



Federal Demonstration Project Update

September 7-9, 2008

Presented by

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The Army Research Office

- Manages \$500M of Army focused basic research across the country
- Integrated with DOD and National R&D Community

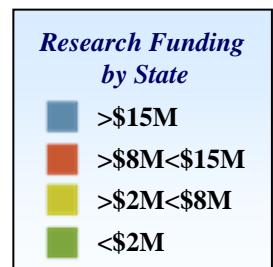
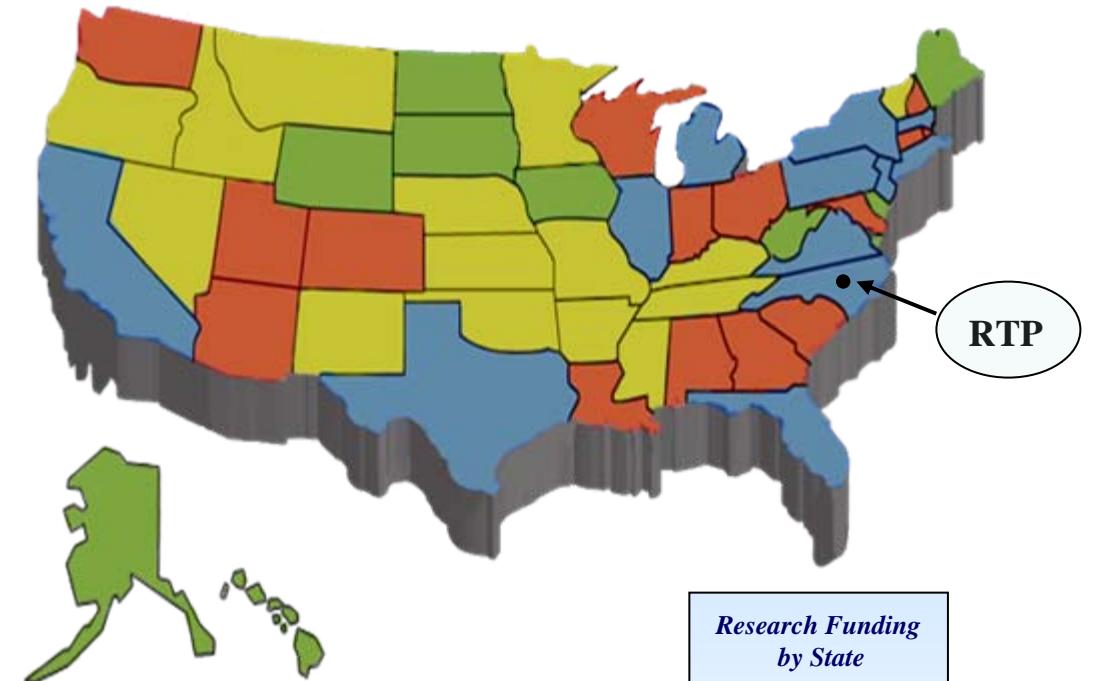
Funds Army Research
at over 200 Academic
Institutions

Develops Science to
Ensure Army **Technological**
Superiority

Assesses Scientific
Opportunities to Achieve
Army Vision

Strengthens the
research infrastructure
at HBCU/MIs

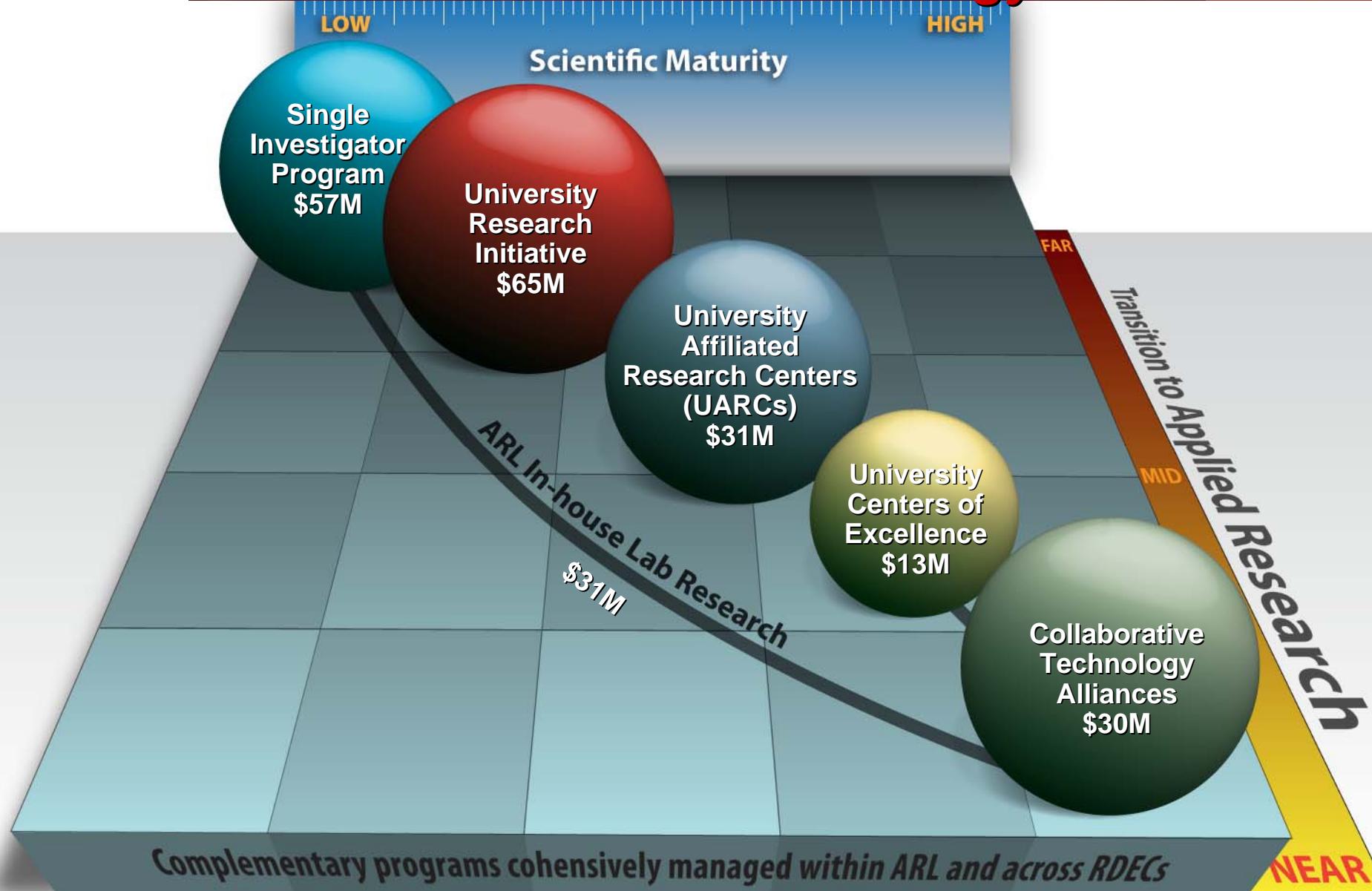
Educes a Superior
Workforce in Army-Critical
Technologies





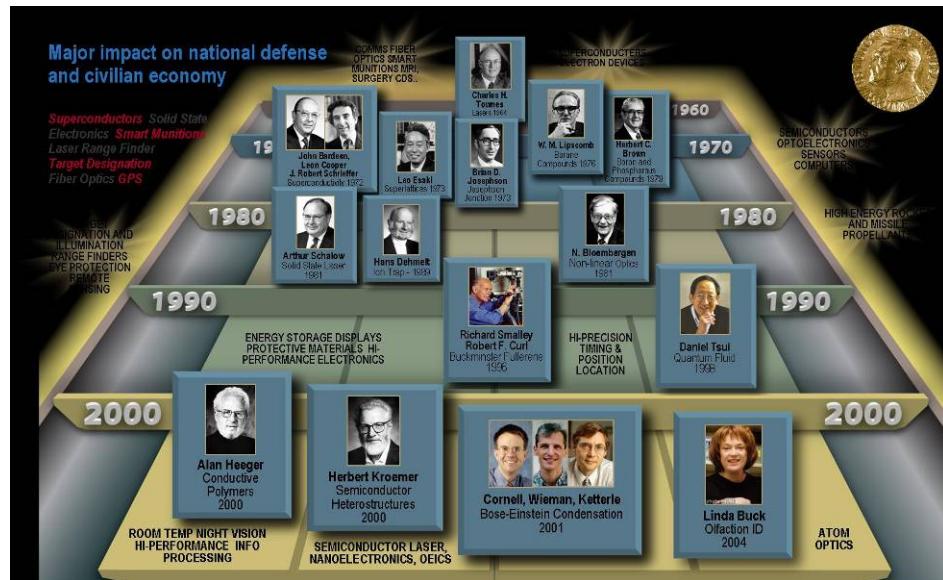
ARL Basic Research Portfolio

From Ideas to Technology

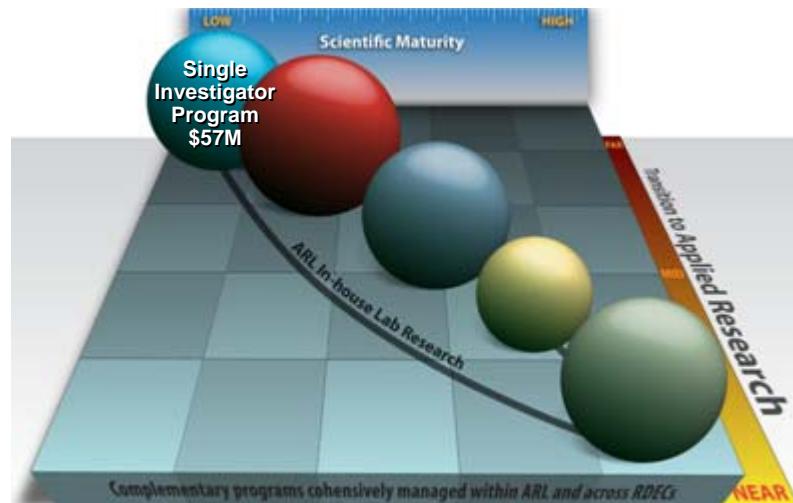




Single Investigator Program Leverages World-Class Academic Expertise



Exploit the innovation and flexibility of academia



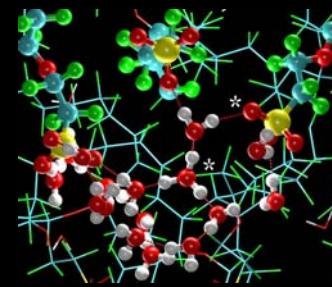
6.1 Dollars

| (\$M) | FY08 | FY09 | FY10 | FY11 | FY12 |
|-------|------|------|------|------|------|
| 61102 | 54.7 | 68.3 | 66.9 | 69.2 | 71.0 |

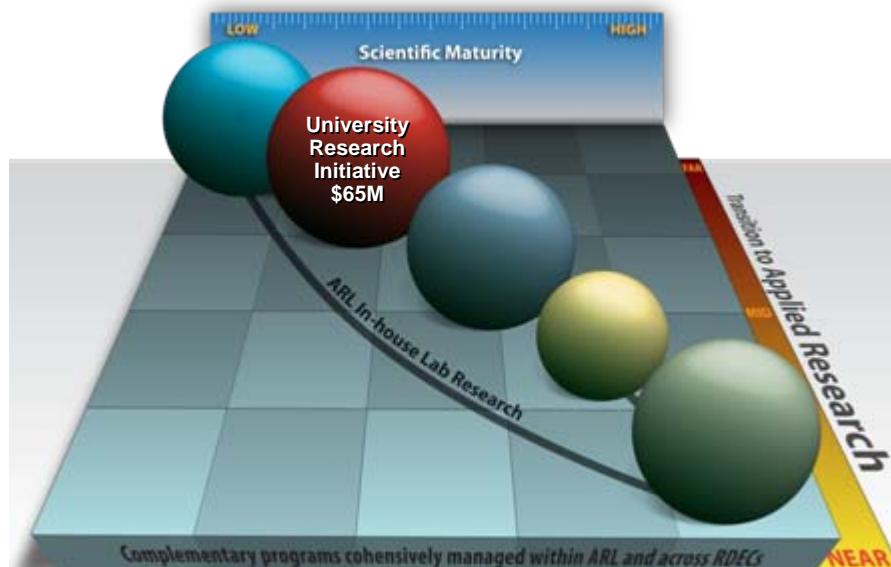
- Rapid and agile exploitation of novel science opportunities world-wide**
- Extremely cost-effective**
- All states and D.C.**
- >250 institutions**
- Graduate students supported: ~1400**
- ~ 900 university grants, \$112k/yr grant**



University Research Initiative



Experimental Study of Polymeric Membranes in Fuel Cells



| (\$M) | FY08 | FY09 | FY10 | FY11 | FY12 |
|-------|------|------|------|------|------|
| 61103 | 62.9 | 77.0 | 76.4 | 77.8 | 80.7 |

Includes MURI, DURIP, PECASE

Multi-Disciplinary University Research Initiative (MURIs)

- **Research vital to the Army, but applicable to multiple Services**
- **Investigates high priority, transformational topics such as biologically inspired mobile networks of autonomous vehicles, self-assembling multifunctional ceramic composites**
- **Critical mass of researchers; \$1.25M/year, 5-years**
- **Approximately 10 new initiatives started annually**



University Affiliated Research Centers (UARCs) University Led with Industry Partnership(s)



Electrodynamics &
Hypervelocity Physics



Soldier Survivability

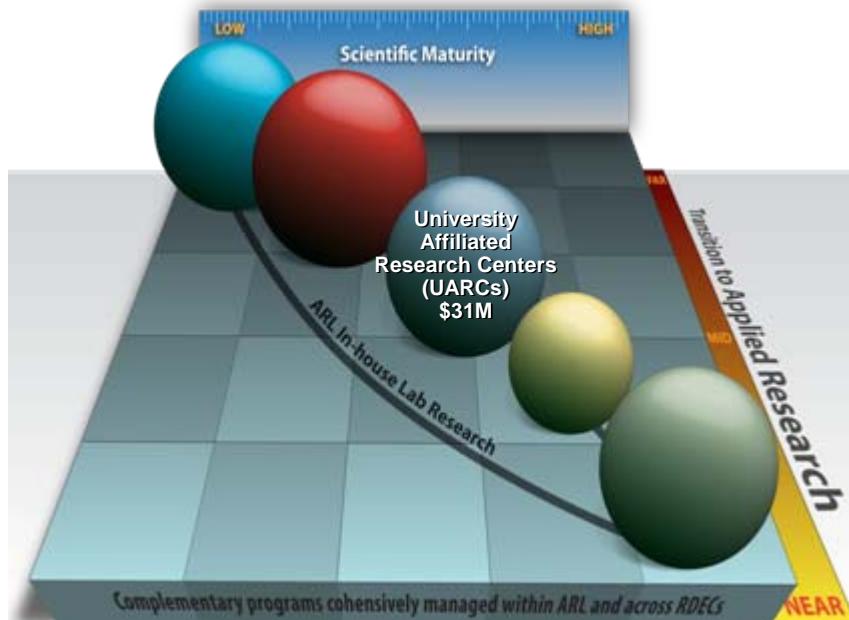


Immersive
Environments



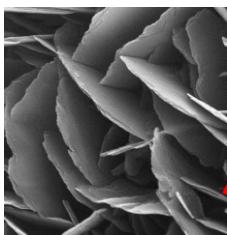
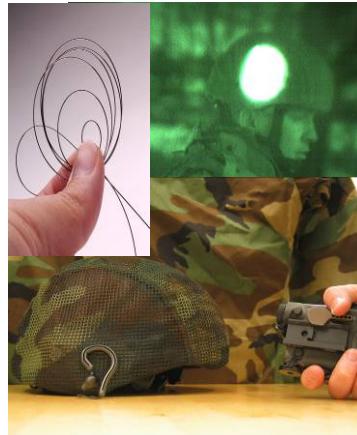
Biotechnology

High intensity focus on emerging opportunities



| (\$M) | FY08 | FY09 | FY10 | FY11 | FY12 |
|-------|------|------|------|------|------|
| 61104 | 29.5 | 35.0 | 33.6 | 35.4 | 37.7 |

Optoelectronic **fiber-device**
covering for ID and line-of-sight IR communication



Bio-Inspired Materials
for Lightweight
Portable Energy



Relevant MLPs

**Sensing
Power & Energy
Human Dimension**

**Survivability
Lethality
Battle Command**



University Centers of Excellence

University Researchers Focused on Army Interests Over Long Term



Battlefield Capability Enhancement Centers



Sensor Fusion



North Carolina A&T State University

explore. discover. become.

C2 Decisionmaking



Flexible Displays



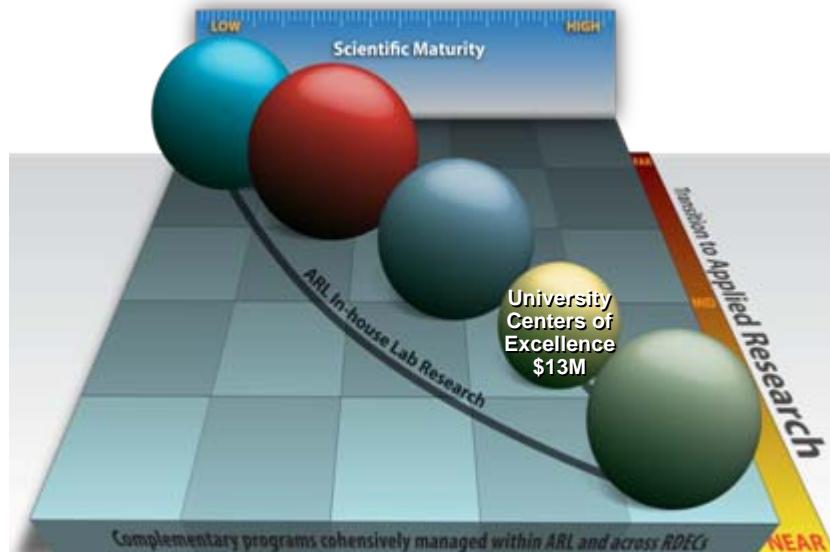
Battlefield Communications

TUSKEGEE
UNIVERSITY



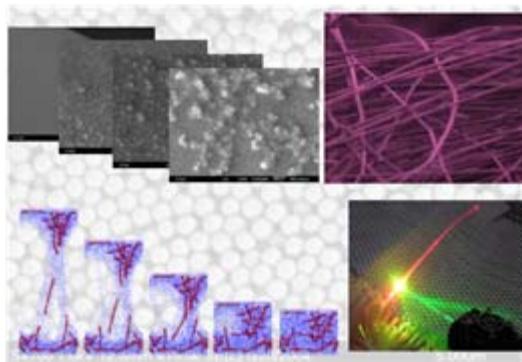
Extremities Protection

- Cooperative Agreement – 5 Efforts
- HBCU/MI lead with TRADOC Battle Lab Collaboration
- Focus on rapid transition of basic research
- \$500K/year efforts
- New 5 yr program starts beginning FY09



Complementary programs cohesively managed within ARL and across RDECs

High Perf Computing



Materials

| (\$M) | FY08 | FY09 | FY10 | FY11 | FY12 |
|-------|------|------|------|------|------|
| 61104 | 7.1 | 9.1 | 9.2 | 9.6 | 10.0 |

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

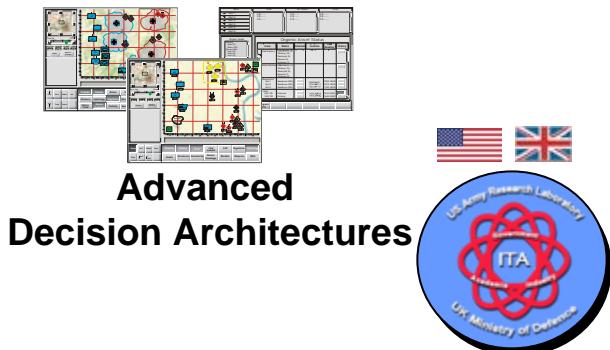


Collaborative Technology Alliances

Industry-Led Partnerships with Universities and the Army



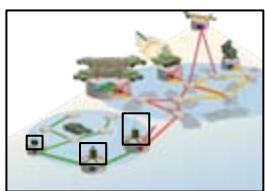
| (\$M) | FY08 | FY09 | FY10 | FY11 | FY12 |
|-------|------|------|------|------|------|
| 61104 | 27.8 | 33.1 | 34.6 | 35.5 | 36.4 |



MAST

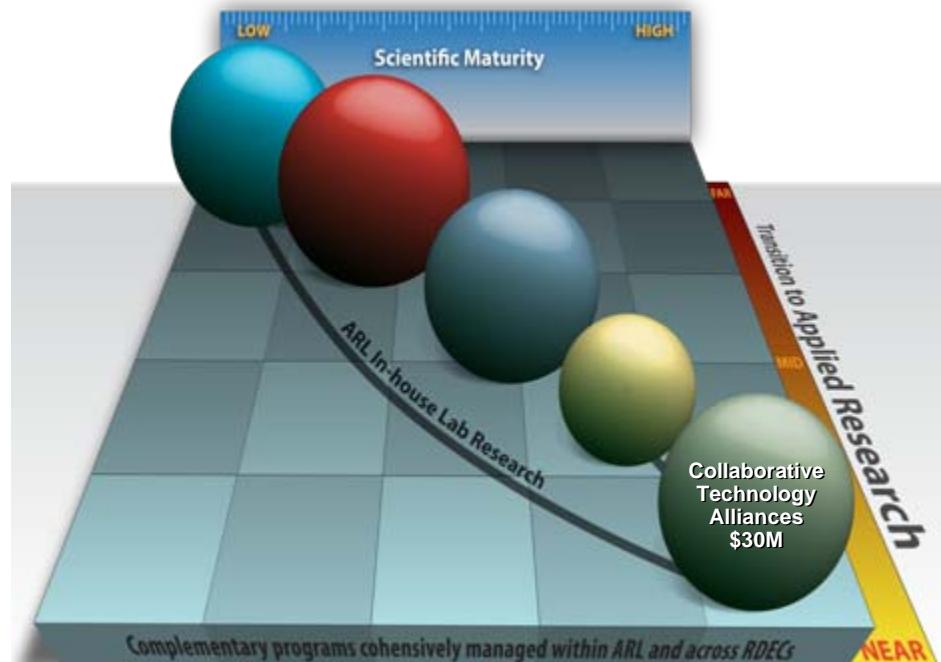


International
Technology
Alliance



Robotics

Comms & Networks



FUTURE CTA INVESTMENTS

- Topics Under Consideration
 - Robotics (continuation)
 - Cognition and Neuroergonomics
- Proposed Commencement FY10
 - Network Science (FY 09)



FY08 Investment Strategy

LEVERAGE

DARPA ~ \$98M

- Microactive Flow Control
- Power Sources
- VLSI Photonics
- MEMS
- Spins in Semiconductors
- MetaMaterials

DTRA ~ \$31.2M

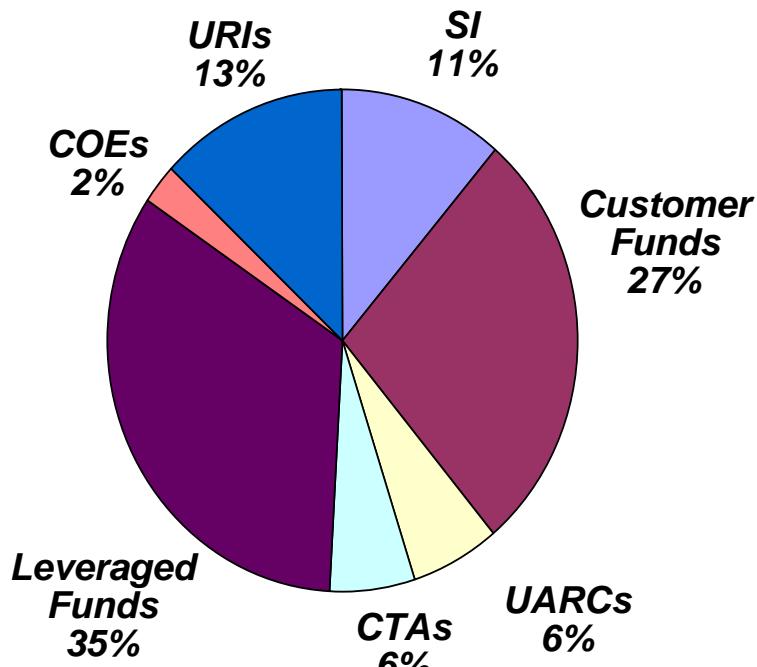
- Chem Bio Defense

DDR&E ~ \$15.2M

- HBCU/MI program
- DEPSCOR

SBIR/STTR ~ \$27.3M

Cong Adds ~ \$16.4M
(6.1)



Extramural Research
FY08 \$500.2M

CUSTOMERS

- All RDECs
- Corps of Engineers Labs
 - Terrestrial Sciences
 - Engineering Sciences
- Medical Res & Matl Command
- Bio & Chemical Sciences
- Mathematical Sciences
- ASA(ALT)
 - e.g. Board on Army S&T
- Missile Defense Agency

COLLABORATIONS

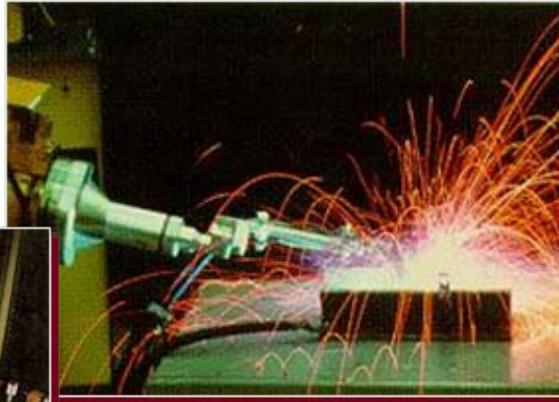
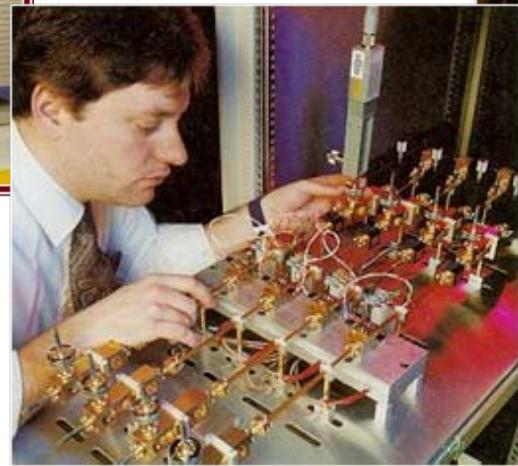
- Missile Defense Agency
- DARPA
- DTRA
- DDR&E
 - e.g. HBCU/MI, DEPSCOR



Small Business Technology Transfer (STTR) Program



**High Tech Teaming -
Small Business and Research Institutions**



Phase I - Feasibility Study
\$100K with no Options
Six Months Performance
One in Ten Win

Phase III -
Commercialization
No More STTR Funds...
One in Eight Successful

Phase II - Development
\$750K
One in Three Win
Two Years Performance

Army STTR...

Pursues innovations through teaming
with small businesses and research institutes.

TECHNOLOGY DRIVEN. WARRIgHTER FOCUSED.

\$16.7M for FY06



ARO Funded Nobel Laureates

Major impact on national defense and civilian economy

Nobel Laureate Examples:

Superconductors Solid State Electronics **Smart Munitions**
Laser Range Finder
Target Designation
Fiber Optics GPS

TARGET
DESIGNATION AND
ILLUMINATION
RANGE FINDERS
EYE PROTECTION
REMOTE
SENSING

COMMS FIBER
OPTICS SMART
MUNITIONS MRI,
SURGERY CDS..

SUPERCONDUCTORS
ELECTRON DEVICES

SEMICONDUCTORS
OPTOELECTRONICS
SENSORS
COMPUTERS

HIGH ENERGY ROCKET
AND MISSILE
PROPELLANTS

19

1980

1990

2000

1960

1970

1980

1990

2000



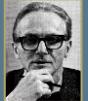
John Bardeen,
Leon Cooper
J. Robert Schrieffer
Superconductivity 1972



Leo Esaki
Superlattices 1973



Charles H.
Townes
Lasers 1964



W. M. Lipscomb
Borane
Compounds 1976



Herbert C.
Brown
Boron and
Phosphorus
Compounds 1979



Arthur Schalow
Solid State Laser
1981



Hans Dehmelt
Ion Trap - 1989



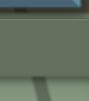
Brian D.
Josephson
Junction 1973



N. Bloembergen
Non-linear Optics
1981



Richard Smalley
Robert F. Curl
Buckminster Fullerene
1996



Daniel Tsui
Quantum Fluid
1998



Alan Heeger
Conductive
Polymers
2000



Herbert Kroemer
Semiconductor
Heterostructures
2000



Cornell, Wieman, Ketterle
Bose-Einstein Condensation
2001



Linda Buck
Olfaction ID
2004



ROOM TEMP NIGHT VISION
HI-PERFORMANCE INFO
PROCESSING

SEMICONDUCTOR LASER,
NANOELECTRONICS, OEICS

ATOM
OPTICS

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.



Active BAAs

- IARPA Advanced Materials and Fabrication for Coherent Superconducting Qubits Program, W911NF-08-R-0011, 16 DEC 2008
- RF Technology Solutions to Detect and Locate Improvised Explosive Device (IED) Threats, W911NF-08-R-0009, 29 August 2008
- Depart. of Defense (DoD) Historically Black colleges and Universities and Minority Institutions (HBCU/MI) FY 2008, W911NF-08-R-0008, 18 SEP 08
- Department of Defense (DoD) Minerva Research Initiative, W911NF-08-R-0007, 03 OCT 2008
- Defense University Research Instrumentation Program (DURIP) FY 2009, AFOSR-BAA-2008-5, 26 August 2008
- U.S. Army Research Office BAA, FY 2007 – FY 2011 revised, W911NF-07-R-0003-02, 30 SEP 2011
- Note: All BAAs can be found at:
<http://www.arl.army.mil/www/default.cfm?Action=6&Page=8>



Research Terms and Conditions



- Approved by ARO Management for implementation on 1 July 2008
- Utilized for FDP and Non-FDP Awards
- Agency Specific Requirements Updated as 1 July 2008
- Web-link for Research Terms & Cond., Sub-award Requirement, Implementation, Agency Specific and Prior Approval Docs:

<http://www.arl.army.mil/www/default.cfm?Action=29&Page=218>



Implementation Document

- ***Continuing Institutional Members from Phase IV:***
- *Existing grants will not be modified. New grants awarded after 1 July 2008 will contain new Terms and Conditions*
- ***New Institutional Members in Phase V:***
- *New grants awarded after 1 July 2008 will contain new Terms and Conditions*
- ***Emerging Research Institutions in Phase V:***
- *New grants awarded after 1 July 2008 will contain new Terms and Conditions*
- ***Outgoing Institutions from Phase IV:***
- *Existing grants will not be modified.*



QUESTIONS

- ANY QUESTIONS?

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