Brookhaven National Laboratory
Translating Discoveries to Market Deployment

STEAB
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Walter Copan
Technology Commercialization and Partnerships
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www.bnl.gov/techtransfer
DOE Mission
Discover the Solutions that Power and Secure America’s Future

BNL Approach
Create discovery to deployment impact from interdisciplinary research

Facilities
Interdisciplinary team-oriented research

Science Challenges
- Energy Security
- Climate Change
- Origins of the Universe
- Accelerator Science/Detectors
- Human Health / Environment
- National Security

Collaborators, Users

Moving Discoveries to Deployment
BNL Inventions - Changing the World

- World’s First Video Game
- MAGLEV Transportation
- PET reagent $^{18}$FDG – Millions of health diagnoses per year
- L-DOPA – Used in the treatment of Parkinson's Disease
- High Temperature Superconductors - YBCO Fabrication
- T7 Protein Expression System for Biotech
- Integrated Positron Emission Tomography + Magnetic Resonance Imaging for medical diagnostics
- Small Animal Imaging Systems for health research
- RadioTin systems for Cancer Therapy
- Thermoelectric Power Generators (TEP)
- Core-Shell Electro catalysts for Fuel Cells, Automotive and Chemical Process

- ... and many more!
Technology Commercialization and Partnerships

Walter G. Copan
Manager

C. Michael
Senior Administrative Assistant

Technology Commercialization
- W. Copan
  Manager (Acting)
- K. Elcess
- C. Brakel
- P. Upadhya
  (Opening)
- C. Condemi
  Admin Specialist

Entrepreneurship & Economic Development
- K. Elcess
- SBU NYSBDC
  + Other
  External Partners

Partnerships
- M. Furey
  Partnerships Manager
- V. Coccorese
  Admin Asst.
- A. Schwarz
  BNL Partnership Coordinators

Matrixed Functions
- BNL Proposal Center
- Business and financial
  Marketing and communications
- Economic development
- Stakeholder relations
- Industry and academic partner relationships

Intellectual Property Legal Group*
- D. Price, Lead
- L. Husebo
- M. Pacella, Paralegal
- W. Russell, Paralegal

*Co-located with TCP and Matrixed with Legal

Your resource for BNL Partnerships and Technology Transfer
Technological Impact Examples of BNL Nuclear Physics Research

a) CRADA to develop ion Rapid Cycling Medical Synchrotron (iRCMS) with BEST Medical
b) HTS magnet development expertise from BNL’s work for NP accelerators critical in attracting ARPA-E grant for Superconducting Magnet Energy Storage (SMES)
c) First combined MRI-PET imaging (on mouse liver) done with $^{52}$Fe nanoparticles developed by BNL’s radioisotope group
BNL IP Portfolio Facts

- 250+ Issued or Pending patents / Technologies
- 400+ Active License Agreements
- 80+ License Agreements producing products
- Inventions Commercialized ~35%

- Commercialization with BNL
  - Agreements are with Brookhaven Science Associates
  - Exclusive licenses require business plan, performance milestones and due diligence
  - Identify target applications / territories for commercialization opportunity development
  - Opportunities: Technology development and collaboration with BNL for technologies, products
Many new technologies available are featured on BNL’s website for commercial development: www.bnl.gov/techtransfer

- Gene expression systems
- Radiotracers
- Bioimaging systems
- PET/MRI scanners
- ASICs
- Cancer diagnostics and therapies
- Antidepressants
- Radiation detectors
- Aerosol monitoring systems
- DNA-guided nanoparticle assemblies

- Catalysts for:
  - Making methanol from syngas
  - Novel cathodes and anodes in fuel cells
  - Direct methanol fuel cells...

- Novel battery and energy storage technologies
- Superconductors
- CNT fabrication and uses
- Solar cell designs and compositions
- Thermoelectrics
- Waste remediation
- Etc.
Expanding Entrepreneurial Ecosystem
BNL – an Integral Role in NY & Long Island Innovation Infrastructure

Long Island Energy and Life Sciences Technology Opportunity Showcase with Special Guest Speaker Senator Charles Schumer

The Federal Start-up America Initiative offers special, limited opportunities for licensing ground-breaking technology from our national laboratories. For the remainder of 2011, Brookhaven National Laboratory and other national laboratories have cut fees for start-up option from as much as $50,000 to $1,000. As part of Senator Schumer’s Stay in NY program, Accelerate LI has teamed up with Brookhaven National Laboratory to offer a unique look at the patents and technology opportunities that are available for commercialization and facilitate one-on-one dialogues with cutting-edge researchers at the Lab.
“There is no other place in the world at the moment where [my research] could have been done” - BNL User
Flexible Commercialization

- BNL creates technology ‘seed corn’ for a wide range of businesses
- Maturation investment moves from lab toward market
- BNL supports companies getting started through research collaborations
  - Commercial licensing of patented technologies
  - Research licenses
  - Software and other copyright licenses
  - Option agreements
    - Technology evaluation
    - Start-up businesses
  - Equity-based licenses
Flexible Partnerships with BNL

Research and Development Programs, Collaboration and Research Services

• Facility User Agreements (Open / Proprietary)
• Sponsored Research Programs
• “Work for Others” (WFO)
  – Research and Technical Services
• Cooperative Research and Development Agreements (CRADA)
• New! Agreements to Commercialize Technology (ACT)
• Consortia and Teaming
Agreements to Commercialize Technology (ACT)

• New DOE partnership mechanism
  – Created in response to industry and stakeholders
• Support wider range of Industry-Lab Partnerships
  – Complements WFO, CRADA and User Agreements
• Contractor can negotiate business-appropriate terms with third party clients in more flexible agreements
• Incentivizes labs / contractors to assume certain risks that U.S. Government entities cannot assume
• Contractor may choose to accept and share some risk in doing work for and/or with clients
  – payment terms, project deliverables, milestones, etc.
• Launching in FY2013
  – BNL will use ACT for selected projects
<table>
<thead>
<tr>
<th>Terms</th>
<th>ACT</th>
<th>NF WFO</th>
<th>CRADA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business terms</strong></td>
<td>As negotiated between parties</td>
<td>Set WFO terms</td>
<td>Set CRADA terms</td>
</tr>
<tr>
<td><strong>Pre-payment</strong></td>
<td>As negotiated (contractor may advance funds)</td>
<td>Client pre-pays 60(90) days of project budget</td>
<td>Client pre-pays 60(90) days of project budget</td>
</tr>
<tr>
<td><strong>Project deliverables</strong></td>
<td>As negotiated (may agree milestones, timing, deliverables)</td>
<td>Best efforts</td>
<td>Best efforts</td>
</tr>
<tr>
<td><strong>IP Rights</strong></td>
<td>As negotiated; designated IP lead</td>
<td>IPR to funding client</td>
<td>Contractor grants FOU IP License option to client</td>
</tr>
<tr>
<td><strong>Government Use License</strong></td>
<td>Research Use only</td>
<td>Government Use License</td>
<td>Government Use License</td>
</tr>
<tr>
<td><strong>Data rights protection</strong></td>
<td>Protected 5 years (or more) but allows research use</td>
<td>Data belongs to funding client</td>
<td>Protected 5 years</td>
</tr>
<tr>
<td><strong>Indemnification</strong></td>
<td>As negotiated</td>
<td>Client indemnifies</td>
<td>Client indemnifies</td>
</tr>
<tr>
<td><strong>Compensation</strong></td>
<td>As negotiated</td>
<td>Best efforts budget</td>
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