Faculty Challenges in a Tight Budget

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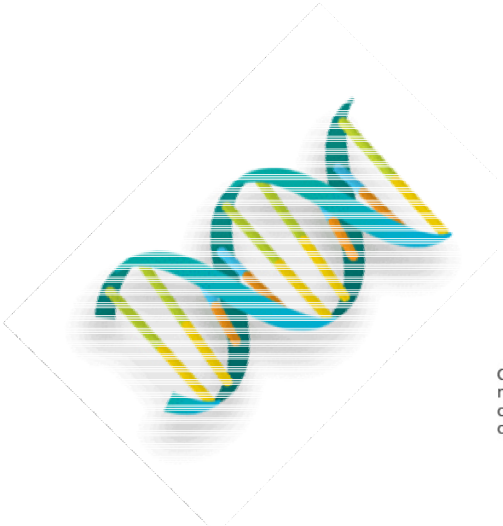
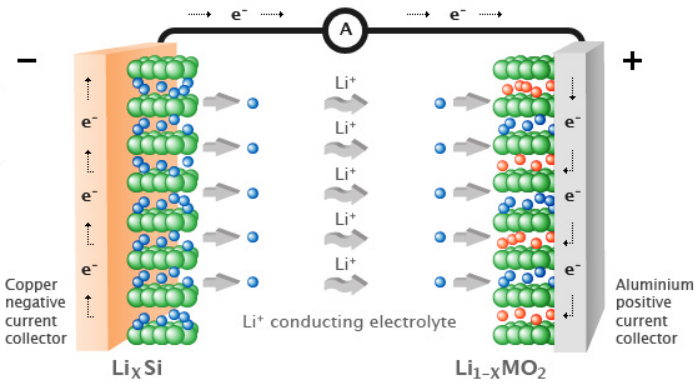
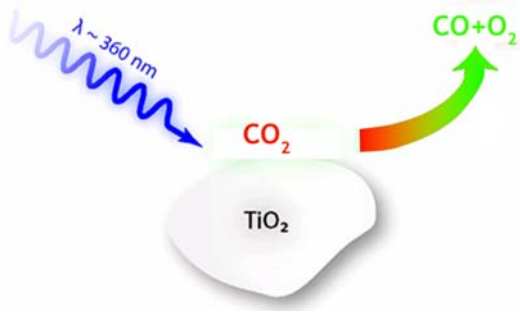
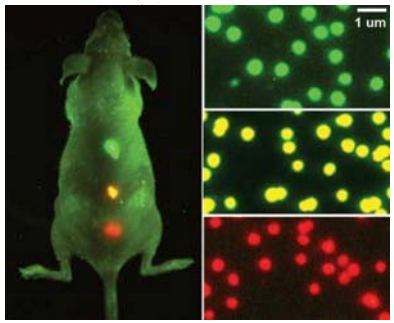
Chemistry Today









Health | Energy | Environment

Chemistry provides solutions to many of the world's most pressing problems

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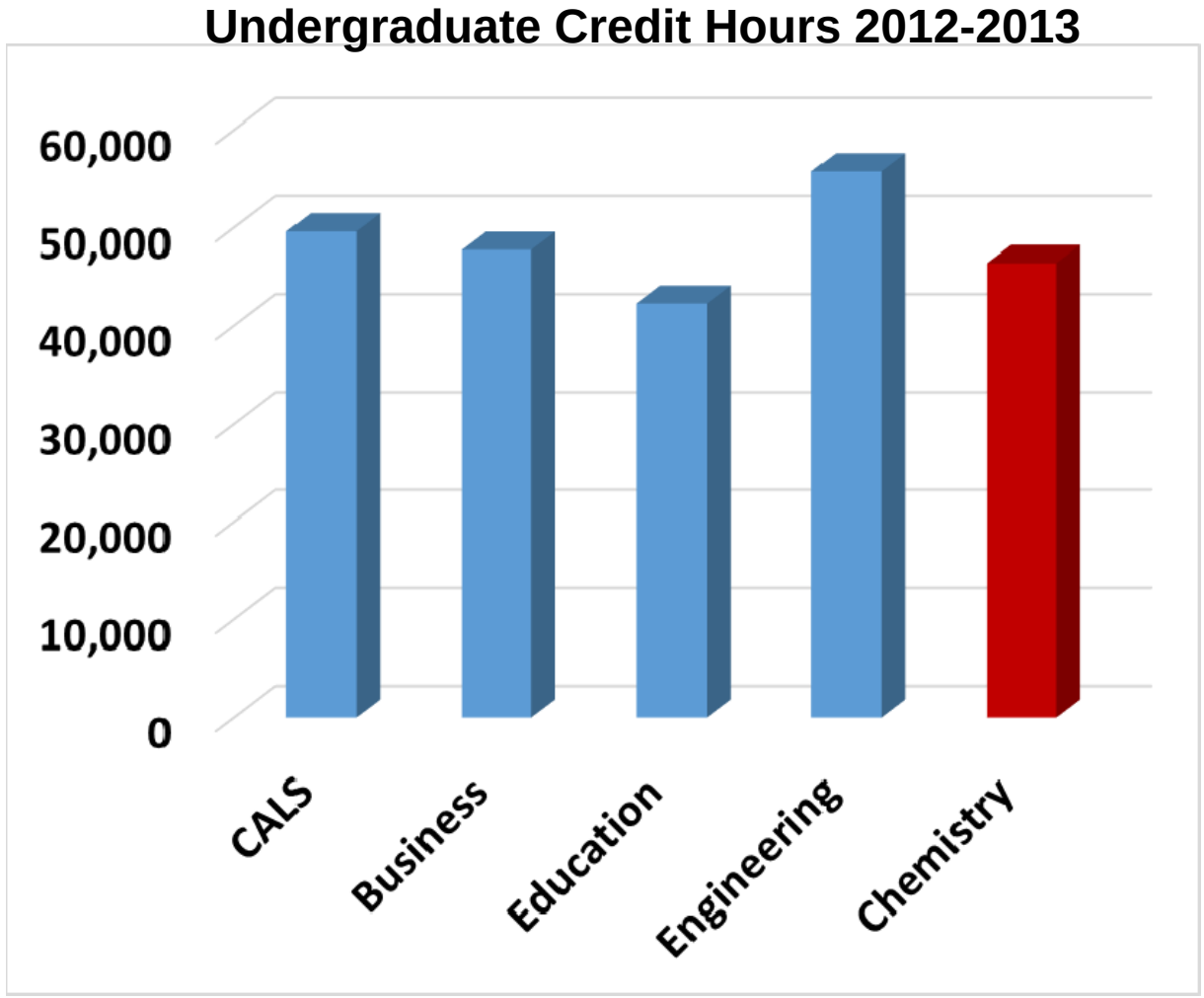
Chemistry as a Gateway to STEM

Majors that require chemistry:

- Pre-med
- Pre-dentistry
- Nursing
- Pharmacy
- Engineering
- Biological sciences
- Veterinary medicine
- Education
- Agricultural sciences
- Genetics
- Physical sciences
- Nutritional science
- And many more!

Scale of Instructional Program



The Chemistry Department teaches as many undergraduate credit hours as some schools and colleges.

Undergraduate Chemistry Education

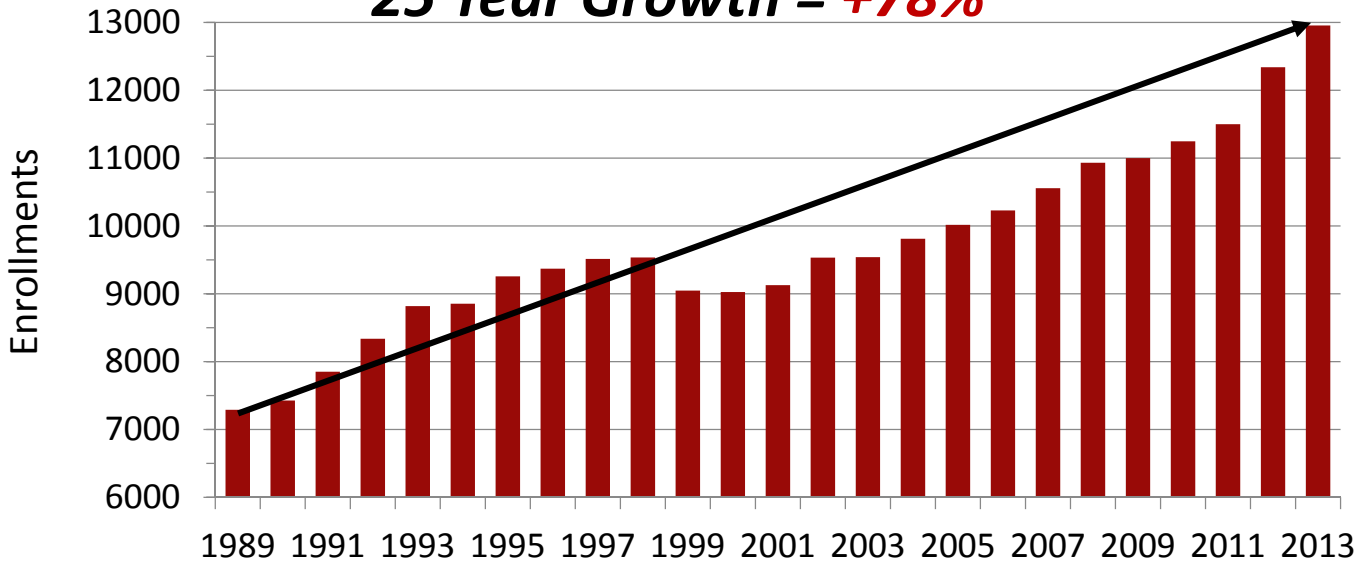
Department goals:

- Provide best education possible
- Providing timely access to courses, targeting 4-year graduation rate
- Faculty-taught courses
- Reducing the achievement gap
- Providing career advising and mentoring
- Providing chemistry experiences beyond the classroom

The consequence: Enrollment pressure

Undergraduate Chemistry Enrollment

25 Year Growth = +78%



Other metrics show a similar and even more compelling story…

Organic Chemistry Enrollment

25 Year Growth = +147%

Chemistry Majors

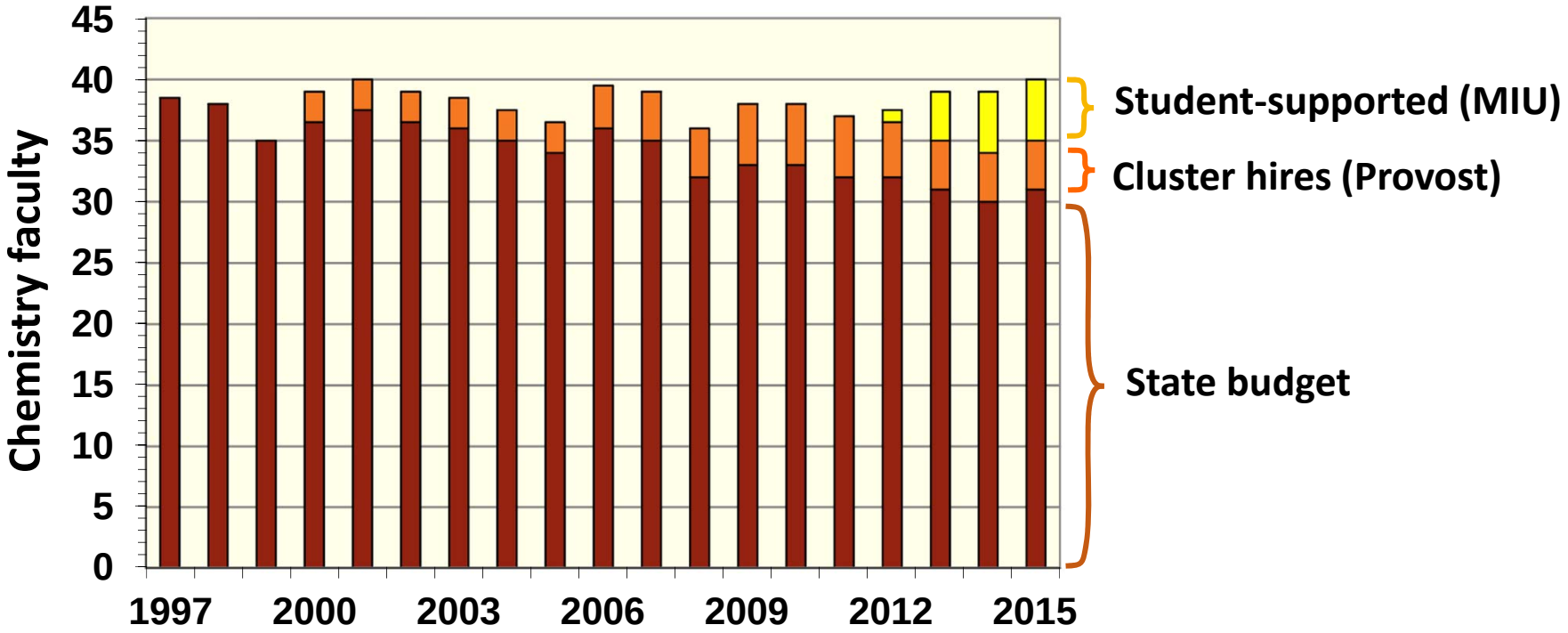
25 Year Growth = +219%

Chemistry's gateway role and increases in STEM fields have produced large enrollment increases

Enrollment Pressure

Current labs do not meet modern standards and cannot accommodate increased demand

Chemistry Faculty Positions



- Enrollment increases not matched with increases in faculty positions
- Faculty positions increasingly supported by non-tuition student fees (MIU) and non-permanent income sources (cluster hires)
- **Lack of support from base state budget leaves long-term fate in question**

Enrollment Pressure and Budget Cuts

The challenge: balancing student access to courses vs. demand for undergrad courses taught by faculty

Decreased course offerings:

- Chem 108, Chem for non-majors: Cut 1 semester
- Chem 327, Quantitative Analysis: Cut 1 lecture
- Chem 346, Organic Lab: Cut 1 semester, now taught by lab director instead of faculty
- Chem 524, Instrumental Analysis: Cut 1 semester, taught by lab director instead of faculty
- Chem 561/565, Physical: Each course now offered once every 2 years

Maximized use of facilities:

- General chemistry: Cut Chem 103 labs to every other week, added early morning labs, now runs from 7:45 a.m. to 8:30 p.m.
- Organic chemistry: Added early-morning and late-evening labs (7:45 a.m. – 9:45 p.m.)

Staffing changes:

- Laid off 2 staff members
- Did not replace a retiring faculty member
- Increased teaching load on staff lab directors

Undergraduate Chemistry Advising

Responsibilities:

- Advise up to 200 chemistry majors
- Annually place 13,000 students in optimum courses
- Train and supervise 100 TAs
- Accommodate students with disabilities

Challenges:

- Overwhelming enrollment increases
- Increasing fraction of students on campus now STEM majors, requiring improved access to chemistry courses
- Substantial number of international students
- Prevalence of mental health issues among students

Undergraduate Research and Mentoring

One-on-one mentoring through research is a *transformational* experience for undergraduates.

Over 130 undergraduates engage in individualized research projects with a chemistry faculty member

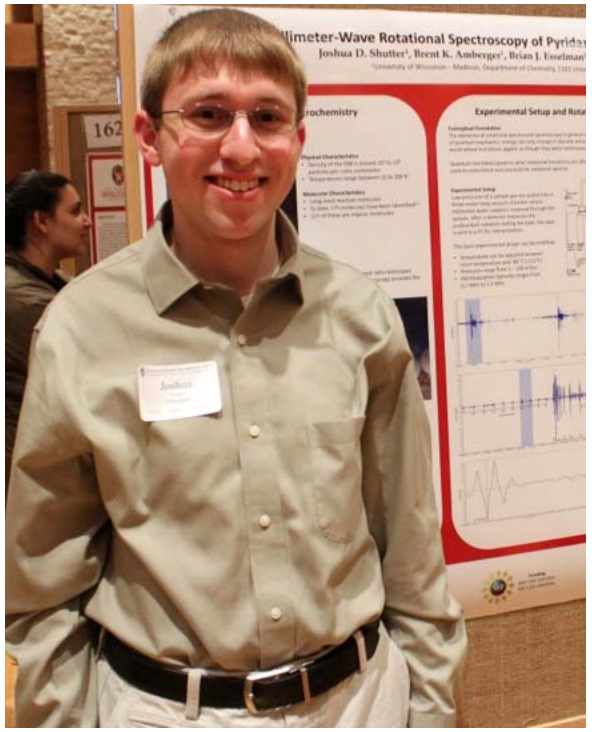
Benefits:

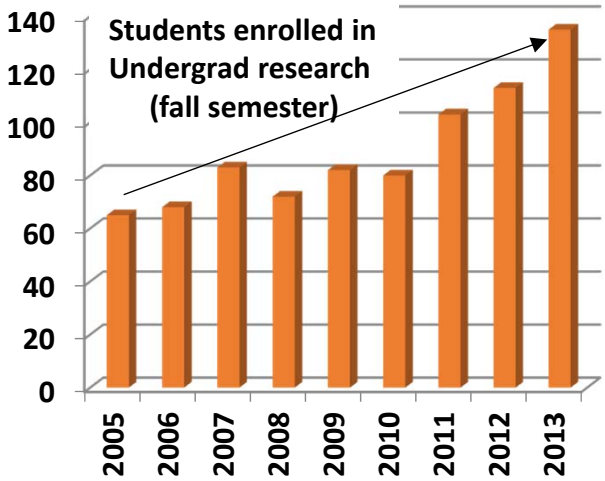
- Direct access to world-renowned faculty mentors
- Reinforces classroom learning and connect multidisciplinary concepts
- Hands-on experience with state-of-the-art facilities, research equipment
- Ticket to further opportunities

Undergraduate Research and Mentoring

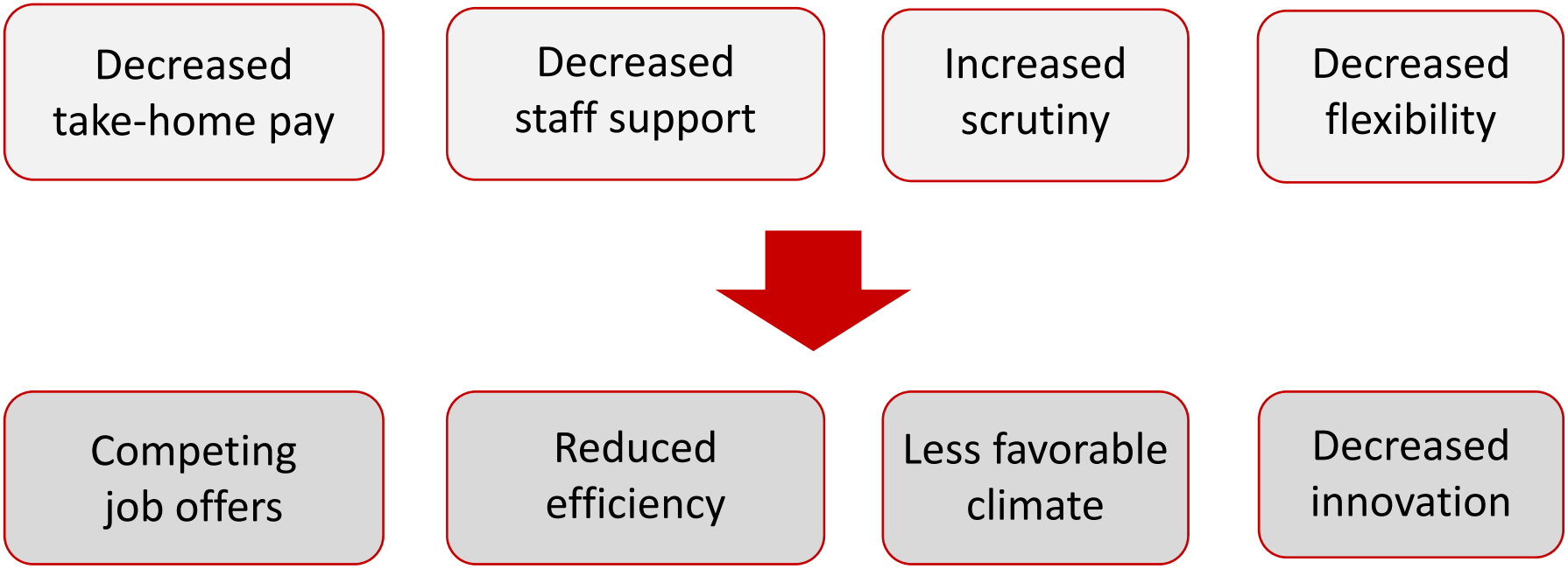
Challenges:

- More students interested in research than spots available. Many students are shut out.
- Funding currently comes from gift funds or faculty research grants
- No funds for undergraduate researchers' supplies





Budget Cuts: Direct Impact on Faculty



It is far less expensive to keep top faculty satisfied than it is to replace them

Modest amounts of flexible funding (professorships, gift funds) have tremendous impact on faculty satisfaction, productivity, and morale.

Budget Cuts: Impact on Innovation

8+ recent companies founded by chemistry faculty members:

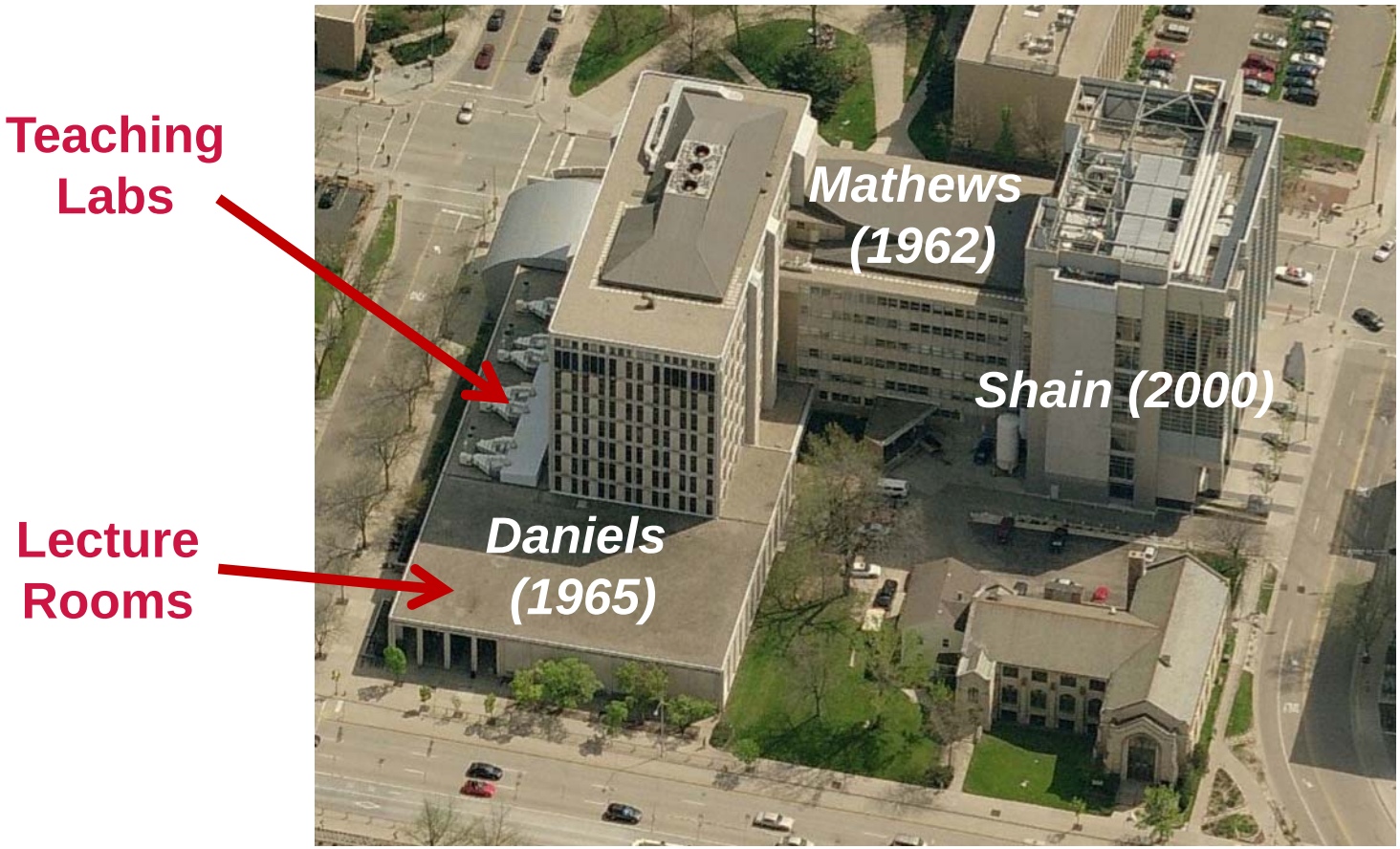
- 383 inventions disclosed to WARF campus-wide (16 from chem), 2013
- Little state funding for further commercialization efforts ($750,000/year supporting 5 projects in 2014)

And now for some good news …

Chemistry Building Project

UW-Madison

Current Chemistry Facilities



Proposed Chemistry Instructional Building

Mechanical Penthouse

Labs

Classrooms/ Lobby

Makes the most of a valuable site, enables essential revitalization of HVAC across older buildings

Giving Opportunities

New eight-story tower:

- **Lecture rooms, resource/study rooms, atrium (3 floors)**
  - One lecture room with special amenities on main floor
- **Instructional laboratories (3-4 floors)**
  - Organic, inorganic, analytical, physical chemistry
- **Research laboratories (1-2 floors)**
  - Shared labs for collaborative research, undergraduate research

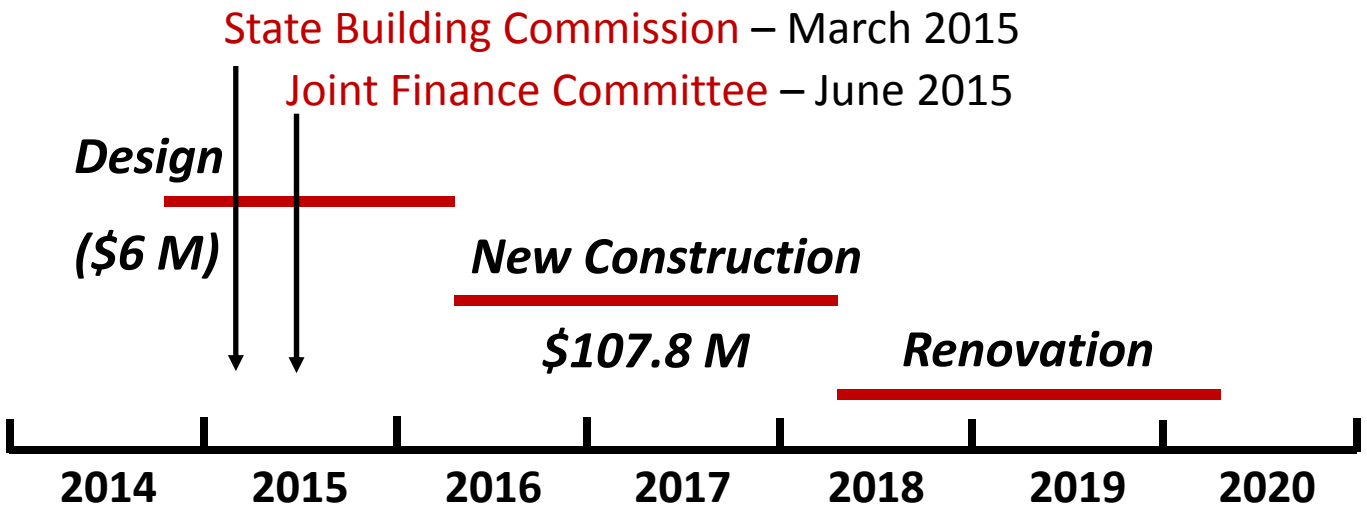
Renovation of existing buildings:

- **Modernize general chemistry instructional laboratories**
  - Restore weekly labs in 104, enable modern curriculum
- **Undergraduate support spaces**
  - Advising, student organizations, classrooms
- **Chemistry Learning Center**
  - Support for at-risk students
- **Urgent mechanical rehabilitation**

Current UW System Capital Budget Request

1. Boebel Hall Renovation, Phase II – *UW-Platteville* – $19.7 M
2. **Chemistry Addition/Renovation – *UW-Madison* – $107.8 M**
3. Innovation Campus – *UW-Milwaukee* – $75.0 M

Anticipated Timeline



Architect selected: Ballinger / Strang – contract signed with state
Funding likely to be split into two biennia – project scope unaffected

Building Project: Partners

State of Wisconsin - $107.8 M

- Instructional facilities (labs, lecture rooms, student support)
- Mechanical rehabilitation

Philanthropic Partners - $15 M

- Shared research labs for collaborative research
- Additional mechanical rehabilitation
- Margin of excellence

- Strategic philanthropic naming opportunities available
- Partnerships in place by early 2015 will influence the state's decision-making process
- Private gifts will extend the impact of this project

Summary

- UW-Madison Dept. of Chemistry is routinely ranked as one of the top 10 chemistry departments in the United States.
- Chemistry is a gateway to many degrees and professions.
- Chemistry's 40 faculty members
  - ✓ teach 13,000 undergraduate enrollments and 45,000 credit-hours/year
  - ✓ mentor 130 individual undergrad researchers on individual projects
  - ✓ pump $17 Million/year into the state economy via research grants.
  - ✓ provide high-tech Wisconsin jobs via 8 Startup companies

But...

State budget cuts and enrollment increases place tremendous pressure on faculty, staff, and physical facilities

- Student access is increasingly difficult to provide
- Lack of “flexible” funding impedes ability of faculty and staff to innovate
- Time, financial pressure limits individual mentoring opportunities
- Faculty and staff are increasingly targets of opportunity
- 50-year-old facilities are not adequate to train 21st-century chemists

Gift funds and chaired professorships have a huge impact on productivity, morale, and our ability to innovate in teaching and research

Upcoming building provides many opportunities to help

Thank You!

Questions?

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Batttery: http://smartech3d.blogspot.com

Girl: http://varsinaissuomenpiiri.mll.fi

Reaction: http:// www-rml.ch.cam.ac.uk