

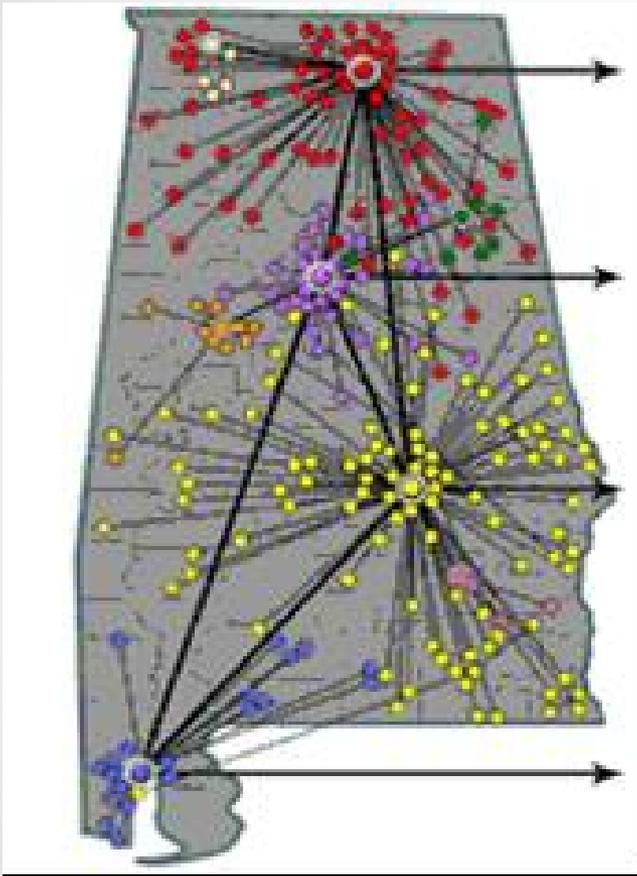
CyberConnections in Nano Bio Science

Alabama EPSCoR C2 and Beyond

Dr. Karen Boykin

Education Outreach Diversity Officer

- Addressing State Connectivity Plan
- Identifying Broad Band Gaps
- Connecting Alabama Research Network Authority, Research Institutions, and Community College System



Metrics

- Economic Growth: Spin Offs, Businesses, Jobs Created
- Provide Virtual Space for Sharing & Modeling (Research)
- Community College 3D Visualization Program:
 - Undergraduate nano, bio, and sensor technology
 - K-12 summer science camp
 - Computer stations for community access and training
- Target broad participation, particularly minority populations and rural areas with math & science education.
- Develop Virtual Organization Supporting EOD linkages for inquiry based teaching in STEM and Social Sciences.

Workforce Training

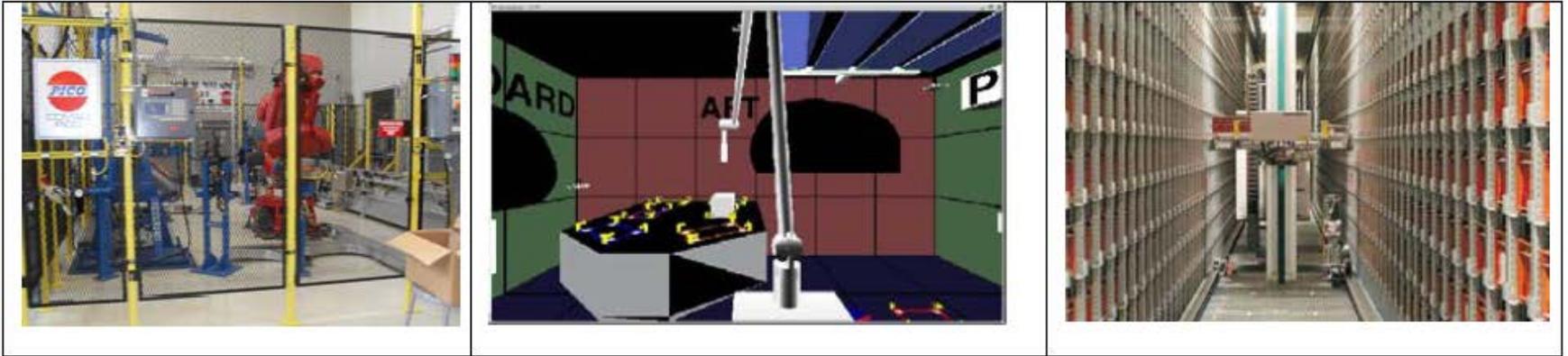
- Two Year Colleges
- Dept. of Labor award for Hybrid On-Line Learning Program (Potential MOOCs)
- NAFTA re-training individuals impacted by off shore relocations
- Underemployed populations; individuals with life experience and knowledge from industry
- Economic hit area but with new industry coming offering reemployment for certain skill-sets



Public Access

2Year College Programs

- Virtual Robots: Pharmaceutical & Automotive Industry Uses

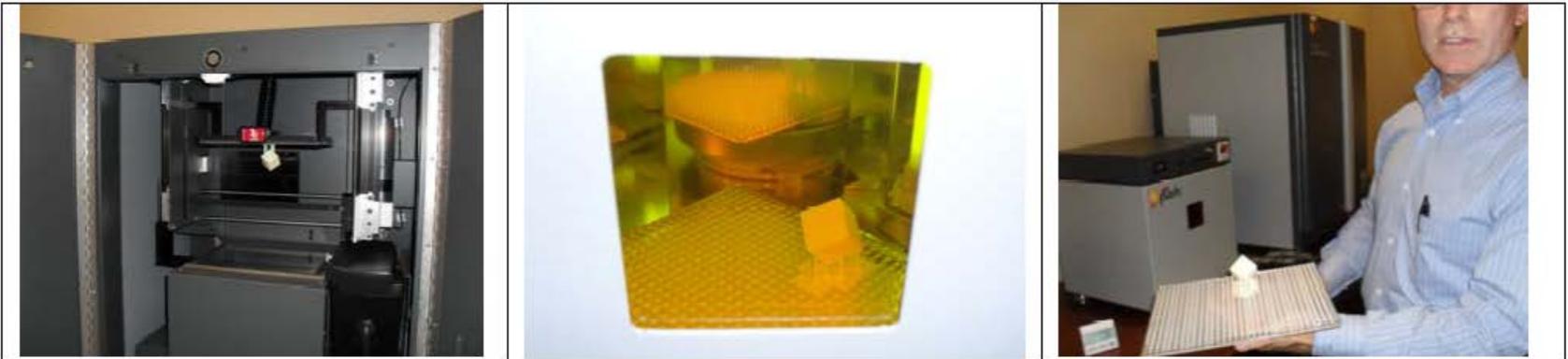


- Visual Trainers: Virtual Welding



2 Year College Programs

- Photonics and Lasers



- Working with UAB Enabling Technology Lab



2 Year College Programs

- Biomedical Program and New CAVE Imaging

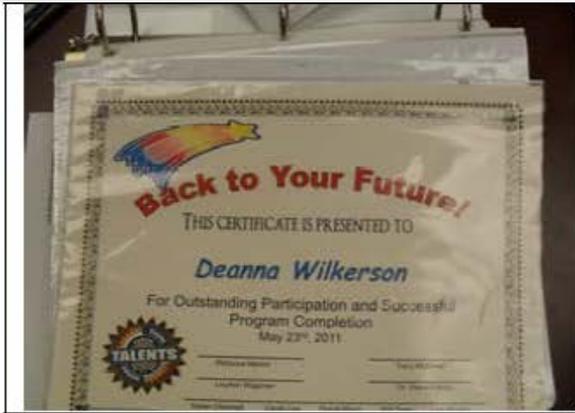


- 3D Teleconferencing and Conference Space Upgrades



2 Year College Programs

- Entrepreneurial Camps (Pipeline)



- Summer Science Programs (Pipeline)



More K-12 at PhD Institutions

- RII Outreach Programs
 - Workshops, Seminars, Research Experiences
 - Students AND Teachers...
- **Nano Bio Science Academy for Teachers**
- **Math Science Partnership in Nano Bio Science**
 - 2/3D Visualization and Simulation Program with Community Colleges
 - Alabama Blackbelt (rural south)
 - **7 Counties, 16 Schools, 80 Teachers**



Visualization and Imaging

- Awareness and Training
- What is Nano? How do you see Nano?

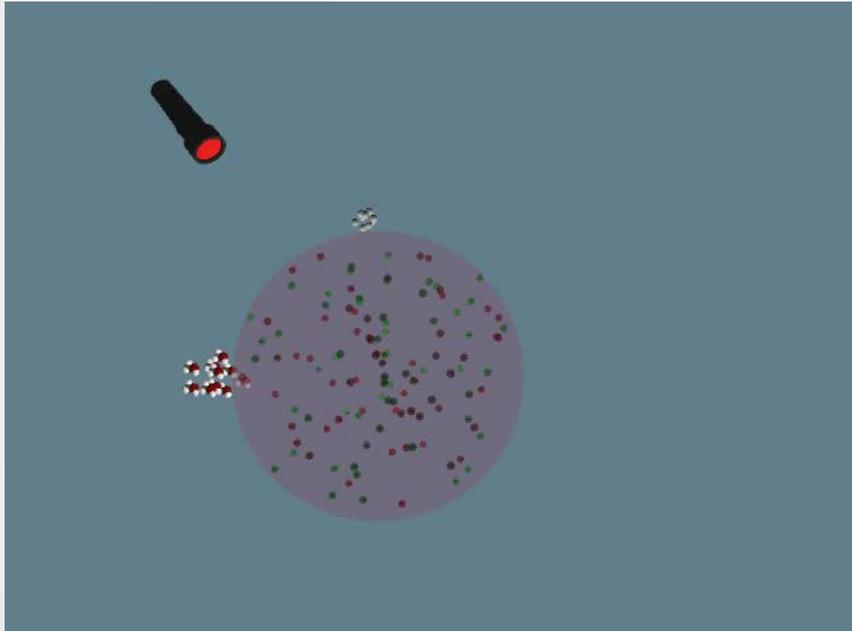


Visualization and Imaging

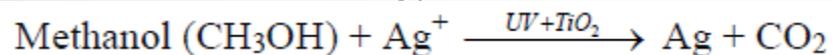
- Awareness and Training
- What is Biotechnology? How can we use virtual tools?



2D Images



TiO₂ Energy Module



- Building Blocks for the Nano Bio Pipeline
- Introducing Basic Research Concepts
- Important Areas for Future Research
- Introducing General Applications
- Created by UAB and Two Year Colleges
- Two-Way Learning!

2D Images



<https://www.dropbox.com/s/82oxtzbixtw6gzy/ratPellet.mp4>

Owl Pellet Module

- Alabama State University, HBCU
- NanoBio Research
- Updating Existing Teaching Tools
- Other Year 1 Modules
 - UA, Scale and Surface
 - Auburn U. Osmosis
 - Tuskegee U. Lunar Phases
 - TU, Parts of a Microscope
- Middle Schools
- Tied to State Curriculum
- Website Address:

http://www.tuskegee.edu/math_and_science_partnership_msp.aspx

Educational Competitiveness

RII C2 Aspiration is that in coming years, through enhanced new technologies, building on strengths, and expanding expertise in critical, focuses in nano-bio-sensor areas, we will transform K-20 institutions. Educational institutions will be hubs of statewide, potentially global networks, of collaborative relationships joining teachers, faculty, researchers, practitioners and professional colleagues, working together on shared initiatives that will improve education and serve the wider public good. Evaluation will build off recent technology education studies.

A successful Interactive Digital Center and 2-3D Visualization Program will involve:

Measure/Goal	Metric	Timeline
Virtual programs will train individuals for emerging jobs in nano, bio, sensors	Pedagogy created in collaboration with HudsonAlpha, UAB, and others involved in private sector needs.	Yr 1-3
	Quantity and quality of data used and shared.	Yr 1-4
	Number of students enrolled in program over time; increasing?	Yr 1-4
Teachers provided materials and trained for introduction to K-20	Content development and follow up surveys for SIM, Engineering Academies, Camps and professional development activities.	Yr 1-3
	Clearinghouse and partner institution usage monitored for material requests and implementation in classroom; SIM performs assessment.	Yr 2-4
Successful implementation	Number of students in programs increasing over time.	Yr 1-4
	Number of teachers and programs using content materials	Yr 1-4
	Diverse populations and areas in state active in programs.	Yr 1-4
	Surveys and interviews indicate positive experiences	Yr 2-4
	New partnerships working with program: SDE, higher ed, private sector	Yr 2-4

Next Steps

- Building on
 - Sharing Content
 - Teaching in STEM
- Increased Rural Networking
 - Understanding Needs
 - Building on Excitement
 - Leveraging Support
- Sharing Virtual Spaces
 - Testing UA and UAB Sessions
 - Testing Alabama-Idaho Linkage
- Testing New Teaching Tools
- Linking with Others...

