



# Science that Matters: Fermilab's Partnerships with Industry

Cherri J Schmidt

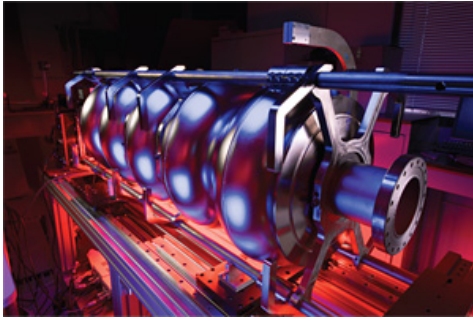
Community Advisory Board Meeting

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# Science that Matters: Fermilab's Partnerships with Industry

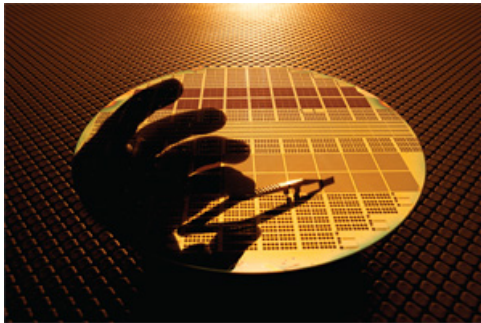
- Overview
  - Fermilab's technology strengths
  - How we partner with industry
- Three short stories
  - 3D Integrated Circuit Technology
  - Salvia Mystic Spires Blue
  - The Electromagnetic Mop
- IARC: Paving a new future
- Questions

# Fermilab's Technology Strengths



## Accelerator Technology

Fermilab is the U.S. accelerator laboratory, dedicated to developing particle accelerators for physics research. This technology also has many applications outside of physics, including medical applications like PET scans and commercial applications like curing rubber tires or shrink-wrapping products. Through the Illinois Accelerator Research Center (IARC), Fermilab partners with industry and universities to help create accelerator-based products, applications, companies and jobs



## Detector Technology

Accelerators can collide particles together, but scientists need detectors to reveal what happens when they do. Fermilab has been at the forefront of detector technology for decades, working most recently on the massive CMS detector at the Large Hadron Collider in Switzerland and the next generation of neutrino detectors for experiments in the U.S. The technologies developed for these physics experiments can be applied to fields as diverse as the financial industry and medical diagnostics.



## Computing Technology

Particle physics experiments produce an enormous amount of data. It takes an extraordinary amount of computing power to sift through that data and find the one signal in a billion that could tell us more about our universe. Fermilab's computing innovations have led to multiple applications, driven by our need to process massive amounts of information, store it and transmit it effectively.

# How we partner with industry



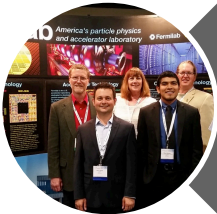
Procurements



Strategic Partnership Projects (SPP)



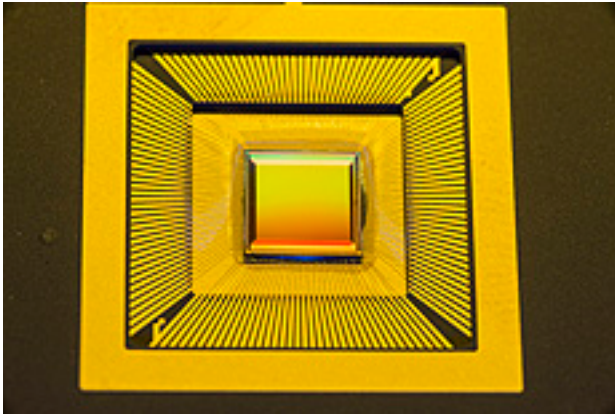
Cooperative Research and  
Development Agreements (CRADAs)



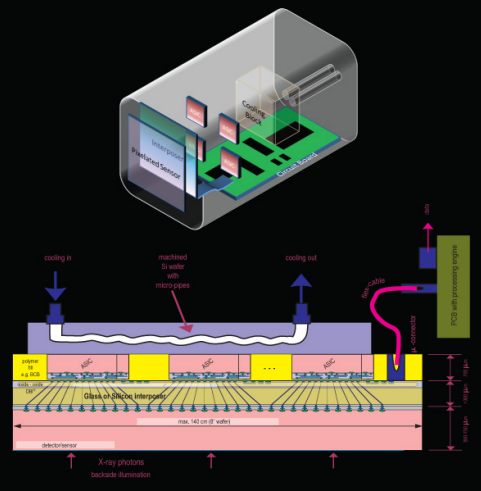
Licensing Agreements



# 3D Integrated Circuit Technology



VIPRAM



PIXELATED DETECTOR

## Partner

- Tezzaron Semiconductor
- Naperville, IL

## Objectives

- Develop next generation detector technology for physics applications
- Use commercial off-the-shelf technology for cost and reliability

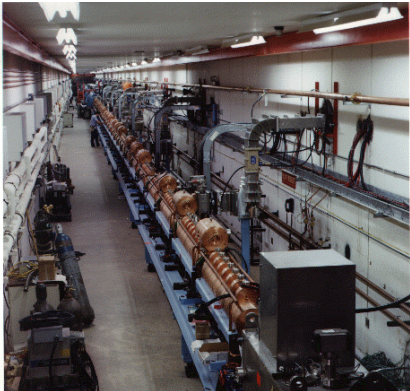
## Type of Agreement

- Procurement

## Results

- High Speed Pattern Recognition
- High Resolution Imaging Systems

# Salvia Mystic Spires Blue



*More than 3000 cancer patients treated at Fermilab's Neutron Therapy Facility (NTF)*



*More than 15,000 patients treated at Loma Linda University Medical Center*



## Partner

- Ball Horticultural
- West Chicago, IL

## Objectives

- Leverage DOE's investment in accelerator facilities for industrial applications through the Neutron Irradiation Facility (NIF)

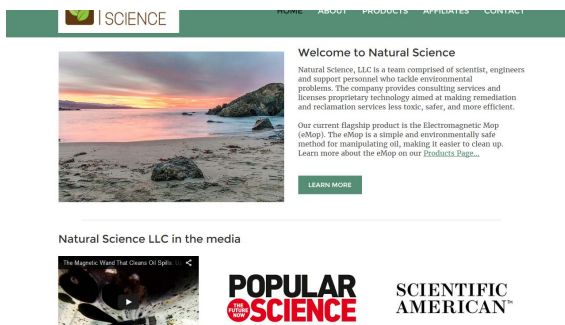
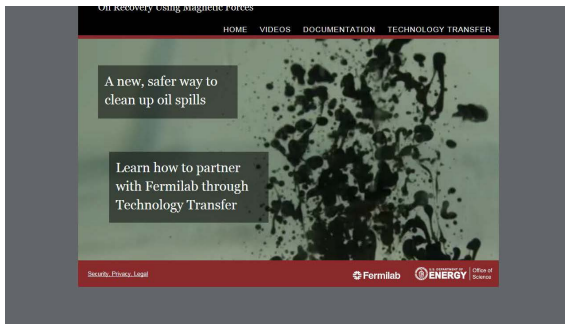
## Type of Agreement

- Strategic Partnership Projects (SPP) Agreement

## Results

- Salvia Mystic Spires Blue (US Patent PP 18,054)
- Available in U.S., Canada, Europe, Japan, and Australia

# Electromagnetic Mop



## Partner

- Natural Science, LLC
- Big Rock, IL

## Objectives

- Develop next generation detector technology for physics applications
- Use commercial off-the-shelf technology for cost and reliability

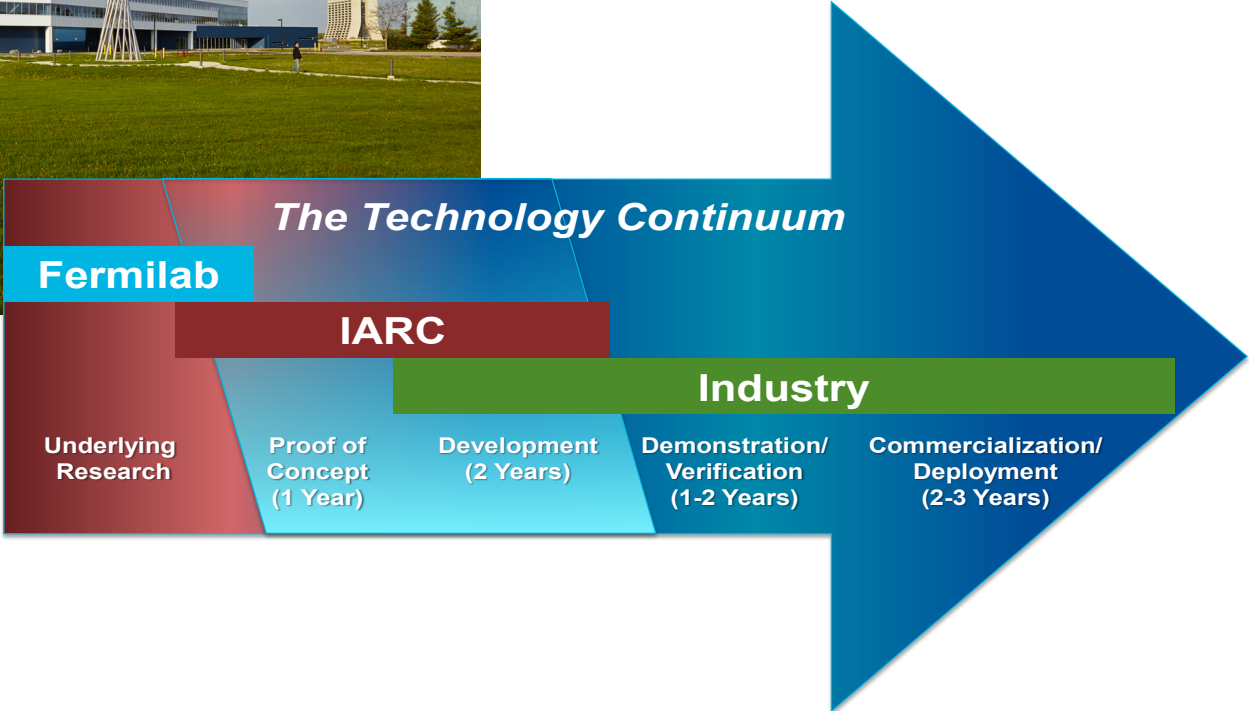
## Type of Agreement

- Partially Exclusive License

## Results

- Natural Science able to secure funding from other agencies to develop technology
- Prototype demonstration scheduled for later this year

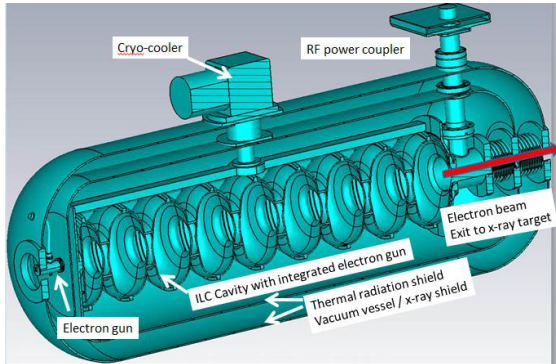
# Illinois Accelerator Research Center



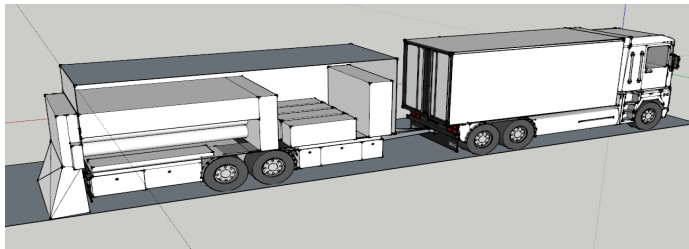
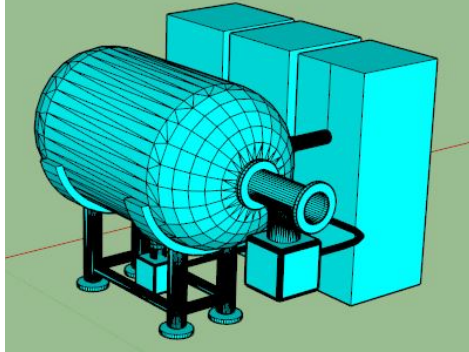


# IARC: Paving a new future

## Technology Roadmap



Skid-Mounted Compact SRF-Based Industrial Accelerator



Crosslinked Pavement Application

## Partners

- Federal and State Agencies
- Universities
- Industry

## Objectives

- Partner with industry to exploit technology developed in the pursuit of science to create the next generation of industrial accelerators, products, and new applications.

## Type of Agreements

- Cooperative Research and Development Agreements (CRADAs)
- Licensing Agreements

## Targeted Results

- Develop a compact, mobile, SRF-based accelerator for industrial applications
- Launch at least one new accelerator-based industry with at least \$1B in annual sales

# Office of Partnerships & Technology Transfer (OPTT)



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Thank you!

