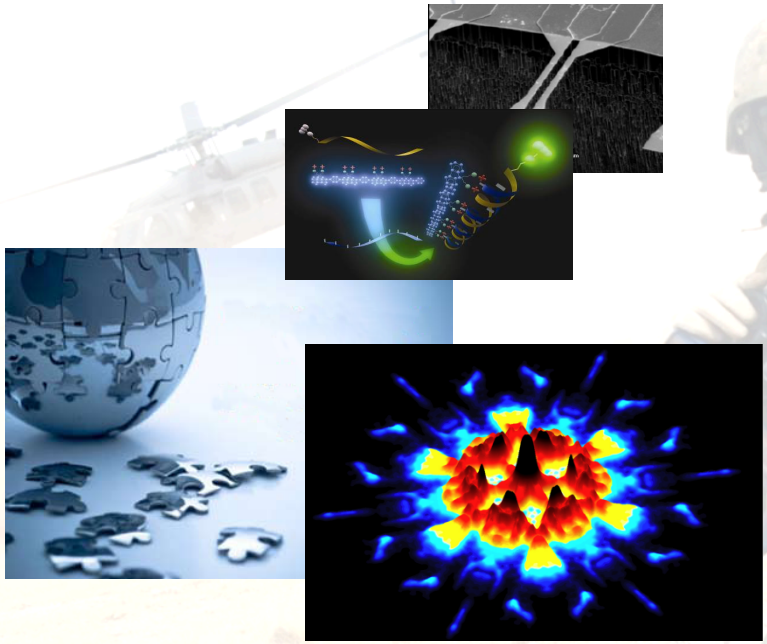
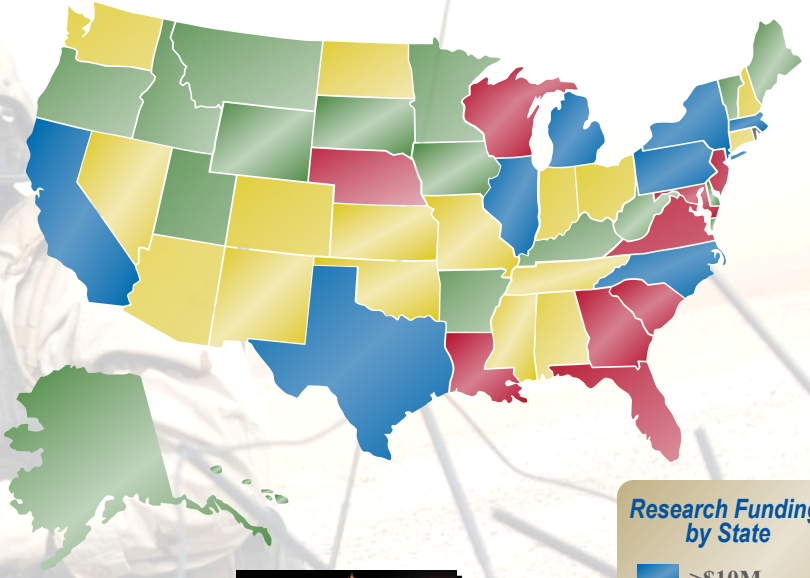
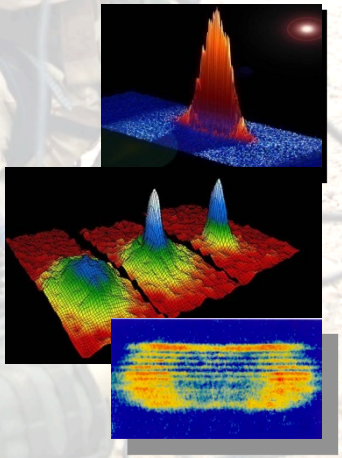
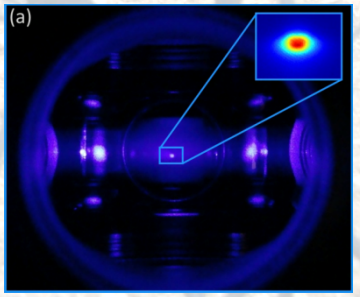
ARO Basic Research





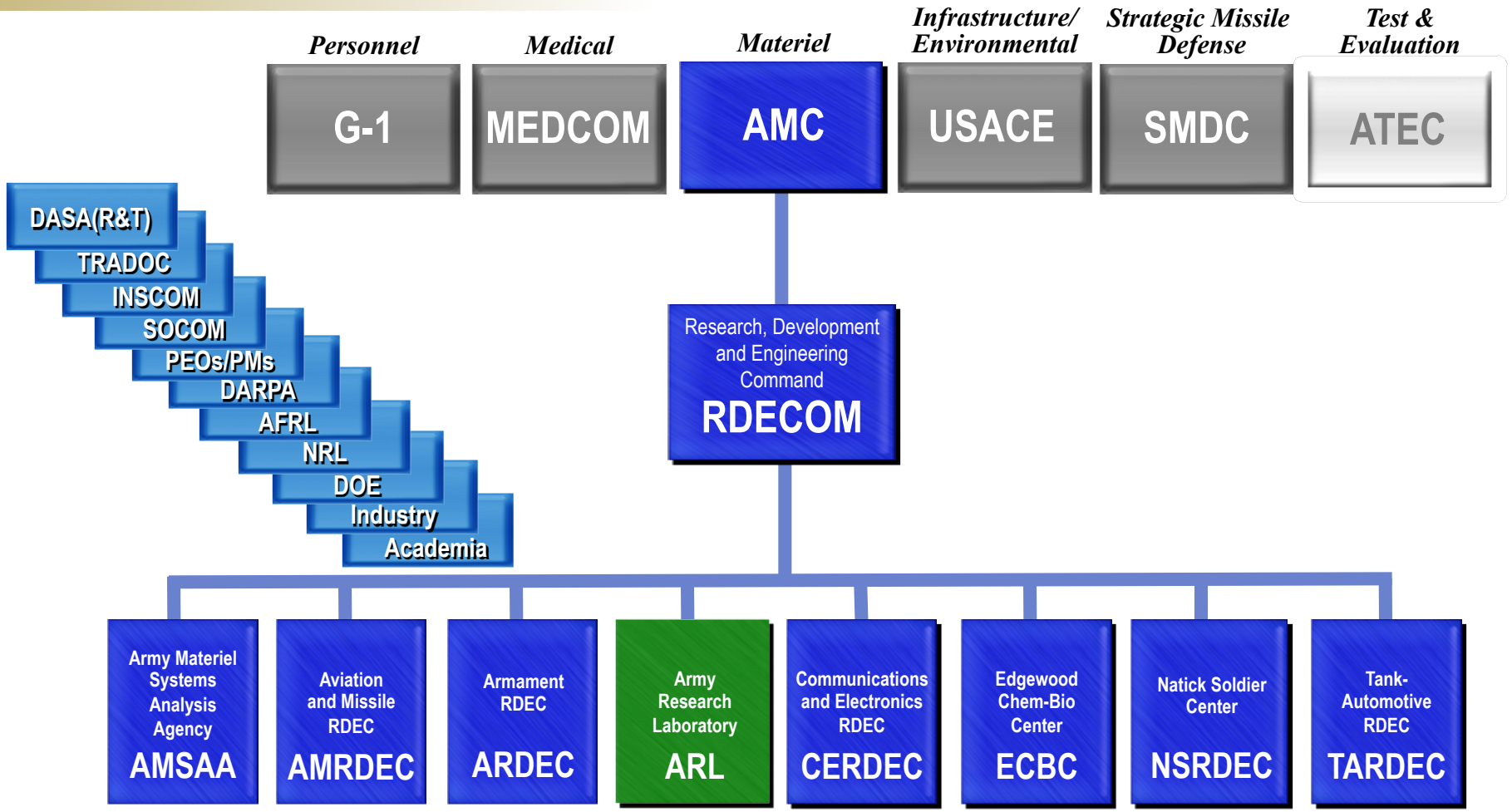




Dr. Thomas Doligalski
Director, Engineering Science
US Army Research Office

March 2015

Army S&T Performing Organizations



ARL provides underpinning Science, Technology, and Analysis to the Army

ARO is ARL's Principal Conduit to Engage the University Research Community

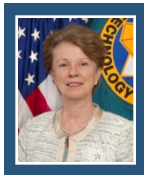
U.S. ARMY RDECOM® TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

U.S. Army Research Laboratory

ARL

Director
Dr. Thomas Russell

Associate Director
Plans & Programs
Mr. Todd Rosenberger



Associate Director
Science & Technology
Dr. Ozden Ochoa

Associate Director
Laboratory Operations
Ms. Teresa Kines

Military Deputy
LTC Timothy Domke (A)

Sergeant Major
Christopher Harris

Chief Scientist
Dr. Joseph Mait

Deputy Director
Basic Science
Director ARO

Dr. David Skatrud

Army Research Office

Information Sciences
Dr. Randy Zachery

Engineering Sciences
Dr. Tom Doligalski

Physical Sciences
Dr. Doug Kiserow

Vehicle Technology
Dr. Mark Valco (A)

Human Research & Engineering
Dr. Laurel Allender

Survivability/ Lethality Analysis
Dr. Paul Tanenbaum

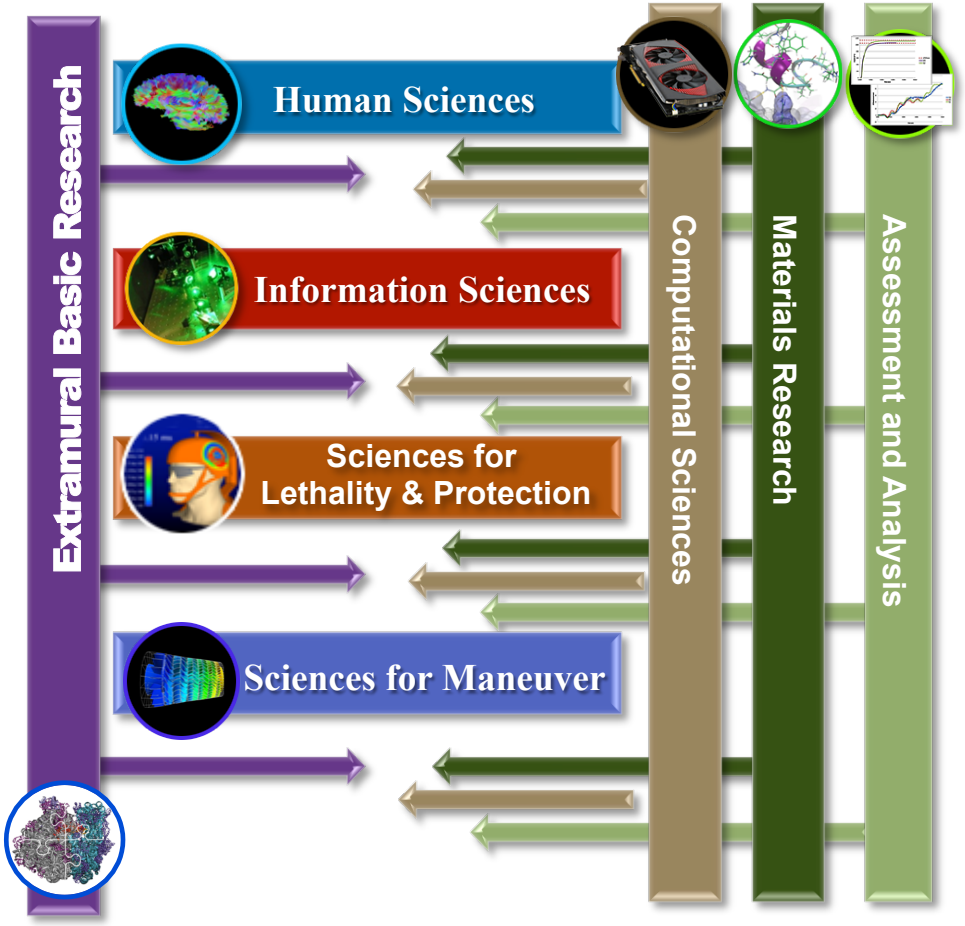
Computational & Information Sciences
Dr. John Pellegrino

Sensors & Electron Devices
Dr. Philip Perconti

Weapons & Materials Research
Dr. Patrick Baker

Changing the Paradigm

S&T Campaign Plans

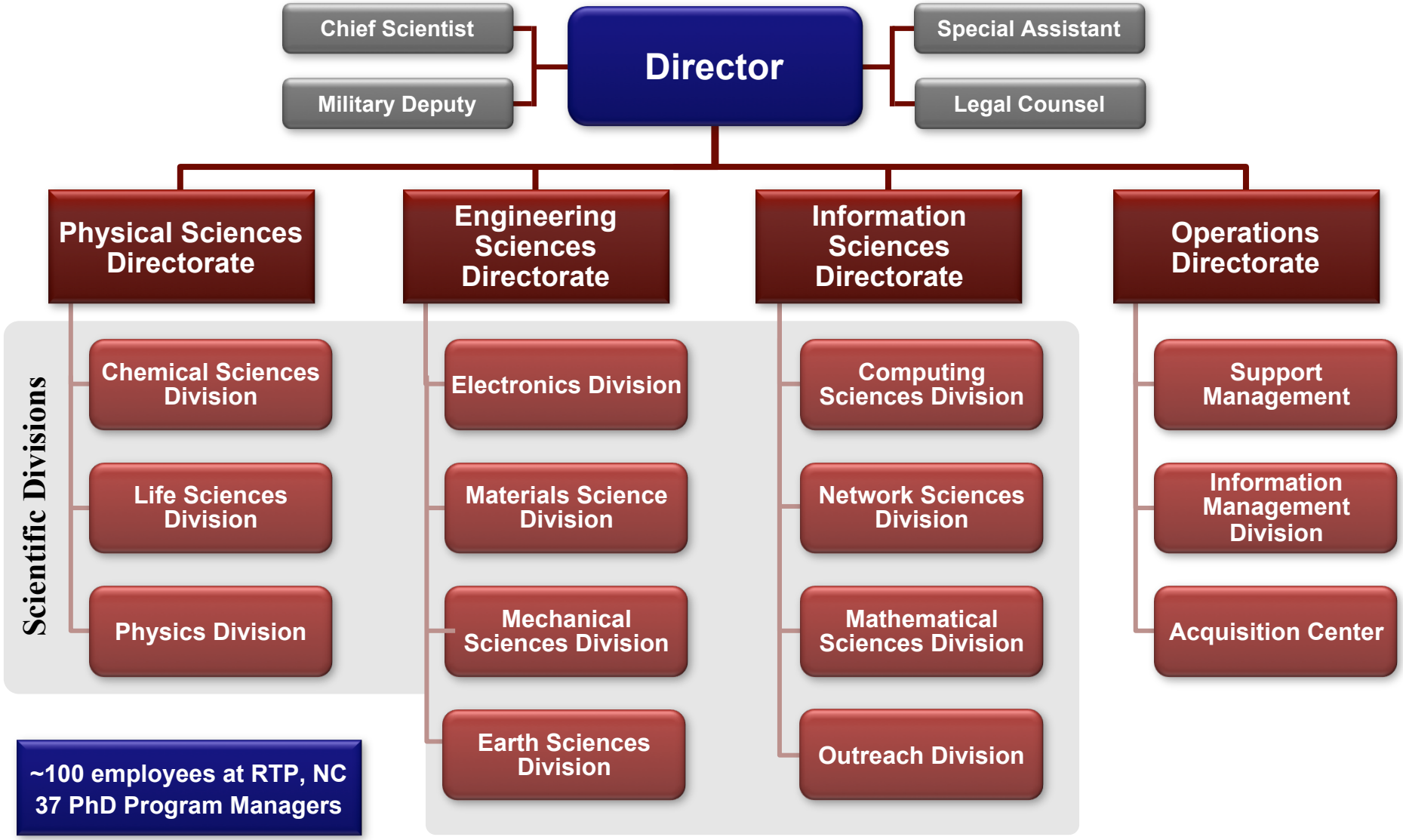


Open Campus Business Model

"We will need new technology over the next 10 years to make a leaner and more capable Army."

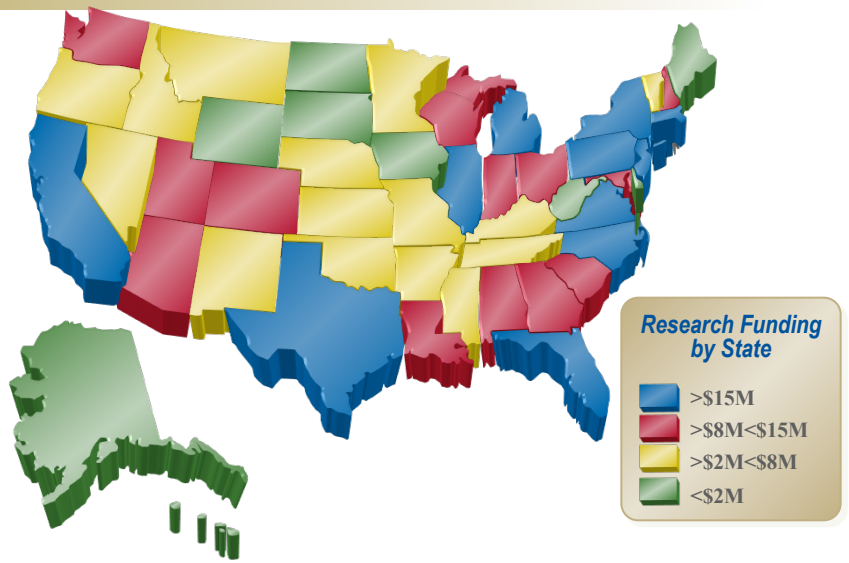
GEN Raymond T. Odierno
38th Chief of Staff, Army

ARO Organization



~100 employees at RTP, NC
37 PhD Program Managers

Army Research Office Goals



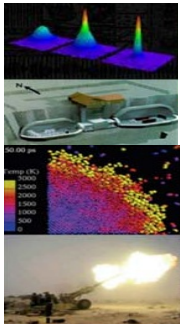
- 270+ Institutes of Higher Learning
- 1121 Individual Investigators
- 47 Research Centers

Research Domains

Chemistry	Materials
Computing & Info Science	Mathematics
Electronics	Mechanics
Environmental	Network Science
Life Sciences	Nanoscience
	Physics

Utilize the vast intellectual capital of our nation's universities to:

- **Create** and Exploit Scientific Opportunities for **Revolutionary New Army Capabilities**
- **Drive Science** to Develop **Solutions to Existing Army Technology Needs**
- Accelerate Transition of Basic Research
- Leverage S&T From Outside Sources
- Create and Strengthen University, Industry, Government Partnerships
- Unbiased expert assessments for HQs
- Educate and Train the Future S&E Workforce for the Army
- Prevent Technological Surprises



Research ranges from atom optics for underground bunker/tunnel detection to nano-energetics for more powerful and insensitive munitions and propellants

ARO an Integral part of ARL

Mission

Provide innovative science, technology, and analyses to enable full spectrum operations.

Vision

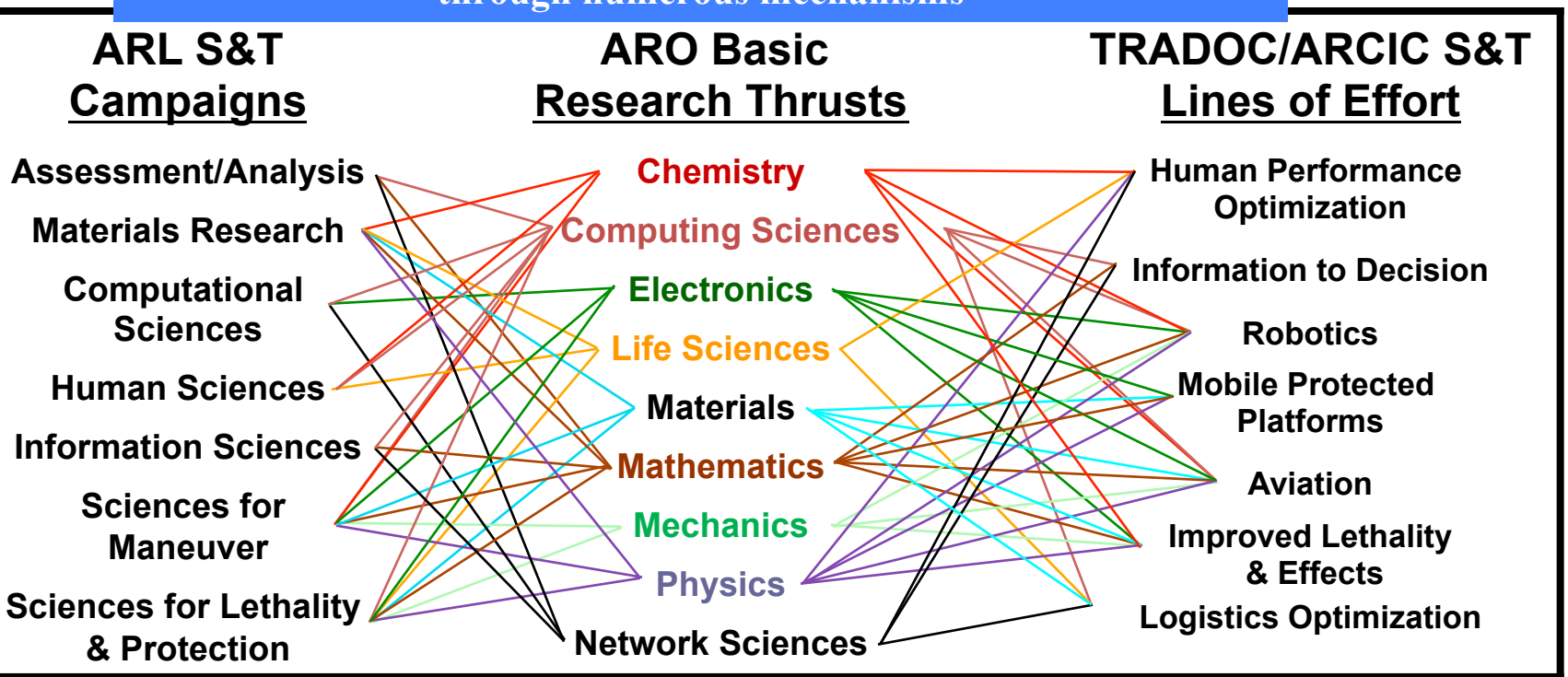
America's Laboratory for the Army: Many Minds, Many Capabilities, Single Focus on the Soldier

Acknowledged Scientific, Technical and Analytical Excellence

Recognized bridge between the Nation's Scientific and Technical Communities and the Army

Leader in providing innovative solutions for the current and future Army

ARL Extramural and In-House tightly integrated and collaborative through numerous mechanisms



Business Model

Exploit a Unique Understanding of Both the Warfighter and Basic Research

- Know what the warfighter needs now
- Determine what the warfighter needs in the future
- Understand the current cutting-edge of science and engineering
- Drive the cutting-edge in new directions to create new solutions for the warfighter

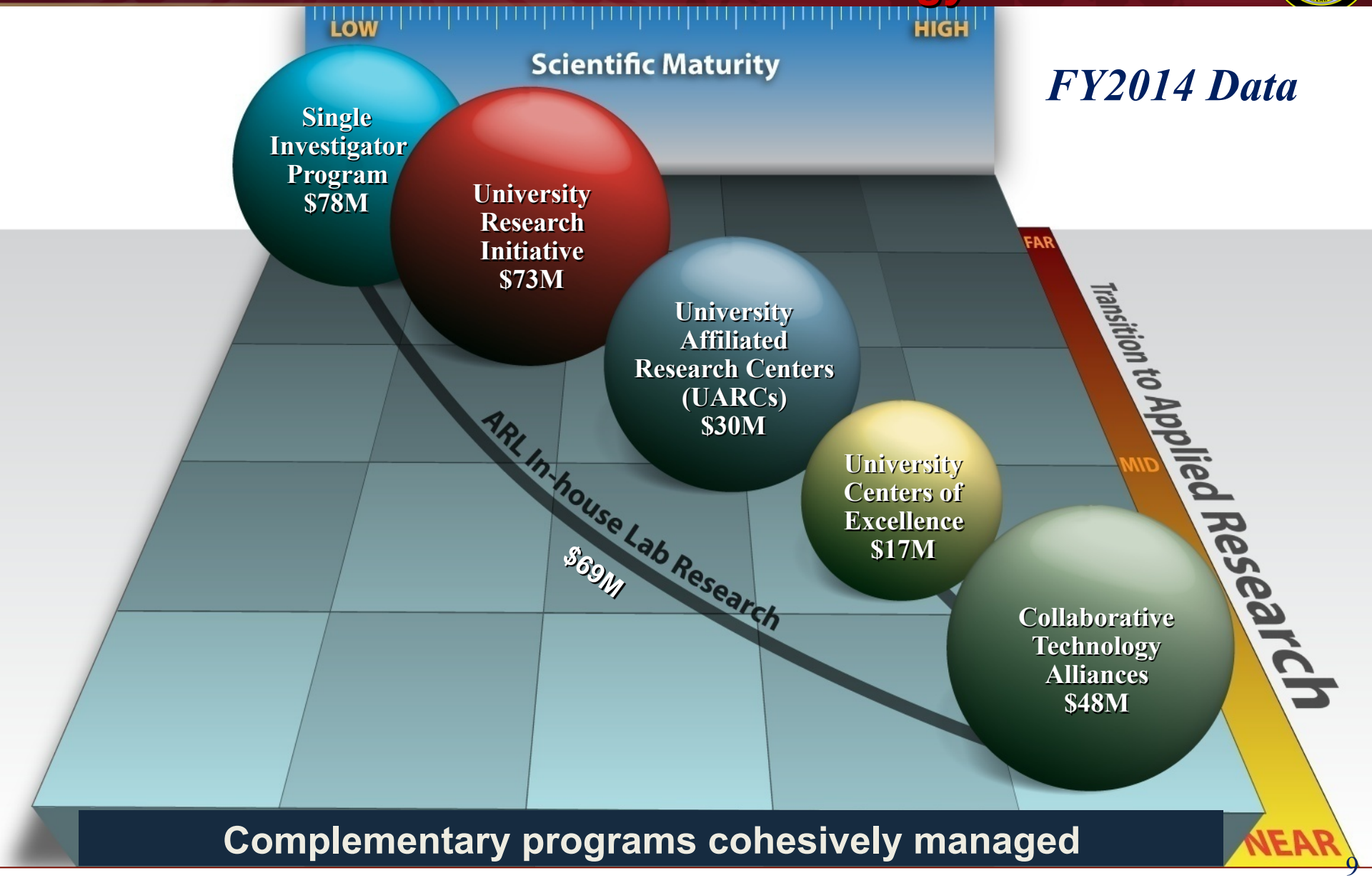
Utilize a Coordinated and Cohesive Set of Mechanisms

Utilize and Help Create Strategic Guidance

ASD(R&E) S&T Priorities for FY13-17	***OSD High Interest Basic Science Research Areas***	***ASAALT Special Focus Areas***	***TRADOC Top 5 Warfighter Outcomes***
• Data to Decisions • Engineered Resilient Systems • Cyber Science and Technology • Electronic Warfare / Electronic Protection • Counter Weapons of Mass Destruction • Autonomy • Human Systems	• Synthetic Biology • Quantum Information Science • Computational Modeling of Human Behavior • Cognitive Neuroscience • Nano-Science and Nano-Engineering • Engineered Design and Transport of Energy / Information in New Materials	• Biotechnology • Nanotechnology • Neuroscience • Network Science • Immersive Technology • Quantum Effects • Materials Modeling • Autonomous Systems	• Battle Command Network • Counter IED and Mine • Unmanned Systems Opns • Battlespace Awareness • Human Dimension

ARL Basic Research Portfolio

From Ideas to Technology



FY2014 Data

Complementary programs cohesively managed

Objective of Each Approach

University Single Investigators

- Utilize world-class academic expertise world-wide
- Rapid, agile exploitation of novel scientific opportunities
- Very Cost Effective
- 3yr grants, ~$120K.yr, No Automatic Renewal

Multidisciplinary University Research Initiatives

- University-led, multidisciplinary initiatives
- 3-5 year duration, $1.25 M/year efforts

University Affiliated Research Centers

- University-led consortium
- High intensity centers for emerging opportunities
- 5-8 year duration, $5-10M/year efforts

University Centers

- University-led, focused initiatives
- 5 year duration plus options;
- $1-10M/year efforts

In-house Research

- Maintain Army "smart-buyer" capability
- Army-unique facilities
- Provide world-class researchers in Army critical areas

Collaborative Technology Alliances (CTAs)

- Partnership with in-house labs, academia, and industry
- Focused technology initiatives and rapid transition
- (staff rotation) 5-8 year duration;
- 20-30 man-year, $5-8M/year efforts

Goal of Research Approach

Exploit Scientific Opportunities | Overcome Technical Barriers | Both