



# CS 10K: Mobilizing the Computing Community

Jan Cuny, NSF

June 8, 2011

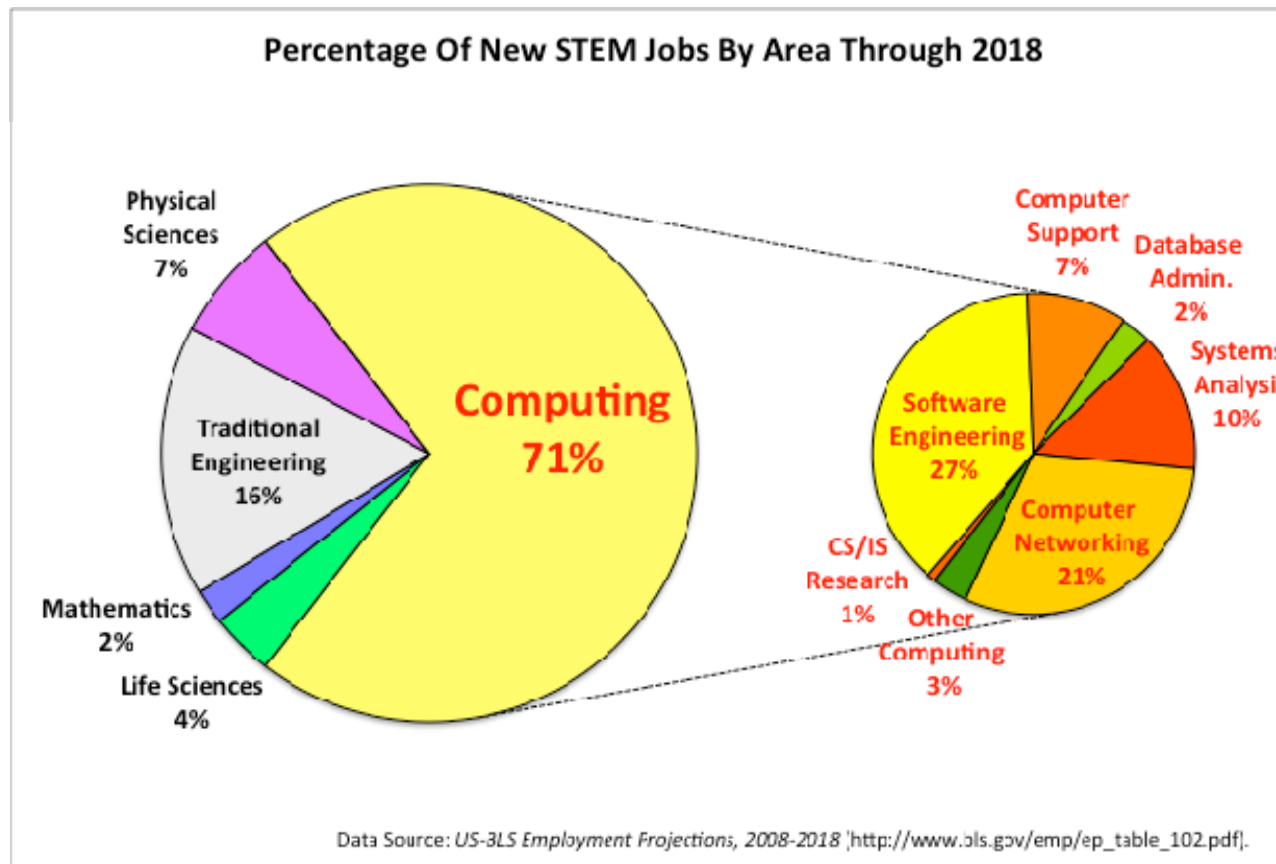
By 2018, there will be 1.4 million computer specialist job openings.

US universities will have generated enough graduates to fill about 1/3 of these openings.

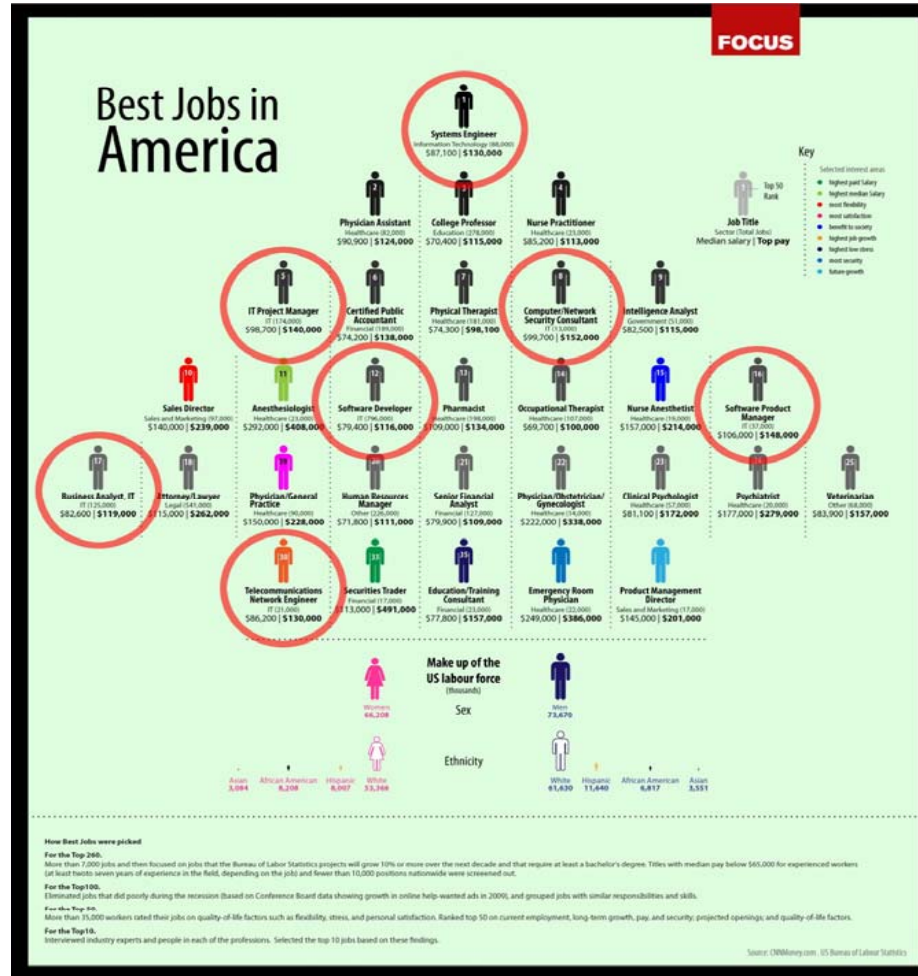
—NCWIT, By the Numbers, 2009



# Strong Predicted Job Growth



# ... and they're good jobs

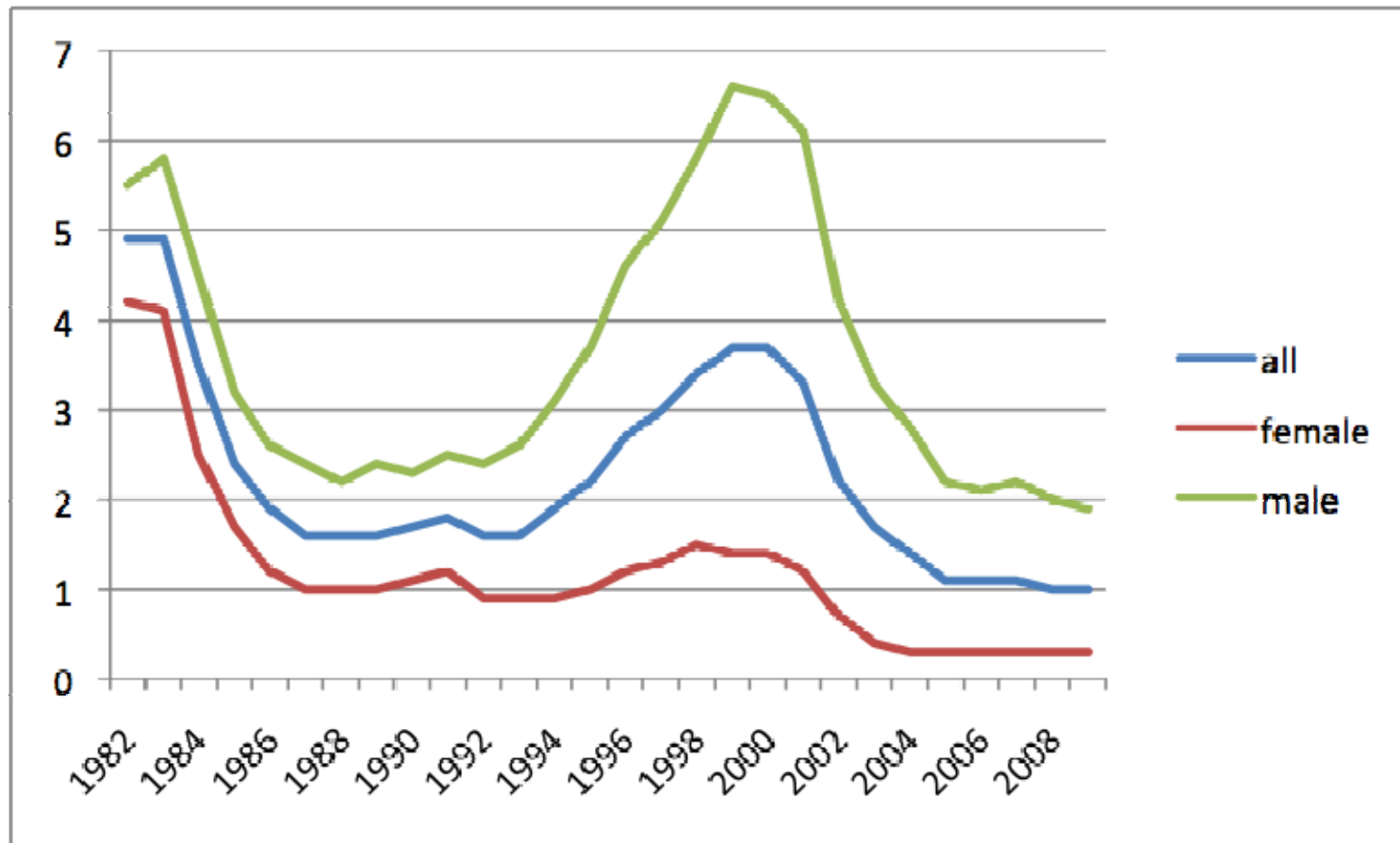


# Challenges

- Low student interest



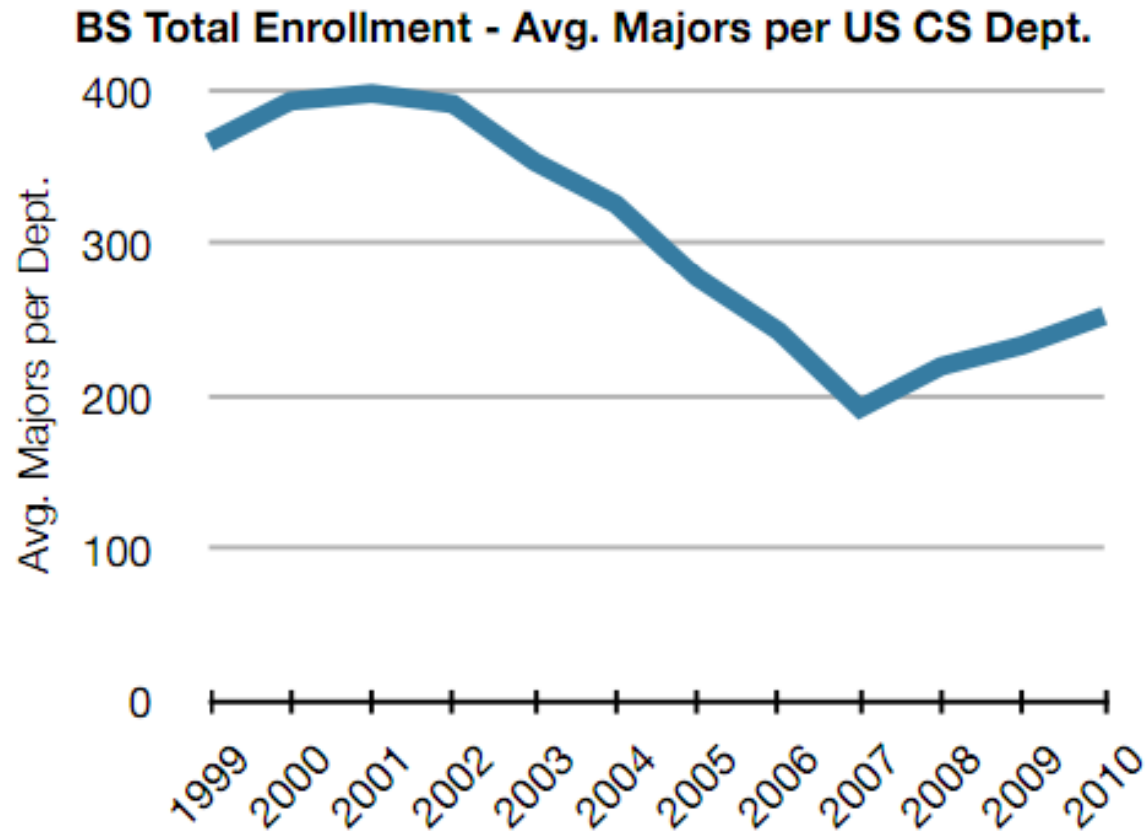
# Intended CS majors



Data source: HERI, Slide: NCWIT



# CS & CE Majors



—CRA Taulbee Survey, 2011



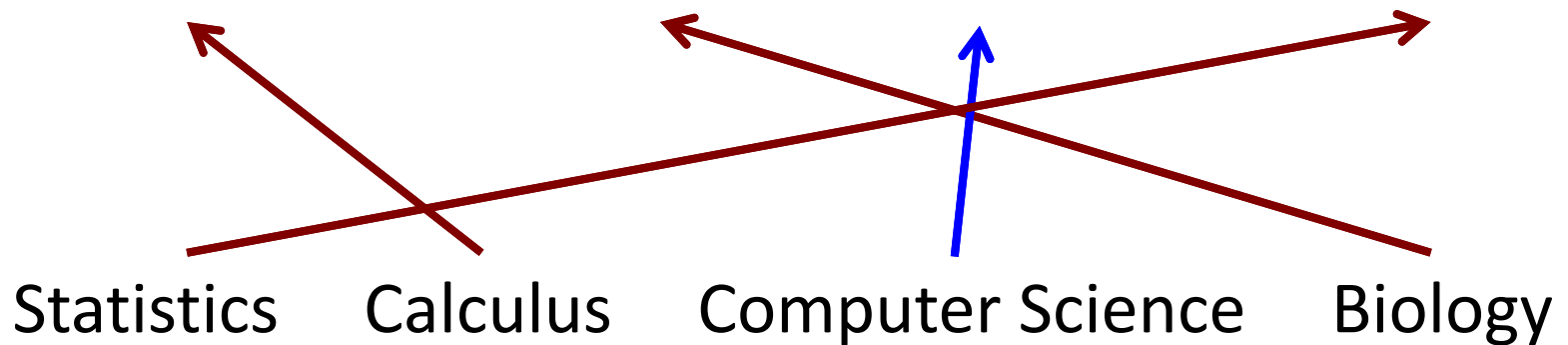
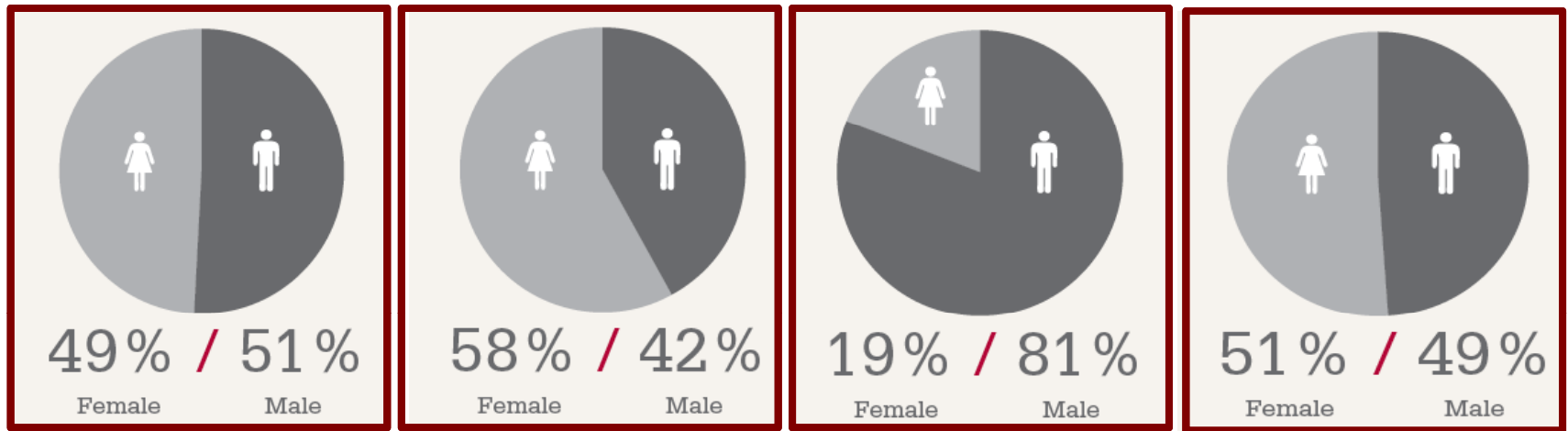
# Challenges

- Low student interest
- Dismal engagement of minorities, women & persons with disabilities





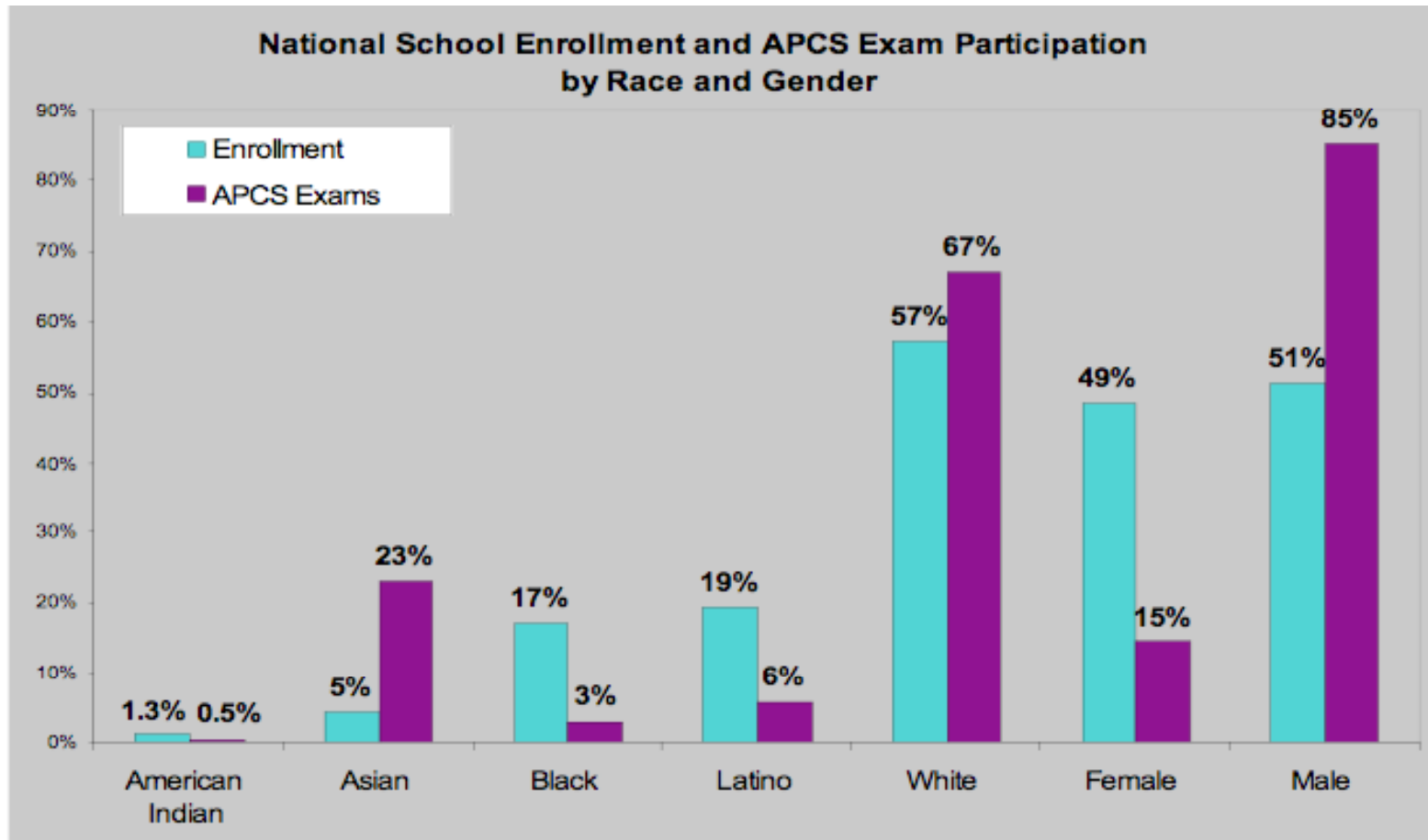
# 2010 AP Gender Gap



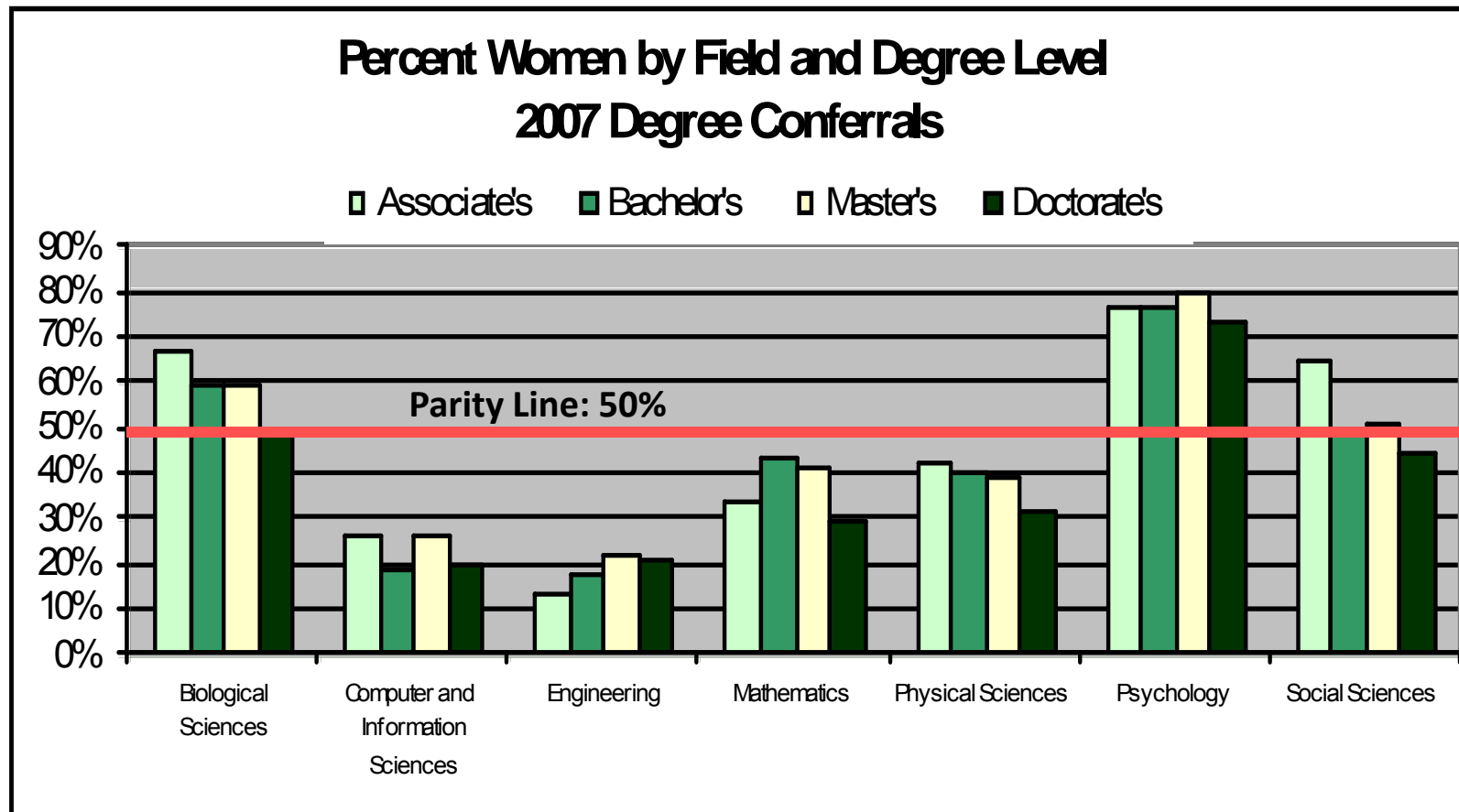
—College Board, 2010



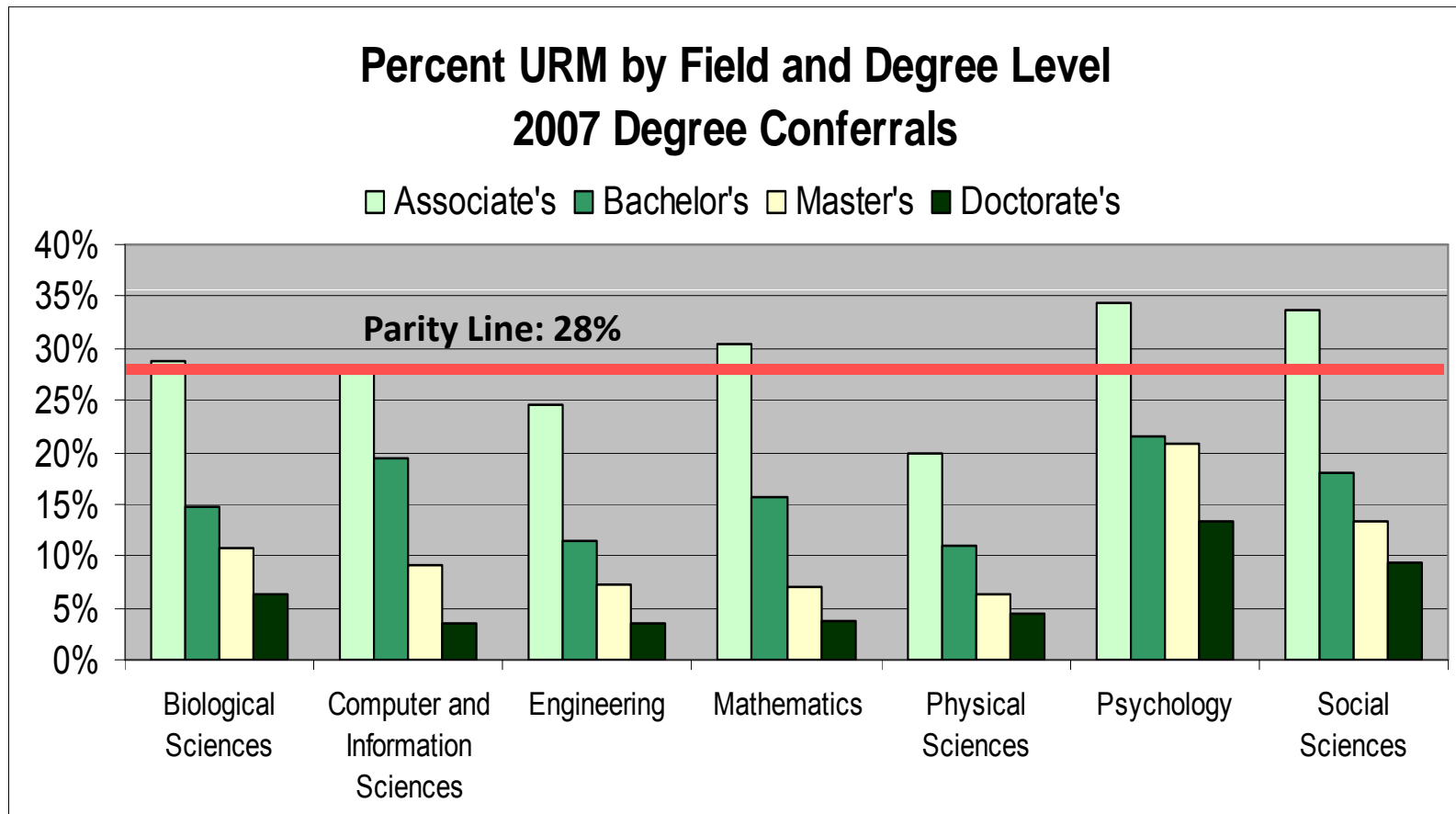
# The Missing 70%



# How do we compare on gender?

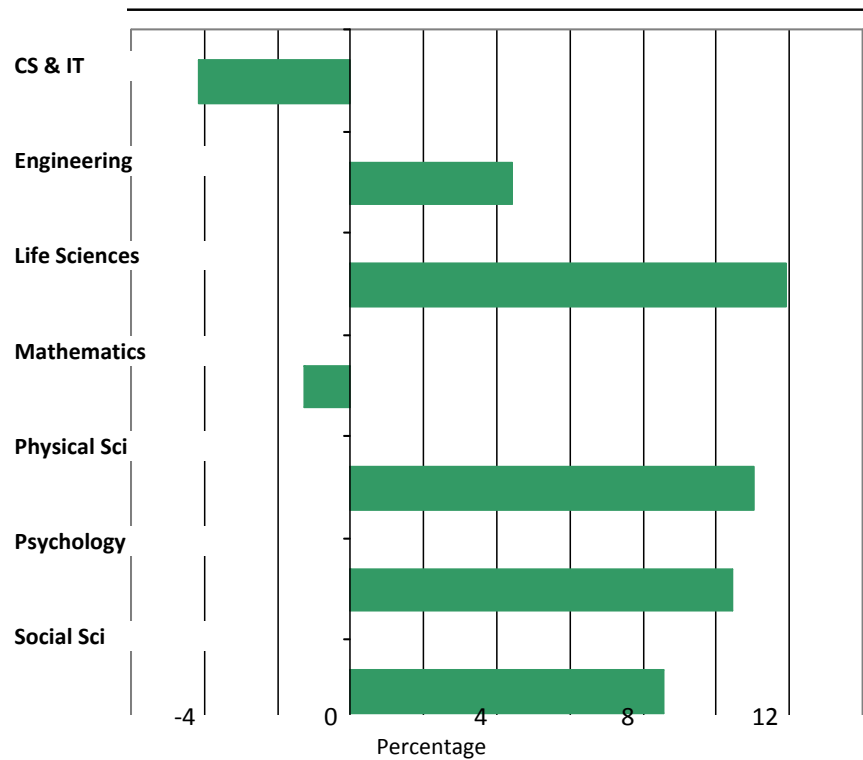


# How do we compare on minorities?



# The Trend

Change in Percentage of Women and URM's Obtaining Associate's, Bachelor's, Master's and Doctorate Degrees 1986 - 2005



Source: National Center for Education Statistics, Digest of Education Statistics



# Challenges

- Low student interest
- Dismal engagement of minorities, women & persons with disabilities
- Negligible presence in K-12
  - Lack of an educational research base
  - Academic computing not available in most high schools

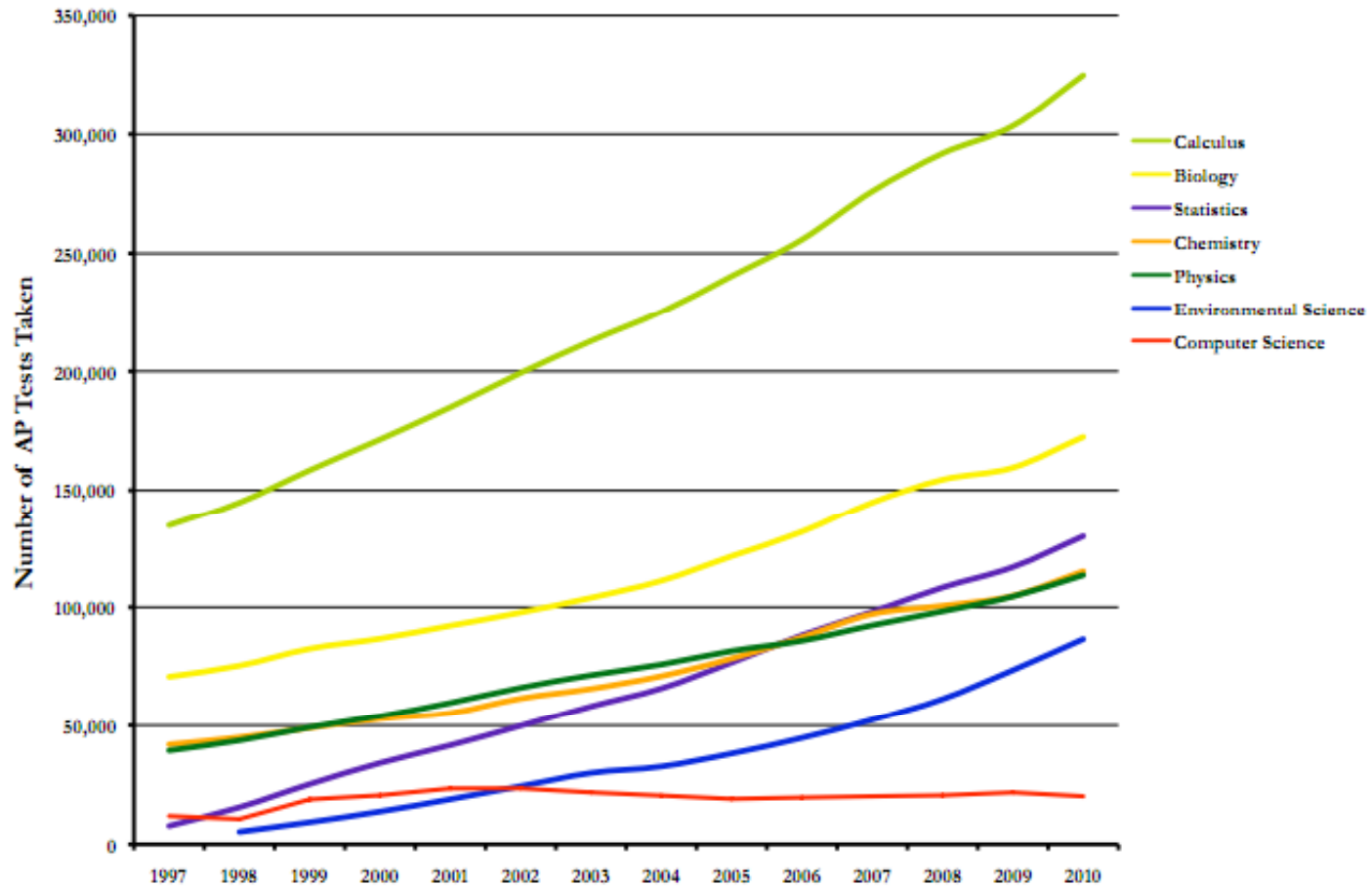


The percentage of U.S. students taking STEM courses has increased over the last 20 years for all STEM disciplines *except* computer science, where participation dropped from 25% to 19%.

2009 NAEP High School Transcript Study



# High School Participation in AP STEM Disciplines



Source: College Board Exam Volume Data

\*Computer Science up until 2009 had an A and AB test as of 2010 they are only offering the A test





# High School is Key



# Why High School?

- We need to do *much* better there.
- Without the HS piece, anything we do for middle school will be lost.
- Without the HS piece, anything we do at the college level will be insufficient.

# CS 10K Project

Develop an effective new high school computing curriculum and get it taught in 10,000 schools by 10,000 well-prepared teachers by 2015.

Featuring a new  
CS AP course, CS  
Principles



# CS Principles



- Engaging, accessible, inspiring, rigorous
- Focused on the fundamental concepts of computing (CT)



# Pilots

## 2010-11

- Berkeley, Dan Garcia
- Metro State Denver, Jody Paul
- UC San Diego, Beth Simon
- UNC Charlotte, Tiffany Barnes
- University of Washington, Larry Snyder

## 2011-12

- ~18 colleges
- ~36 high schools



# Beyond the AP Curriculum

- Additional course models
- Standards & assessments
- Teacher preparation X 10,000
- Entrée into schools

CE21

Yikes!



Accomplishing all of this is beyond NSF's mission and resources!



# Exploring Computer Science

- LAUSD, Jane Margolis
- Piloted ECS 08/09
- ~20 LAUSD schools 10/11
- Spreading in CA and  
CALCSEPOL
- Complete, detailed curriculum  
& lessons plans on CSTA site
- Google collaboration around data & CENS participatory  
science cell phone apps
- “G” credit and CTE credit



# Computing Community Involvement

## Departments

- Pilot the course; Work with Ed Schools; Train and mentor Teachers; Talk to students about HS teaching;

## Companies and Foundations

- Join CS 10K Private/Public Partnership; Join C in C; Get involved in CS Ed Week activities; Build a cluster

## Individuals

- Advocate in state, local colleges and high schools; Join/Found a CSTA Chapter; Support local teachers (bring students); Do something related for CS Ed Week 2011; Build a cluster





# Right now I need ....

Help with mail reviews of single proposals from both university faculty & high school teachers.

Volunteer: [jcuny@nsf.gov](mailto:jcuny@nsf.gov)

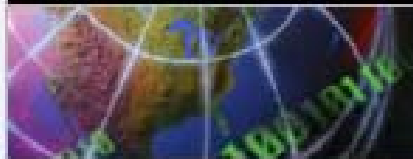




SEARCH

NSF Web Site

**Computer & Information Science & Engineering (CISE)**



Email Print Share

## Computing Education for the 21st Century (CE21)

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### PROGRAM GUIDELINES

Solicitation [10-619](#)

**Please be advised that the NSF Proposal & Award Policies & Procedures Guide (PAPPG) includes guidelines implementing the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: Grant Proposal Guide Chapter II for further information about the implementation of this requirement).**

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# ThankS!

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