NAS STEP/STL Committee, August 2008

Driving Economic Development: The Role of the Public Research University

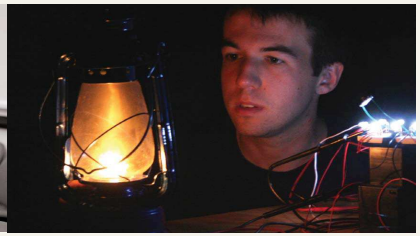
Linda Katehi, Provost

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

NASULGC Background

- ***218 members***, including the land grant and largest public research universities in every state
- ***29 major university systems***
- Conduct almost ***$30 billion*** of research
- Award close to ***a million degrees/certificates*** annually and educate the dominant share of nation's undergraduates in science, math and engineering



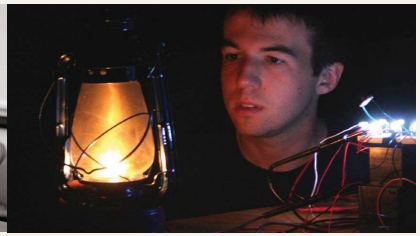



The Mission of the Public University

The ***Mission*** of the Public Research University has become multifaceted as it addresses the needs of a new, more global, less isolated and more vulnerable society. It is to:

- *Provide **Access** to High-Quality Education*
- *Help the Public Improve **Quality of Life***
- *Create **New Knowledge** and **Drive Innovation***
- *Engage the community in Translating this Intellectual Wealth to **Economic Prosperity***



How do Universities Participate in Economic Development :

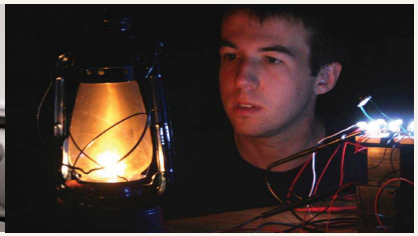
Focus on solving ***critical social problems***:

- *Health Care*
- *Energy and Sustainability*
- *Climate Change*
- *Poverty*

by

- *Formulating new questions*
- *Seeking solutions that span multiple intellectual domains*
- *Creating new knowledge*
- ***Translating knowledge into products and services***

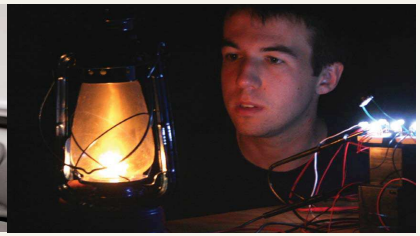


The Importance of Translational Research in Economic Development

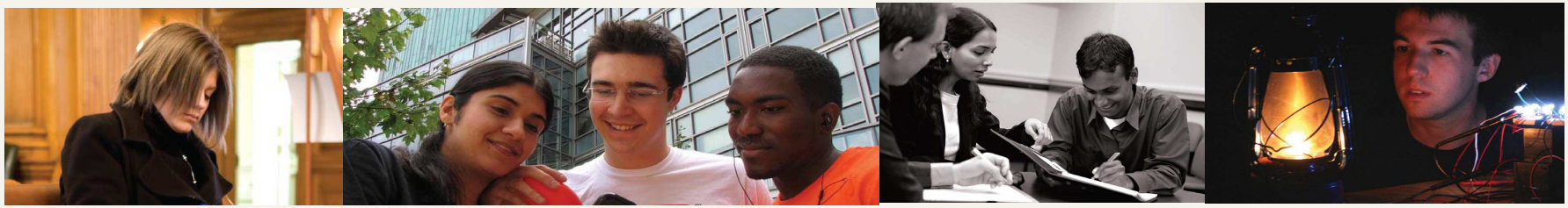
- Whether in the Life Sciences or in Physical and Behavioral Sciences, ***translating knowledge into products and services*** is becoming an integral part of the process that connects Research to Development
- ***Taking ideas to the market place*** leads to economic growth and increase of wealth
- Universities find themselves increasingly committed to this cause by ***recruiting and hiring faculty*** who contribute to this process



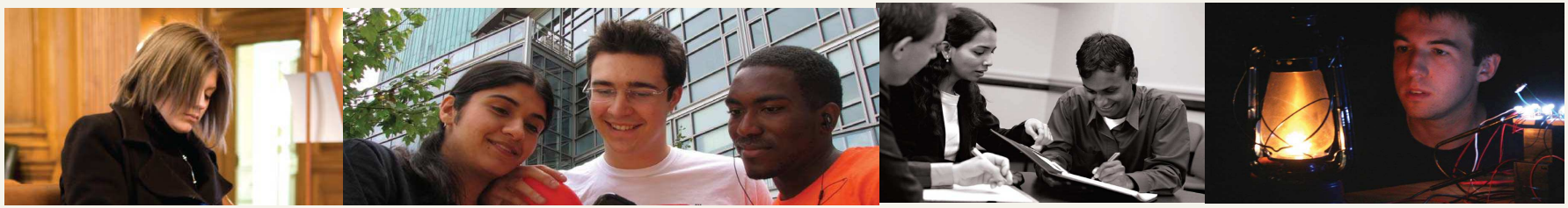
Existing Disciplinary Structures at Odds with Translational Research and Scholarship

- Present academic disciplines reflect an ***outdated understanding*** of social needs and priorities
- The social needs and pressures that drive scholarship and scientific inquiry require ***new fields of study and new methodologies for translating knowledge***
- The problems facing our society drive student interest in new fields that are ***problem focused*** rather than discipline focused



How do we translate knowledge into products and services

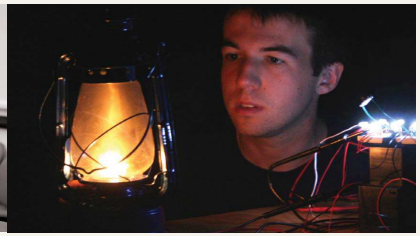
- ***Old Model – Passive Participation***
  - *Consulting*
  - *Applied Research*
- ***New Model – Semi – Active Participation***:
  - *Licensing*
- ***New Model – Fully Active Part***:
  - *Start ups*
  - *Research Parks and Incubators*



Importance of Intellectual Property

- Core university mission is to ***create and disseminate knowledge*** through research, teaching and engagement
- ***Access to cutting edge knowledge*** is critical to completing this mission
- Assigning ownership changes new knowledge to ***Intellectual Property*** and ***wealth***
- ***IP protection creates an incentive to invent and create,*** "To promote the Progress of Science and the useful Arts.." –U.S. Constitution
- Utility of IP as a public good ***requires balancing the tension between*** encouraging creation of IP by granting a property right vs. development and public availability by sharing/selling the right to others

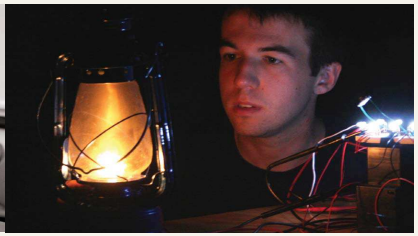


Technology Commercialization from Universities

- 25 years ago ***federally sponsored research*** was considered a ***public good*** that should be published to be in the public domain.
- ***Bayh-Dole Act of 1980*** made it possible for Universities to own intellectual property generated from public funds and gave Universities responsibility for ensuring intellectual property was developed for public good.
- This change ***drove the development*** of more sophisticated ***Offices of Technology Management-*** spawned new ideas about how Universities should play in advancing economy.



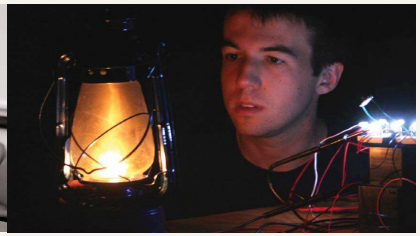



University Participation in Economic Development

It creates tension in and among their traditional intellectual communities

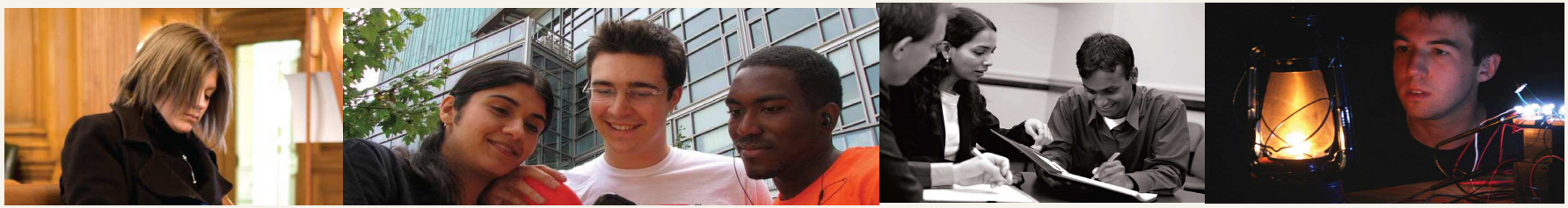
- issues arising during ***promotion and/or tenure***
- difficulties in ***assigning IP***
- issues of ***access*** or ***ownership***
- ***difficulties*** in ***technology transfer***
- impact of bureaucratic processes on ***entrepreneurship***
- issues of ***conflict*** and ***commitment***



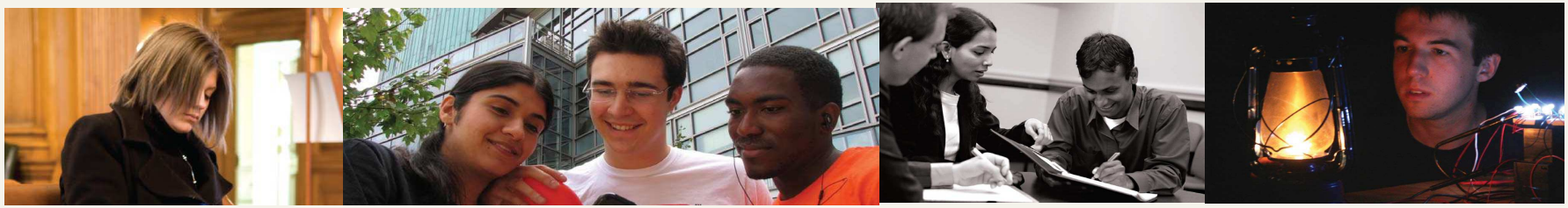
How Can Universities Best Drive the Economy?

- Which has greater net benefit, start-ups or MNCs?
- Where are the jobs and wealth created?
- Does a start-up culture lead to greater technology development and wealth creation?
- How do we continue to generate IP for start-ups?
- Are start-ups important to attracting faculty and students?
- How critical is MNC sponsored funding to faculty research programs?



The Role of University-Industry Relations and Collaborations in Higher Education

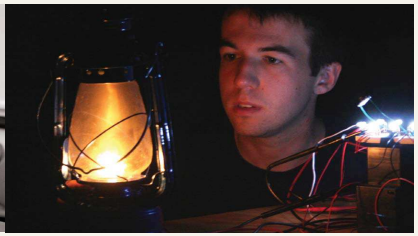
- Industry-University collaborations have been fundamental in Higher Education
- Universities are important to Industry because they:
  - *Educate the Workforce*
  - *Provide the environment for the Creation of new Ideas*
  - *Participate in the solution of specific problems (Translational Research)*
- Industry is important to Universities because it
  - *Supports Education (internships)*
  - *Provides support for Basic Research*
  - *Helps define immediate problems*



Economic Development: the Role of University-Industry Collaborations

- Both Industry and Universities contribute to Economic Development by successfully transforming ideas to products and services
- Universities and Industry are strong partners in economic development but for distinctly different reasons
  - ***Industry is driving economic development in an effort to create wealth for the stakeholders***
  - ***Universities are supporting economic developing in an effort to improve quality of life for the public***
- The differences in the mission between Industry and Universities raise some important issues of incompatibility in processes and attitudes



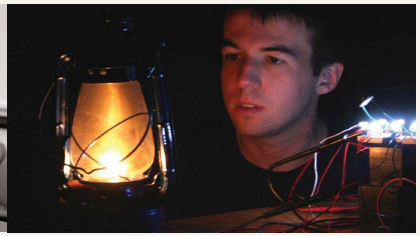



Creating Partnerships with Corporations:

Introduce Additional Pressures into Existing Structures

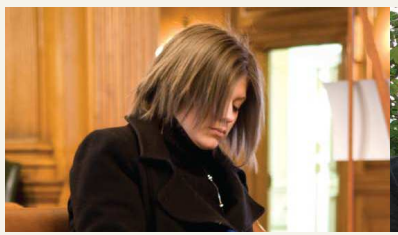
- The inherent misalignment between industry and university missions ***introduce barriers in exploring and establishing partnerships:***
  - *Universities want to produce **scholarship** and create knowledge – Industry wants to produce **wealth** and **promote** their products or services*
  - *Universities **educate** – Industry **trains***
  - *Universities recognize **shared ownership** – Industry needs **exclusivity***
- *The rigidity of the educational infrastructure in Universities **is at odds** with the need for **flexible and entrepreneurial structures** demanded by **translational research***

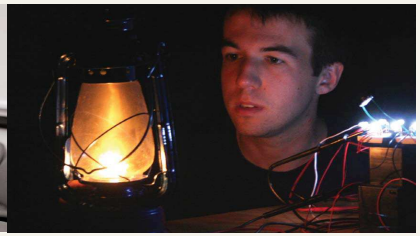


Universities are Committed to Supporting Economic Development

- They value and depend on successful collaborations and partnerships with industry
- Their effort to meet closely the needs of interested industrial partners ***creates tension*** within their existing structures and at times creates ***conflicts*** with state guidelines (for public universities)
- These incompatibilities should ***not be perceived as barriers but taken as opportunities*** for new thinking and the development of new approaches
- ***Trust and respect reduce barriers*** and allow university and industry partners to break new ground

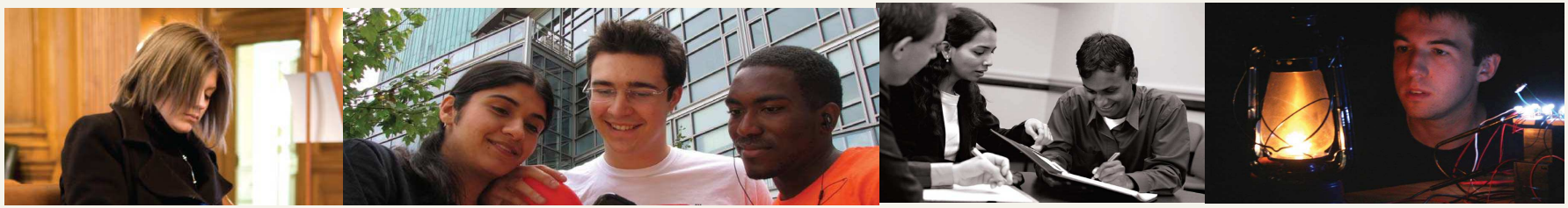


Universities and Industry are successful in forming partnerships

The inherent misalignment between university and industry missions and objectives can be overcome by focusing on the common goals and interest of:

- *Training and Employing the Most Capable and Competitive Workforce*
- *Supporting Economic Development*
- *Improving Quality of Life for the Stakeholders*

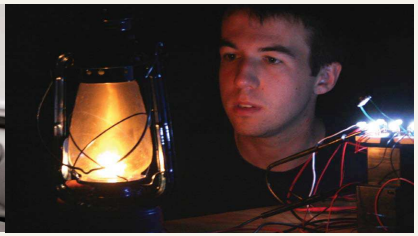


Respect and Trust are the Key Ingredients of Good Partnerships

Examples of Successful Partnerships

- IBM – University of Illinois Partnership on ***Petascale Computing***
- BP – UC Berkeley and University of Illinois on ***Biofuels***
- Rolls Royce – Purdue ***University Technology Center on Propulsion***
- GM – University of Michigan: ***Automotive Research Center***



Additional Comments or Questions