Industrial Innovation and Partnerships

Division Director (IIP)
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Office of Industrial Innovation (SBIR/STTR)
• Thomas Allnutt – BT
• Ali Andalibi – BT
• Errol Arkilic – EO/IT
• Ian Bennett – IT
• Cheryl Albus – AM/CT
• Deepak Bhat – AM
• Rathindra DasGupta – AM
• Juan Figueroa – EL
• Bill Haines - EL
• Murali Nair - EL

Industry University Cooperative Research Centers (I/UCRC)
• Alex Schwarzkopf
• Edward Clancy
• Glenn Larsen

Partnerships for Innovation (PFI)
• Sara Nerlove

Grants Opportunities for Academic Liaison With Industry (GOALI)
• Donald Senich

• Advanced Materials and Manufacturing (AM)
• Biotechnology (BT)
• Chemical Technology (CT)
• Electronics (EL)
• Information Technology (IT)
• Special Topics

Innovation through Partnerships
Employment of Scientists and Engineers*

- **Education Sector**: 36%
- **Government Sector**: 18.50%
- **Large Business/Industry Sector**: 32.50%
- **Small Business/Industry Sector**: 13%

* Data from NSF Science Indicators
Sources of Funding for New Startups

<table>
<thead>
<tr>
<th>Source</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends and Family</td>
<td>94</td>
<td>20.5%</td>
</tr>
<tr>
<td>No External Funding</td>
<td>57</td>
<td>12.4%</td>
</tr>
<tr>
<td>Individual Angel(s)</td>
<td>49</td>
<td>10.7%</td>
</tr>
<tr>
<td>Angel Network</td>
<td>26</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Institutional Sources</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Venture Capital</td>
<td>85</td>
<td>18.6%</td>
</tr>
<tr>
<td>State Funding</td>
<td>36</td>
<td>7.9%</td>
</tr>
<tr>
<td>SBIR/STTR</td>
<td>32</td>
<td>7.0%</td>
</tr>
<tr>
<td>Corporate Partner</td>
<td>25</td>
<td>5.5%</td>
</tr>
<tr>
<td>Institutional Funding</td>
<td>26</td>
<td>5.7%</td>
</tr>
<tr>
<td>Other</td>
<td>28</td>
<td>6.1%</td>
</tr>
<tr>
<td>Total</td>
<td>458</td>
<td>100.1%*</td>
</tr>
<tr>
<td>Number of U.S. Respondents</td>
<td>155</td>
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</table>

* Because of rounding, total does not equal 100%.
SBIR / STTR Participating Agencies

- DOD  Defense
- HHS  Health
- NASA Space
- DOE  Energy
- NSF Science & Eng
- DHS Security
- USDA Agriculture
- DOC Commerce
- ED  Education
- EPA Environment
- DOT Transportatio

TOTAL > $2.0+ B
FY 2007

Innovation through Partnerships
NSF SBIR “Innovation” Model

PHASE I
Feasibility Research
$100K ($150K)

PHASE II
Research towards Prototype
<$500K

Private Sector or Non-SBIR Investment

PHASE III
Product Development to Commercial Market

Federal Investment

Taxes

Innovation through Partnerships
Partnerships Opportunities in SBIR/STTR

- Partnership Optional in SBIR (up to $100K)
  - Small Business Prime
  - In Phase I up to 1/3 can be other
  - In Phase II up to 1/2 can be other
- Partnership Mandatory in STTR (up to $150K)
  - 40% to 70% can be Small Business
  - 30% to 60% can be Academia/FFRDC

Innovation through Partnerships
Faculty Partnership in Small Businesses

- Faculty members can own small firms
- Faculty members can be “Senior Personnel” on a grant budget
- Faculty members can consult
- Faculty members can be part of a university subcontract
- University laboratories can do analytical and other service support
- Faculty members can be Principal Investigators (must have documentation as not primarily employed by the university)
NSF Merit Review Process

- Typically reviewed by panel meetings
- Panelists come from Academia/Industry/Government Labs

- Intellectual Merit
  - Quality of the Research

- Broader Impact

Commercialization Potential & Commercialization Path

Innovation through Partnerships
2006 Phase I Proposals

Total Submitted = 2166
Total Awards = 321

Blue = ESPCoR State
Red = Awards
Black = Total Submitted Proposals

Innovation through Partnerships
2006 Phase II Proposals

Total Submitted = 155
Total Awards = 80

Innovation through Partnerships

Blue = ESPCoR State
Red = Awards
Black = Total Submitted Proposals
NSF SBIR “Innovation” Model

PHASE I
Feasibility Research
$100K ($150K)

PHASE II
Research towards Prototype
<$500K

PHASE III
Product Development to Commercialization

Federal Investment

Investment Focused Topics

Phase I Grantees Workshop

Phase IIB Investment <$500K

Private Sector or Non-SBIR Investment

SBIR MatchMaker

Phase II Grantees Workshop

Taxes

Innovation through Partnerships
Supplements

• **Workforce**
  – Membership in I/UCRC
  – Students and Teachers
    • REU, RET, RAHSS, GRS (broaden participation)
  – Community Colleges
    • Phase IICC (broaden participation)
  – Phase IIA
    • Graduate and Faculty (broaden participation)

• **Commercialization Incentives**
  – Phase IIB
  – Phase IB

_Innovation through Partnerships_
Economic Impact

SBIR/STTR Phase IIB

Third Party Investment (SBIR)

Innovation through Partnerships
Grantees’ Profile*

- **Invistics**
  - IT applied to Manufacturing
- **Key Bowl**
  - Assistive Technology
- **Sensant**
  - Electronics applied to Biotech

*selected posters of grantees

*Innovation through Partnerships*
Provides manufacturing performance software designed specifically for high-mix manufacturing environments.

Invistics' **Flow Path Management System (FPMS)** improves upon current Enterprise Resource Planning (ERP) & Supply Chain Management (SCM) software by incorporating:

- Lean Manufacturing
- Inventory Management
- Factory Simulation
- Manufacturing Production

FPMS enables high mix manufacturers to more accurately:

- Set performance goals
- Unmask barriers to achieving goals
- Measure effectiveness and model outcomes for continuous improvement

**Performance Workbench**

Optimizes operating policies to maximize performance and identifies which capabilities need attention to reach higher goals.

**Design Workbench**

Assists in designing flow of materials through manufacturing networks.

**Execution Workbench**

Enables effective, easy-to-use supply chain execution.

**Innovation through Partnerships**

http://www.invistics.com
Innovation through Partnerships

Winterpark, FL

Creates advanced text input systems

Flagship product orbiTouch reduces harmful hand and wrist motion that cause:
- Carpal tunnel syndrome
- Arthritis
- Neuro-muscular control problems
- Age-related conditions
- Other physical or cognitive disabilities

Fully functional 128 “key” capability and 3-button mouse function

Typist creates a keystroke by sliding the two domes into one of their eight respective positions

Ten years of research show orbiTouch reduce repetitive strain injury (RSI) by up to 82% over standard keyboards and 60% over ergonomic keyboards

Innovation through Partnerships

http://www.keybowl.com
Sensant’s Silicon Ultrasound™ probe technology features electronic scanning, novel Fresnel focusing, and high frequency operation, for state of the art volume imaging.

Silicon capacitive microfabricated transducer (CMUT) produces superior image quality compared to piezoelectric crystal technology used in conventional ultrasound imaging equipment.

Incorporation of integrated circuit technology allows for a more exact manufacturing process and fluent integration into ultrasound systems.

CMUT delivers superior volumetric 4D imaging for a wide range of applications, including:

- Improved manufacturing process
- Detecting irregular or diseased tissue

50% detection of breast cancer with mammography
97% detection of breast cancer with ultrasound as adjunct

Acquired by Siemens Medical Solutions Ultrasound Division in 2005, after 7 years as Sensant.
2004 COV Recommendation

**Recommendation**

1. Reorganization
2. National Conferences
3. Good Phase II Comm Reviews
4. Ph I Comm Reviews
5. Documentation on Decisions ~Borderline
6. Commercialization Showcase
7. Track Phase IIB

**Action**

1. DMII to OII to IIP
2. NSF to States
3. Strengthened Commercial Plan
4. EO, New CAP
5. Strength-Weakness, Fund with Revision
6. MatchMaker, Ph II Workshop, Telephone Follow-up
7. Highlight to Director

*Innovation through Partnerships*
Economic Impact

Jobs and Sales Growth (SBIR)
Telephone Survey ~ 300 Phase II Grantees

At the start of award
- Jobs: $283
- Sales (in million dollars): 2934

At the time of survey
- Jobs: $655
- Sales (in million dollars): 4229

Innovation through Partnerships