ITTC 2009
Industry Advisory Board
and
KTEC Site Review

Joseph Evans
Director

Jim Stiles
Associate Director

Keith Braman
Director of Technology Commercialization

April 3, 2009

10:15 – 11:35 a.m.

New Directions and Projects

> ❖ Perry Alexander (IAL)

> ❖ Erik Perrins (telemetry)

> ❖ James Sterbenz (GpENI)

> ❖ Shannon Blunt (radar/comm)

❖ Welcome

❖ Introductions

❖ State of the Center

❖ Strategy and direction

❖ Core competencies

❖ Management team

❖ Goals and objectives

❖ Past two years' progress on goals and objectives

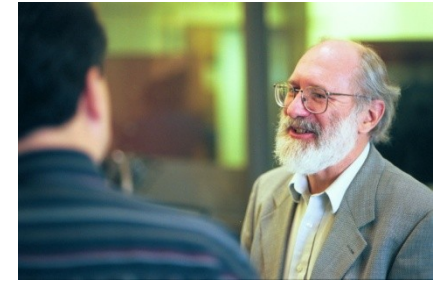# Introduction

To be a global leader and strategic partner in the creation and commercialization of innovative technologies in information systems, networking and communications, bioinformatics, and radar.

FOCUS on RESEARCH:

To advance knowledge and create innovative technologies in information systems, network and communications, bioinformatics, and radar
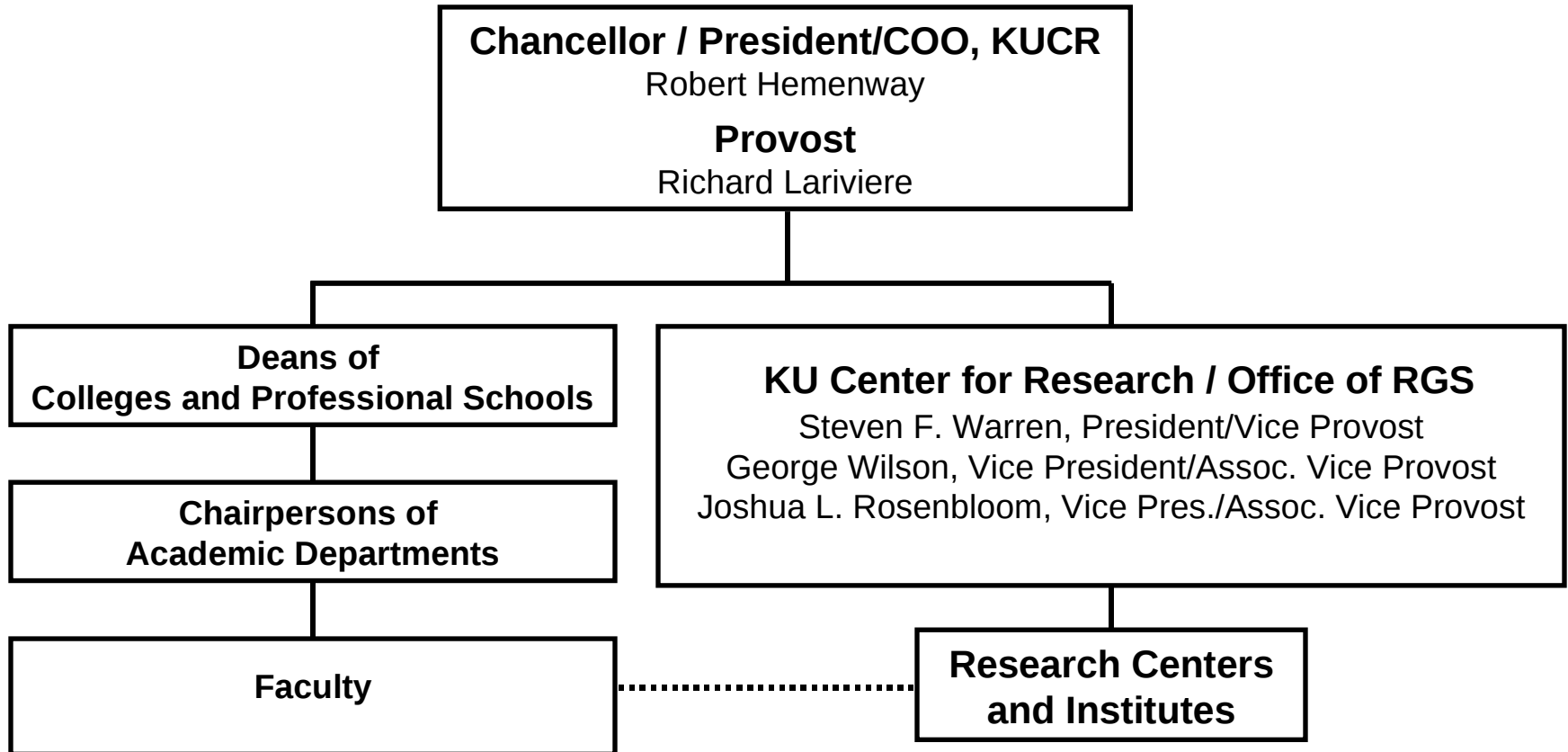
FOCUS on STUDENTS:

To educate and train students for technology leadership

FOCUS on ECONOMIC DEVELOPMENT:

To transfer knowledge and innovative technologies to Kansas companies and national industries

By providing an outstanding interdisciplinary

Chancellor / President/COO, KUCR
Robert Hemenway
Provost
Richard Lariviere

**Deans of
Colleges and Professional Schools**

KU Center for Research / Office of RGS
Steven F. Warren, President/Vice Provost
George Wilson, Vice President/Assoc. Vice Provost
Joshua L. Rosenbloom, Vice Pres./Assoc. Vice Provost

**Chairpersons of
Academic Departments**

Faculty

**Research Centers
and Institutes**

- ❖ **KTEC's Mission:** "To create, grow and expand Kansas enterprises through technological innovation"

- ❖ ITTC works in partnership with KTEC network to foster technology-based economic development in Kansas

- ❖ ITTC is the only state-designated Center of Excellence focused on information technology & telecommunications

State of the Center

Strategy and Direction

Focus on ideas

- ❖ Innovative concepts bring value to our students, our collaborators and the community, and the researchers themselves

- ❖ Provide an environment for the growth of our intellectual capital

- ❖ Discussions and seminars, with particular focus on the new faculty

- ❖ Enable rapid formation of research areas or clusters so that the organization properly represents ITTC expertise and capabilities

Grow our national and international reputation

❖ The success of research organizations is often facilitated by recognition of capabilities and competence

❖ Increase ITTC's external visibility through focused visits and talks

❖ Enable and encourage the constituent laboratories and research groups to have greater visibility so that ITTC researchers can promote their work

Focus on relationships in order to increase external funding

❖ Continue to pursue traditional agencies and organizations such as NSF, but…

❖ It is important to build a network of potential funding opportunities, establish a positive reputation, and then be ready when an appropriate research solicitation is available

❖ Identify and pursue center-scale opportunities in conjunction with partners

❖ Build relationships to enable restricted or classified research opportunities to be pursued

Insure that ITTC is seen as critical to the University's future

❖ Information technology is a foundational aspect of research in most fields of study

❖ Encourage interdisciplinary efforts that build upon the expertise of the researchers

Continue to support economic development by working closely with KTEC and other organizations

- ❖ KTEC survey established that there are 2,182 information technology companies in Kansas, employing nearly 62,000 IT workers (similar to Kansas biosciences sector)

- ❖ KTEC recently formed SITAKS, the Software and Information Technology Association of Kansas

- ❖ Opportunities for ITTC to establish closer ties with a wider range of Kansas companies, which can lead to research and commercialization opportunities

- ❖ Continue to encourage ITTC investigators to participate in technology transfer activities

Core Competencies

Communications & Networking Systems
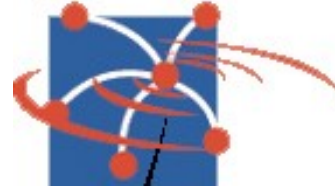
Radar & Remote Sensing

Computer Systems Design

Systems Approach to Solving Problems

Intelligent Systems

Information Assurance

Bioinformatics

e-Learning

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What questions are we trying to answer?

How to model, characterize, and understand "processes"?

- ❖ Communications networks
- ❖ Biological
- ❖ Signals such as communications and radar
- ❖ Cognition and reasoning

How to efficiently use resources?

How to design systems with assurances?
- ❖ Security, reliability, predictability

How to extract information?
- ❖ Detect "events" and find "entities" in data

How to deliver and present information?

Communications & Networking Systems

Radar Systems & Remote Sensing

Computer Systems Design

Information Assurance

Intelligent Systems

e-Learning Design

Bioinformatics & Computational Life-Sciences

How to model, understand, & characterize "processes"?
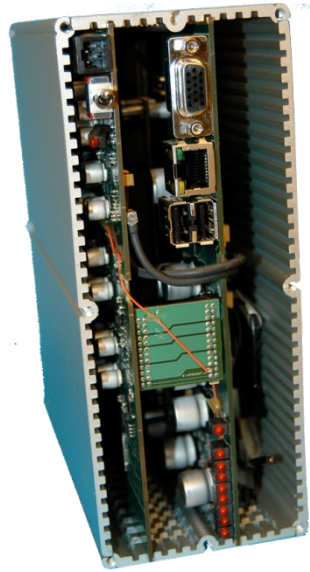
How to efficiently use resources?

How to design systems with assurances?

How to deliver & present information?
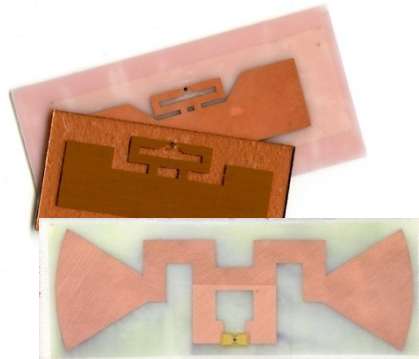
How to extract information from data?

Core Network and
Experimental
Fiber Links

Software

RFID Design

Computer Cluster
(768 cores, 35 TB)

Optical Systems
Laboratory

And much more, including our
greatest resource, our professional
staff and facility

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33 Tenure-track faculty

1 Research faculty

3 Postdocs

8 Technical staff

6 Support staff

Current student population ~ 106

- ❖ ~ 40 PhD, ~57 MS, ~9 BS

ITTC is Multidisciplinary

- ❖ Collaboration across engineering, education, math, biology
- ❖ Collaboration on computing cluster expansion (NSF MRI)
  - ➤ Chemical & Petroleum Engineering   Kyle Camarda
  - ➤ Molecular Structures Group   Jianwen Fang
  - ➤ Ecology and Evolutionary Biology   Mark Holder
  - ➤ Mechanical Engineering   Sarah Kieweg
  - ➤ Chemistry & Molecular Biosciences   Krzysztof Kuczera
  - ➤ Molecular Graphics and Modeling Lab   Gerry Lushington
  - ➤ Mathematics   Bozenna Pasik-Duncan
  - ➤ Natural History Museum, Biodiversity Research Center, and Ecology & Evolutionary Biology   A. Townsend Peterson
  - ➤ Natural History Museum and Biodiversity Research Center   Jorge Soberon

❖ Kansas start-ups
  ➢ Video Stream Comparison System (Veatros)
  ➢ Rosetta SLD-Language & Tools (Cadstone)

❖ Existing Kansas companies
  ➢ Neo Abacus
  ➢ Sprint/Nextel
  ➢ eLearning Creations

❖ Internal commercialization efforts
  ➢ Duet-on-Pitch
  ➢ RFID Microstrip Antenna
  ➢ Rosetta SLDL Tool Development
  ➢ SAFFIRE
  ➢ PMD Compensation
  ➢ Meta Juris

Identifying and supporting early-stage opportunities is the key to ITTC's continued commercialization success.
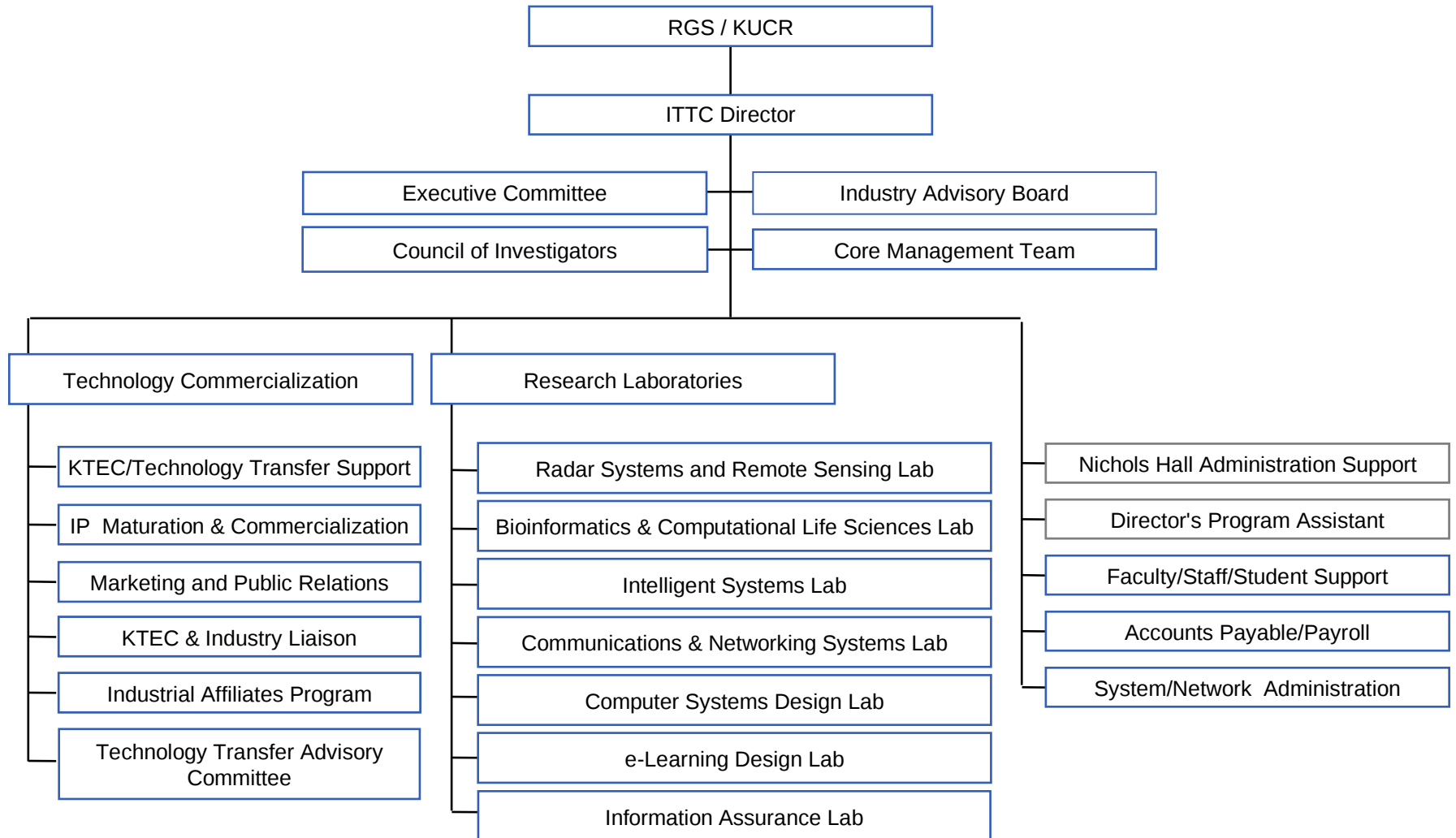
Today's successes are the result of seeds sown and nurtured over several years.

Technology maturation and commercialization are integral to sustained success in information technology research and development.

Management Team

ITTC Organization

RGS / KUCR

ITTC Director

Executive Committee

Industry Advisory Board

Council of Investigators

Core Management Team

Technology Commercialization

- KTEC/Technology Transfer Support
- IP Maturation & Commercialization
- Marketing and Public Relations
- KTEC & Industry Liaison
- Industrial Affiliates Program
- Technology Transfer Advisory Committee

Research Laboratories

- Radar Systems and Remote Sensing Lab
- Bioinformatics & Computational Life Sciences Lab
- Intelligent Systems Lab
- Communications & Networking Systems Lab
- Computer Systems Design Lab
- e-Learning Design Lab
- Information Assurance Lab

- Nichols Hall Administration Support
- Director's Program Assistant
- Faculty/Staff/Student Support
- Accounts Payable/Payroll
- System/Network Administration

Internal

- ❖ Industry Advisory Board (annual meeting)
- ❖ Administrative management team (daily)
- ❖ Applied technology staff (weekly)
- ❖ Lab Directors (as needed)
- ❖ Council of Investigators (monthly)
- ❖ Technical staff (monthly)
- ❖ Administrative staff (monthly)
- ❖ Executive Committee (semi-annual)
- ❖ Core Management Team (as needed)

External

- ❖ KUCTC Technology Transfer Office (weekly)

- ❖ KTEC University Program Committee (quarterly)

- ❖ KTEC Commercialization Centers − LRTC, ECJC, WTC (quarterly)

- ❖ KU Center Research Directors (monthly)

- ❖ Community Partners − ITKC, LTA, Kauffman, ... (monthly +)

ITTC National Leadership

Current Program Managers

- ❖ Victor Frost – Program Director, NSF Computer and Network Systems, Directorate of Computer & Information Science & Engineering (CISE)

- ❖ Glenn E. Prescott – NASA Program Executive for Technology

Former Program Managers

- ❖ Ron Hui – 2005-2007, Program Director, NSF Electronics, Photonics and Device Technologies

- ❖ Joseph Evans – 2003-2005, Program Director, NSF Computer and Network Systems, Directorate of Computer & Information Science & Engineering (CISE)

- ❖ Gary Minden – 1994-1996, Program Manager, DARPA Information Technology Office

Many faculty active in professional society leadership roles…

Goals and Objectives

- ❖ Research and energy of new ITTC researchers
- ❖ Continue to pursue possibilities for restricted research
- ❖ Build on NSF GENI and other recent successes
- ❖ Continue and expand ITTC's activities in cognitive radios
- ❖ Build relationships with the US Army at Ft. Leavenworth and the Kansas Air National Guard at McConnell AFB
- ❖ Position ITTC for growth in information systems security
- ❖ Exploit ITTC's RFID investments
- ❖ Work with other KU centers and institutes on multidisciplinary efforts in energy and transportation
- ❖ Federal stimulus funds!

Goals

| Metric	Current	2011 Goal
Research Expenditures	FY 08: ~$4.1M	~6M
# of "Active" ITTC-Affiliated Tenure-Track Faculty	33	33
# of Research Faculty	1	1
# of Investigators	38	38
Funding per Faculty Investigator	~$142,000	~$210,000
# of Technical Support Staff	8	10
# of Postdocs	3	3
# of Ph.D. Students	40	50
# of M.S. Students	57	60
# of Undergraduate Students	9	15
# of Journal Papers/Year	~125	~150
# of Faculty in Leadership Positions	7	10

Recent Progress

- ❖ Created the Information Assurance Laboratory
- ❖ Applied for NSA Center for Academic Excellence in Information Assurance Education, which will enable other NSA-sponsored programs to be pursued
- ❖ Awarded NSF GENI project
- ❖ Awarded large airborne telemetry projects
- ❖ Expanded the ITTC computing cluster through an NSF MRI award in collaboration with a multidisciplinary group
- ❖ Worked with KUCR / RGS to establish systemic foundations for growth of research computing at KU
- ❖ Sponsored a new / junior faculty research seminar series

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ITTC R&D Expenditures (external sources)
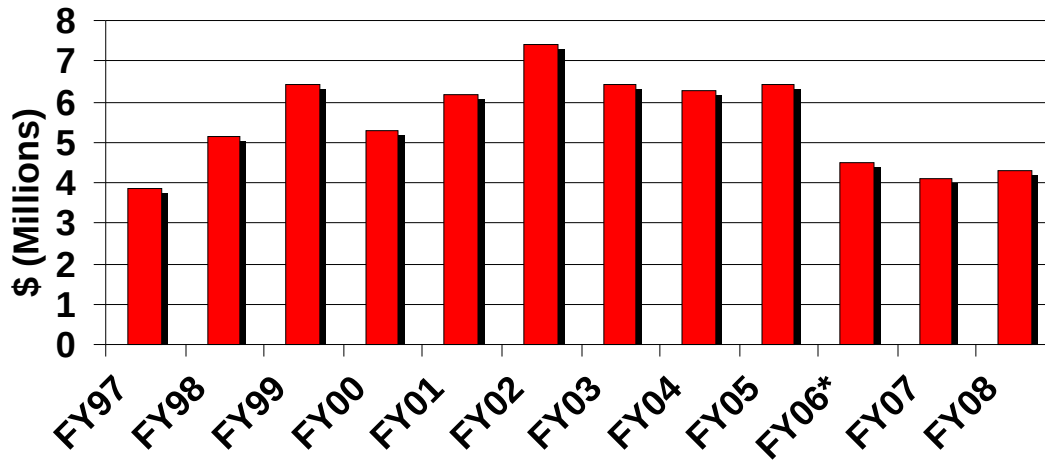
ITTC R/D&C Revenue Sources FY2008

Other 15%
State 24%
Tech Comm 13%
Industry 10%
Federal 52%
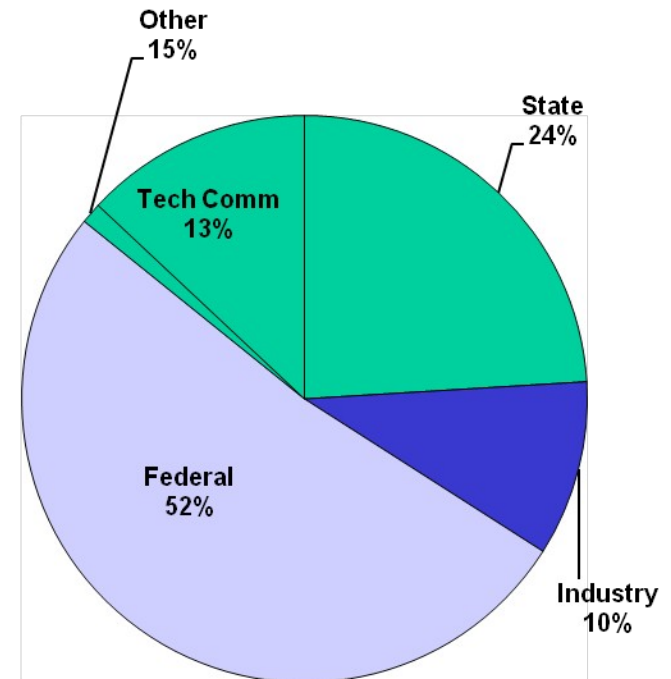
*Note: In FY06 the CReSIS NSF Center is established and transitioned out of ITTC

New Research Areas

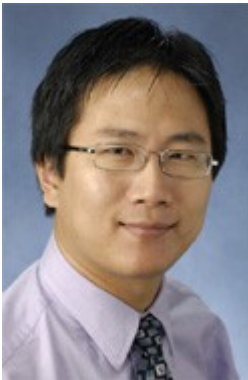❖ Andy Gill

❖ Brian Potetz

❖ Bo Luo

❖ Gunes Ercal-Ozkaya

❖ **Perry Alexander**

❖ **James Sterbenz**
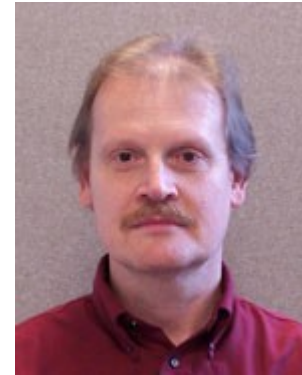
❖ **Erik Perrins**

❖ **Shannon Blunt**

Discussion IAB and Peer Review team

1. What research questions does your organization need answered that ITTC might address?

1. What new fundamental science and engineering innovations are you tracking that ITTC should be aware of? These might feed into ITTC systems and engineering research.

1. What is/are the next national differentiators that ITTC should be looking to develop? For example, should ITTC pursue differentiators in our traditional areas of expertise (e.g., a national cognitive radio networking testbed) or seek to expand into other areas (e.g., a nano material research center).

1. Energy research will be a new growth area for the next decade. Are there any opportunities in energy research that you think ITTC could explore?

1. Given that the economy has forced scaling back of engineering resources at some organizations, is it possible to leverage ITTC resources to help advance your future efforts? For example, could ITTC contribute to optical or wireless network architecture design for future deployments or other efforts that might be resource-starved at the moment?

1. Do you have infrastructure the ITTC might be able to utilize in its research mission?

1. What is your 2, 3, and 5 year need for new students (BS, MS, and PhD)?