and Economic Development, MSU Innovation Center
Everyone who loves Michigan State University knows of its determination to educate young people, its extraordinary global connections and its ambition to be one of the world’s leading research universities. We have a remarkable history of advancing the common good with an uncommon will.

Our success has placed us on an extraordinary path—but if we are to achieve our full potential we need to empower our students and faculty and make available the resources to achieve their dreams. The Empower Extraordinary campaign will propel this great university forward through its people and with you at its side.

Entrepreneurs of All Kinds at MSU—
Building an Ecosystem to Inspire

Michigan State University aspires to grow an entrepreneurial ecosystem that integrates innovation, enhanced technology, new teaching models, professors of practice, business partnerships, and professional support for startups and hands-on experimentation. We are evolving curriculum to include entrepreneurship-based courses to help students chart their own paths, providing hands-on learning experiences to increase collaboration and communication skills, and meeting real need and demand through company-sponsored partnerships and design projects. We are also investing in programming and resources that help move ideas from concept to market.

This requires a strong network of university units, community partners, economic development agencies, venture and angel funders, regional accelerators, and incubators. Our success is supported by the voice and experience of real-world entrepreneurs in the design, development, and testing of new education and support solutions.

This assembling of programs and relationships helps to break down silos and increase collaboration across units and services to bring path-breaking innovation to the marketplace and to establish a platform for experimentation.

This campaign includes goals for funding student startup support programs in the Hatch and the Hive, and endowing the GreenLight Business Model Competition and the GreenLight Fellowship Program. Both GreenLight programs support early and next stage startup partner development. Supporters and partners work with the Innovation Center to identify additional ways to support entrepreneurship at MSU, in the form of travel stipends, lecture series, and student organization support.

givingto.msu.edu/unit/entrepreneurship.cfm