

CORNELL ENGINEERING

College of Engineering Engineering College Council Meeting

March 26, 2009
Christopher Ober
Interim Dean



Monday, March 23, 2009

Overview

- Overview of the Meeting - The College in a Period of Transition
- Who am I?
- New Deans, Directors, and Faculty
- Research in Sustainability and Energy
 - Centers
- State of the College (The good news)
 - Admission Trends
 - Research statistics
 - Goals as Interim Dean
- New Economic Reality (The bad news)
- Response to input from last ECC meeting

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Monday, March 23, 2009

CHRISTOPHER K. OBER, INTERIM DEAN (Start: Jan. 01, 2009)

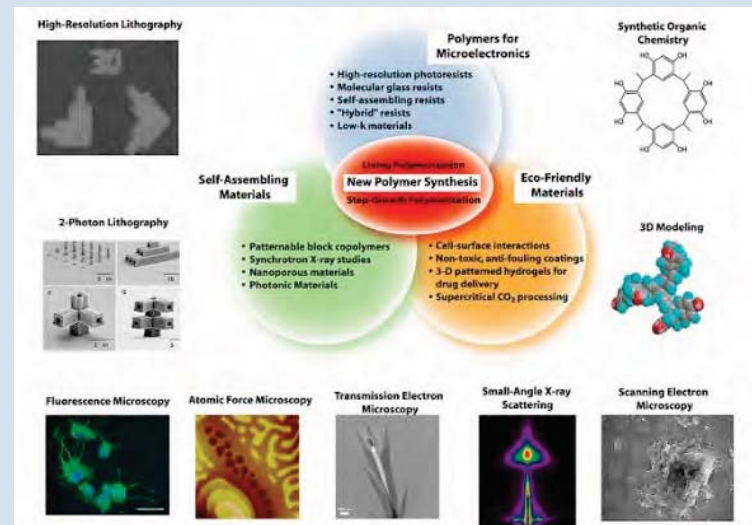
DEGREES:

- M.S. and Ph.D., University of Massachusetts
- B.Sc., University of Waterloo

APPOINTMENTS:

- Assoc. Dean for Research and Graduate Studies (9/07-12/08)
- Director, Department of MSE (1/00-12/03)
- Director of Graduate Studies, MSE (1/91-12/94)
- Francis Norwood Bard Professor of Materials Science (Came to Cornell Engineering in Sept. 1986 as an Asst. Professor)
- Xerox Research Centre of Canada
 - 9/84-8/86 Senior Research Staff
 - 4/82-8/84 NSERC Canada Industrial Post Doctoral Fellow

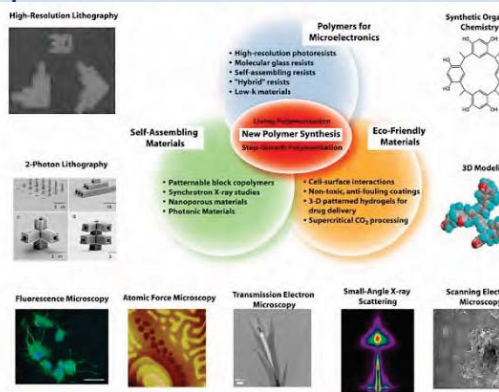
CHRISTOPHER K. OBER, INTERIM DEAN (Start: Jan. 01, 2009)



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AREAS OF RESEARCH FOCUS:

- Fundamental studies of self-organization in polymers
- Lithographic materials for microelectronics and biotechnology
- New environmentally and biologically friendly materials



AWARDS:

- 2008 NSF Special Creativity Award
- 2008 President, IUPAC Polymer Division
- 2007 Humboldt Research Prize
- 2006 ACS Award in Applied Polymer Science
- 2004 Photopolymer Science & Technology Award
- 2003 International Sematech Outstanding Contribution Award

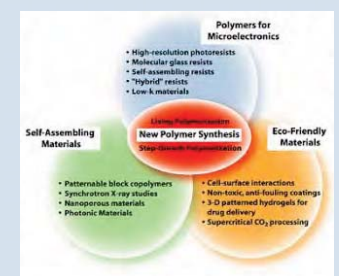
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Interim Associate Dean for Research and Graduate Studies—Marjolein van der Meulen

DEGREES:

- S.B. MIT
- M.S. Stanford
- Ph.D. Stanford

APPOINTMENTS:

- Professor, Mechanical and Aerospace Engineering, Cornell
- Senior Scientist, Hospital for Special Surgery, NYC
- Co-Director of the Advance Program

AREAS OF RESEARCH FOCUS:

Mechanics of biological materials, computational mechanics, solid mechanics



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Director of Electrical and Computer Engineering—Tsuhan Chen

DEGREES:

- B.S. National Taiwan University
- M.S. Caltech
- Ph.D. Caltech

APPOINTMENTS:

- Professor and Director, Electrical and Computer Engineering, Cornell University
- Professor and Assoc. Director of ECE and Co-Director of the Industrial Technology Research Institute Laboratory, Carnegie Mellon University

AREAS OF RESEARCH FOCUS:

Computer vision and pattern recognition, computer graphics, multimedia coding and streaming, multimodal biometrics, system implementation, bioinformatics



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New Faculty Starting in January or July '09



Salman Avestimehr-
ECE



Delphine Gourdon-
MSE



Hadas Kress-
Gazit-MAE



Brandon
Hincey-MAE



Xiling Shen-ECE



Noah Snively-CS



Jefferson Tester
('66, MS '67)-CBE

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ECC Leadership – New Chair and Vice Chair

- Robert W. Shaw, Jr., Chair of the ECC
 - Cornell B.S. '63 EP; M.S. '64 EE
 - Ph.D. from Stanford in Applied Physics
 - President, Aretê Corporation
 - Chairman and Director, CTP Hydrogen Corp.
 - Director, H2Gen Innovations, Inc.
 - Member, Dept. of Energy's Hydrogen Technology Advisory Committee (HTAC)
- Excellent candidate for Vice Chair identified

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Energy in the College

www.geo.cornell.edu/eas/energy

BEE CBE CEE EAS ECE MAE MSE



Wind



Solar

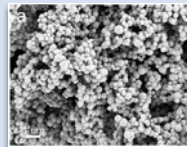


Energy

A developing area in the strategic plan



Fuel Cells



Batteries

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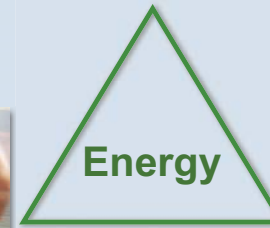
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Energy in the College

BEE CBE CEE EAS ECE MAE MSE



Engineering Faculty and Departments



Tester

CCSF



CU-KAUST

Archer Giannelis

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KAUST-CU Center for Energy and Sustainability



- A dynamic venue for fundamental scientific studies, graduate education, and technological innovation addressing emerging problems critical to the US and the world
- Research/education focuses on a technology platform of novel hybrid nanomaterials (NIMs) recently discovered at Cornell
- Multidisciplinary team of faculty from Cornell and 7 partner universities with complementary expertise in materials synthesis, theory, property characterization and process engineering
- A unique outcome of the Center will be the development of new models for major research universities to enhance their culture for entrepreneurship and their interface with industry

Research Thrusts in the Center

- CO₂ capture and sequestration
- PVs and solid-state lighting
- Water treatment and desalination
- Nanomaterials for enhanced oil production



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Cornell Center for a Sustainable Future: CCSF

CCSF advances multidisciplinary research and cultivates innovative collaborations within and beyond Cornell to foster a sustainable future for all.

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Cornell Center for a Sustainable Future: CCSF

CCSF advances multidisciplinary research and cultivates innovative collaborations within and beyond Cornell to foster a sustainable future for all.

Energy

- Carbon Management
- Climate Change
- Conversion, Storage, Distribution
- Efficiency and Conservation
- Renewable Sources
- Systems Analysis and Deployment
- ●●●

Environment

- Biodiversity
- Biogeochemistry
- Buildings to Cities
- Environmental Sociology
- Mitigation/Adaptation
- Sustainable Agriculture
- Water Resource Mgmt.
- ●●●

Economic Development

- Food & Water Systems
- Human Health, Nutrition and Education
- Institutions, Policy and Governance
- Population and Migration
- Poverty Reduction
- ●●●

For more information see: www.ccsf.cornell.edu

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Energy

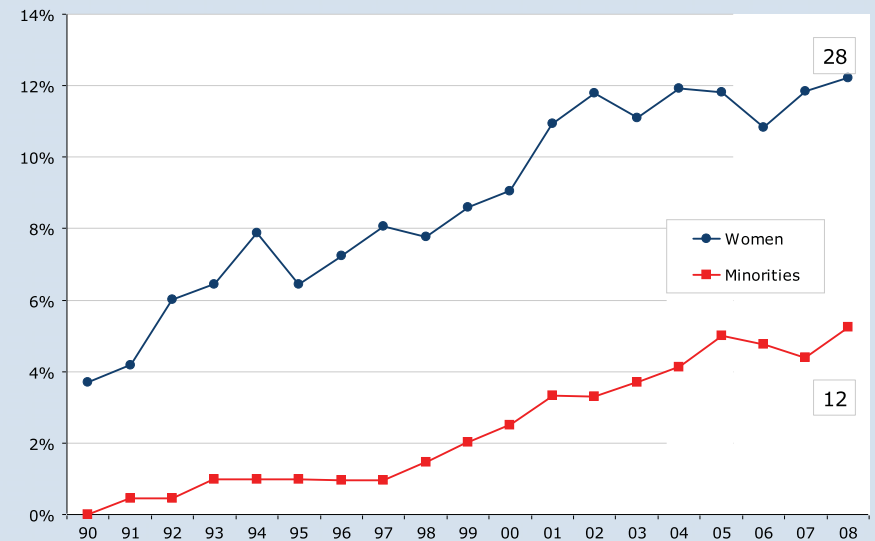
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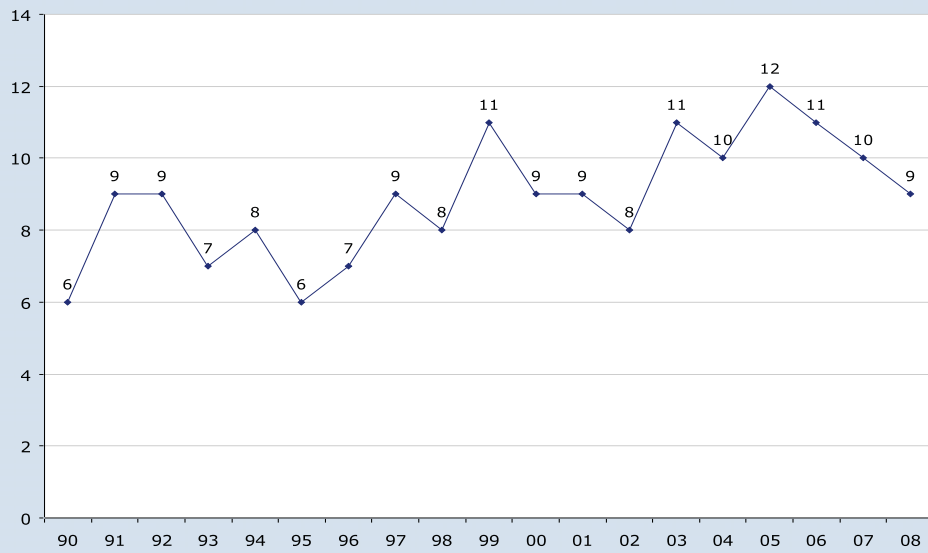
Jeff Tester,
Associate Director

For more information see: www.ccsf.cornell.edu

Faculty Diversity (URM)



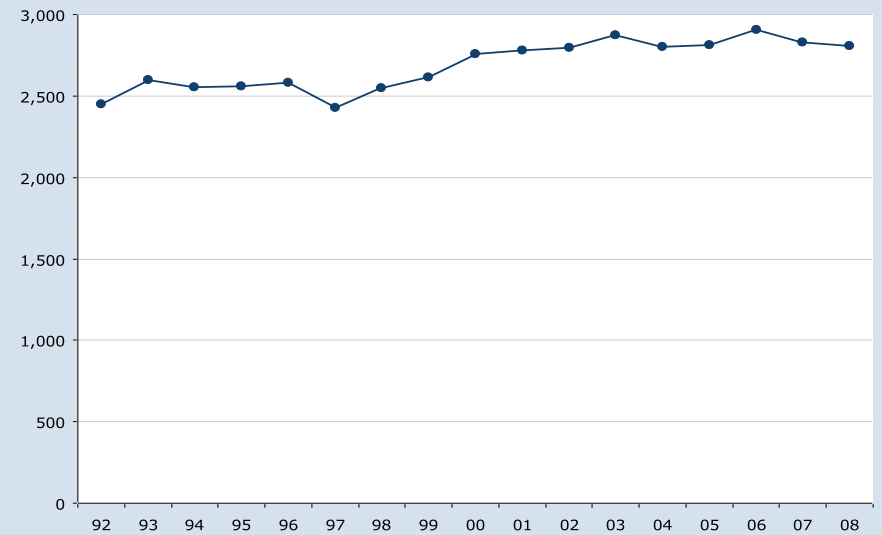
Cornell Engineering Graduate Rank in U.S. News 1990-2008



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Engineering Undergraduate Enrollment



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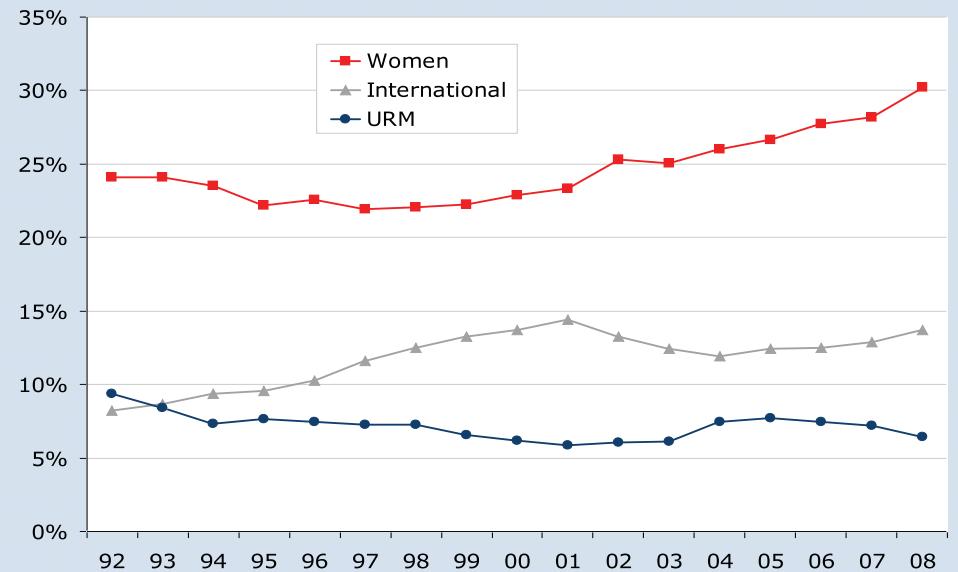
Application Trends at Peer Schools

School	Undergrad Applications 2009 vs 2008
Cal Tech	+12% overall
Clarkson	+33% overall
Carnegie Mellon	+ 5% overall and +13% in engineering
Columbia	+12% overall
Cooper Union	+10% overall
Cornell	+3% overall and +17% in engineering
Florida Tech	+8% overall
Harvey Mudd	-8% overall
U of Michigan	no change overall and +11% in engineering
MIT	+17% overall
Olin	-7% overall
RPI	+10% overall
Stevens Inst Tech	+5% overall

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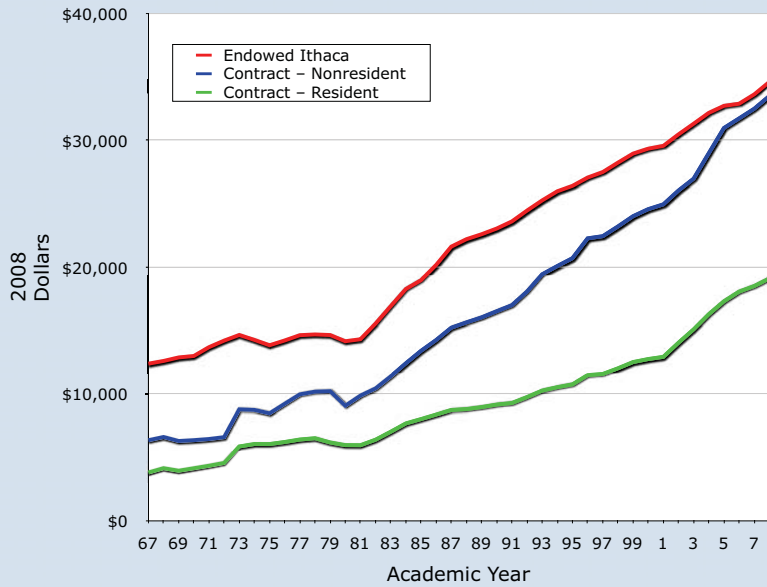
Undergraduate Women, Minorities and International Students



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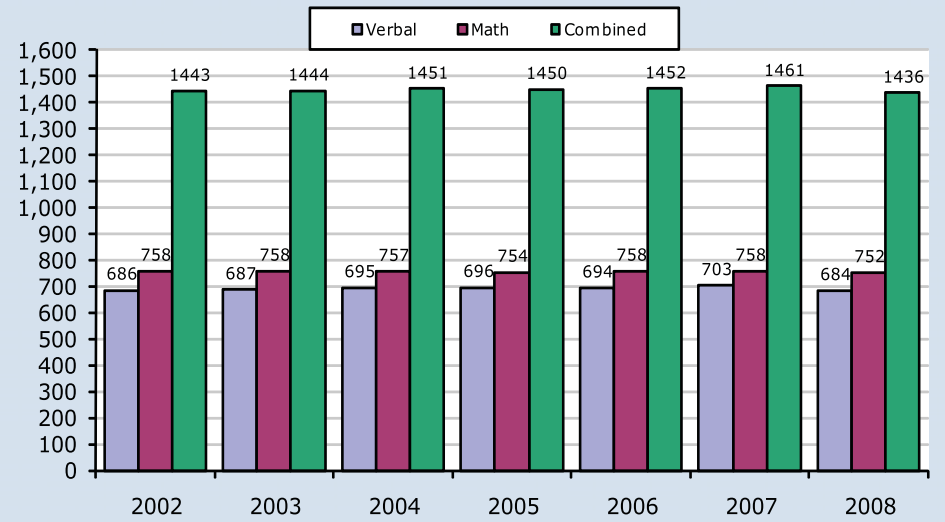
Undergraduate Tuition (2008 dollars)



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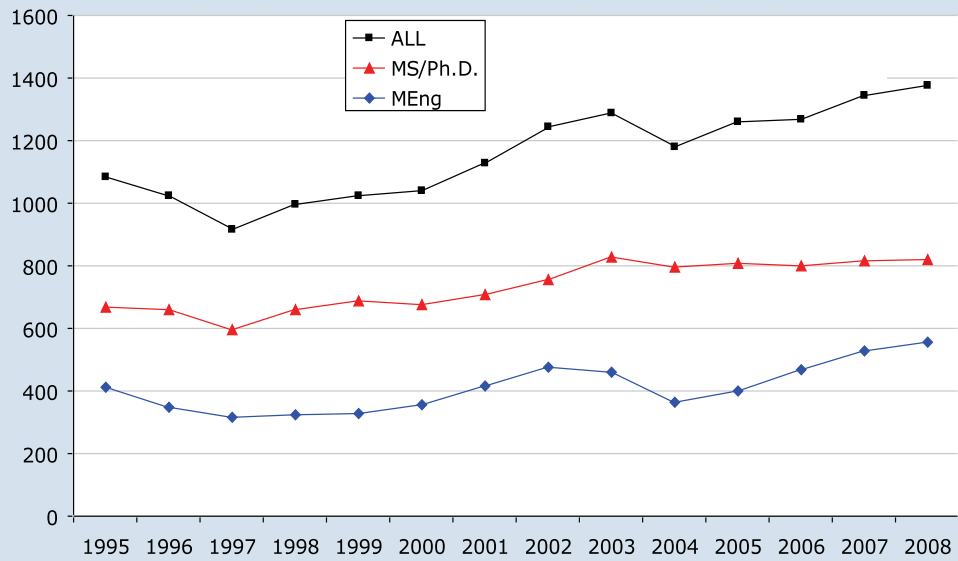
Recruit the Highest Quality Undergraduate Students – SAT Scores



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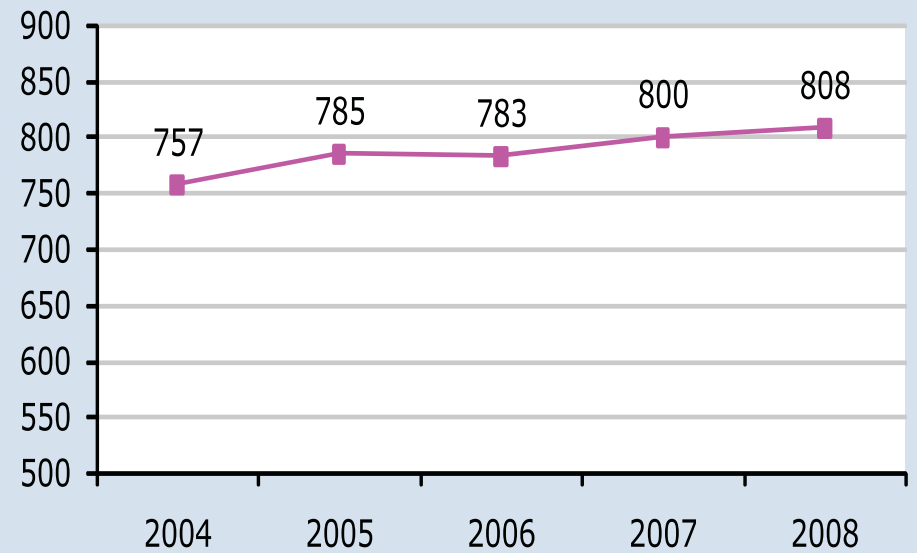
Graduate Student Enrollment



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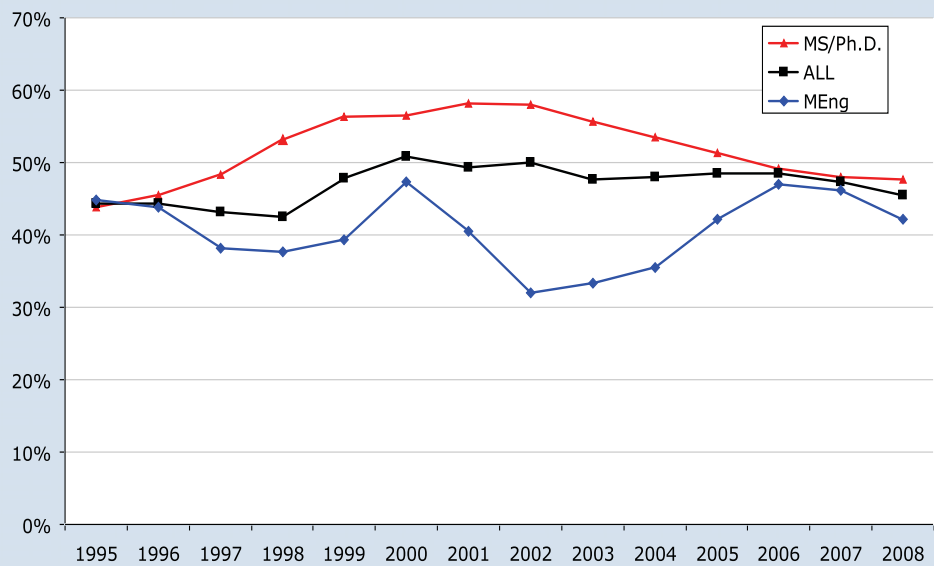
Significantly Grow the PhD Program



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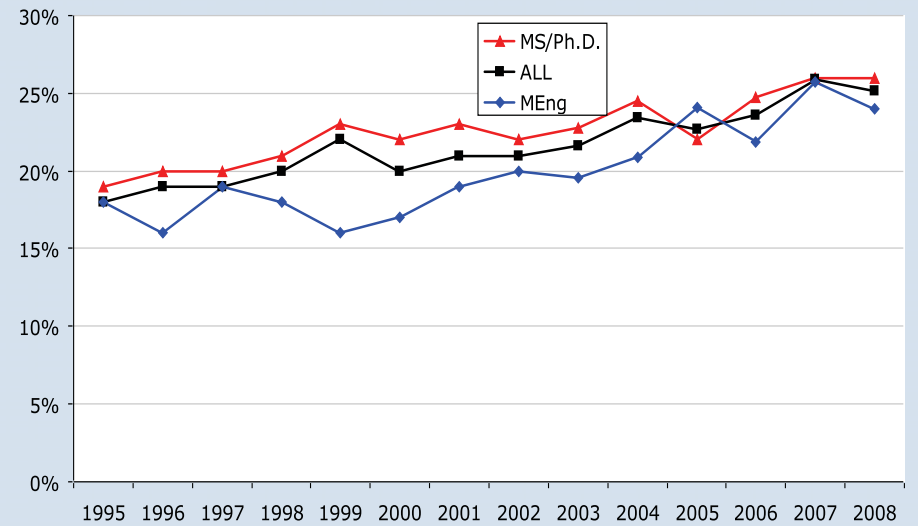
Graduate Student Enrollment International



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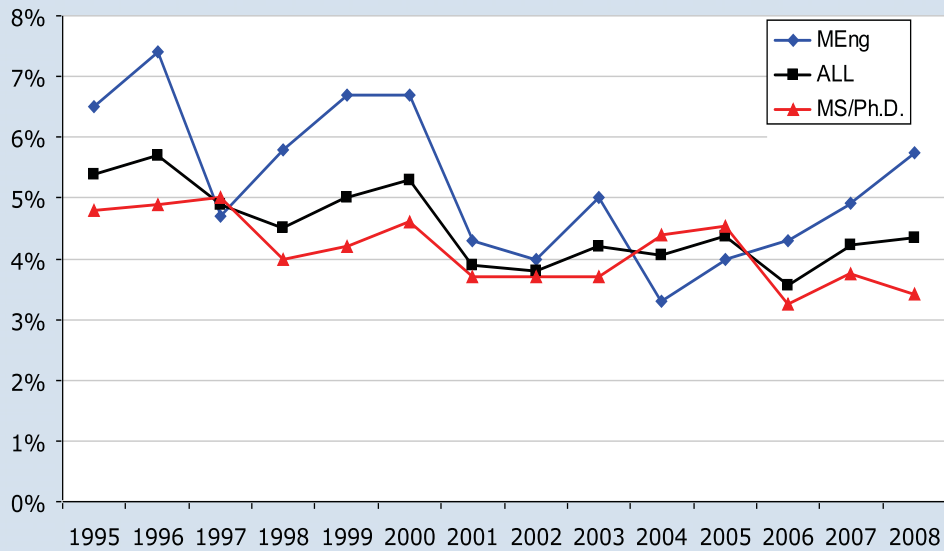
Graduate Student Enrollment Women



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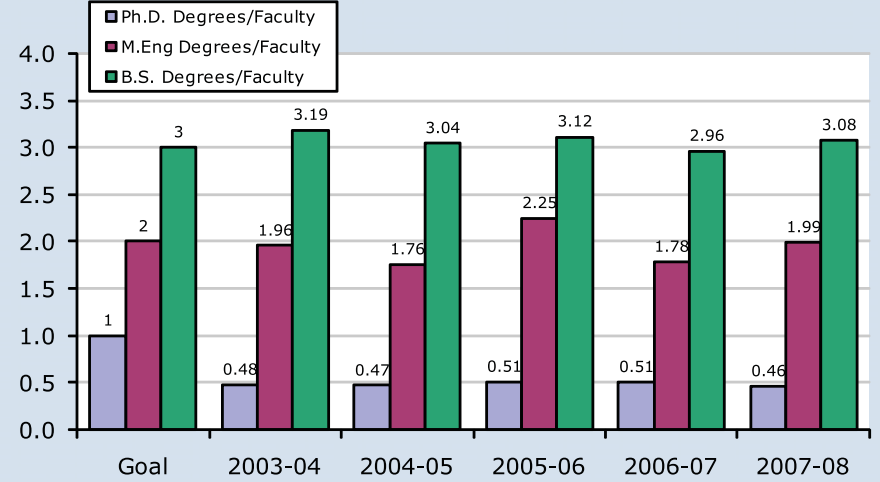
Graduate Student Enrollment Underrepresented Minorities



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Graduate 1 PhD, 2 MEng, and 3 BS Students per Faculty Each Year – 3:2:1 Goal



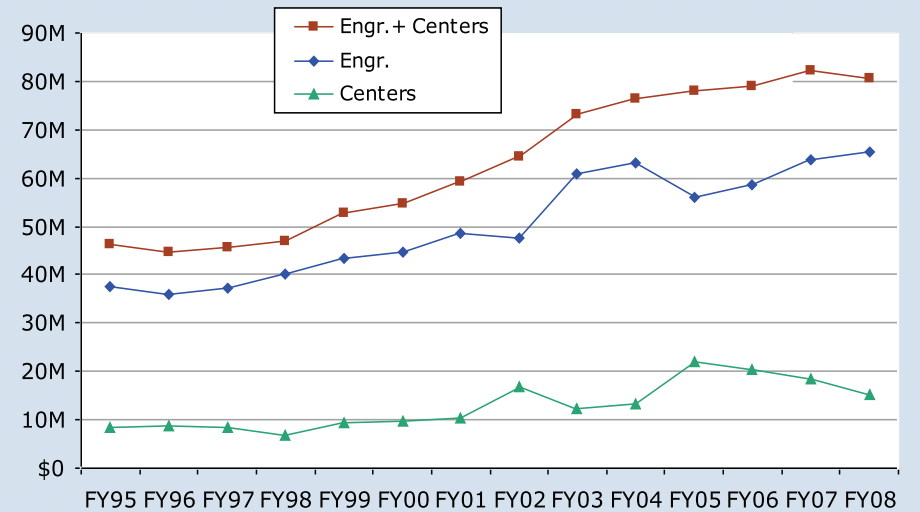
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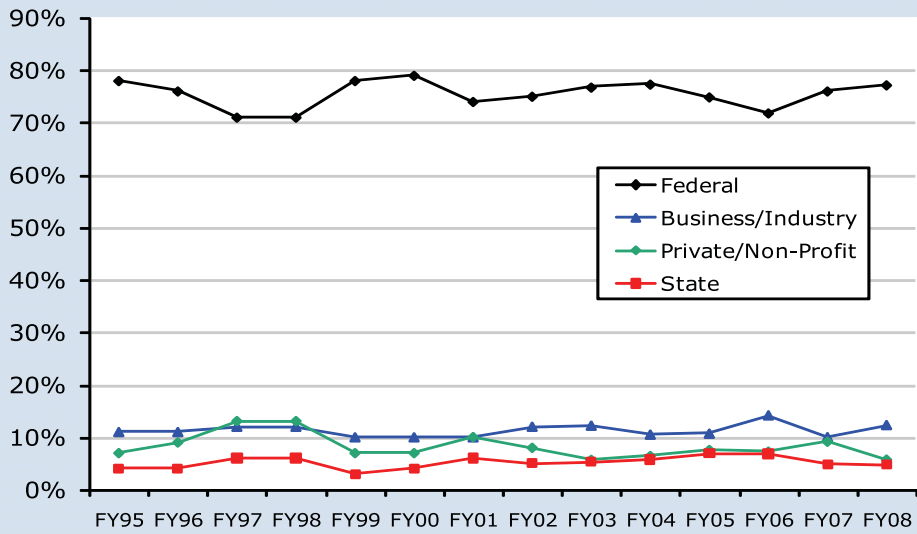
Student to Faculty Ratio and Research Expenditures per Faculty

	Undergrad to Faculty Ratio	Grad Student to Faculty Ratio	Total Student to Faculty Ratio	Sponsored Research Expenditures per Faculty Thousands
ENGR	11.9	5.8	17.7	\$281.2
Arts and Sciences	7.7	2.3	10.1	\$134.9
CALS	8.8	2.5	11.3	\$202.0

Research Expenditures



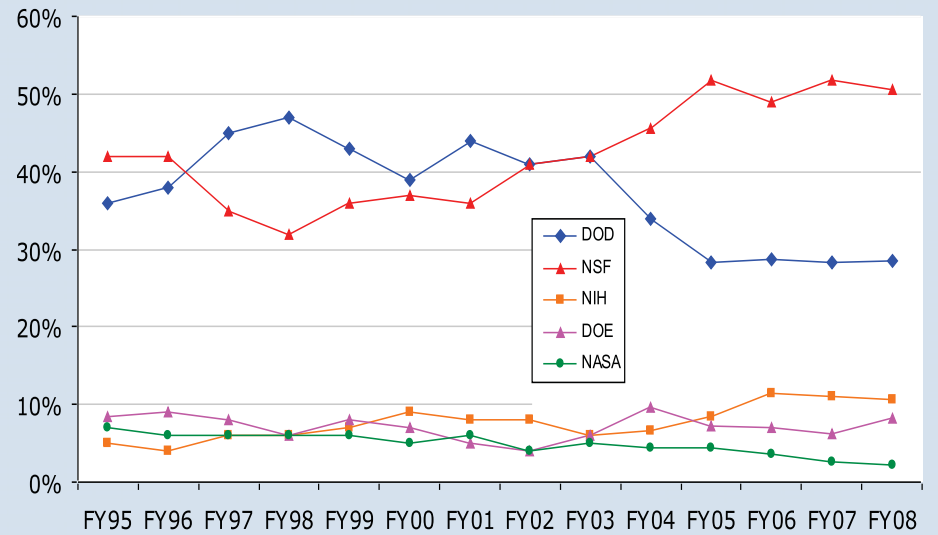
Distribution of Research Expenditures



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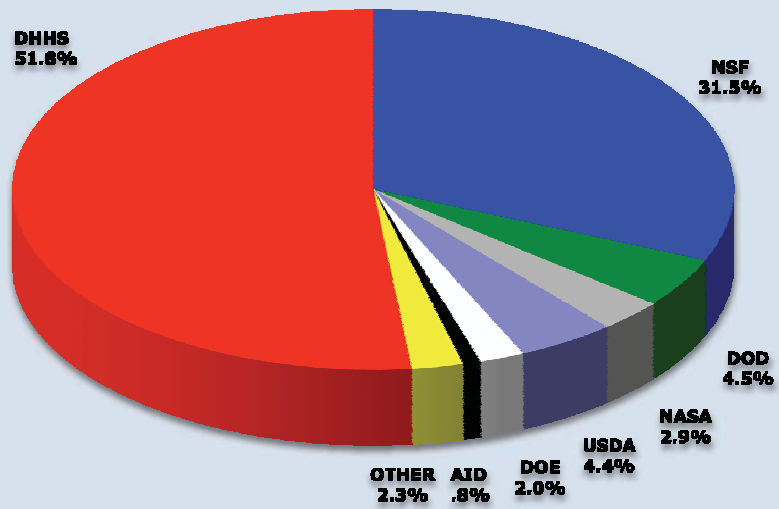
Research Expenditures – Distribution of Federal Funding



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Distribution of Cornell's Federally Sponsored Research



Slide from R. Buhman, Vice Provost for Research, Feb. 2008

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Dragon Day 2009



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Departures - now the bad news

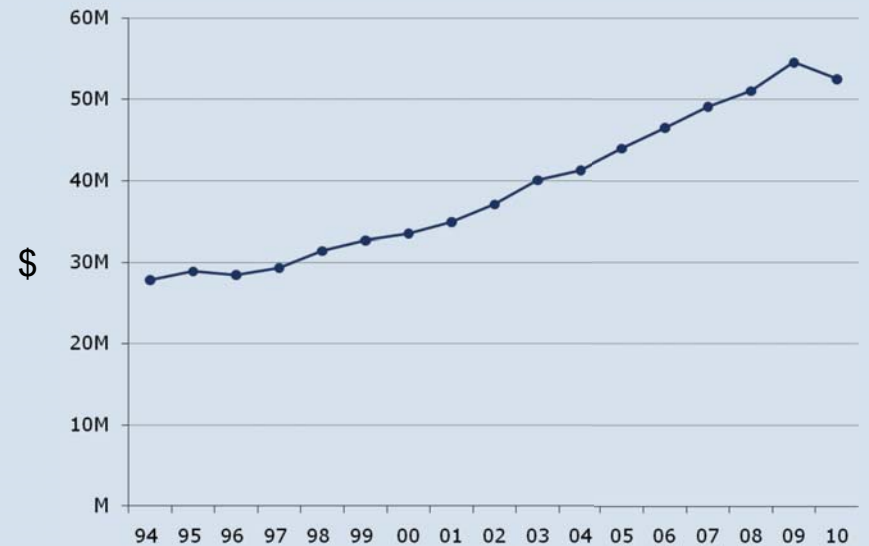
- Tim Dougherty '88 will leave Engineering
- New post at United World Colleges
- Position will be filled by Jim Mazza and Jessica Traynor while search is being carried out
- We will miss him



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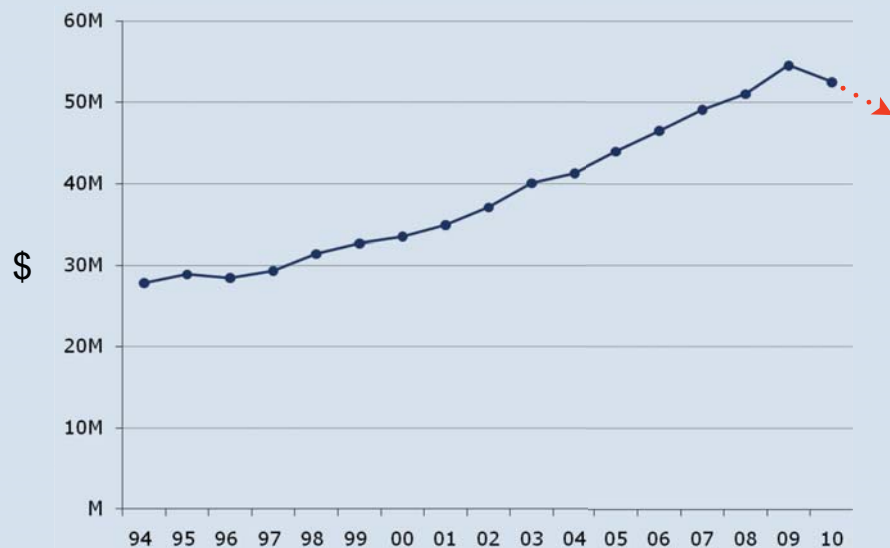
Engineering Budget - University Allocation



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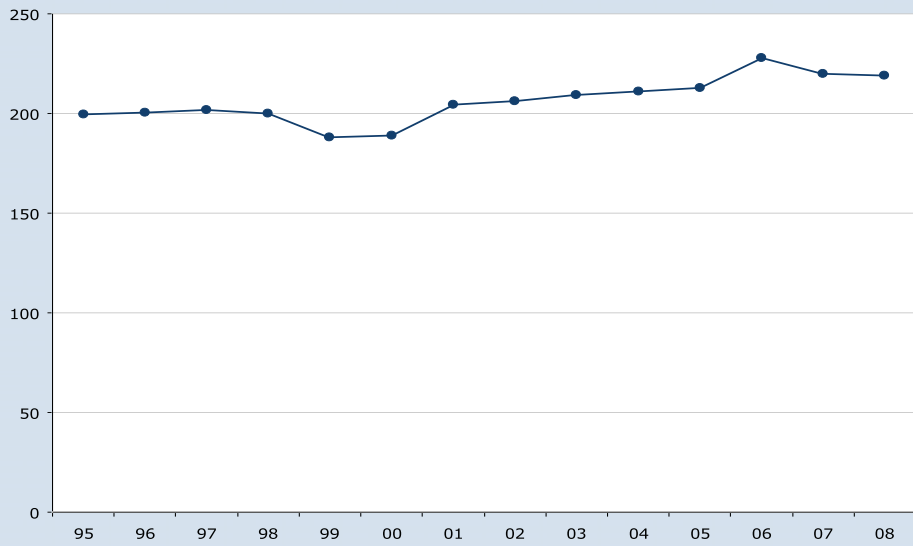
Faculty Searches

- Six faculty searches are in progress (out of 12 planned):
 - BME - 1
 - ORIE - 1
 - MAE (Biomechanics) - 1
 - ECE - Up to 2
 - Energy - 1 or 2
- Fewer faculty searches, both at Cornell and nationwide, may increase the quality of the pools, but will also heighten the importance of making hires that help us meet our strategic goals

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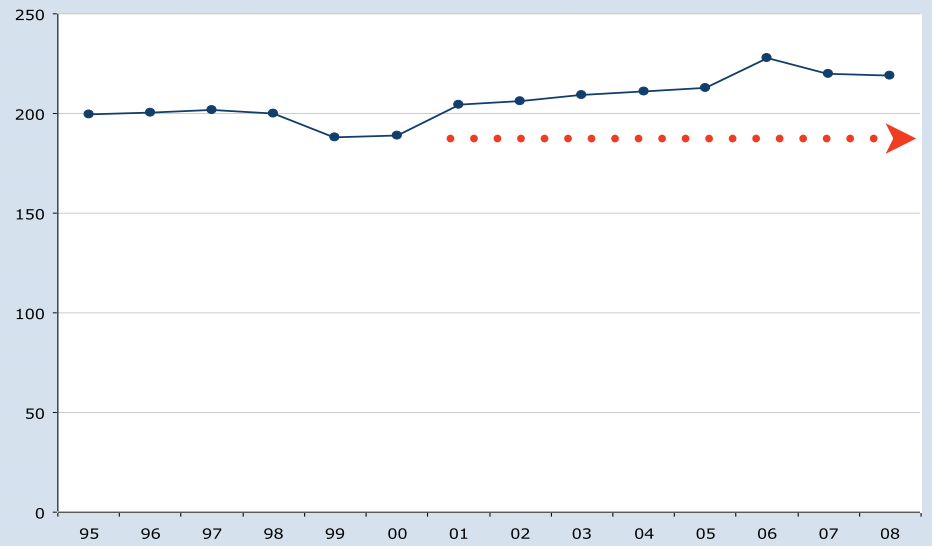
Faculty FTE



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Faculty FTE



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Progress on Facilities Master Plan

- New Life Sciences Building
 - Complete
 - Home for BME Department
- CS/CIS Gates Hall
 - On Engineering Quad
- Physical Sciences Building
 - Construction has started
 - Home for AEP
 - \$141M project (197K gsf)
 - Also, Clark Hall renovation
- Olin Hall Infrastructure Upgrade
 - \$14M
- ECE 4th Floor Addition
- New Engineering Building



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Progress on Facilities Master Plan

- New Life Sciences Building
 - Complete
 - Home for BME Department
- CS/CIS Gates Hall
 - **Pause**
- Physical Sciences Building
 - Construction has started
 - Home for AEP
 - \$141M project (197K gsf)
 - Also, Clark Hall renovation
- Olin Hall Infrastructure Upgrade
 - \$14M -underway
- ECE 4th Floor Addition - **Indefinite hold**
- New Engineering Building - **Indefinite hold**



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Response to last ECC Meeting

- ECC asked many useful questions and offered helpful suggestions
- Are there too many departments?
 - TAM merged into MAE
- Offer retirement incentives
 - Done by College - Cathy will mention
- College has enough space - use more effectively
 - Space audit being done by departments
- Marketing needs improvement
 - New college communications strategy being implemented
- Research and industry outreach
 - Forming joint committee with VPR to improve cooperation with industry - IP, contracts, educational services

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Theoretical and Applied Mechanics (TAM) Merger into Mechanical and Aerospace Engr

- TAM Dept. and budget merged into Mechanical & Aerospace Engineering effective January 1, 2009
- Decision based on our new fiscal constraints and consideration that TAM:
 - Extensive study of competitiveness of department
 - One of the last TAM departments in the country – at the end of a trend
 - 13 faculty, many of whom are close to retirement
 - No undergraduate program (although faculty teach our undergraduate math courses)
 - Will focus and strengthen College when merger complete

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Implementation of the TAM Merger

- A Transition Team has been appointed to help implement the merger and provide recommendations by the end of the spring semester:
 - Lance Collins, MAE, Chair
 - Alan Zehnder, TAM
 - Michel Louge, MAE
 - Andy Ruina, TAM
- The Graduate Field of TAM will still exist
- TAM faculty have been given tenure in MAE (as of March 1, 2009)
- Some TAM faculty plan to associate with additional departments

College Goals for 2009

- Address the budget challenges
 - Strategically implement budget cuts
 - Identify new and increase existing revenue sources
 - Leverage the budget pressure to strengthen the college
- Strengthen the undergraduate program
- Grow research funding and the graduate program in strategic areas of the college to achieve 3:2:1 plan
- Implement strategic efficiencies driven by budget reductions
- Fund raise

Discussion

