Diversity in Science and Engineering : A Roadmap To and Through Graduate School for Underrepresented Minorities (URMs)

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Diversity Webpage :
http://web.mit.edu/cortiz/www/Diversity/mitdiversityhome.html

MIT Initiative on Race and Diversity:
Committee Members: Lotte Bailyn, Emery Brown, Paula Hammond (Chair), Leslie Norford, Christine Ortiz, Marcus Thompson, Wesley Harris (ex-officio), Barbara Liskov (ex-officio)

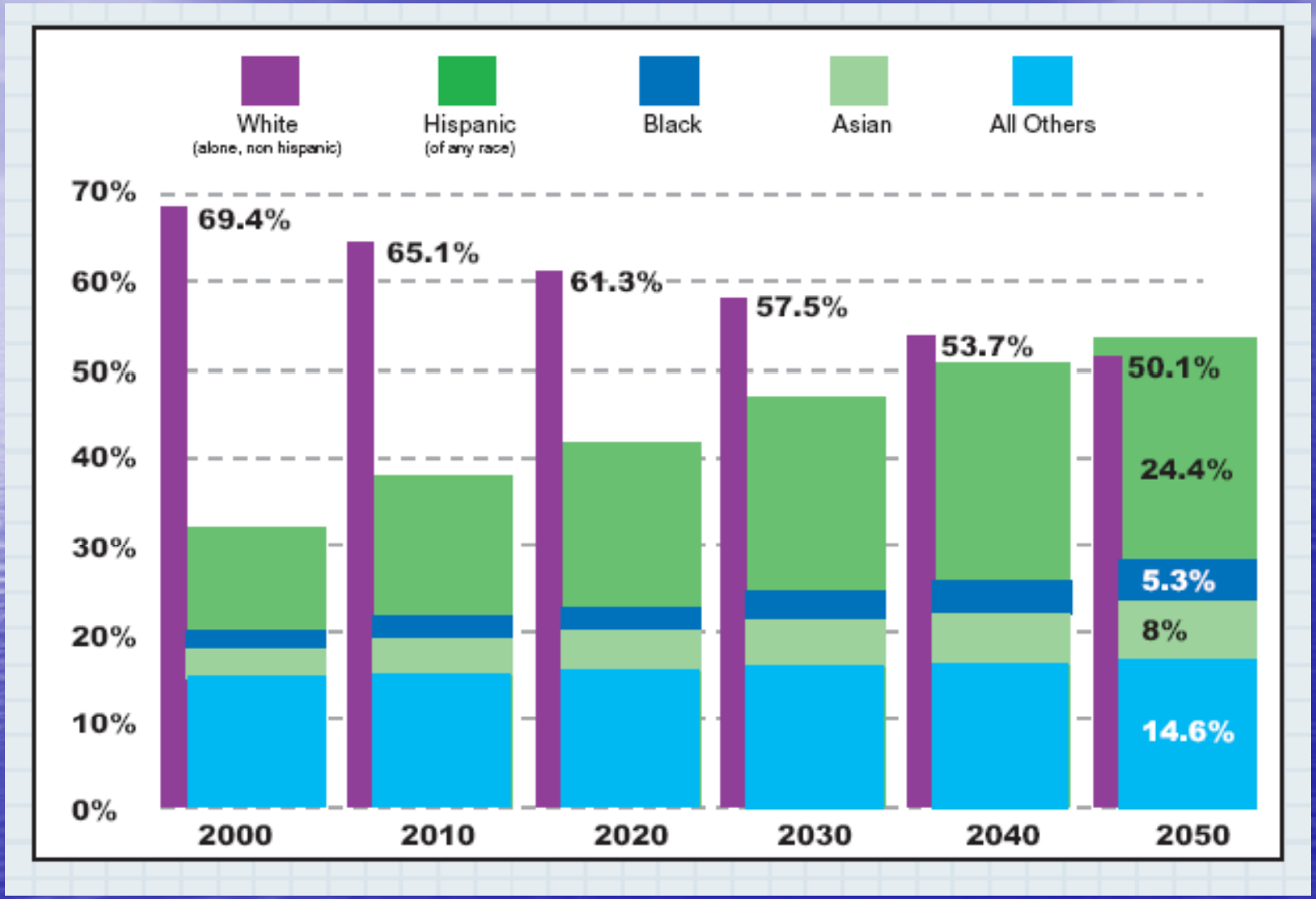
Diversity Goals

1) to create a measurable increase in the % of underrepresented minorities at all academic levels, especially above the baccalaureate where large drop-offs take place

2) to promote a diverse community continually working towards a "common good", i.e. beneficial for all members, that includes a climate of inclusivity, collegiality, respect, equity, minimal bias, transparency, honesty, trust, value, consistency, and connectivity

3) to develop underrepresented minority leaders at all levels in the academy who exhibit academic excellence, a passion for their discipline, a strong sense of ethics, and an understanding and appreciation of their discipline in a broad global, political, and socio-economic context

Diversity – Why?



In 50 years, URMs will be nearly half of population.

Diversity – Why?

- The highest levels of excellence are only found if one accesses the broadest pools of talent.

- A diverse faculty will take on a more diverse set of problems of societal import and will broaden the perspectives and world view at MIT and beyond.

- A diverse faculty will attract and train a more diverse cohort of new scholars, who will assume leadership roles in future society.

- These scholars will contribute to the solution of transnational problems – environmental issues, immigration, economic development – that are affected by issues of race and ethnicity. Solutions to these problems will contribute to national and regional security.

Elements of MIT Race Initiative

3 stages

-Extensive quantitative and qualitative study on experiences of faculty at MIT. Analysis of study results.

-Determination of solutions, recommendation for immediate and long term Institutional change

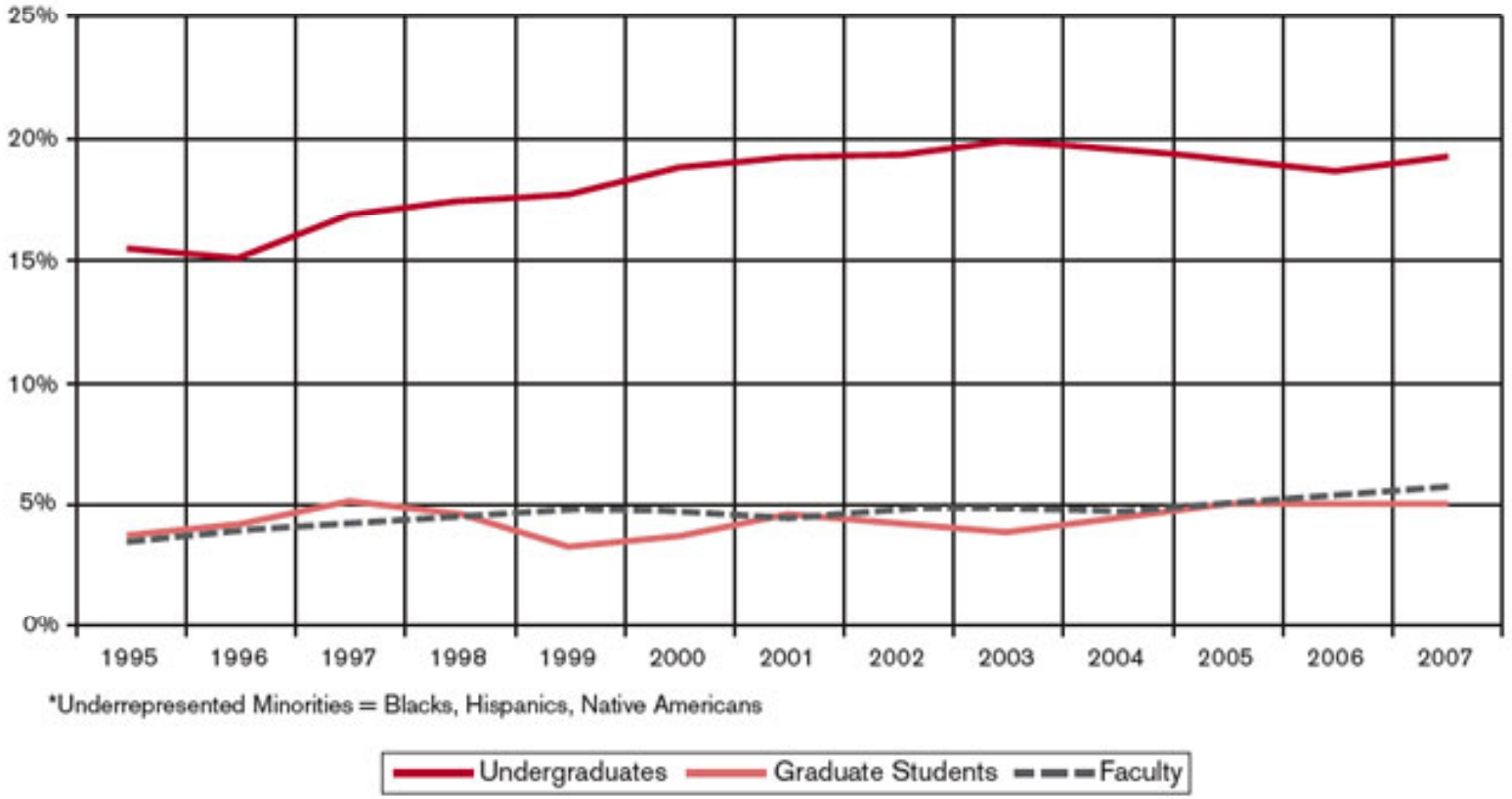
-Implementation of change

Will be ongoing, include means of Institutional accountability and maintenance for long term change

First 2 stages anticipated 12 to 18 months

Where possible, clear and readily implemented solutions can be addressed during study.

Percentage of Underrepresented Minorities at MIT



Number of Underrepresented Minorities at MIT													
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Undergrads	691	676	746	763	773	808	818	814	829	804	790	758	793
Grad Students	199	228	283	256	179	209	267	256	236	282	309	307	307
Faculty	33	38	38	42	44	44	42	46	47	46	50	53	57

University trends are reflected at the department level
e.g. MIT Department of Materials Science and Engineering (2007)

Undergraduate URMs 17/90 = 18.8%

Graduate URMS 7/200 = 3.5 %

5 were incoming this year
Berkeley (2), VA Tech, Texas A&M

(1) MIT Diversity → CONVERGE, visit to Berkeley, ugrads, talked to ugrad advisors
- All funded through first year
-Peer mentors

University trends are reflected at the department level
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US Citizen or Perm Res	Total:	Grad	UG
Chicano or Mexican American	9	2	7
African American, Non-Hispanic	8	3	5
Native American or Alaskan Native	2	0	2
Other Hispanic American	4	2	2
Puerto Rican	1	0	1
TOTAL	24	7	17

Facilitating a Path *TO* Graduate School

Substantive Undergraduate Research:

-Integration into a active research group

-Well thought out projects at an appropriate technical level and scope

-Graduate student / post-doctoral mentors who have a passion for science (URM)

-Interaction with faculty (URM)

-Critical training

Continuous Information Flow From Multiple Sources

-Benefits of higher education / limitations of the B.S.; Ph.D. opportunities after graduation (beyond research)

-Counteracting reasons why not to go :

Debt $, Family, Location, Too long, Insecurity, Overqualified for jobs, Isolation

Facilitating a Path *TO* Graduate School

Continuous Information Flow (Cont'd)

-**Advising** : Early on (freshman year) conveying graduate school requirements to undergraduates so that they can prepare throughout their undergraduate career (e.g. get to know faculty for letters of recommendation, build up CVs, apply for fellowships, international internships, etc.)

Support to Facilitate Academic Excellence at Undergraduate Level

- (e.g. UMBC) Financial support, study groups of differing levels, tutoring, mentoring, advising, summer internships, building community, academic and social integration, support and motivation, career counseling, etc.

(*American Psychologist* 59, 6, 547-556)

Facilitating a Path *TO* Graduate School

International Experience

-Summer Internships Abroad

Departmental Recruitment

-On Campus Hosting Weekends (MIT-CONVERGE)

-Off-Campus Recruiting (SHPE, NSBE, SACNAS, etc.)

URM Graduate Student Participation is Crucial

Faculty Participation is Crucial

-Graduate admissions committees aware of diversity issues

-Peer University Networking to Identify Talent

-Create an environment conductive to a diverse population

-Show continual understanding and commitment to diversity (e.g. Dept. Head, administrators); websites, hosting weekends, etc.

Why should I go to graduate school?

- You are driven by passion, curiosity for research/science and engineering
- You want to have numerous career options /job offers when you graduate
- Financial Security : You want to earn more than $100,000/year five years after finishing your Ph.D.
- You want to be a Professor, Dean, or President of a college or university
- You want to conduct research at a university or in industry or at a government lab
- You want to avoid the industrial "glass ceiling", i.e. you want to be a manager and move up the professional management track
- Tomorrow's leaders will be scientists and engineers.

Why graduate school?

- You want to have a positive impact on society;

  major technological developments that originated and/or were developed at universities; computing, laser, internet, global positioning satellites, financial engineering, modern medicines → energy, environment, food, manufacturing, communications

  -"This is the most exciting time in human history in science and engineering and technology. Exponential advances in knowledge, instrumentation, communication, and computational capabilities create mind-boggling possibilities." C. Vest, Former MIT President

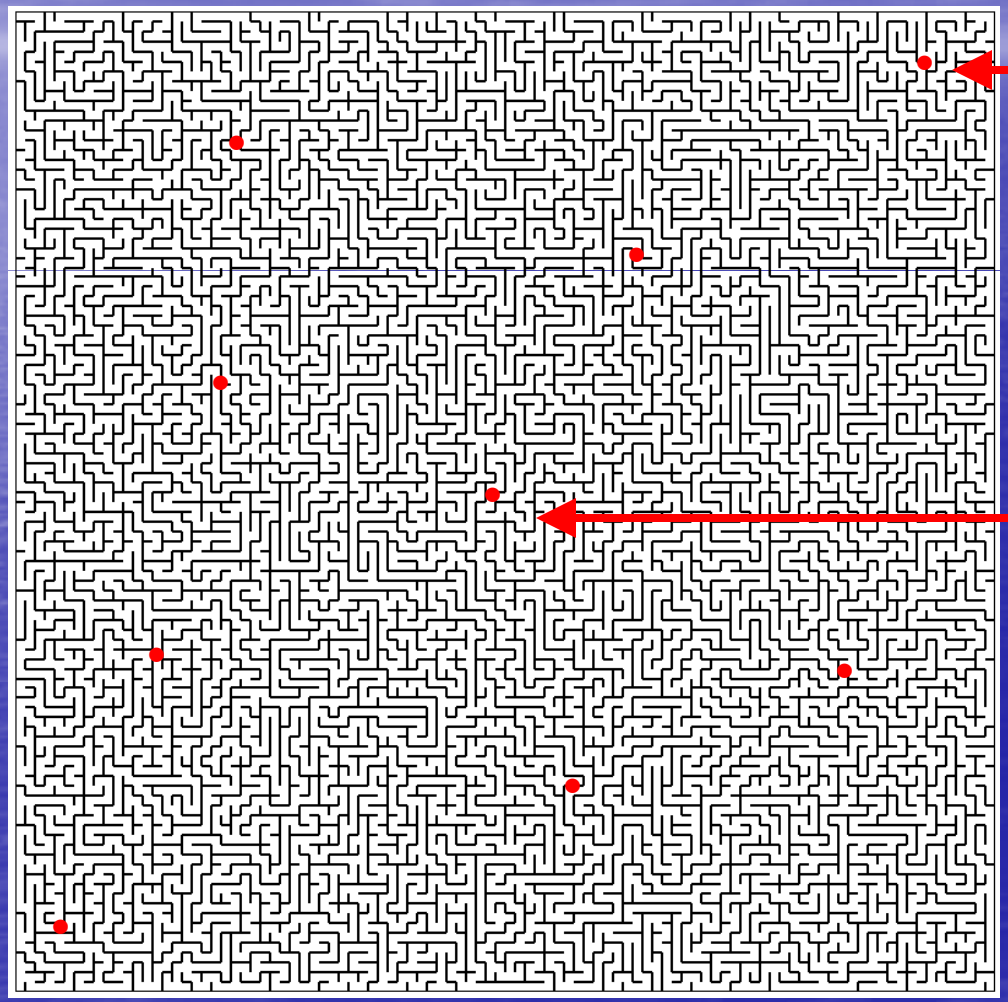
- Globalization→ Innovative programs during graduate school that includes exposure to different cultures, customs and work ethics.

A Roadmap Through Graduate School For URMs

Graduate School

Preventing “Orphans” – student can not locate a PhD advisor

The Thesis Maze : The Thesis is a Long Road



you

Why am I doing this? Where do I get the motivation to continue? (a Critical Junction)

Graduation

Recruitment and Retention of URMs to Graduate School
"Looking from the Balcony"

- Step back and see the big picture; take a global view

- Think about the longer-term (5-10 years); spend the time to think about and create a 5-10 year strategic plan

  -What are you passionate about?

"Looking from the Balcony" Implementation

- Keep your strategic plan in mind on a daily basis : take advantage of the opportunities along the way to building a coherent foundation for your strategic career/life plan
- Don't think of graduate school stipend as a salary; it is an investment in your future and your future family.
- Seek out opportunities for international collaborative exchange as a graduate student - ask your thesis advisor.
- Network-Keep in mind your peers will be your future colleagues.
- Don't be discouraged by criticism or take it personally; it serves to improve your skills and is a necessary part of training

Some challenges for URMs in graduate school

- Academic and social isolation
- Identification of mentors
- Financial Issues - Debt
- Family
- Location

What makes a good PhD Advisor for URMs? anecdotal comments

- Enthusiastic - a passion for the project
-Availability, makes an conscious effort to be available
-Invested in thesis project; "I didn't feel like I was in it alone"
-Always willing to discuss new ideas / results
- Open-minded to suggestions
- Timely feedback on writing, etc.
- Constructive criticism
- Sends information on career advancement; awards, fellowships, etc.
-Support prior to qualifying exam; practice exams

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