# Collaborative Research Priorities for the State

Virginia Research and Technology Advisory Commission
(VRTAC)

University and Federal Laboratory Subcommittee Overview

January 6, 2007

# VRTAC University and Federal Laboratory Subcommittee

Subcommittee Members:

Dr. R. Ariel Gomez, Co-Chair, University of Virginia
Dr. Lydia W. Thomas, Co-Chair, Mitretek Systems

Dr. H. Frederick Dylla, Jefferson Laboratory
Dr. Bradley W. Fenwick, Virginia Tech
Mr. Mark A. Frantz, RedShift Ventures
Dr. Mohammad A. Karim, Old Dominion University
Dr. Matthew Kluger, George Mason University
Mr. Stuart A. Koch, Naval Surface Warfare Center, Dahlgren Division
Mr. Terrence Leslie, Micron Technology
Dr. Francis L. Macrina, Virginia Commonwealth University
Dr. Dennis Manos, College of William and Mary
Dr. John A.S. O'Neil, Oak Ridge National Laboratory
Ms. Lesa B. Roe, NASA Langley Research Center
Dr. William Wasilenko, Eastern Virginia Medical School

# The Goal

The VRTAC University & Federal Laboratory Subcommittee was formed to develop a shared vision of research and development priorities and investment requirements to:

- Increase Research Capacity of the Commonwealth
- Enhance Economic Development

# The Focus

Strategic Research and Development Areas selected:

- Energy, Conservation and the Environment
- Future Microelectronics
- Lifespan Biology and Medicine

# Detail of Targeted Research Areas Selected

## Energy, Conservation and the Environment

- Alternative Energy
  - Biorenewables (UVA, VT, JMU, VCU, VSU)
  - Fuel Cells (VT, UVA, VCU, JMU)
  - Hydrogen (UVA, VT, JMU, VCU)
  - Photovoltaics (UVA, VT, JMU, VCU, ODU, NSU, NASA, JLab)
  - Wind and Coastal (ODU, JMU, VT, WM, NSU)
- Conservation and Sustainability (UVA, VT, GMU, HU, NASA)
- Environment (UVA, JMU, VT, NASA)
- Societal Implications of Policy (VT, UVA, WM, JMU, GMU)

## Future of Microelectronics in Virginia

- Advanced silicon-based systems (UVA, VT, VCU, ODU, WM, JMU, GMU)
- Spintronics (UVA, WM, VCU, GMU, VT, NSU, JLab)
- Molecular Electronics (UVA, VCU, WM, VT, GMU)
- Quantum Dot Electronics (UVA, VCU, VT, ODU, NASA)
- Nanotube-based Electronics (VT, ODU, VCU, UVA, JMU, WM, GMU, JLab, NASA)

## Lifespan Biology and Medicine

- Biological Processes (UVA, VCU, JMU, EVMS, GMU, VT, JLab)
- Regenerative Medicine (UVA, VCU, VT, WM, JMU, GMU)
- Diabetes/Obesity (VCU, VT, UVA, EVMS, GMU)
- Cancer and the Virginia Biomarker Network (EVMS, WM, VCU, VT, GMU, ODU, JMU, UVA, JLab)
- Healthy Aging (EVMS, UVA, GMU, WM, VT)

# The Investment Required

Recommended investment to launch Virginia toward national leadership in each of these three areas:

- **$45 million per year for 5 years**, ($15 million per area)
- matched with a **cost share of $15 million per year** from university/industry/federal laboratory teams

# Projects with Two Types of R&D Activities

- **Capacity-building Collaborative Research Focus**
  - Coordinating university teams and consolidating strengths, thereby lifting each team to the forefront nationally in the topic areas chosen
  - Enabling significant Federal R&D awards in the short term, and attracting industry to the state based upon the educated talent resulting from the R&D projects
  - Establishment of a framework and policies to help build research capacity in these research areas at Virginia universities, through recruitment of nationally renowned faculty, top quality graduate students, and postdoctoral fellows
  - Investments in critical research instrumentation and networking of existing and newly acquired state of the art equipment

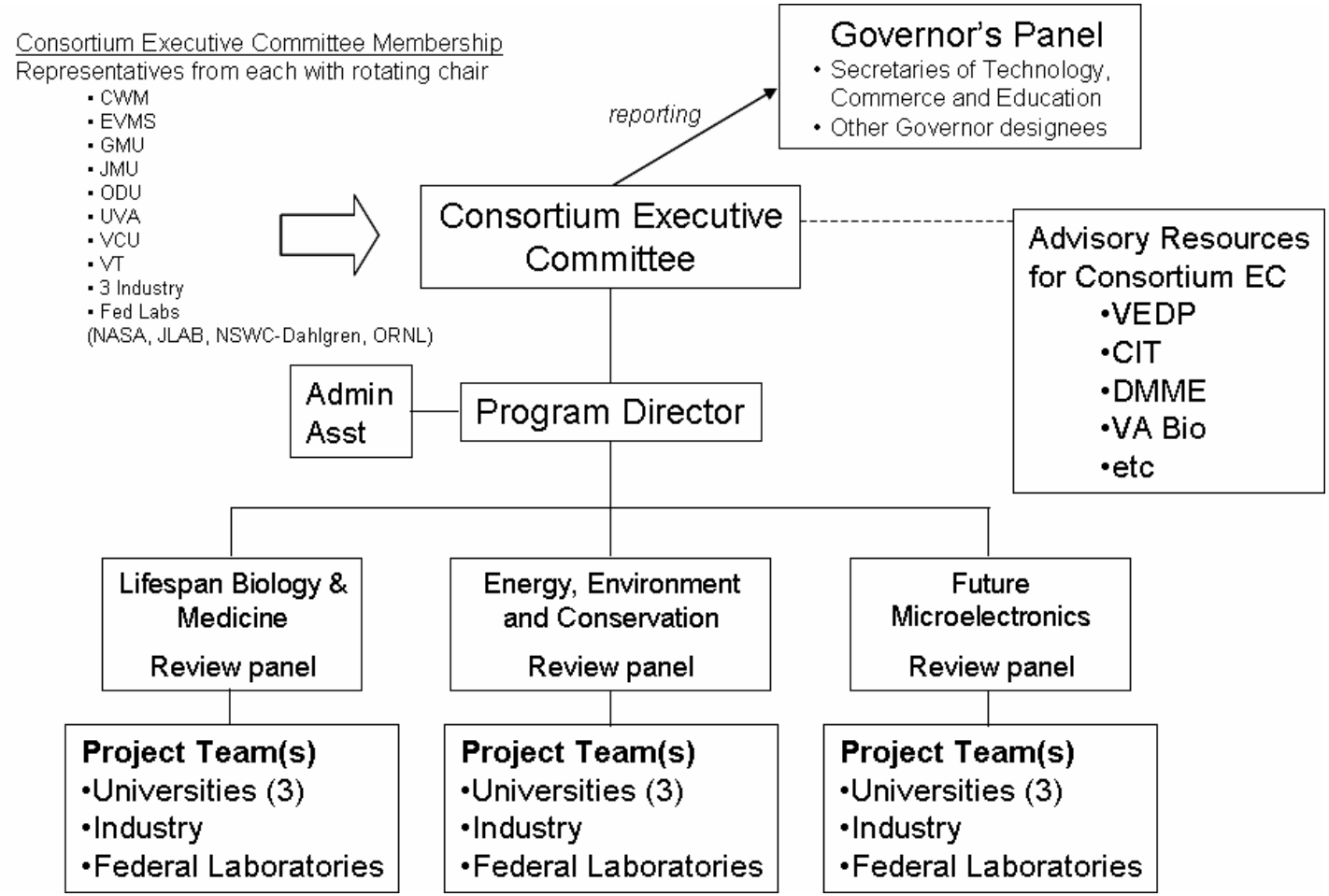
- **Economic Development Focus**
  - Provision for support for collaborative research, development and pilot scale economic development projects involving universities, industry, and federal labs in the research areas chosen for emphasis.
  - Leading directly to the formation of jobs in the near term through the industrial partners
  - In order to foster jobs creation and economic revitalization, at least three projects (one project per research area) will be located in economically deprived areas of Virginia.

# The Management

Consortium structure recommended to manage grant program with:

- Governor's Panel
- Executive Committee
- Program Manager
- Expert Review Panels
- Collaborative Research Project Teams

# Proposed Management Structure



# Measuring Success

To track the impact of the proposed investment, each project will report key metrics which may include:

- Federal and non-federal research grants awarded (including major centers)
- Publications and citations
- Number of articles in Science and Nature
- Faculty inducted into the National Academies
- Number of national and international faculty awards
- Graduate students supported
- Number of undergraduates involved in research
- Industrially sponsored contracts
- Technology transfer as indicated by patent filings, licenses or other agreements
- Businesses started or relocated
- Jobs created and workforce trained