

Recruiting and Retaining Hispanics in Physics

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OUTLINE

- Do we have a problem?
 - Some stats
- Origin of the problem
- A Solution of the problem
- An institutional example
- Recommendations



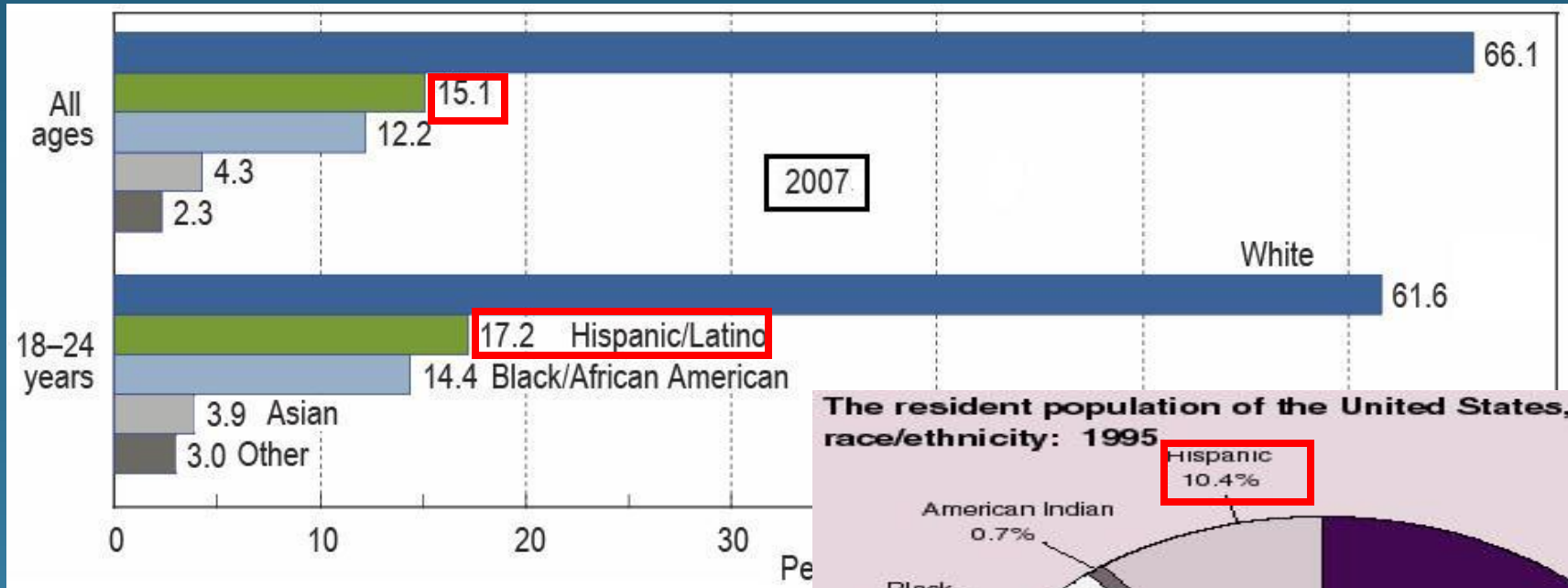
An Issue of Equity

“Young Hispanic undergraduates are half as likely as their white peers to finish a bachelor’s degree, a disparity at least as large as the disparity in finishing High School.”

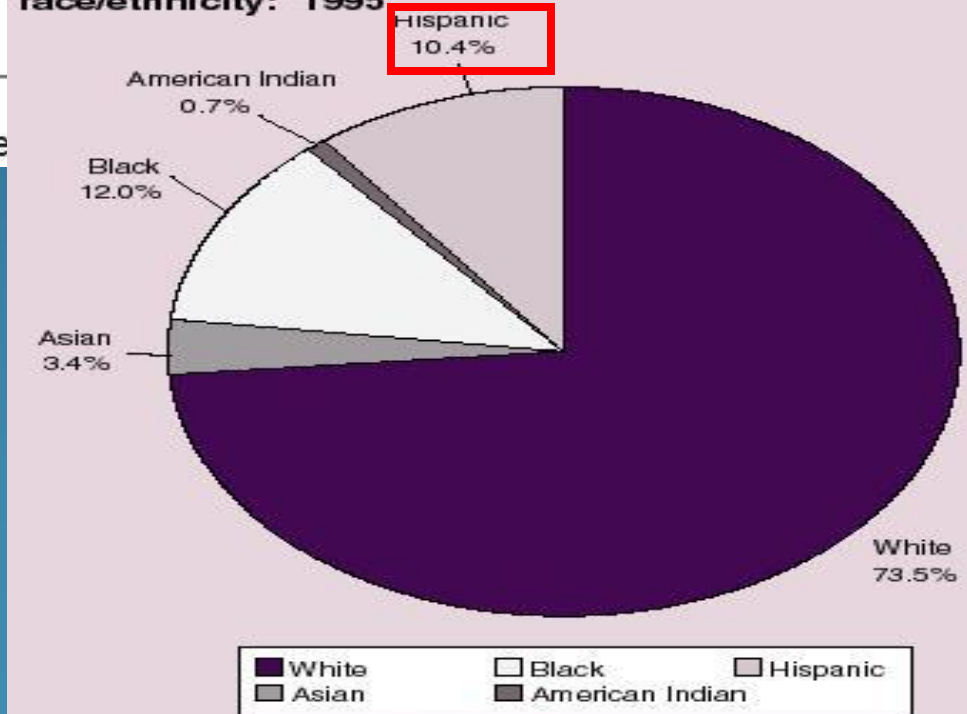
Richard Fry, November 2005,
Pew Hispanic Center



Population of United States: 2007



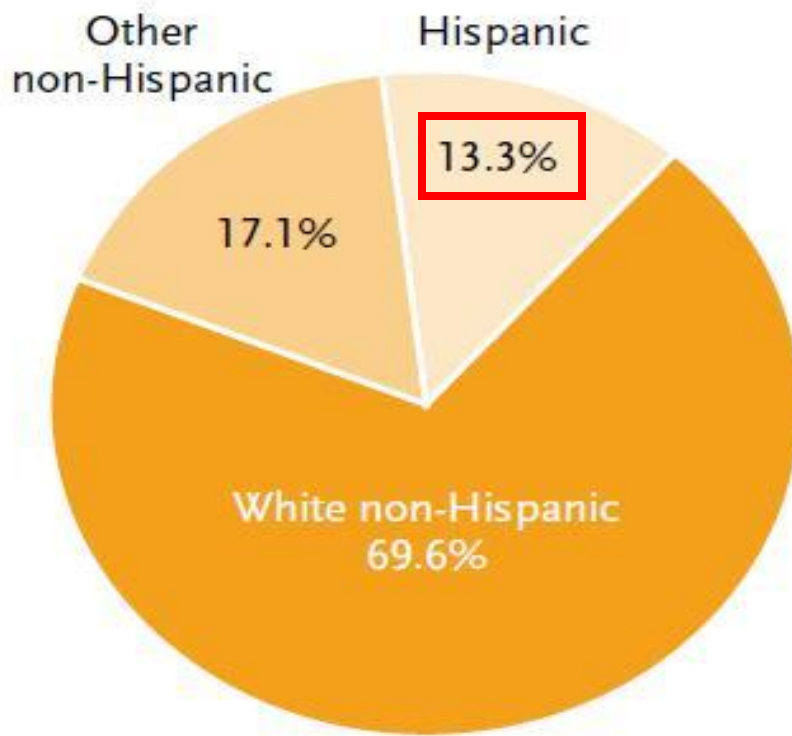
The resident population of the United States, by race/ethnicity: 1995



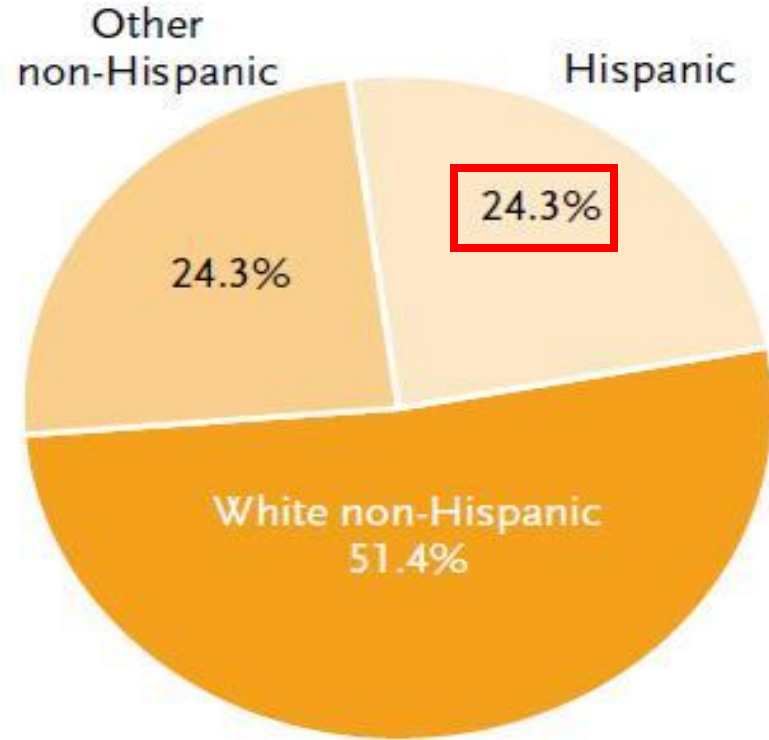
15 years ago: 1995

Workforce: 2005 and 2050

Distribution of U.S. Labor Force by Race/Ethnicity, 2005 and 2050



2005



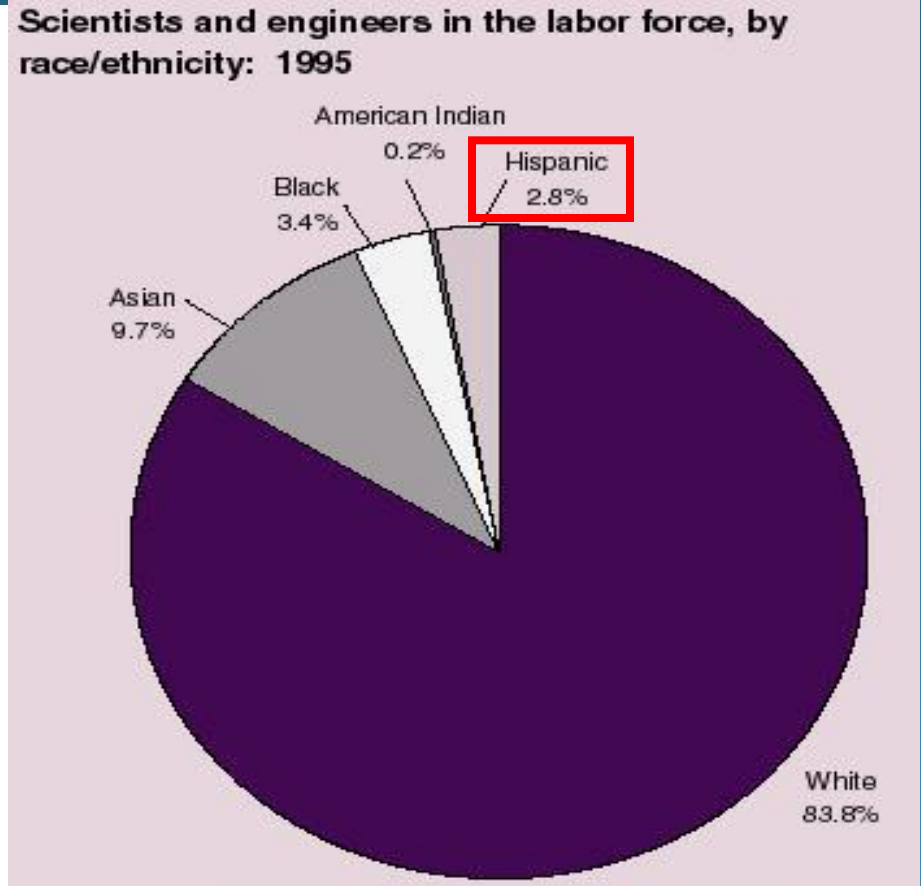
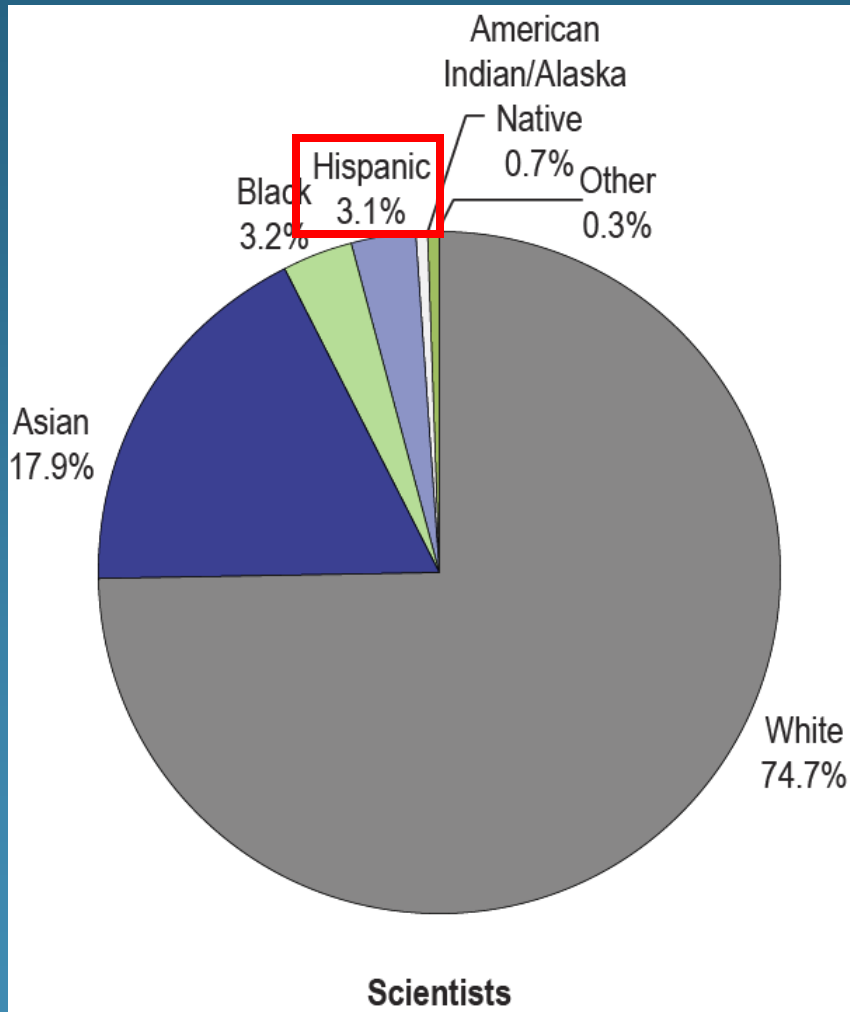
2050*

U.S. Labor Force Trends

by Marlene A. Lee and Mark Mather

POPULATION REFERENCE BUREAU June 2008

Employed doctoral scientists and engineers by ethnicity: 2006

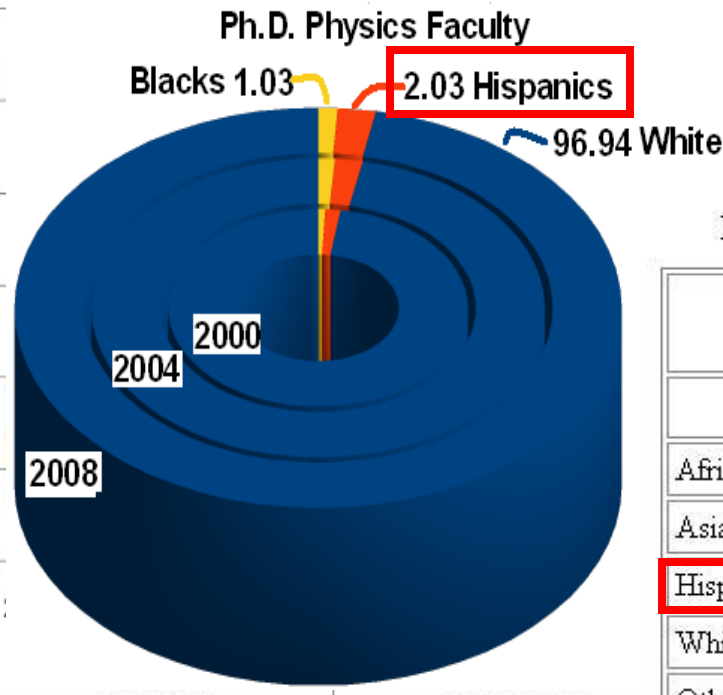
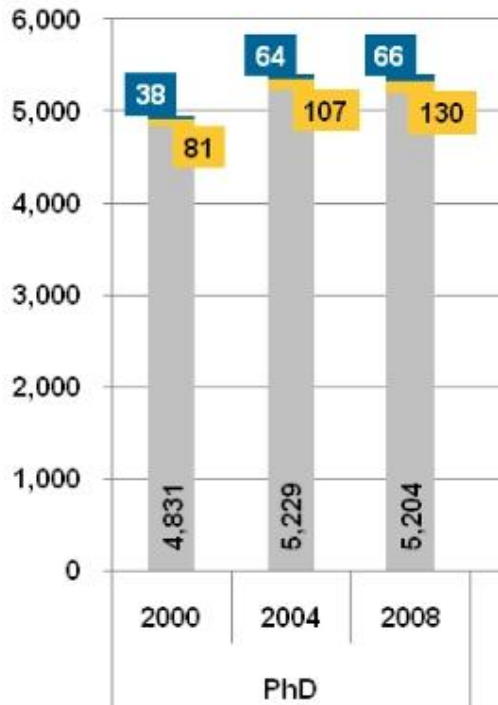


15 years ago: 1995

Ethnicity of Physics Faculty

Number of African-American and Hispanic Physics Faculty by Highest Degree Awarded by Department, 2008

Number of Faculty Members



Race and Ethnicity of Physics Faculty, 1996 and 2000.

	Physics		All Disciplines ²
	1996 ¹	2000	1995
African-American	1.5	1.8	5.0
Asian	10.1	9.9	5.1
Hispanic	1.4	2.0	2.4
White	85.3	84.2	86.7
Other	1.8	2.0	0.8

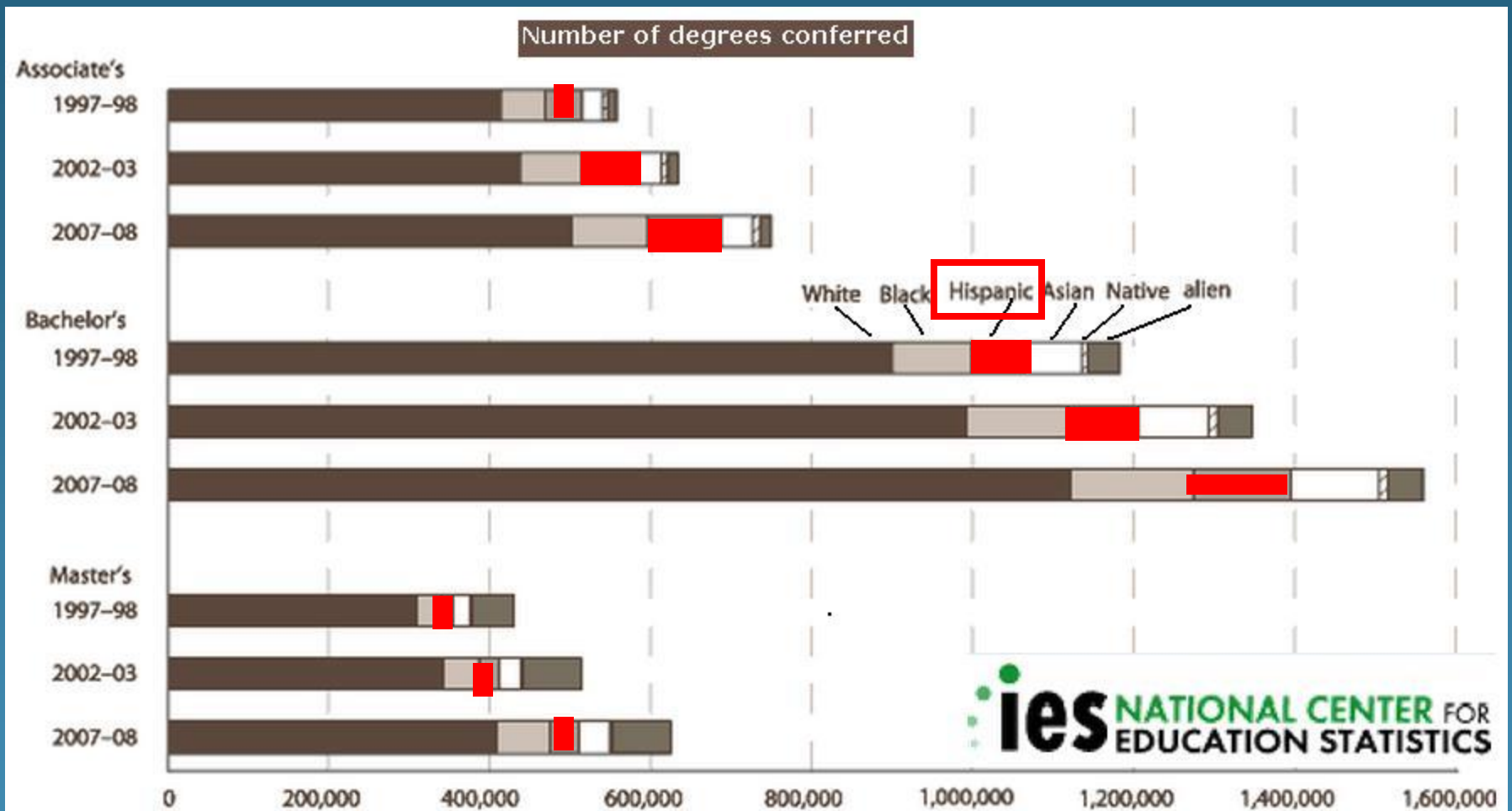
¹ Revised since the 1996 report.

² Source: National Center for Education Statistics.

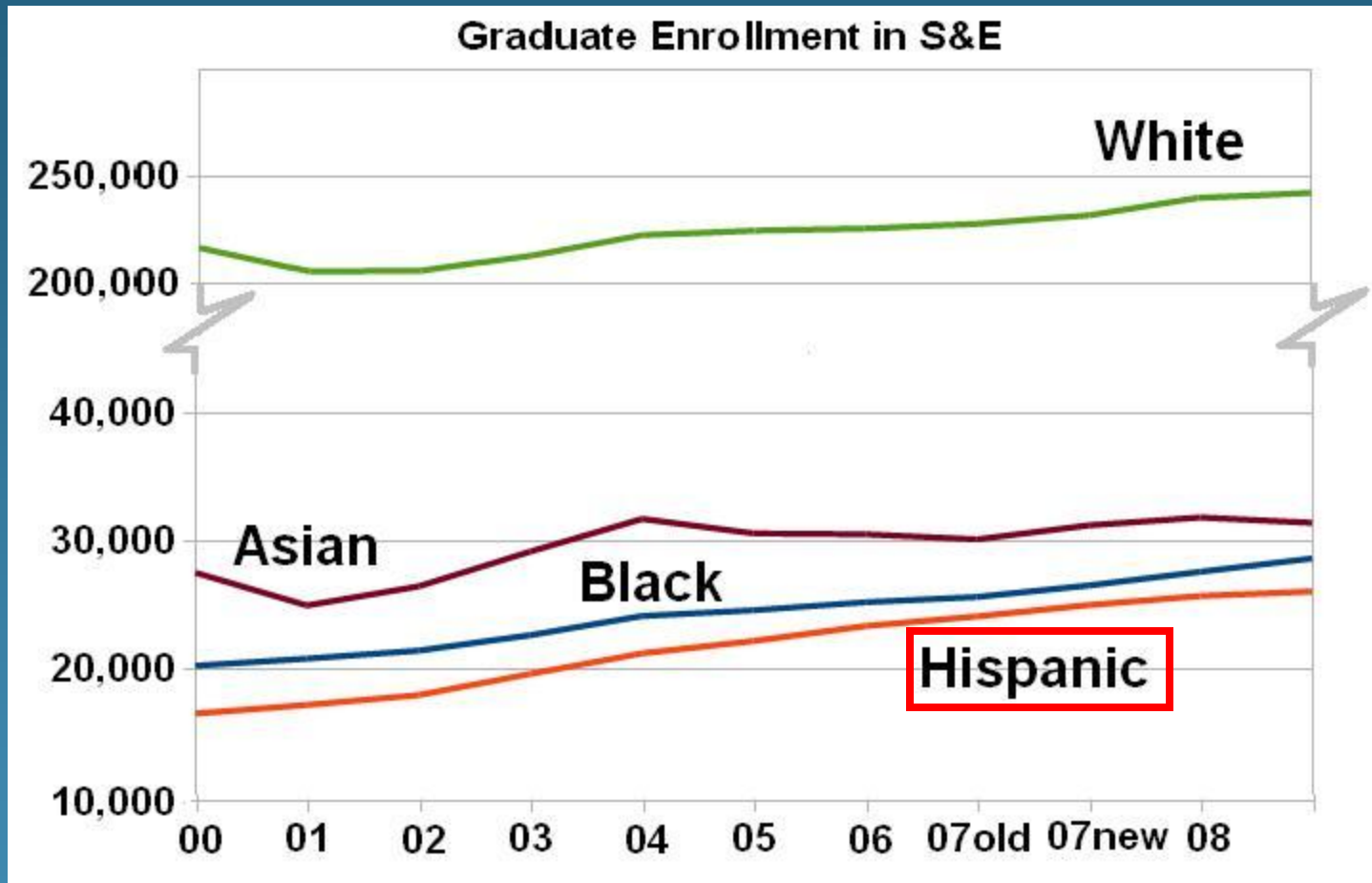
<http://www.aip.org/statistics>

10 & 14 years ago

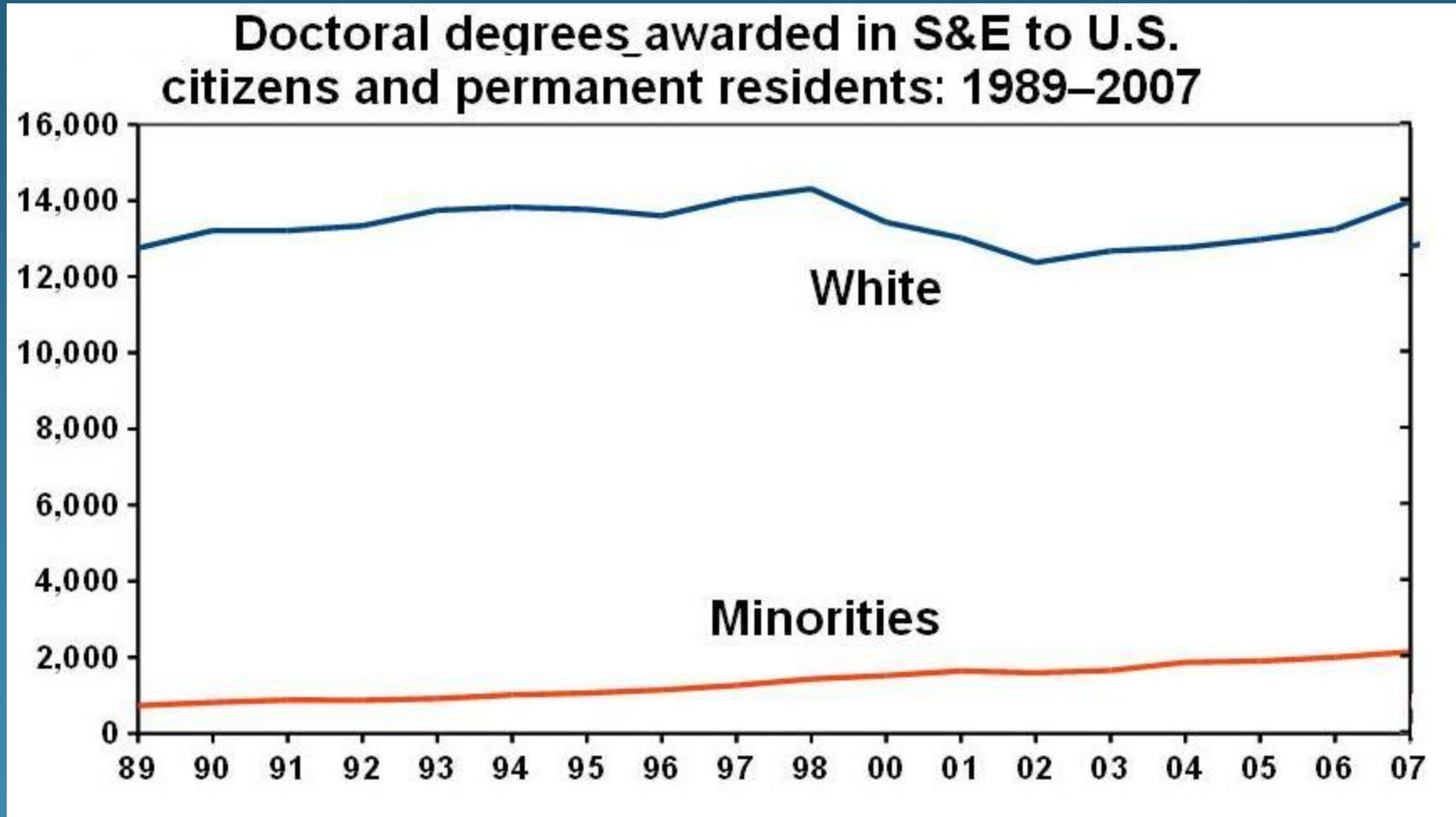
Beginning of pipeline: all areas



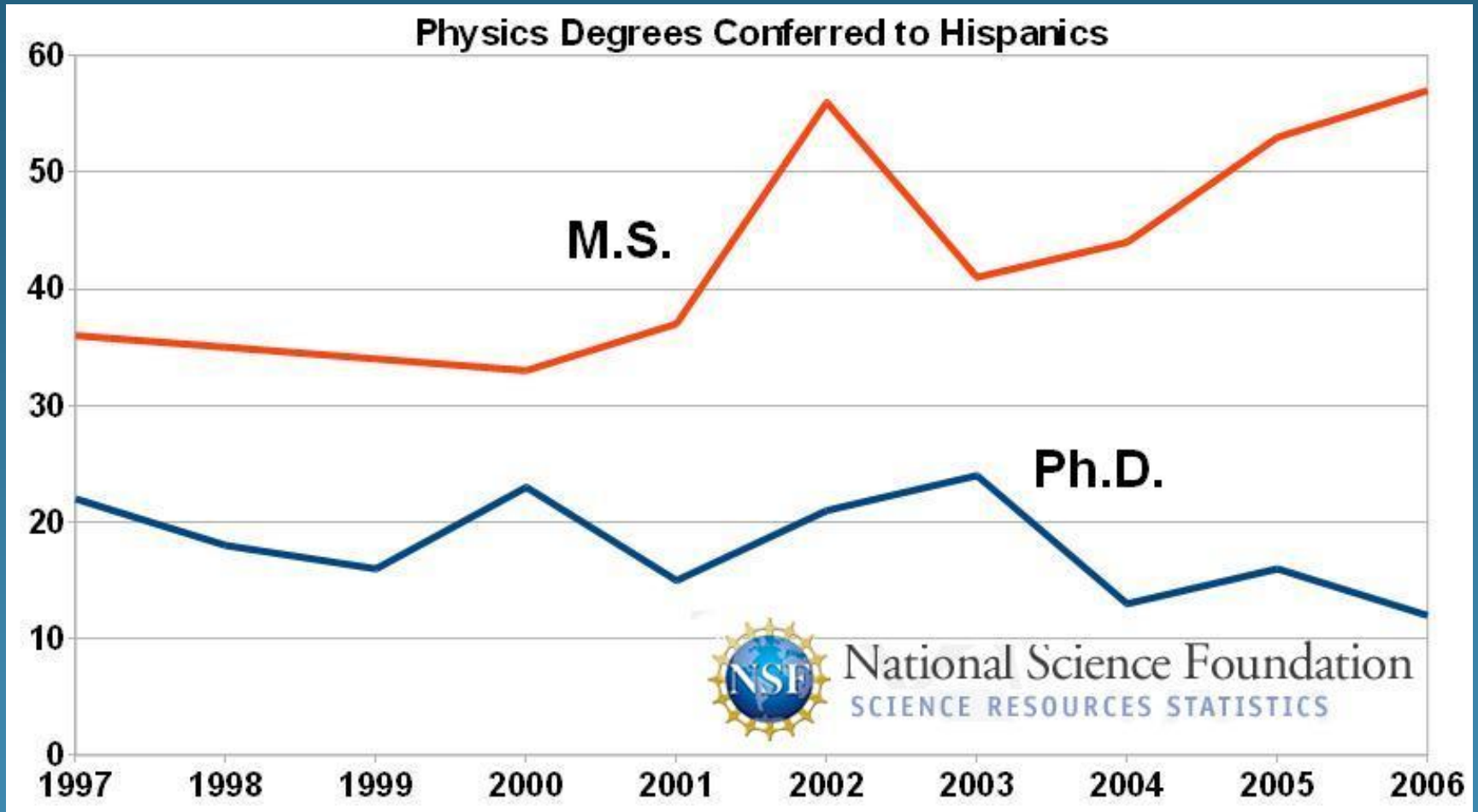
Middle of pipeline: S&E



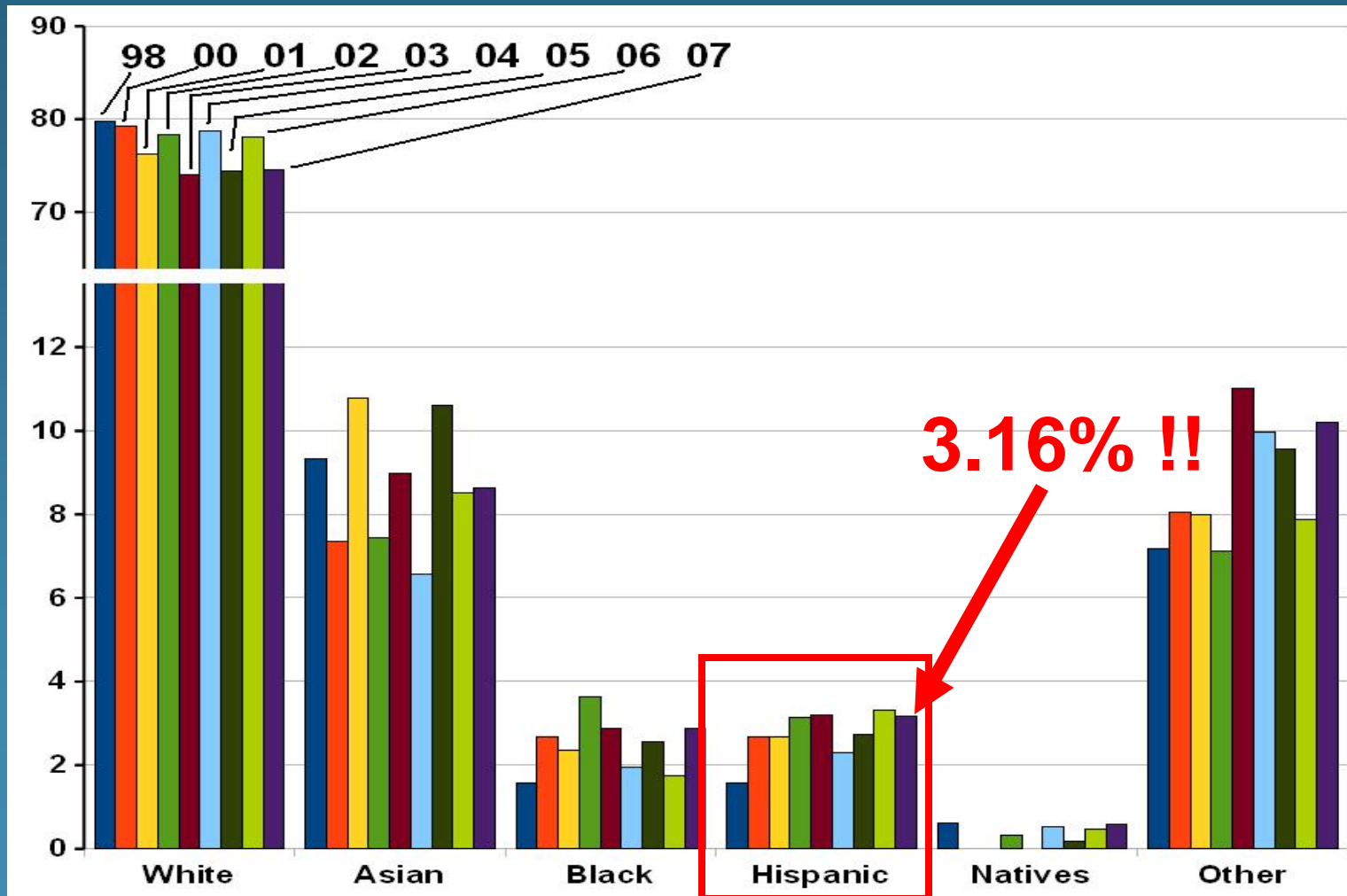
End of pipeline: S&E



End of pipeline: Physics



End of pipeline: Percentage of Physics Ph.D. Recipients 1998 - 2007



THE SCALE OF THE PROBLEM

Hispanics are:

- Population (all ages): 15.1 %
- Population (ages 18-24): 17.2 %
- Labor Force: 13.3 %
- Expected Labor Force in 2050: 24.3 %

- Employed Doctoral Scientists: 3.1 %
- Physics Faculty: 2.03 %
- Physics PhD Degrees: 3.16%
- S&E BS Degrees (2006): 7.7 %



INDEED WE DO HAVE A PROBLEM !

ORIGIN OF THE PROBLEM

Hispanic Characteristics

- **Disconnected to science**
- **1st in family to attend university**
- **Need to help support family**
- **Reduced travel experience**
- **Culture shock**

ELEMENTS TO SOLVE THE PROBLEM

- Disconnected to science
 - Educate parents
 - Newspaper articles
 - Radio: Universo (radiouniverso.org), Star Date
 - Science Fests
 - Educate teachers and students
 - High School newsletter
 - Physics circus
 - Summer workshops
 - Summer bridge programs
 - Physics Department open house
 - Visits to high schools



RADIO PROGRAM UNIVERSO

HIGH SCHOOL NEWSLETTER

Universo Online | Su Guía para el Universo - Netscape 6

File Edit View Search Go Bookmarks Tasks Help

http://radiouniverso.org/

Home Search Bookmarks Free AOL & U... Instant Message WebMail Calendar Radio People Yellow Page

Observación de los Cielos | Guías | Radio | Busqué

Universo Online

Búsqueda de programa

Fase Lunare

Provided by U.S. Naval Observatory

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Aviso del día para mirar las estrellas...
Plutón está en su mejor momento esta semana. El planeta asciende a la puesta del Sol y se mantiene en el cielo toda la noche. También está en su momento más brillante de todo el año, sin embargo, usted aún necesitará un telescopio de buen tamaño para encontrarlo. Está en la constelación de Ofiuco.
» Planee su [mirada de las estrellas](#) para la siguiente semana.

Hoy en Universo
Plutón en oposición

La pregunta del día
¿Por qué la Luna tiene fases?

Guía del Sistema Solar
La Guía del Sistema Solar es el recurso de apoyo que mejor compagina con la serie de radio Universo. Visite nuestra vecindad.

Universo
GUÍA DEL SISTEMA SOLAR



The Newsletter of UTEP's Department of Physics

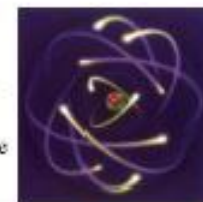
Volume I

Howdy guys!

Spring, 2002

Physica Junior!

Is our new publication for high school Students. The purpose of this newsletter is to build a bridge between the world of physics and you, **yes YOU!** Because, even if you never thought about it, you can be a scientist. So give yourself a chance and explore our world, the world of **The Physics Department of UTEP**



Free gift for your high school!

As you know, **Physics** is the study of *Nature*, and as such it has to do with just about everything you see (or do not see), feel (or do not feel), hear (or do not hear), smell (or do not smell) and taste (or do not taste). For instance physicists discovered the **X-rays** developed the **V-2 Bomber**, found the radiation from the **Big Bang**, designed the trip to the **Moon**, and are now carving **Nanoguitars**, the size of a blood cell.

To see the past hundred years in the history of physics in a dramatic timeline wallchart "A Century of Physics", created by the American Physical Society, please ask your physics teacher to request a **free copy from the editor of Physica Junior!** by phone (915-747-5715), Fax (915-747-5447) or e-mail (physics@utep.edu).



ELEMENTS TO SOLVE THE PROBLEM

- 1st in family to attend university
 - Entering Student Program
 - Faculty Mentors: APS's COM, NSHP
 - Tutoring programs
 - Partnerships with high schools and community colleges
- Need to help support family
 - Hire them as RA, TA, Grader
 - Scholarships/Fellowships
 - SPS



A PARTIAL LIST OF FELLOWSHIPS

AAUW Selected Professions Fellowship

Bunting Fellowship Program

Community Colleges of Connecticut Minority Fellowship

Cooperative Research Fellowship Program

Cornell University Graduate School Fellowships for Women

EPA - Minority Academic Institutions Fellowships for Environmental Study

Fellowship Programs - The National GEM Center

Ford Foundation Predoctoral & Dissertation

Ford Foundation Predoctoral Fellowship Program for Minorities

Freda A. DeKnight Memorial Fellowship

GEM M.S. Engineering Fellowship Program

GEM Ph.D. Engineering Fellowship Program

GEM Ph.D. Science Fellowship Program

Diversifying Higher Education Faculty in Illinois

Mellon Minority Fellowship

Minority Geoscience Graduate Scholarships

Minority Institution Assistance Fellowships

National Academies (Science, Medicine, Engineering Research)

National Consortium for Graduate Degrees for Minorities in

ELEMENTS TO SOLVE THE PROBLEM

- **Reduced Travel Experience/Culture Shock**

- **APS Sectional Meetings**
- **NSHP/SACNAS Meetings**
- **Summer REU**
- **SPS trips**
- **COM's Minorities Speaker List**



AN INSTITUTIONAL EXAMPLE

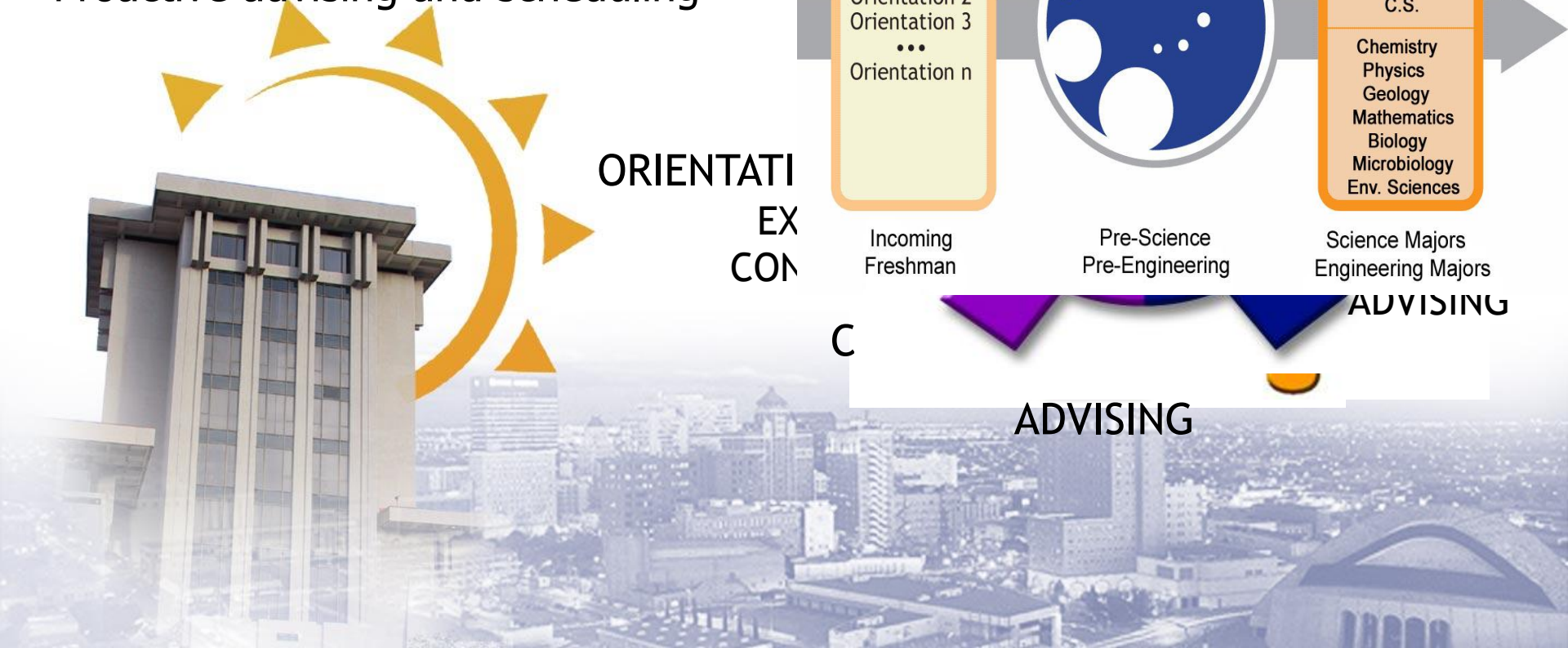
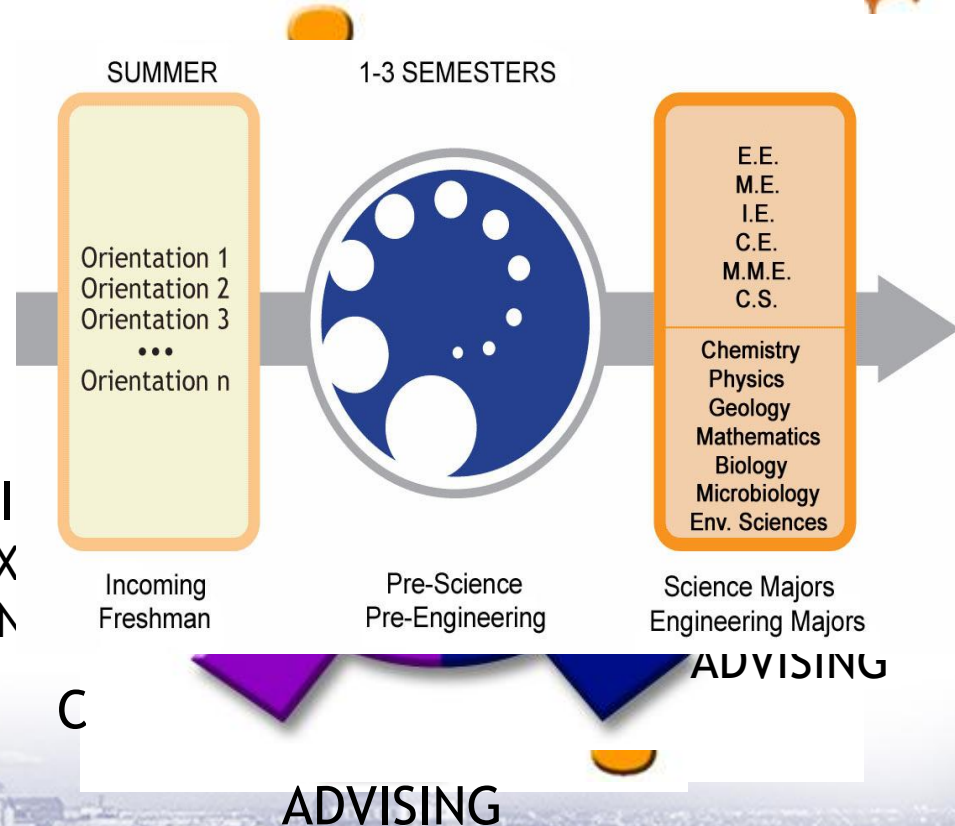




CircLES Entering Students

Retention of SEM students via learning communities in freshman year

- Week long summer orientation
- Placement exams in Math and English
- Course clustering (Math)
- Proactive advising and scheduling



CircLES Middle Years

Retention of SEM students via learning communities in freshman year

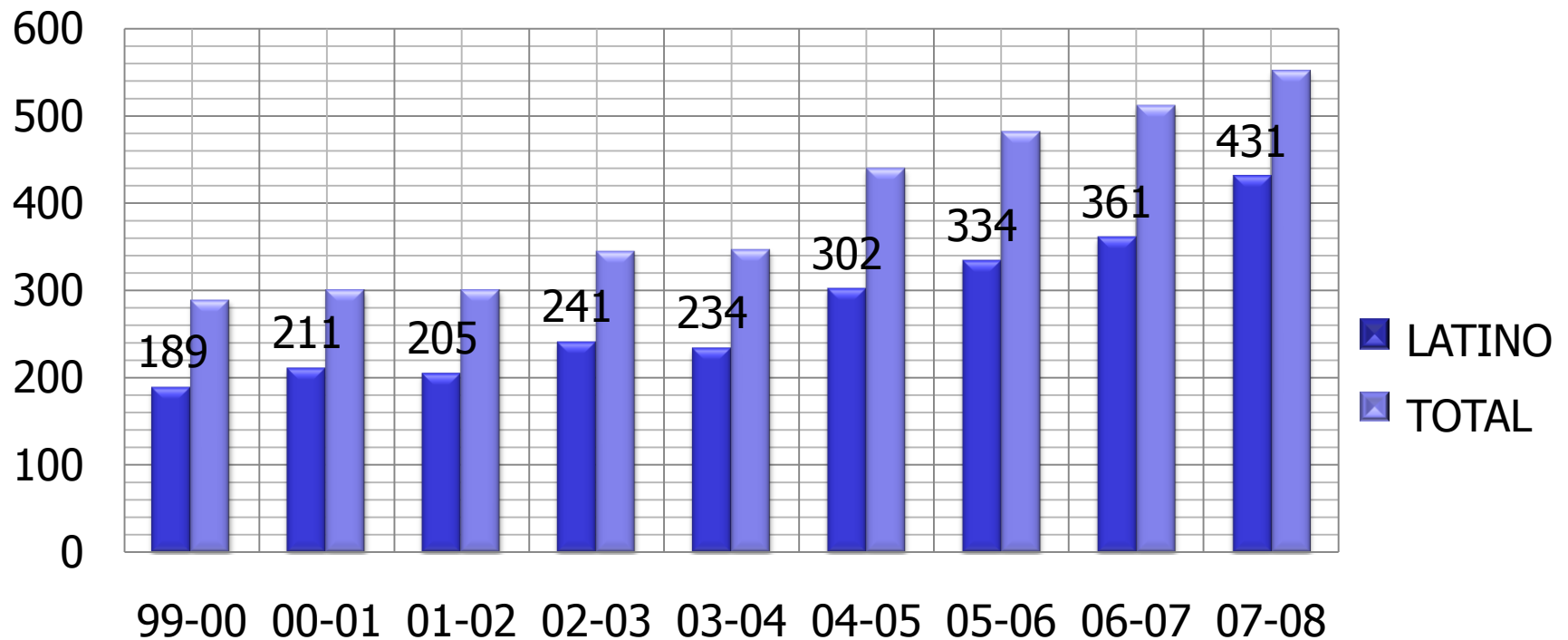
- Tutoring
- Peer Led Instruction
- Workshops
- Faculty Training



ACADEMIC CENTERS
FOR
**ENGINEERS
AND
SCIENTISTS**



BS STEM DEGREES AWARDED 99-08



CLOSING REMARKS

Problem exists and is complex
Problem is simple to solve
Little funds with many willing to help

10 STRATEGIES

- Recruitment:
 - Honors Programs, Scholarships
- Retention:
 - Tutoring, Networking, Campus jobs, Peer Leaders, REUs, RA/TA, Mentors, SPS
- Exposure:
 - APS meetings, PASI, SACNAS/NSHP, etc.
- Connection to graduate school
 - Networking, NSF-GRF, etc.

