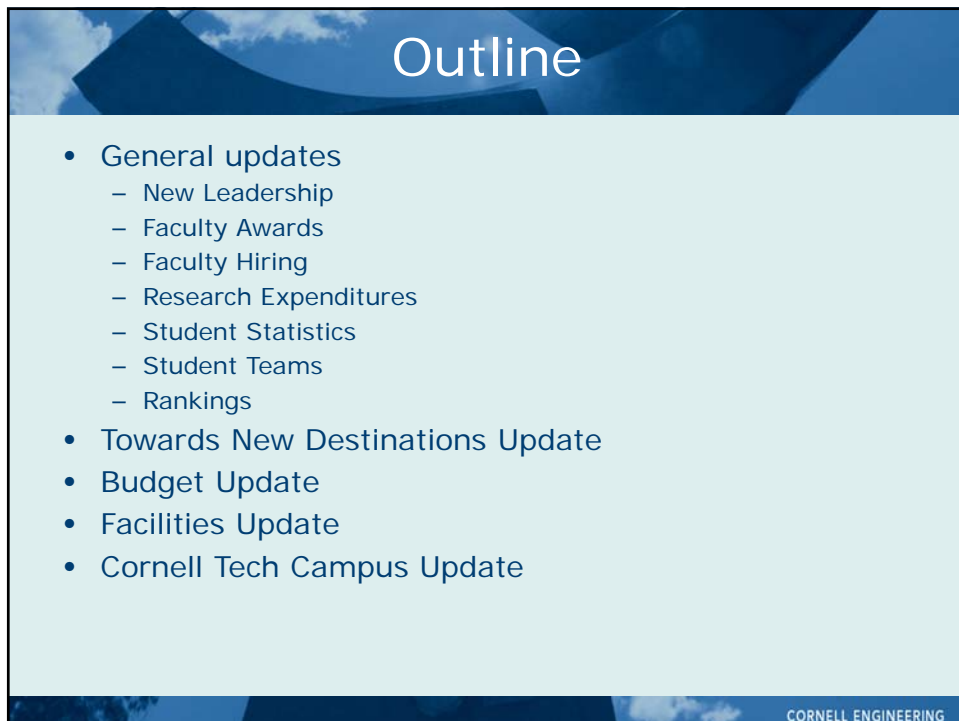



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College of Engineering Update

April 4, 2013
Lance R. Collins
Joseph Silbert Dean of Engineering



Outline

- General updates
 - New Leadership
 - Faculty Awards
 - Faculty Hiring
 - Research Expenditures
 - Student Statistics
 - Student Teams
 - Rankings
- Towards New Destinations Update
- Budget Update
- Facilities Update
- Cornell Tech Campus Update

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Associate Dean for Academic Affairs Cornell NYC Tech Campus



Rajit Manohar
Professor
Electrical and Computer Engineering

- Joined Cornell in 1998.
- Degrees received
 - B.S. (1994), M.S. (1995), Ph.D. (1998) in Computer Science, California Institute of Technology
- Research Focus
 - Asynchronous design
- Manohar will serve as a half-time faculty member at Cornell Tech and half time at Cornell in Ithaca.

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Major Faculty Awards

- **Stephen H. Weiss Presidential Fellowship**
 - Sheila Hemami (ECE) (in recognition of her inspiring teaching of undergraduate students)
- **Academy Award for Technical Achievement**
 - Doug James (CS), along with Theodore Kim '01 and Nils Thuerey and Markus Gross of Eidgenössische Technische Hochschule Zürich Award for wavelet turbulence software, which generates realistic swirling smoke and fiery explosions.
- **American Society of Mechanical Engineers (ASME)**
 - Alan Zehnder (MAE)
- **Sloan Research Fellow**
 - Julius Lucks (CBE)

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Major Faculty Awards

- **Microscopy Society of America Fellow**
 - David Muller (AEP)
- **Microscopy Society of America Albert Crewe Award**
 - Lena Kourkoutis (AEP)
- **Optical Society Fellow**
 - David Erickson (MAE)
- **Inaugural Class of American Mathematical Society (AMS) Fellows**
 - Eva Tardos (CS)
 - Juris Hartmanis, emeritus professor (CS)

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2013 Cook Awards

Alice H. Cook & Constance E. Cook Awards in recognition of those who have made significant contributions to changing the climate for women at Cornell University.

- **Sara Xayarath Hernandez**, Director, Diversity Programs in Engineering
- **Cynthia A. Reinhart-King**, Assistant Professor, Biomedical Engineering
- **Natasha Udpa**, Graduate Student, Mechanical & Aerospace Engineering
- **Elizabeth Wayne**, Graduate Student, Biomedical Engineering

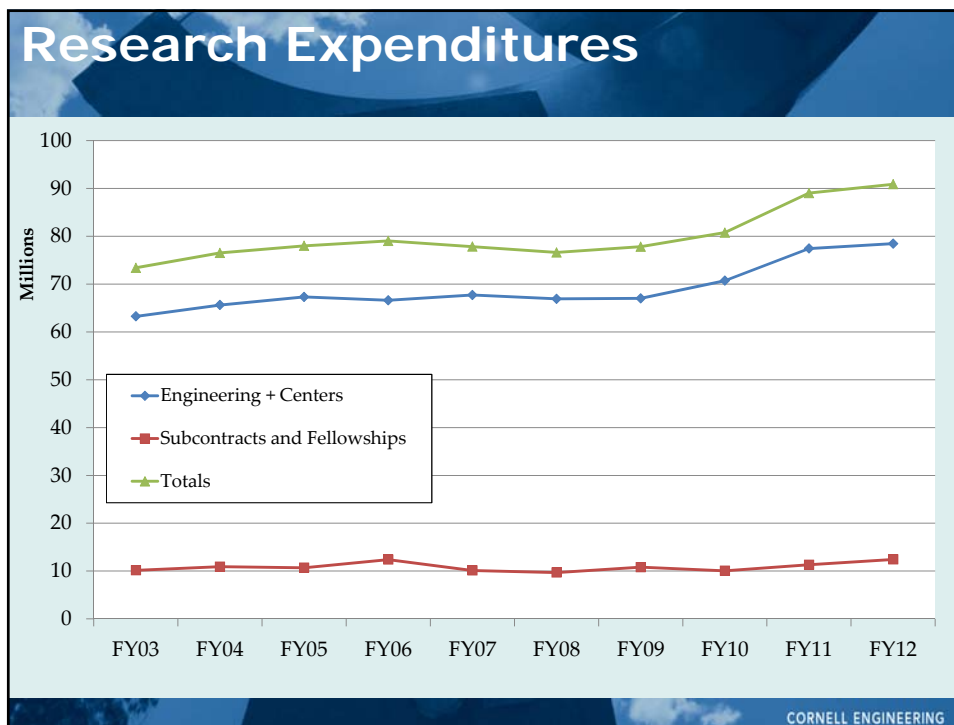
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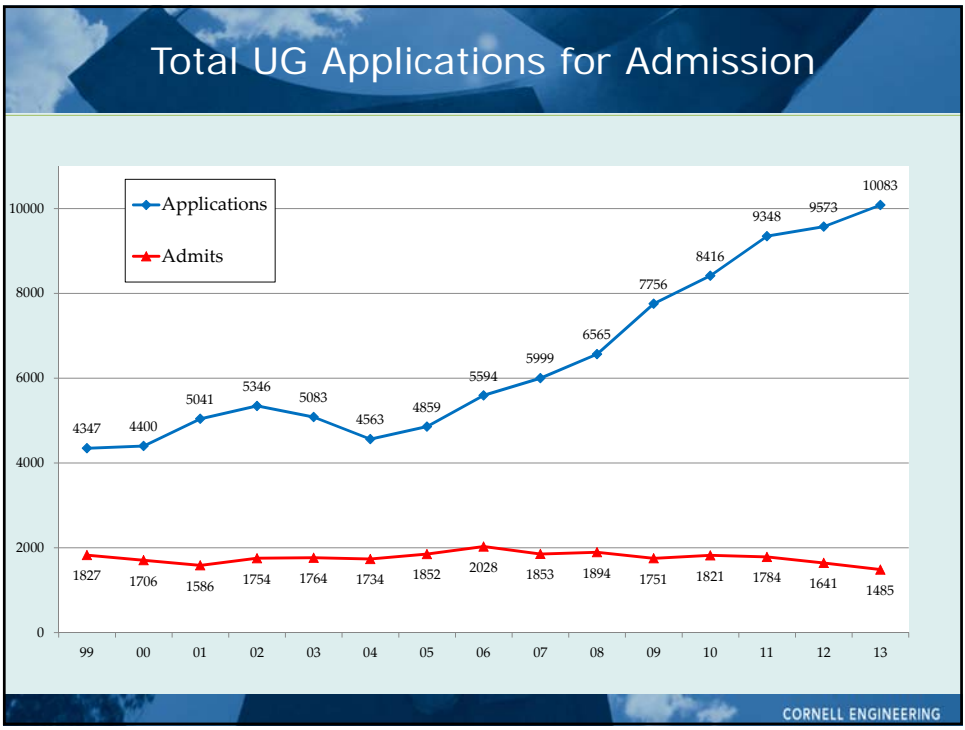
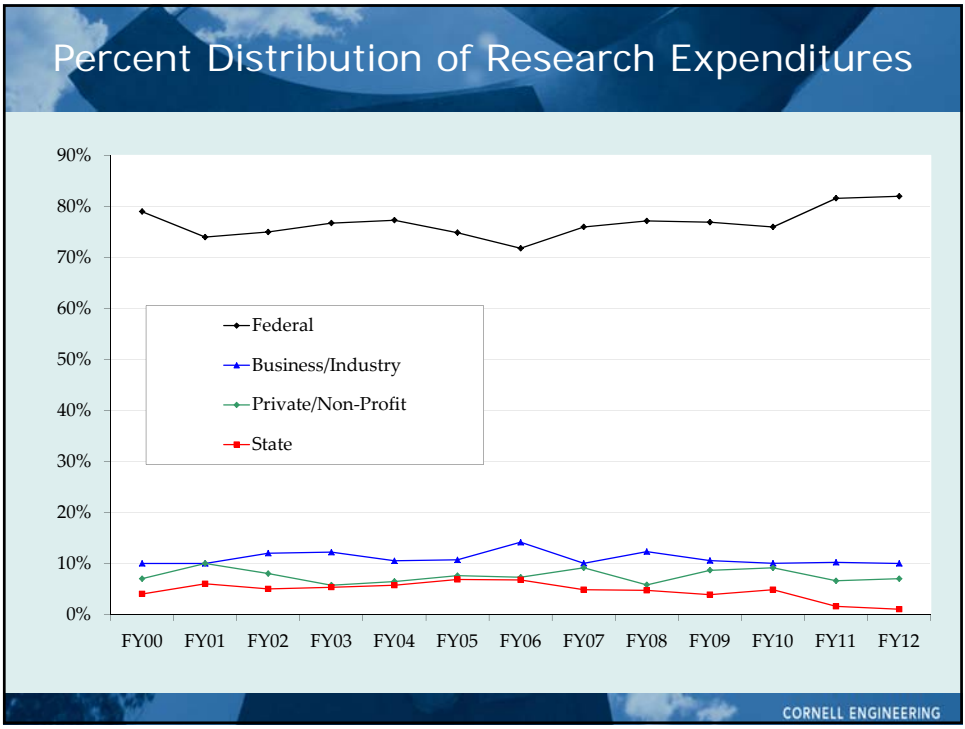
College of Engineering Faculty Hires

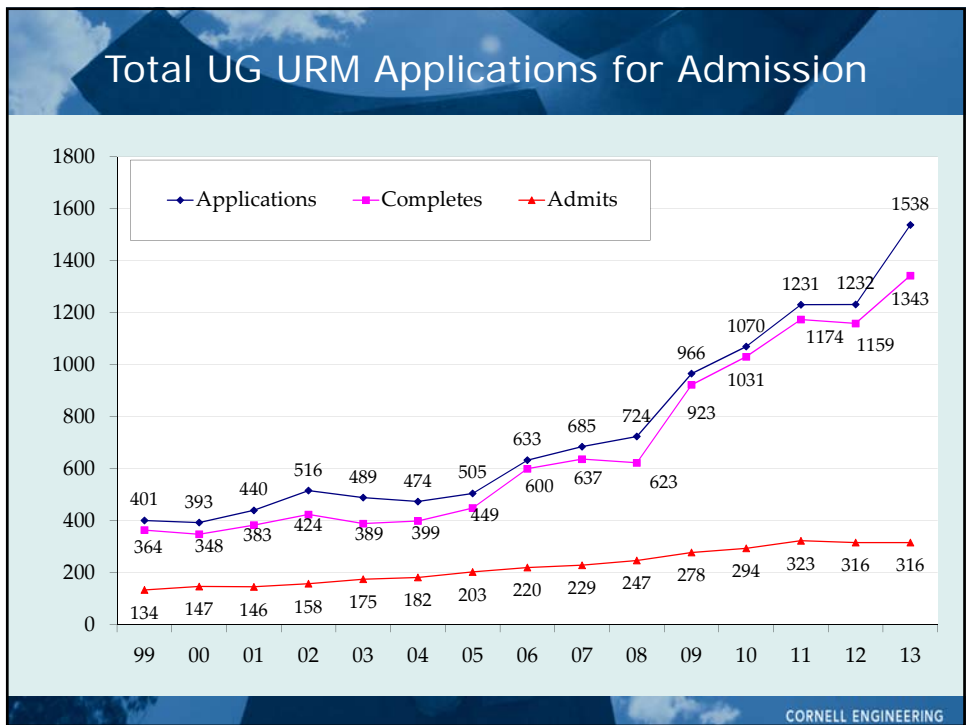
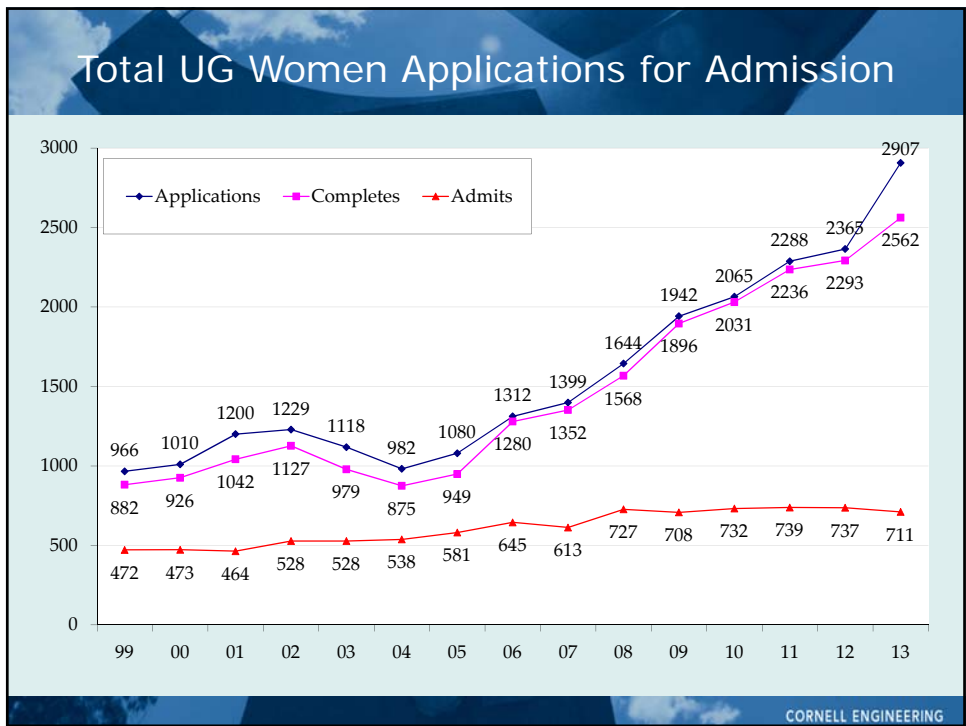
Department	AY 2009-10		AY 2010-11		AY 2011-12	
	Men	Women	Men	Women	Men	Women
AEP	0	0	1	1	0	0
BME	0.25	0	1	0	0	0
CEE	1	0	0	0	2	0
CBE	1	0	0	1	0	0
CS	0	0	1	0	1	1
EAS	0	0	0	0	1	0
ECE	0	0	2	0	0	1
MSE	0	0	0	1	1	0
MAE	0.75	0	1	2	2	0
ORIE	0	0	0	1	3	0
Total	3	0	6	6	10	2

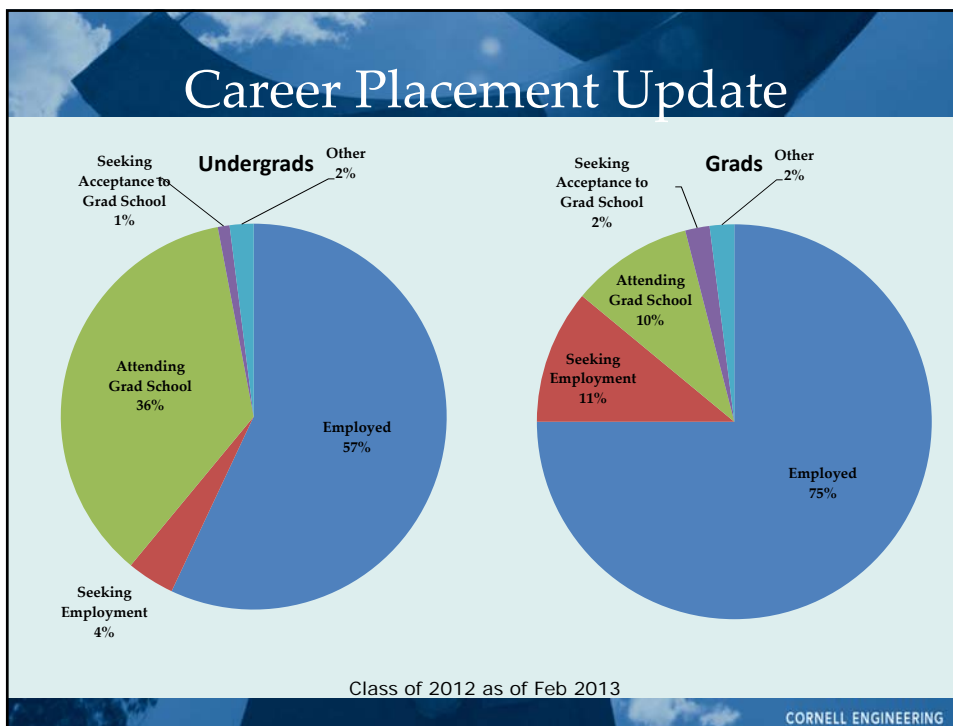
URM

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Student Teams




CUSD students promote sustainability on inaugural cross-country Students@Greenbuild bus tour



ChemE Car "Zapdos" wins Nationals for 3rd time since 2008

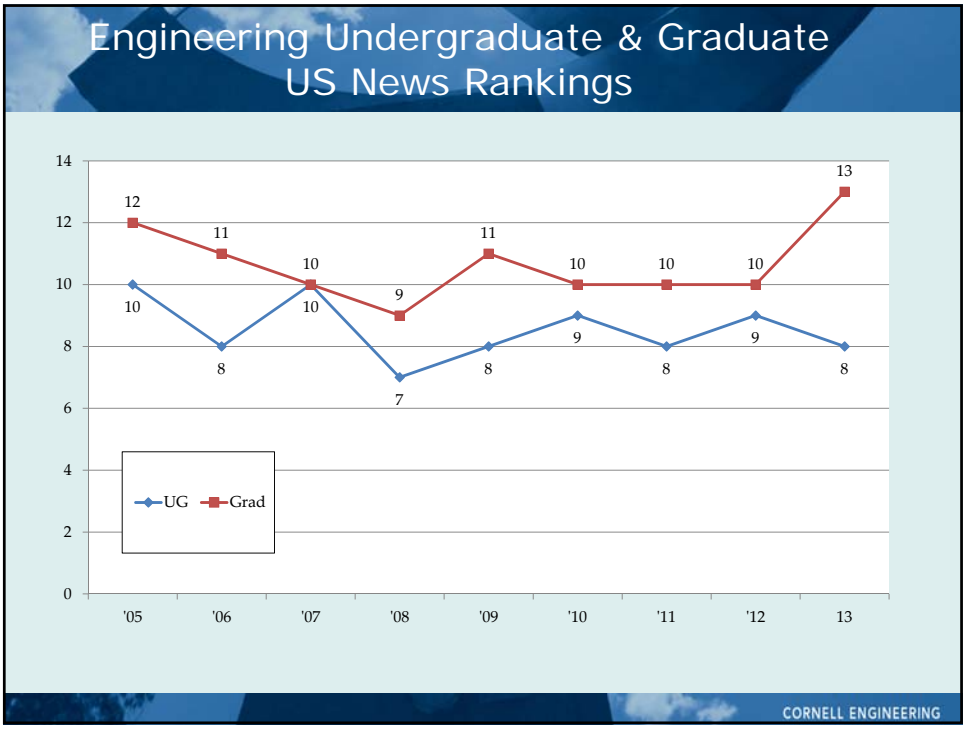


Cornell University Genetically Engineered Machines (CU GEM) design toxin sensor using electroactive bacteria.



AguaClara wins Katerva Award for urban design

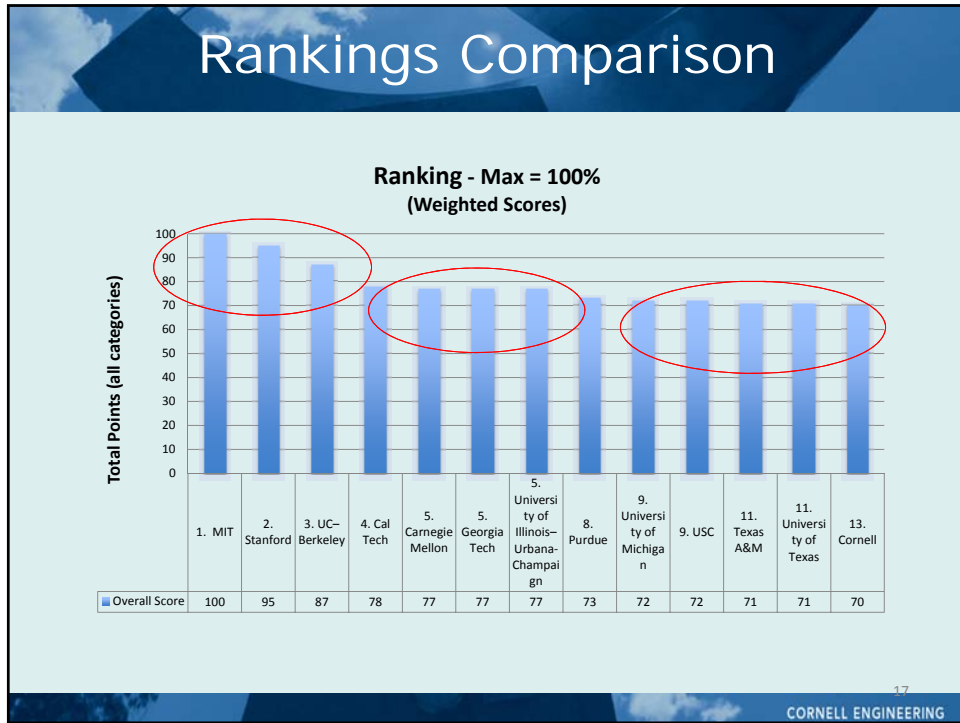
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Cornell Engineering Graduate Program Specialty Ranking 2010 - 2013

Year Rankings Released	2010	2011	2012	2013
College of Engineering	10	10	10	13
Aerospace	12	11	11	11
Bio/Agriculture	4	4	3	3
Biomedical	20	20	15	20
Chemical	13	13	17	16
Civil	10	10	8	10
Computer Engineering	NR	8	9	5
Electrical	9	9	9	7
Environmental	14	14	12	11
Industrial	8	8	10	7
Materials	8	8	10	7
Mechanical	8	8	9	9

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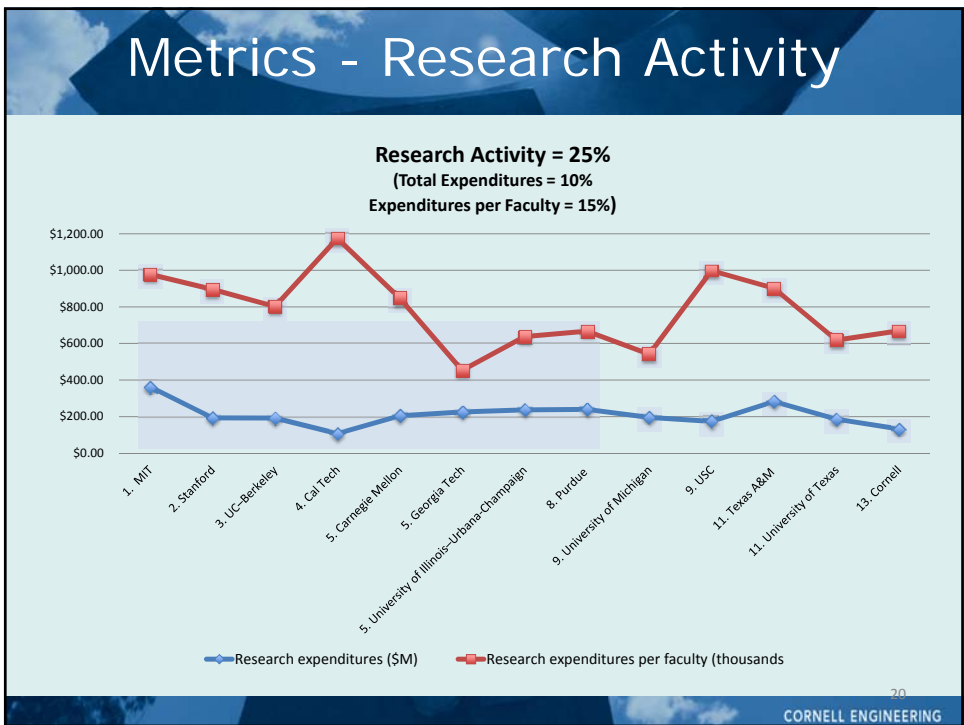
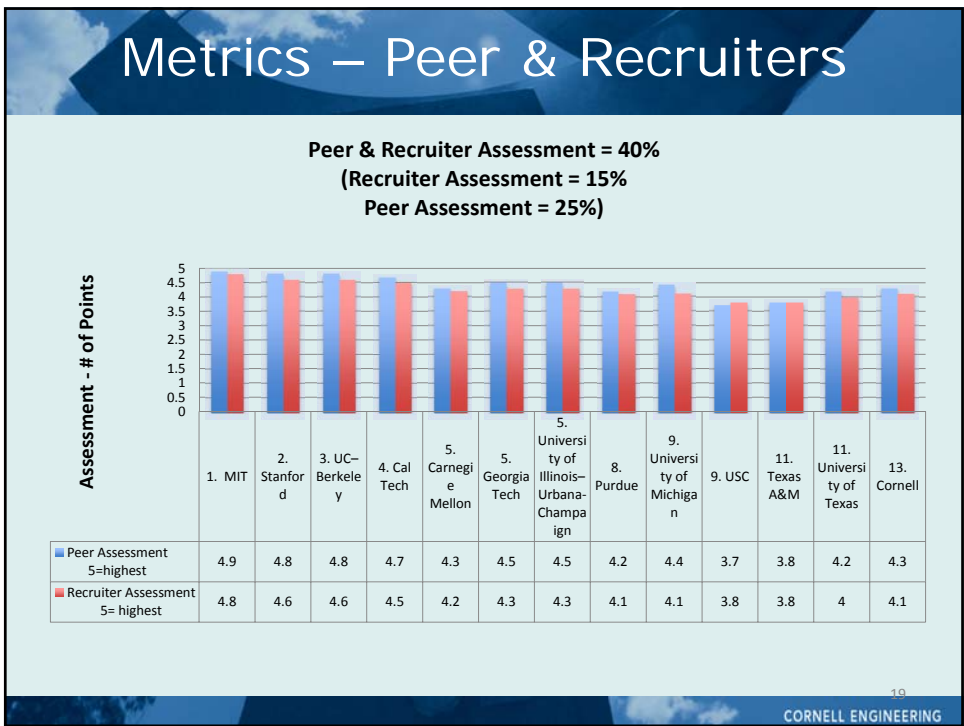


College Ranking US News

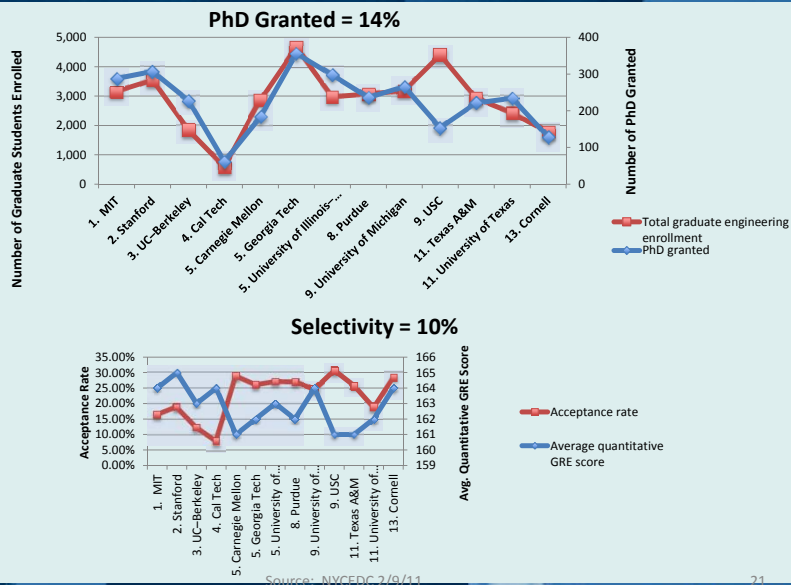
- Issued this March
- Based on complex formulas that measure very subtle fluctuations
- Metrics:

Metric	Weight
Quality Assessment	40%
-Peer Assessment (engineering deans)	25%
-Recruiter Assessment (corporate and company contacts)	15%
Student Selectivity	10%
-Mean GRE Quantitative Score	6.75%
-Acceptance Rate	3.25%
Faculty Resources	25%
-Student to Faculty Ratio	11.25%
-Percent Faculty in NAE	7.50%
-Doctoral Degrees Awarded	6.25%
Research Activity	25%
-External Research Expenditures	15%
-Research Dollars per Full-Time Tenured & Tenure Track	10%

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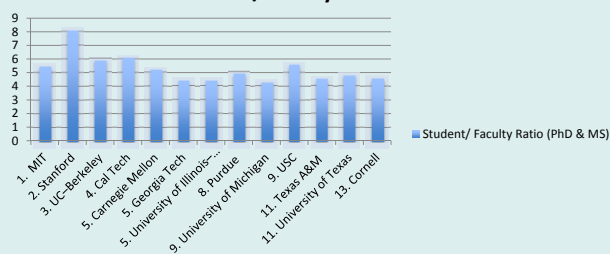


Metrics - PhD Granted & Selectivity

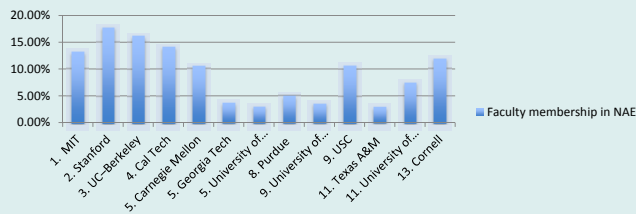


Other Metrics

Students/Faculty Ratio = 7.5%



Faculty Membership in NAE = 3.75%



Towards New Destinations

- Institutional diversity planning initiative
- Developed by the University Diversity Council
- Started 2012-2013
- Each college and unit selects five annual initiatives that best match their particular contexts and goals.
- These become areas of focused effort.
- Each unit reports annually on progress.

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Organizing Rubric

- The framework is structured according to four core principles:
 - **COMPOSITION**
 - **ENGAGEMENT**
 - **INCLUSION**
 - **ACHIEVEMENT**
- Composition refers to the demographic make-up
- Engagement reflects personal, social, and professional commitment to institutional goals and activities; retention
- Inclusion comprises climate and interpersonal relations; climate
- Achievement reflects levels of attainment for underrepresented individuals or groups; opportunities

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2012-13 Initiatives: Engineering

- **COMPOSITION—faculty**
 - Increase the number of underrepresented and women faculty.
- **COMPOSITION—undergraduate students**
 - Increase the overall enrollment of women and underrepresented undergraduates
- **INCLUSION—undergraduate students**
 - Launch the Engineering Leadership Program, designed to develop students' skills in self-awareness, communication and inclusive team-building.
- **INCLUSION—faculty, staff, post docs and academic professionals**
 - Faculty, staff, postdocs, and academic professionals to complete Respect@Cornell training.
- **ENGAGEMENT—undergraduate students, graduate students, faculty, staff**
 - Develop an inclusive, college-wide **communications plan**, including targeted presentations and meetings, and the **development of unit level initiatives**.

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Why emphasize diversity?

“The answer to the problem (of increasing America's STEM talent pool) lives next door, around the block, or across town. Increasing the presence of underrepresented minority (URM) Americans in the study of STEM disciplines must be a primary part of the ultimate solution to the problems of the United States' endangered competitiveness.”

National Action Council for Minorities in Engineering (NACME) 2008 report, Confronting the New American Dilemma

“Only 1.3 percent of the women graduating from U.S. colleges and universities are engineers! The fact remains that engineering is attracting only a small share of the fastest growing segment of college students. This is a huge waste of talent ... our two largest racial minority groups comprise about one third of the college-age kids in our country, and that fraction is steadily growing. But ... they earn less than 13 percent of the engineering degrees.”

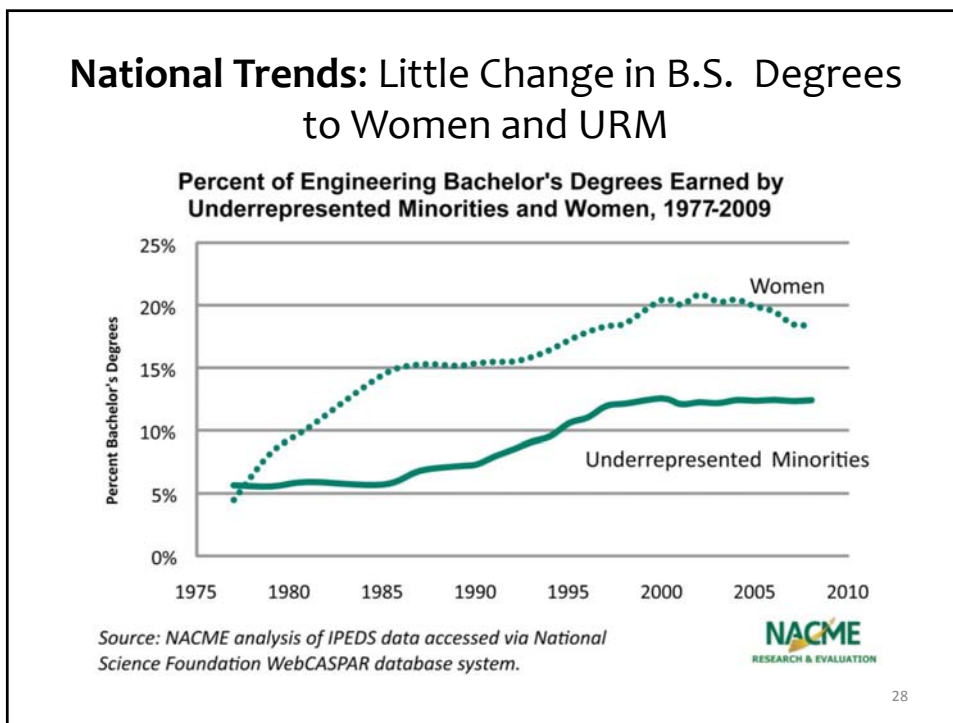
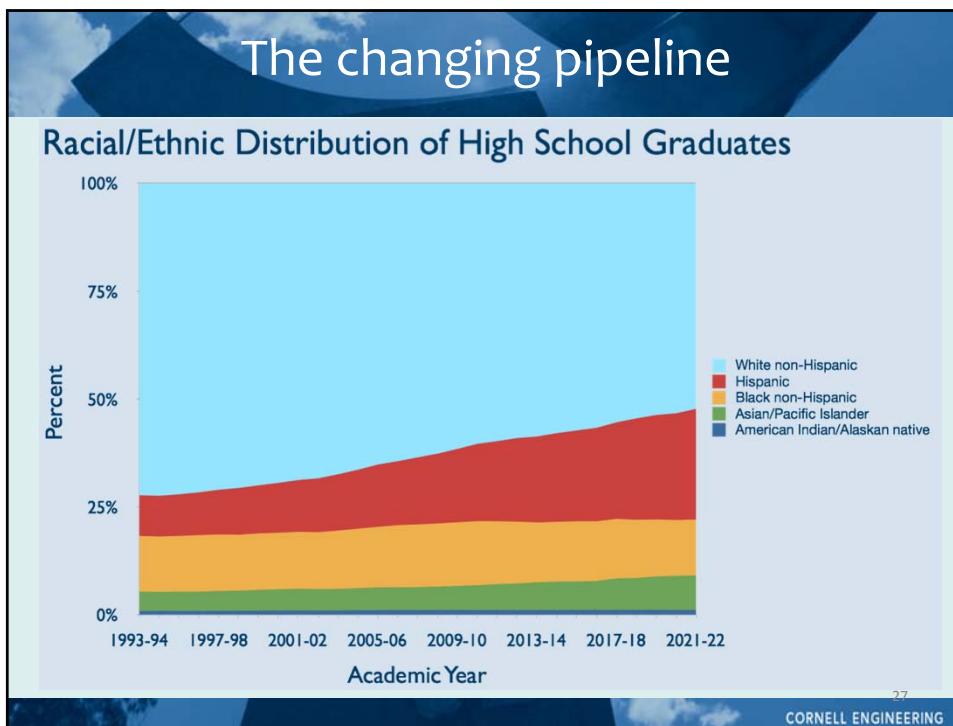
Charles M. Vest, President, NAE, 2011

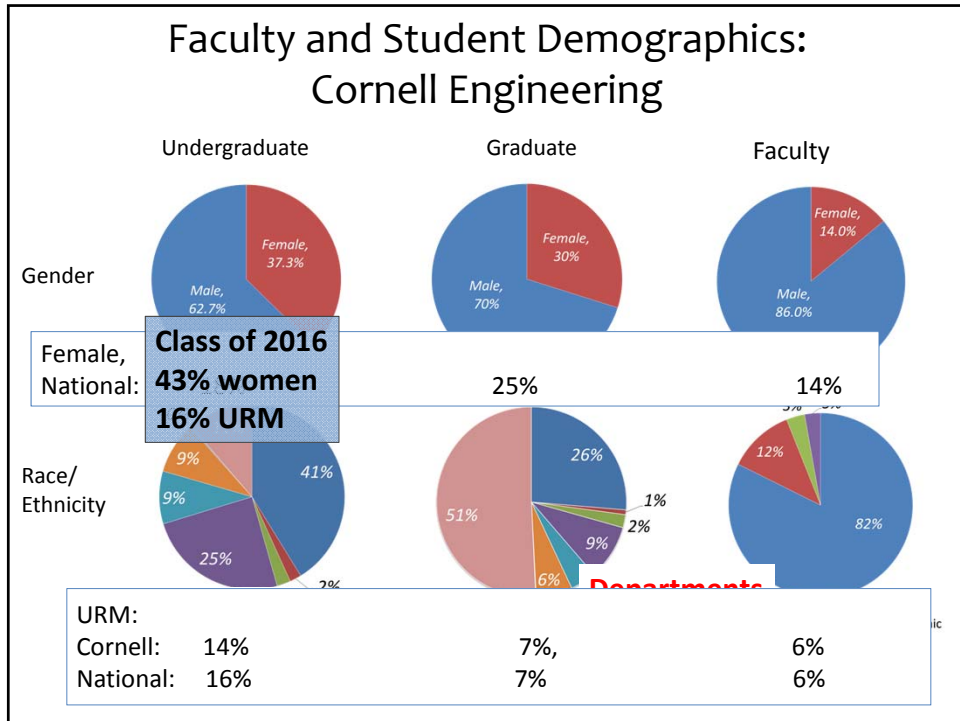
“Radical innovations often happen at the intersections of disciplines... The more diverse the problem solving population, the more likely a problem is to be solved.”

Harvard Business Review, 2007

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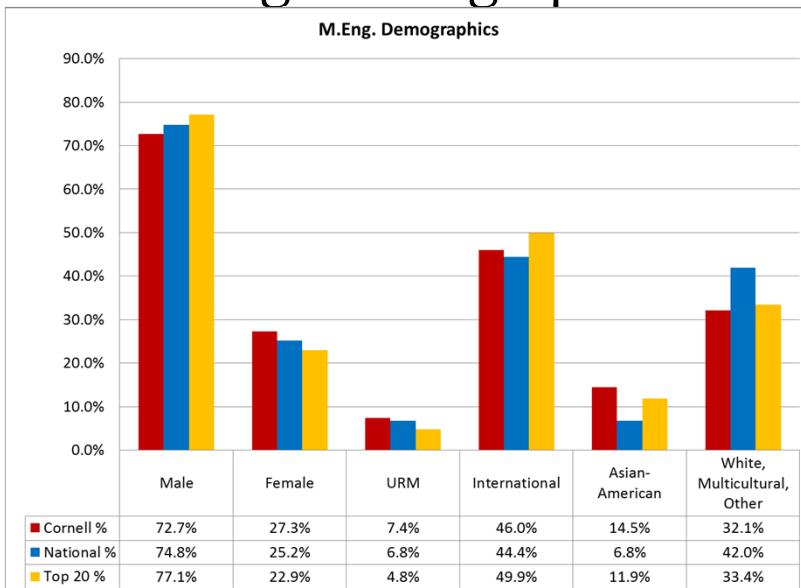


Undergraduate completions

Completion: class entered in 2006

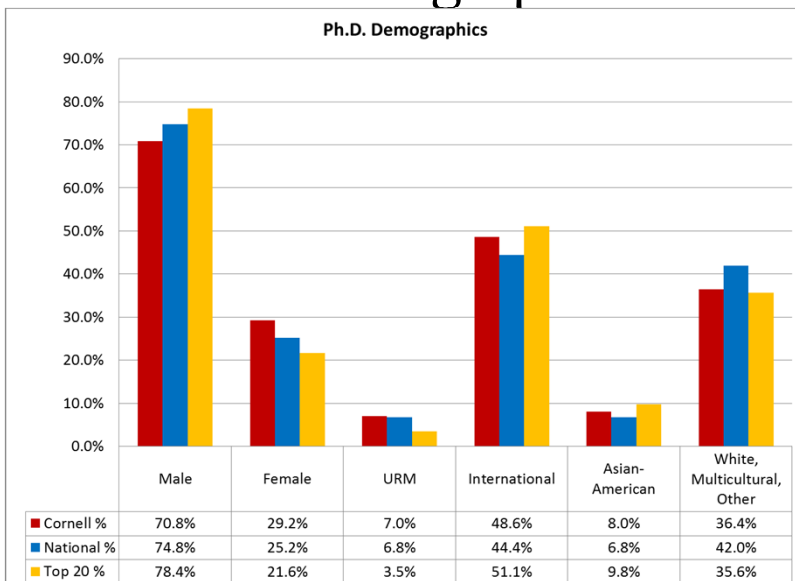
	Bachelors: Engr	Bachelors: any Cornell major
Male	83%	90%
Female	80%	93%
URM	76%	85%
Intl.	82%	87%
Asian-American	88%	93%
White, Multicultural	85%	93%
Overall	82%	91%

M.Eng. Demographics

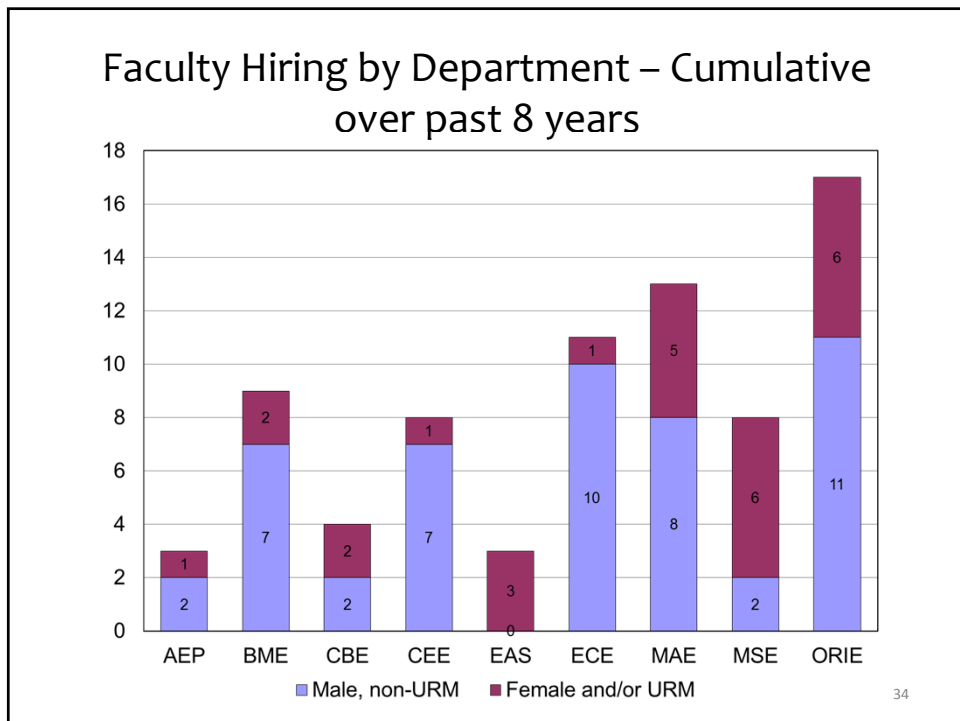
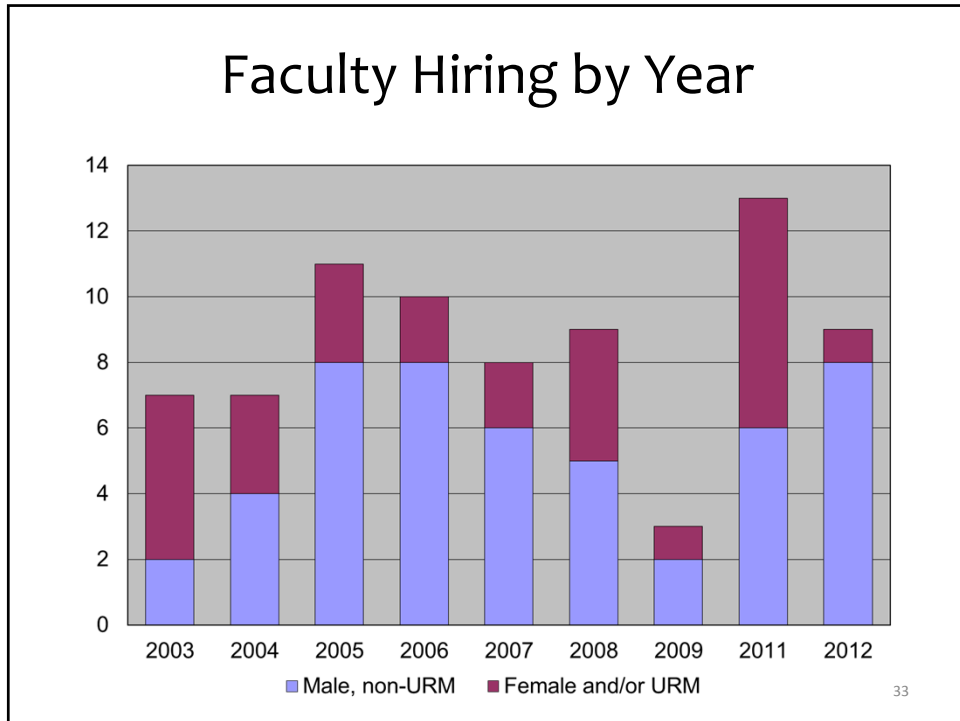


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Ph.D. Demographics



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Discussion

- What steps has department taken to address **faculty** diversity?
- How can the college help?

- What steps has department taken to address **graduate student** diversity?
- How can the college help?

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New Budget Model

- Strategic decision with long term implications
- Three year initiative
 - Thoughtful process
 - Input from key constituents
 - “Small” Dean’s group fully engaged
- Focused on mission of university
- In line with peer university models

Kent Fuchs, Elmira Mangum, Lance Collins, Peter LePage, Kathryn Boor, Mike Kottikoff, Dan Huttenlocher, Barb Knuth

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Budget Model Key Features

- Consolidates three different models in the university (Endowed, Contract, Tub)
- Provides consistent distribution of revenue and expenses (based on metrics)
- Increases transparency-visibility into costs of running college and university
- Allocates strategic funding to Provost (USP)
- Empowers colleges to manage their budgets
 - All revenue & expense streams identifiable; controllable
 - Relieves MEng as the only control variable
- Concerns
 - Underfund a critical college (e.g., CoE, A&S)
 - Unintentionally incent “bad” behavior

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Status of Budget Implementation

- High-level modeling principles defined
- FY 2014 (AY 2013-2014) is transition year
 - Budget allocated by new model
 - Provost subsidy will “bridge” to old budget
- Detailed data for revenue and expenses under review by colleges
- Final budget numbers on March 15
- Plan college implementation for departments
 - Dean’s budget committee
 - Implementation model for departments

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Budget Model Outcome

- New way to view revenue and expenses
- Will require discipline and changes in some processes
- One year to plan for college implementation
- Opportunities...
 - Allocation of graduate tuition to increase program size
 - Incentives for reducing costs (e.g., building renovations)

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Facilities Challenges

- Aging building stock
- College-wide shortage of “wet” and “hybrid” labs
- BME has no room to grow in Weill Hall
- Resources
- Updated Facilities Master Plan
 - Estimated cost: \$147M over 5 years
 - Focus on renovating existing buildings
 - Targeted new construction

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Facilities Update

- Weill BME Instructional Lab (\$1,120,000) – COMPLETED
- Kimball Relocation / Renovation for Wet Labs (\$14,795,000) – IN PROCESS
- Upson Renovation (\$62,760,000)
- New Construction for BME (\$55,758,000) – SITE SELECTION PROCESS



Kimball Wet Lab Concept

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Cornell NYC Tech Update

- Currently located in Google Building (8th and 9th avenues, 15th and 16th streets)
- Campus Leadership
 - **Dan Huttenlocher**, Dean and Vice Provost
 - **Cathy Dove**, Vice President
 - **Craig Gotsman**, Director of Technion-Cornell Innovation Institute (TCII)
- Other Hires
 - **Debra Estrin**, Professor of Computer Science
 - **Greg Pass** (former CTO Twitter), Entrepreneurial Officer
- Cornell MEng degrees approved in NYC
 - CS, ECE, ORIE and IS
- Beta CS class started Jan 2013

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Cornell NYC Tech Update

- Executive Committee drafted operating procedures
 - Cornell Tech faculty appointments
 - Cornell Ithaca faculty involvement in Cornell Tech
 - Cornell professional masters degrees
 - Cornell PhD students at Cornell Tech
 - Guidelines for creating new programs
 - TCII/Cornell faculty appointments
 - TCII dual masters degree – connective media
- Technion-Cornell Innovation Institute (50/50 partnership)
 - Legal agreement approved by both boards
 - Initial planning of “hubs”
 - TCII hiring initiated

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Cornell NYC Tech Update

- Cornell Tech partners with Commerce Department to innovate on how to facilitate commercialization
- Design of Academic Building #1
 - Thom Mayne of Morphosis
 - What have we learned from hurricane Sandy?
- 3rd Party Construction
 - Commercial/Incubator space; Residential housing; Executive training

How do we design an exciting academic program that is successful at producing entrepreneurial leaders?

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A few reflections on the Fall 2012 meeting

- Cornell faculty
 - Teaching excellence is a high priority
 - ETEI provides great support
 - Use social “experts” and “tools” to help identify the faculty with best fit
- Undergraduate education
 - Technical depth; broadening opportunities
 - Leadership training for all (distinguish between “visionary” leadership and management)
 - Active learning strategies
 - MOOCs are here to stay – disruptive?
 - Bending the cost curve (without sacrificing quality)
- Branding

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How should we choose topics for ECC discussion?

- Dean’s choice
- At the intersection of college needs and board expertise
- Ongoing discussions (some topics)
 - Pre/Post-meeting input (e.g. branding)
 - Task force (e.g. tech transfer)
 - Involve relevant university leadership

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What is the ideal format for the ECC meeting?

- Allow plenty of time for interaction and discussion
- Well defined questions
- Posted slide decks not effective; “Flip the classroom” online presentations
- Incorporate presentations from student groups, teams, etc.
- Better use of confluence site for ongoing discussions

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How should we report back recommendations?

- ECC is a “council” not a “board”
- “Public” document
 - Share with college leadership team
 - Posted, allowing members to make further comments via email
 - Provides a permanent record
- Chair’s notes from executive session
 - Clarity on whether public or private
- Option of presentations by committee members

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Additional advice

- Leadership program open to all CoE students
- Project-based learning expanded
 - 500+ students participating on project teams (across the campus)
 - Piloting a new project-based capstone design in CBE
 - Can we commercialize projects? (Cornell Tech will provide important guidance)
- Orientation for new members

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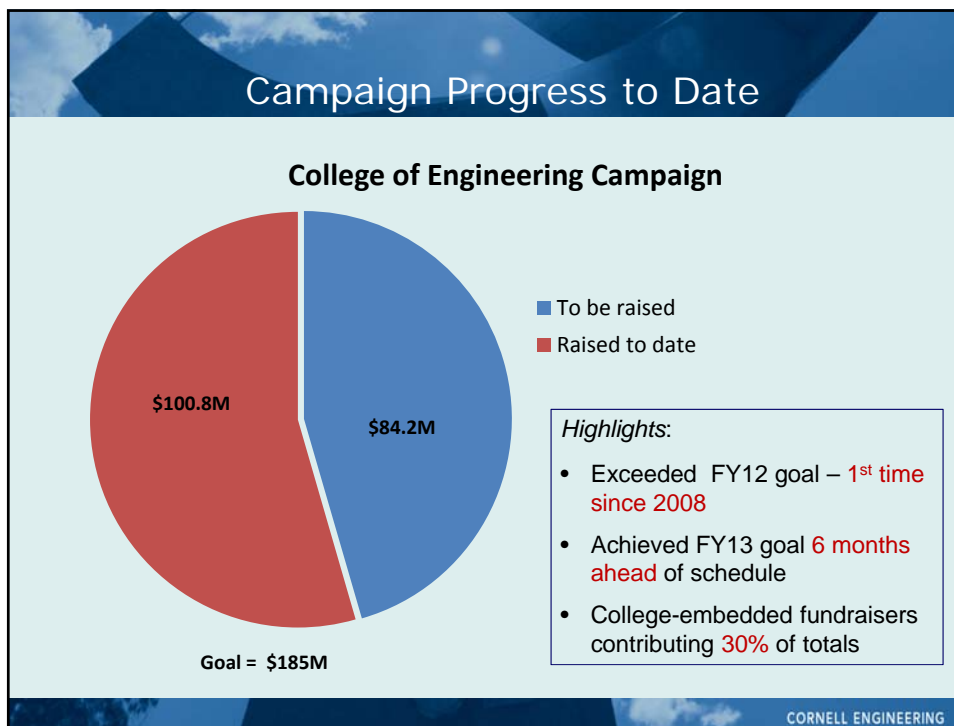
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College of Engineering Cornell Now Campaign Update

Kathi Dantley Warren, Assistant Dean
Alumni Affairs & Development

April 4, 2013





College of Engineering Campaign Priorities

❖ Bioengineering/BME	\$35M
❖ Graduate Fellowships	\$30M
❖ UG Scholarships	\$11.75M
❖ Experiential and Entrepreneurial Learning	\$10M
❖ Faculty Lines	\$9M
❖ Faculty Renewal	\$7.5M
❖ Energy & Sustainable Development	\$9M
❖ Faculty Diversity	\$1M
❖ Physical Sciences Bldg	\$1.25M

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Campaign Goals vs. Progress

PRIORITY: BIOENG/BME

Goal: Fund 4 additional faculty lines in BME

Progress: Funded 2* new professorships in BME

Robert S. Langer '70 Family and Friends Professorship

Anonymous Professorship



Robert S. Langer '70, PhD

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Campaign Goals vs. Progress

PRIORITY: FACULTY

Goal: Raise \$7.5M in current use Faculty Renewal funds

Progress: Secured \$5.4M in Faculty Renewal funds

Funds have helped to hire 11 new Engineering faculty across the College



Meredith Silberstein, PhD
Assistant Professor, MAE
Mills Family Faculty Fellow

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Campaign Goals vs. Progress

PRIORITY:
ENERGY/FACULTY

Goal: Provide increased capacity in Energy research

Progress: Funded 2 professorships

Wold Family Professor in Environmental Balance for Human Sustainability

Ronald C. and Antonia Vajk Nielsen Professorship



John F. H. Thompson, PhD
Wold Family Professor

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Campaign Goals vs. Progress



PRIORITY: PROGRAMS

Goal: Underwrite Student Teams program and other Experiential Learning Initiatives

Progress: Key initiatives funded
John A. Swanson '61 Director of Engineering Project Teams

&

*Swanson endowments for Student Project Teams
Academic Excellence Workshops
and
Engineering Learning Initiatives*

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Campaign Goals vs. Progress

PRIORITY: UG SCHOLARSHIPS

Goal: Improve access for undergraduates through enhanced scholarship opportunities

Progress: Surpassed \$11.75M goal
Raised \$15M for scholarships



PRIORITY: GRAD FELLOWSHIPS

Goal: Provide fellowships for all 1st year students

Progress: Raised \$11.3M towards \$30M goal

Kionix Graduate Fellowship in MSE/ECE

Prakash and Rukmini Sahai Graduate Fellowship in BME

Sporck Excellence in Analog Design Fellowships in ECE

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New Engineering Initiatives Enabled by Philanthropy

Engineering Leadership Program



Erica Dawson, PhD, Director



Werner Zorman, Associate Director

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New Engineering Initiatives Enabled by Philanthropy

CBE Pilot Program in Chemical Product & Process Design

- Anonymous \$900,000 gift funds 2 Industrial Practitioner positions
- Two-semester course begins fall 2013
- Integrates the discovery, design, and manufacturing of chemical products
- Plan to expand to all departments across the College
- MAE in pilot phase

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Current and Future Areas of Focus

❖ **Biomedical Engineering**

- facility and faculty lines

❖ **Graduate fellowships**

❖ **Energy Institute**

❖ **Annual Fund**

- Increase annual totals
- Increase overall alumni participation
- Achieve 100% from all Engineering volunteers

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