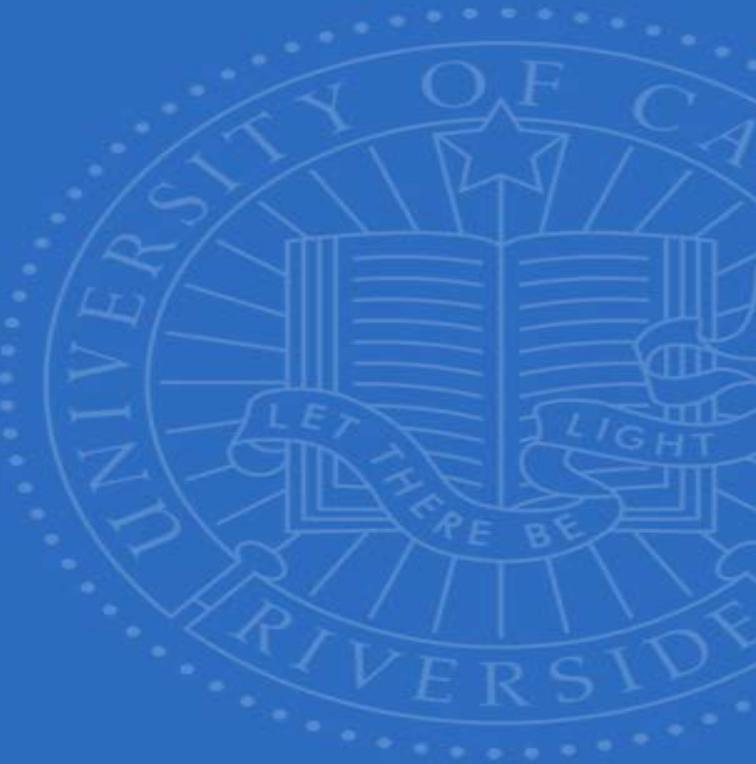


UCR



CE-CERT UPDATE

CENTER FOR ENVIRONMENTAL RESEARCH AND TECHNOLOGY



CE-CERT RESEARCH FOCUS: AIR QUALITY, TRANSPORTATION AND ENERGY

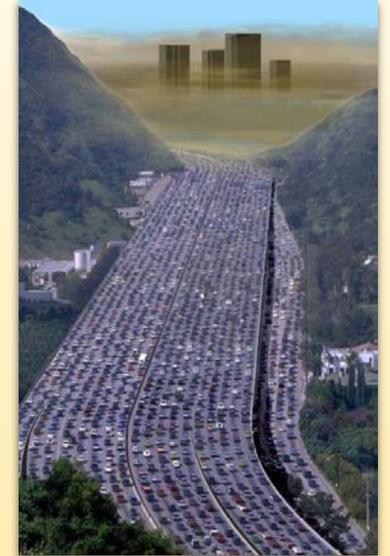


Clean Air

Quantifying and Measuring Emissions
Toxic, Ozone and PM formation

Sustainable Transportation

Intelligent transportation systems
Electric and Hybrid vehicle integration
Eco-driving



Renewable Fuels

Aqueous Processing of Biomass to Fuels
Thermochemical Processing of Biomass to Fuels

Renewable Electricity & Smart Grids

Advanced Solar Energy Production
Energy Storage
Energy Management



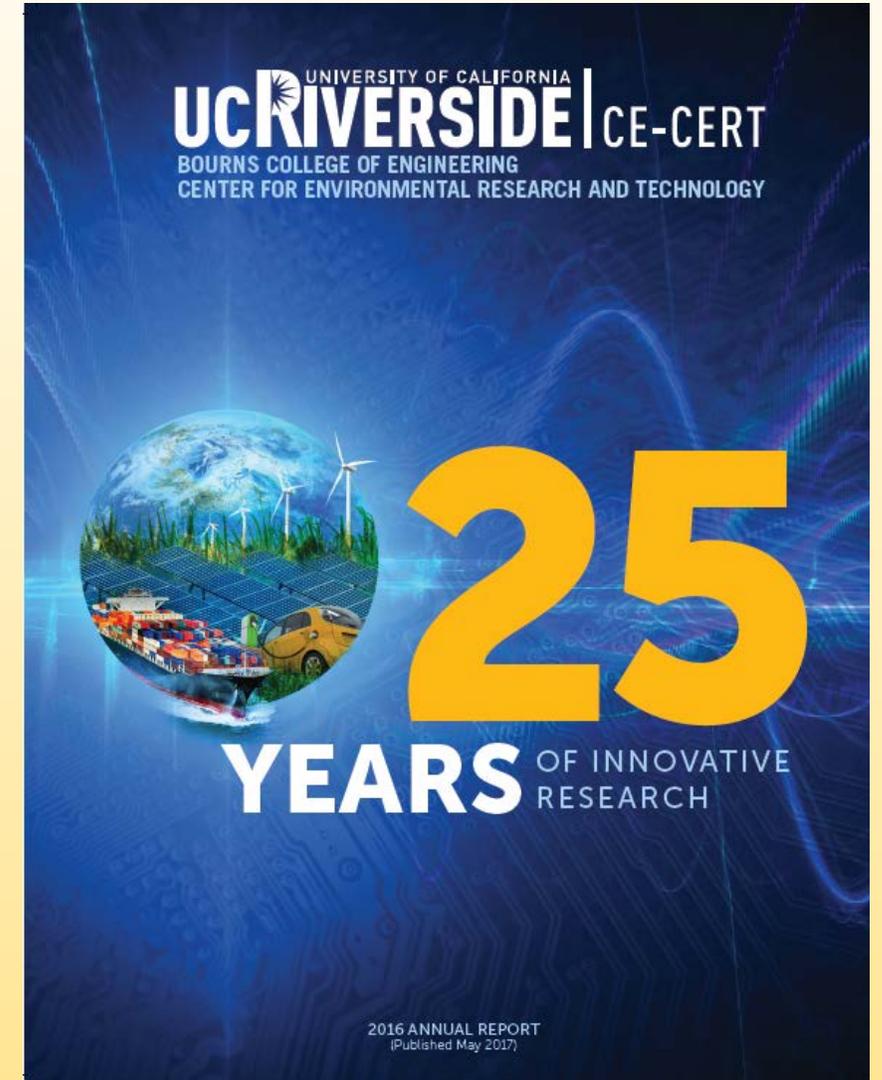
Climate Change Impacts

Impacts of our fuels
Cloud formation & impacts

CE-CERT 2016 SNAPSHOT

- 27 interdisciplinary faculty
- 30 full-time staff
- 43 undergraduates
- 46 graduate students
- 80 industry partners
- 12 major UCR partners
- 40 academic partnerships

\$18 million in ongoing projects



2016 ANNUAL REPORT

2016 YEAR IN REVIEW – MAJOR NEW EFFORTS

- Interaction with the City of Riverside with the “Innovation District”
- Increased joint projects between research groups
- Increased interaction with ARB on multiple levels (research projects, strategic planning, event hosting, etc.)
- Involvement on a broader level with UCR faculty throughout campus
- Increased focus on “sustainability”
- Welcoming the RNG Center

2016 EVENTS: UCCONNECT TRANSPORTATION CONFERENCE

FEBRUARY 11 & 12, 2016

Annual student-organized conference held as a part of the regional University Transportation Center program. UCCONNECT focuses on economic competitiveness by mobilizing society in general, and the workforce in particular; and by delivering goods and services in the most efficient ways possible

At a Glance:

- 160 attendees
- Activities included technical workshops, speakers, and poster presentations on topics such as advanced biofuels, vehicle emissions measurements, and Intelligent Transportation Systems



2016 EVENTS: SOLAR CONFERENCE

FEBRUARY 25, 2016

SC-RISE Conference focused on educating regional, county and city leaders, planners, council members, business utility companies and the general public about market ready technologies, public policy and regulations, economics and financing, and environmental and sustainability issues

At a Glance:

- Approximately 100 attendees
- Panels:
 - The State of Solar Energy and the Role of Energy Storage
 - Streamlining Permitting
 - Economics and Financing Options for Solar
 - Market Ready Technologies
 - Community Solar Strategies



2016 EVENTS: PEMS CONFERENCE

MARCH 17 & 18, 2016

Conference enables emissions professionals to exchange ideas, develop new projects and form partnerships for the implementation of Portable Emissions Measurement Systems (PEMS).

At a Glance:

- Attended by 200 people from over 50 different companies, agencies or institutions representing 10 countries from around the world.
- Comprehensive discussions included:
 - Regulatory development and trends
 - Approaches for measuring in-use PM
 - Current and future research developments
 - Development of new instrumentation for in-use testing



2016 EVENTS: STEP CONFERENCE

OCTOBER 5, 2016

This 5th Annual Science and Technology Education Partnership (STEP) Conference was hosted by Bourns and CE-CERT with the goal of fostering interest in STEM career fields for high school students throughout the Riverside County School District.

At a Glance:

- Attended by 300 high school students
- Activities included hands-on demonstrations and discussions with research faculty and staff



2016 EVENTS: JOSEPH NORBECK MEMORIAL

OCTOBER 17, 2016

This event was held to celebrate the life of Dr. Joseph Norbeck, founding member and former director of CE-CERT.

At a Glance:

- Approximately 70 attendees
- Activities included speakers, an open mic for audience reflections and remembrances, and the dedication of the Joseph Norbeck Multimedia Room



SELECTED 2016 OUTREACH ACTIVITIES

Summer STEM Camp Visit– June 15, 2016

30 students in grades 6-8 learned about CE-CERT's latest research through lab tours and questions and answers with research staff and faculty.



Inspire Her Mind – November 17, 2016

Fostered the interest of 120 female high school students in STEM careers through hands-on activities.



CE-CERT Open House – May 11, 2016

An afternoon of research engagement through laboratory tours, presentations, and discussions with faculty, staff, and students about CE-CERT's latest research activities.



USDOT UNIVERSITY TRANSPORTATION CENTER PARTICIPATION:



- NCST has been a successful center for 3 years, recently renewed for an addition 5 years.
- Partners:
 - University of California: Davis and Riverside
 - USC, GIT, Vermont
- One of the key pillars of research remains with infrastructure and system operations
- Significant cost share from partners (Caltrans, CEC, CARB)



- Center for Advancing Research in Transportation Emissions, Energy and Health
- Partners: TTI, Johns Hopkins, GIT, UTEP, UCR
- examining the impacts of mobile-source emissions on health effects



- Region 9 University Transportation Center
- Headquarters: USC
- UCR is an indirect partner
- Focused on developing strong university-government-industry partnership

CE-CERT FACILITIES



FACILITIES UPDATE: DYNO-IN-THE-LOOP CONCEPT

Transportation Systems
Research Microscopic
Traffic Modeling



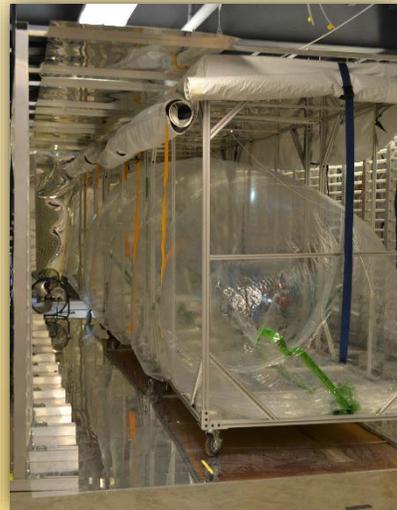
Dynamometer
Operation



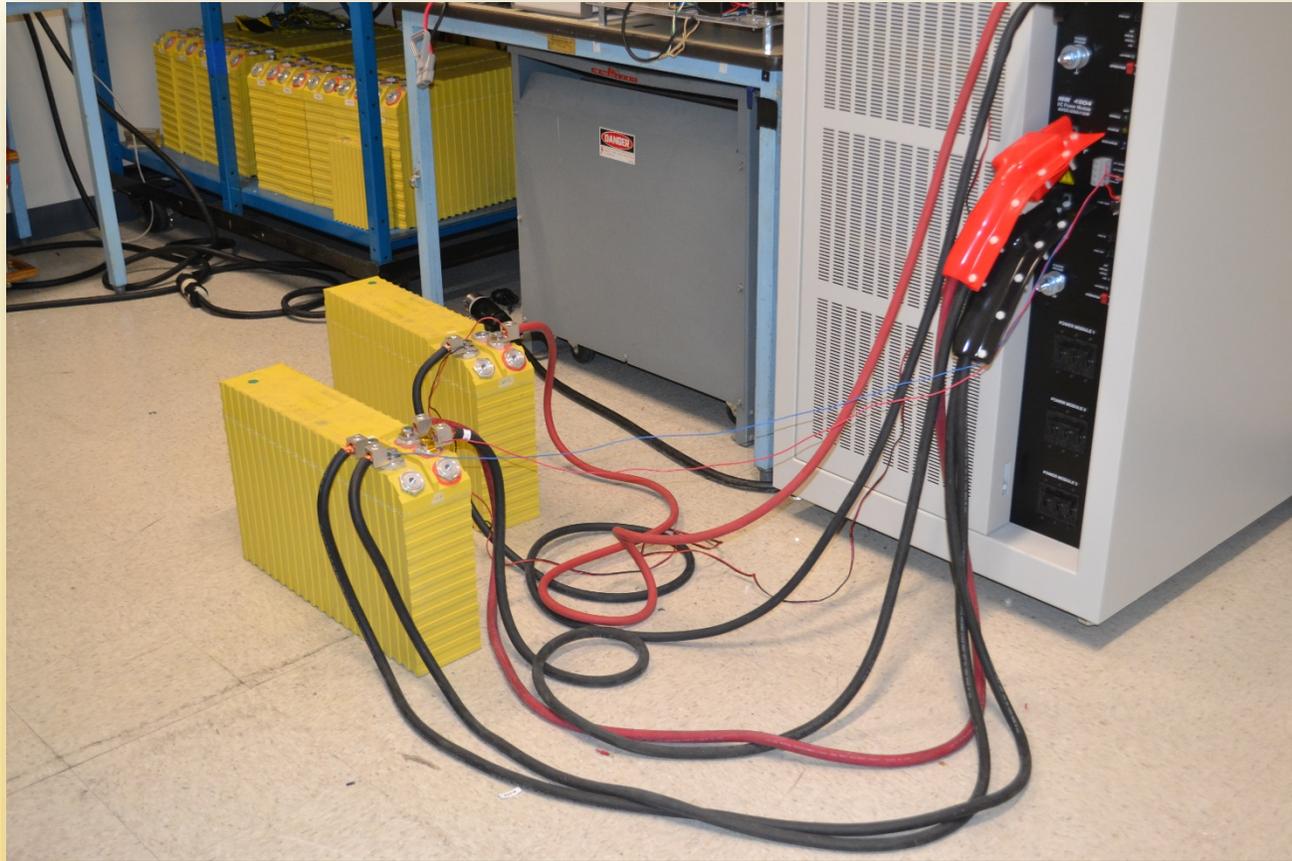
Real-Time Vehicle
Trajectory Data



FACILITIES UPDATES: PORTABLE CHAMBER



FACILITIES UPDATES: BATTERY TEST ROOM



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2016 SCHOLARSHIP AND STUDENT AWARDS

- **Robert Espinoza:** Ford Undergraduate Fellowship, June 2016
- **Jiacheng “Joey” Yang:** William R Pierson Graduate Fellowship, June 2016
- **Yu “Jade” Jiang:** Esther F. Hays Graduate Fellowship, June 2016
- **Partho Roy:** Colin E. Hackett Graduate Award, June 2016
- **Paul Van Rooy:** Salim Khan Award, June 2016 (not pictured)



**Jiacheng (Joey)
Yang**
*William R.
Pierson/Ford
Graduate Fellowship*



Yu (Jade) Jiang
*Esther F. Hays
Graduate Fellowship*



Partho Roy
*Colin E. Hackett
Graduate Award*



Robert Espinoza
*Ford Motor Company
Undergraduate
Award*

OUR 2016 PH.D. GRADUATES

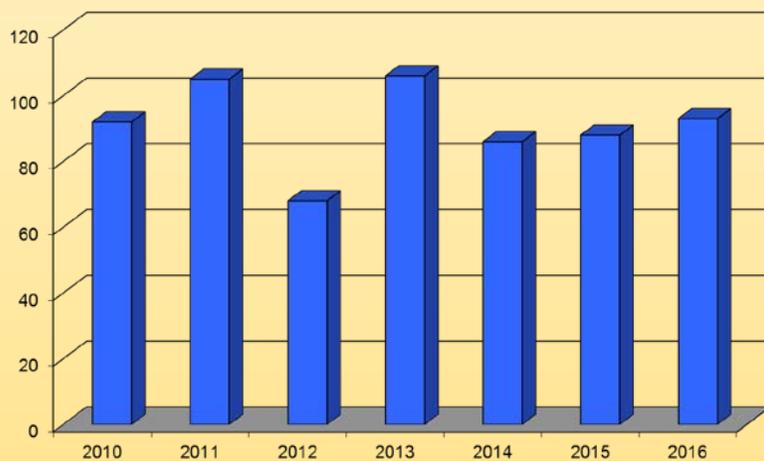
- [Samarthya Bhagia](#). “Factors Contributing to Recalcitrance of Poplar to Deconstruction,” Ph.D. dissertation, Department of Chemical and Environmental Engineering.
- [Mary Kacarab](#). “Impacts of Controlling Reactivity and Temperature on Advanced Study of Secondary Organic Aerosol Formation,” Ph.D. dissertation, Department of Chemical and Environmental Engineering.
- [David Kari](#). “Adaptive/Optimal Vehicle Infrastructure Integration with Intelligent Vehicles & Complex Networked Control Systems,” Ph.D. dissertation, Department of Electrical and Computer Engineering.
- [Lijie \(Sara\) Li](#). “Insights into Predicting Secondary Organic Aerosol Formation from Anthropogenic Volatile Organic Compounds: Impact of Molecular Structure and NO_x Concentration,” Ph.D. dissertation, Department of Chemical and Environmental Engineering.
- [Taehoon Lim](#). “Nanoengineering of ZnO Electrical and Optical Characteristics by Controlling its Morphology and Defects via Reaction Kinetics, Fluid Dynamics, and Stoichiometry in Low-Pressure CVD Synthesis,” Ph.D. dissertation, Department of Materials Science and Engineering.
- [Thanh Yen Vuong Nguyen](#). “Integration of a Novel Co-solvent Enhanced Lignocellulosic Fractionation (CELF) Pretreatment with Biological Conversion to Ethanol,” Ph.D. dissertation, Department of Chemical and Environmental Engineering.
- [Vanessa Ann Thomas](#). “Understanding Synergies Between Pretreatment, Feedstock, and Consolidated Bioprocessing for Lignocellulosic Biomass Conversion,” Ph.D. dissertation, Department of Chemical and Environmental Engineering.
- [Xuewei Qi](#). “Real-time On-line Intelligent Energy Management for Plug-in Hybrid Electric Vehicles,” Ph.D. Dissertation, Department of Electrical and Computer Engineering.

PUBLICATIONS

NOW

ONLINE!

Number of Peer Reviewed Publications



By Calendar Year

Publications

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[Giving](#)

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Publications in eScholarship

In support of the UC system-wide initiative to implement a centralized system for managing publications, the Center for Environmental Research and Technology is now using the [eScholarship](#) platform as its central data repository.

eScholarship provides many publication tools and services that simplify the publishing process, with the goal of giving the researcher direct control over the dissemination of his or her own work. eScholarship is also an important tool in supporting the [UC Open Access policy](#). Click [here](#) to learn more about how eScholarship works.



Quick Searches

- > Click [here](#) to view all CE-CERT publications in eScholarship.
- > Click here to view our [2016 publications](#) in eScholarship ([complete list in PDF](#)).
- > Click here to view our [2016 Annual Report](#) .

Advanced Searches

The eScholarship platform provides a set of tools that allow the user to search by title, keyword(s), author, publication year, and other criteria. To access these tools, use the author search link below. Once the page has loaded, you will see the Advanced Search option below the Search Publications text box in the upper right corner. Click on this link to access the advanced search tools.

- > Click [here](#) to view publications by author.

Alternatively, you may use the Browse Content menu option from the [eScholarship](#) home page.

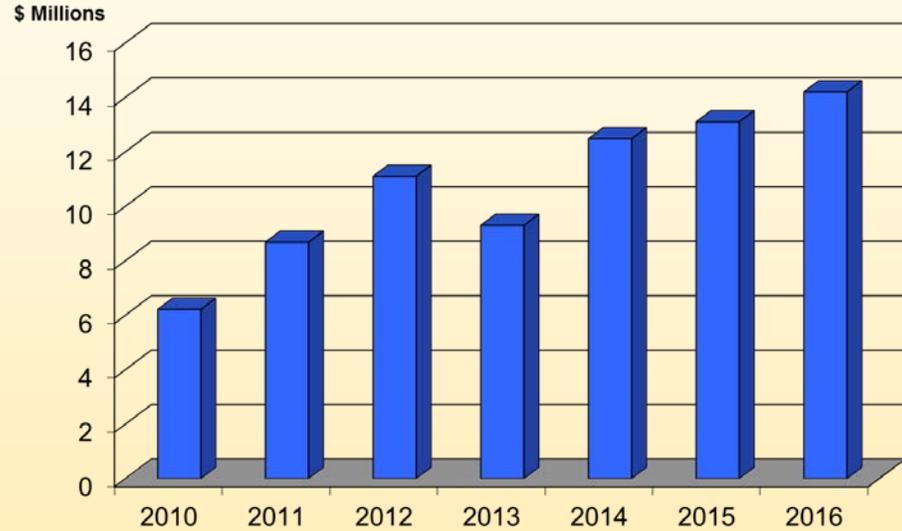
Featured Publications by Research Area

Advanced Thermochemical Research Laboratory

- > [Synthetic Natural Gas Production by Sorption Enhanced Steam Hydrogasification Based Processes for Improving CH₄ Yield and Mitigating CO₂ Emissions](#)
- > [Development of a Fuel Sensor Technology for a Variable-blend Natural Gas Vehicle](#)

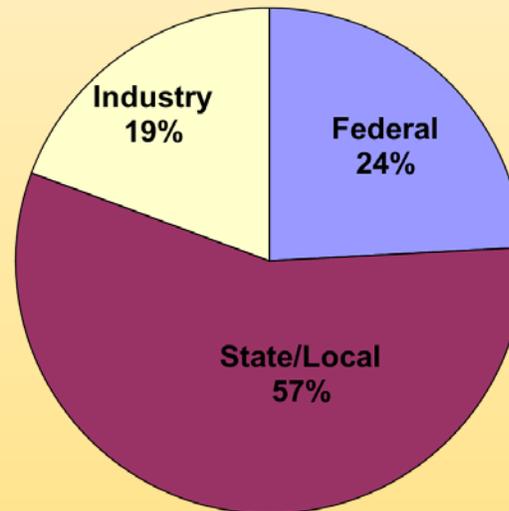
FUNDING ACTIVITY: OVERVIEW

Active Research Dollar Volume



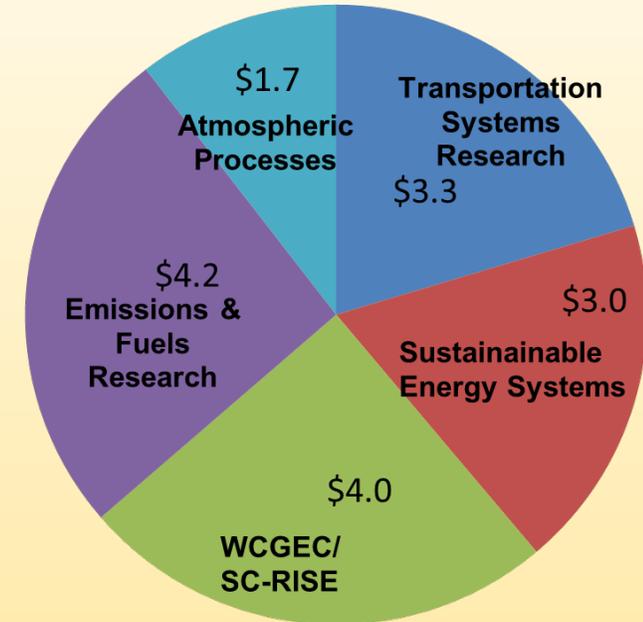
by calendar year, not including cost share contributions

Research Fund Sources 2016*



* not including cost share

Active Research Awards By Area
3 Year Average 2014- 2016



\$ in Millions,
not including cost share contributions

UCR ADMINISTRATIVE LANDSCAPE

- Provost & Executive Vice Chancellor stepped down in December 2016
- Interim Provost now in place: Cindy Larive
- BCOE Dean search inconclusive in 2016, restarting in 2017
- 1st phase of faculty cluster hires now complete; second phase is on hold
- Distributed budget model is now in place, however, many details need to be worked out
- New large effort within Research and Economic Development for Industry Engagement