Some Thoughts on Teaching at a Community College

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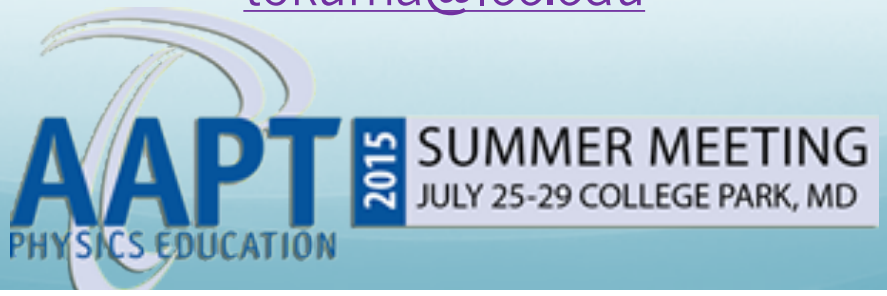


Primary Sources

- American Institute of Physics Statistical Research Center (AIP-SRC)
- American Association of Community Colleges
- SPIN-UP/TYC Project, 2002-2005
- TYC Physics Workshop Project, 1991-2006
- ATE Program for Physics Faculty, 2006-2015
- Many TYC colleagues

Outline

- Introduction
- Information about Two-Year Colleges
  - General Information about TYCs
  - Information about Physics at TYCs
  - Availability of Physics Positions
- Opportunities and Challenges

Introduction

- Two-Year Colleges are as different from each other as R1 universities are different than small liberal arts colleges or public state universities
- Diversity
- Physics enrollment have nearly doubled at two-year colleges in the last sixteen years (1995 to 2011)*
  - Almost 30% of all students taking undergraduate introductory physics
  - Plus ~21% of all students taking undergraduate introductory astronomy
- Hence, there is a need for faculty
- *Source – AIP SRC

General Information about TYCs

- How many, where and size of TYCs?
- Types
- Common Features
- Students
- Education Programs
- Demographic Data

Information about TYCs

- Number of TYCs
  - AACC – 1,123 TYCs (~1,700 campuses)
    - 992 public, 96 – independent, and 35 tribal
  - AIP-SRC – 1,063 campuses that teach physics
- In all 50 states
- Largest number in California (137)
- Size run from 500 to 45,000+ students
- Some are large districts of TYCs

Information about TYCs II
Types of TYCs

- Junior College
  - first two years of a baccalaureate education
- Branch Campus of a University
  - first two years of a university program
- Technical Colleges
  - two years or less technical programs in fields like electronics, automotive, nursing, robotics, process and instrument technology, computer aided drafting, computer information system, ...
  - short training programs for specific jobs
- Comprehensive Community College
  - first two years of a baccalaureate education
  - two year technical programs in fields like electronics, automotive, nursing, robotics
  - community economic development programs
  - community cultural events

Information about TYCs III Common Features

- Diverse-from state to state; students; programs; faculty
- **Local in mission and focus**
- **Low cost** – varies
  - Average - $3,347 for TYCs (public, in district)*
  - Average - $9,139 for 4YCs (public, in state)*
- Open admission policy
- Degrees and Certificates
  - 750,399 Associate Degrees
  - 459,073 Certificates

*Source – American Association of Community Colleges (2015), 2015 Community College Fast Facts

Information about TYCs IV Students

- Commute (25% do have campus housing of some form)
- Work part-time or full-time
  - 62% of full-time students work part-time or full-time
  - 73% of part-time students work part-time or full-time
- 58% of student receive financial aid of some type
- Non-Traditional – average age is 28; median is 24
  - Work training/re-training; underprepared, …
  - 57% are female
- Faculty has role of developing and nurturing students rather than screening or selecting

Information about TYCs V Education Programs

- Transfer, work force, community service
- Flexible education program
  - Evening, weekend, during breaks
  - Off-campus branches
  - Distance education – hybrid, flipped, online, …
- Innovative
  - easier because of small number of physics faculty
  - diverse population represents a large challenge
  - **physics is part of multi-disciplinary department**

Information about TYCs VI Demographic Data

- Over 7.7 million credit students - 5 million non-credit
- 46% of all undergraduates
- 41% of first time college freshman
- 52% of all African American students in higher education
- 57% of all Hispanic students in higher education
- 61% of all Native American students in higher education
- 36% of TYC students are first generation to attend college; 17% are single parents; 12% are students with disabilities; 7% are non-US citizens

Information about TYC Physics

- Departments
- Faculty
- Courses
- Enrollment
- New/Replacement Faculty Positions

Information about TYCs VII "Physics Departments"

- 60% in one-person or 0-person department
- 22% in two-person department
- 12% in three-person department
- 6% in four- or more-person department
- **Majority are part of a larger academic unit and not a separate physics "department"**
- **Most have both full-time and adjunct faculty**

Academic Units where Physics is Housed on Two-Year College Campuses, 2011-12

Academic unit name includes the term …	Prevalence
Science	93%
Math *Example: "Division of Science and Mathematics"*	45%
Arts *Example: "Division of Arts & Sciences"*	18%
Natural *Example: "Division of Natural Sciences"*	14%
Engineering *Example: "Division of Science, Mathematics, and Engineering*	13%
Technology *Example: "Division of Mathematics, Science, and Technology"*	9%
Physical *Example: "Division of Math and Physical Sciences"*	7%

Note: Since academic unit names may include more than one word in the list, totals do not sum to 100%.

http://www.aip.org/statistics

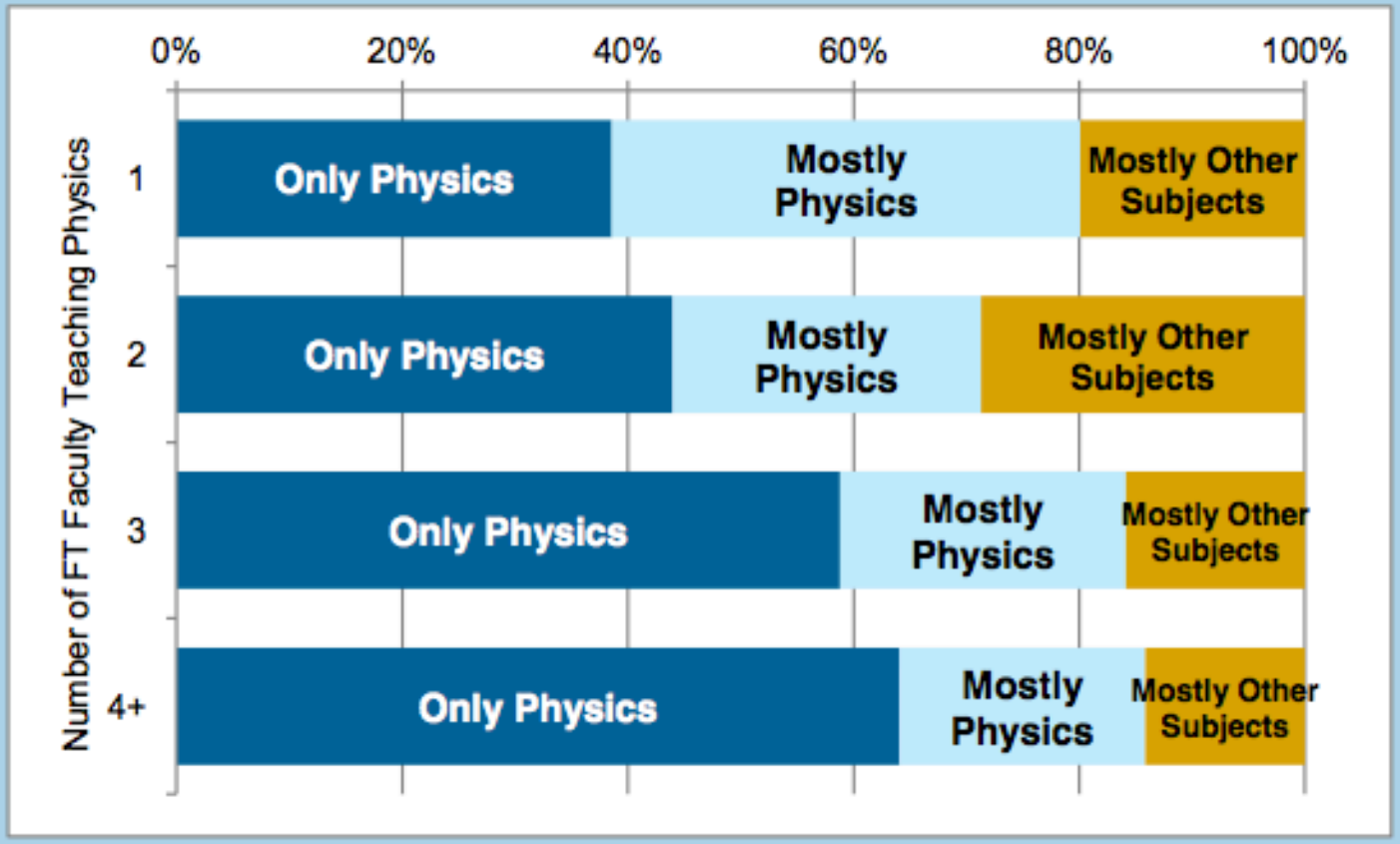
Information about TYCs VIII "Physics Faculty"

- ~99% have at least a Master's degree
- ~30% have two Master's degrees
- ~35% have Ph.D./EED
- 51% of 3,300 physics faculty are full-time; 49% part-time
- 23% are female

Information about TYCs IX "Soft Issues"

- What are some of the positives of TYC Teaching
  - 100% love teaching; 100% enjoy working with students; 89% like not having to do research; 87% liked the impact they were having on society; 70% like the autonomy
- What are some of the negatives of TYC Teaching
  - 100% thought the workload was too heavy; 78% disliked the isolation; 52% disliked the poor image that TYC faculty have
- How do TYC Physics faculty feel
  - 94% feel challenged; 93% fell unappreciated; 92% feel exhausted; 73% feel exhilarated; and 68% feel overwhelmed

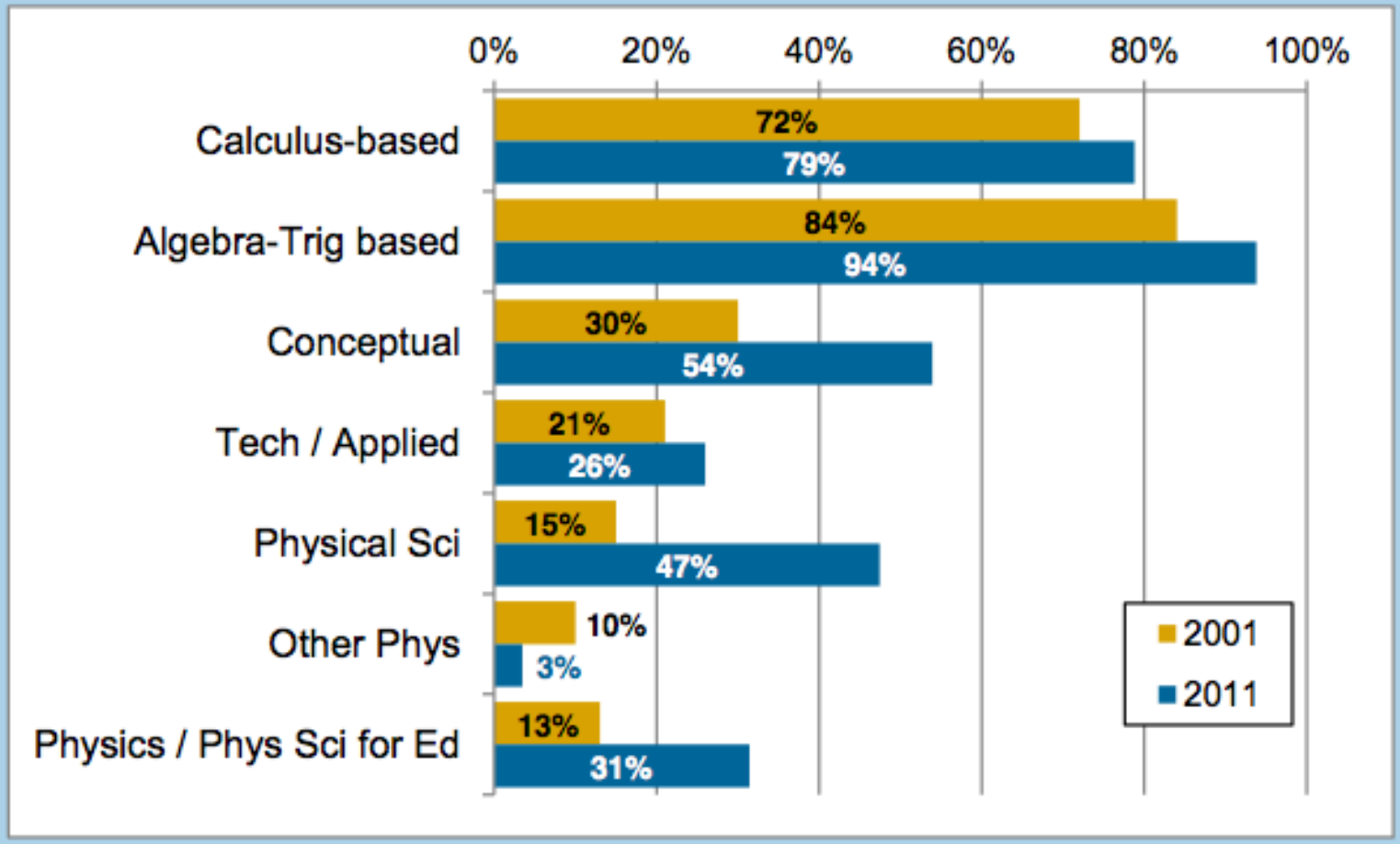
Full-Time Physics‡ Faculty Teaching Responsibilities at Two-Year Colleges by Number of Full-Time Faculty in the Department, 2011-12



‡ The list of courses on the questionnaire included astronomy classes. Since astronomy classes were not included on the questionnaire in earlier years, these numbers should not be compared to those from previous studies we have conducted.

http://www.aip.org/statistics

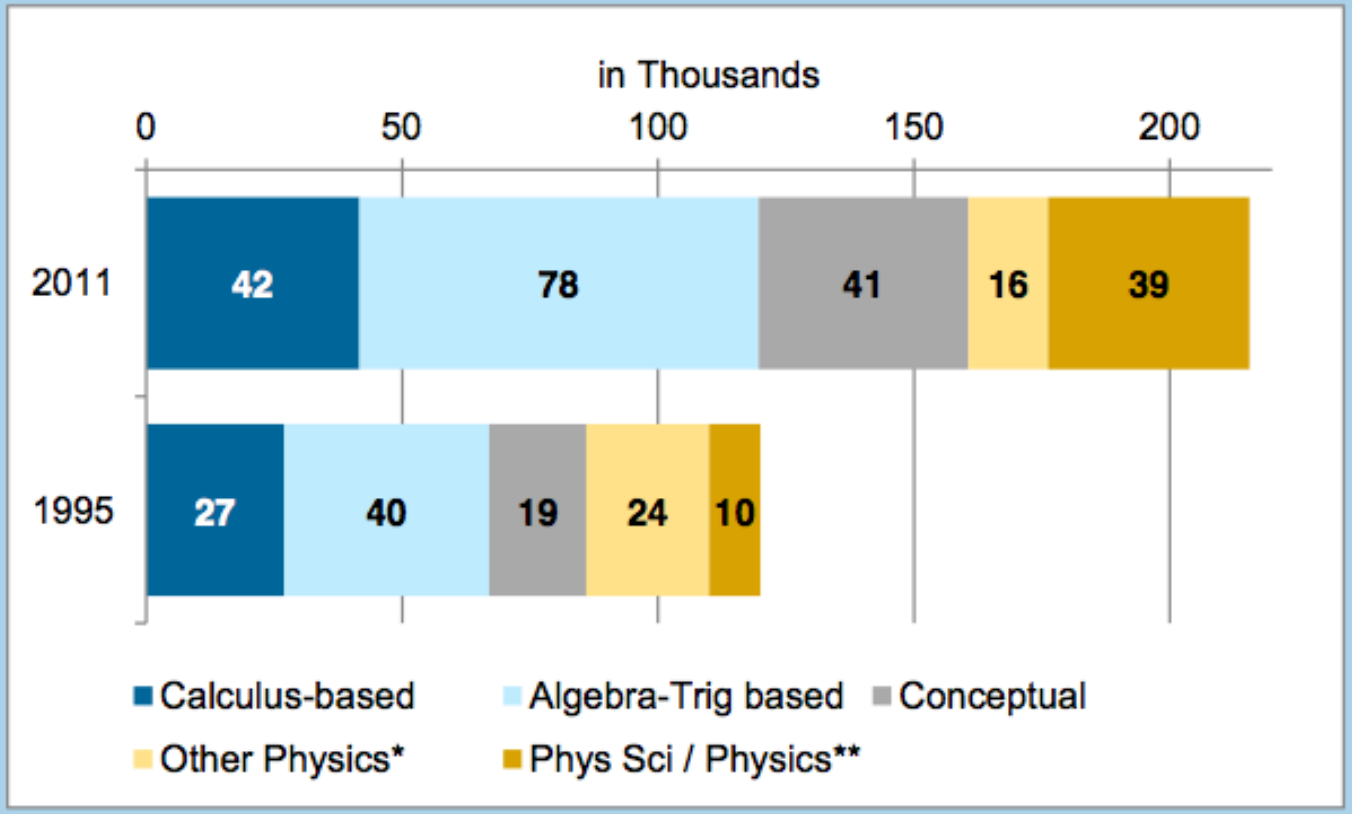
Physics* Offerings at TYC Campuses
At TYC Campuses that Offer Any Physics*
by Type of Course, 2001 & 2011



*** Includes physical science courses that are at least 50% physics**

http://www.aip.org/statistics

Number of Students Enrolled in Physics‡ in Two-Year Colleges by Academic Year & Type of Course

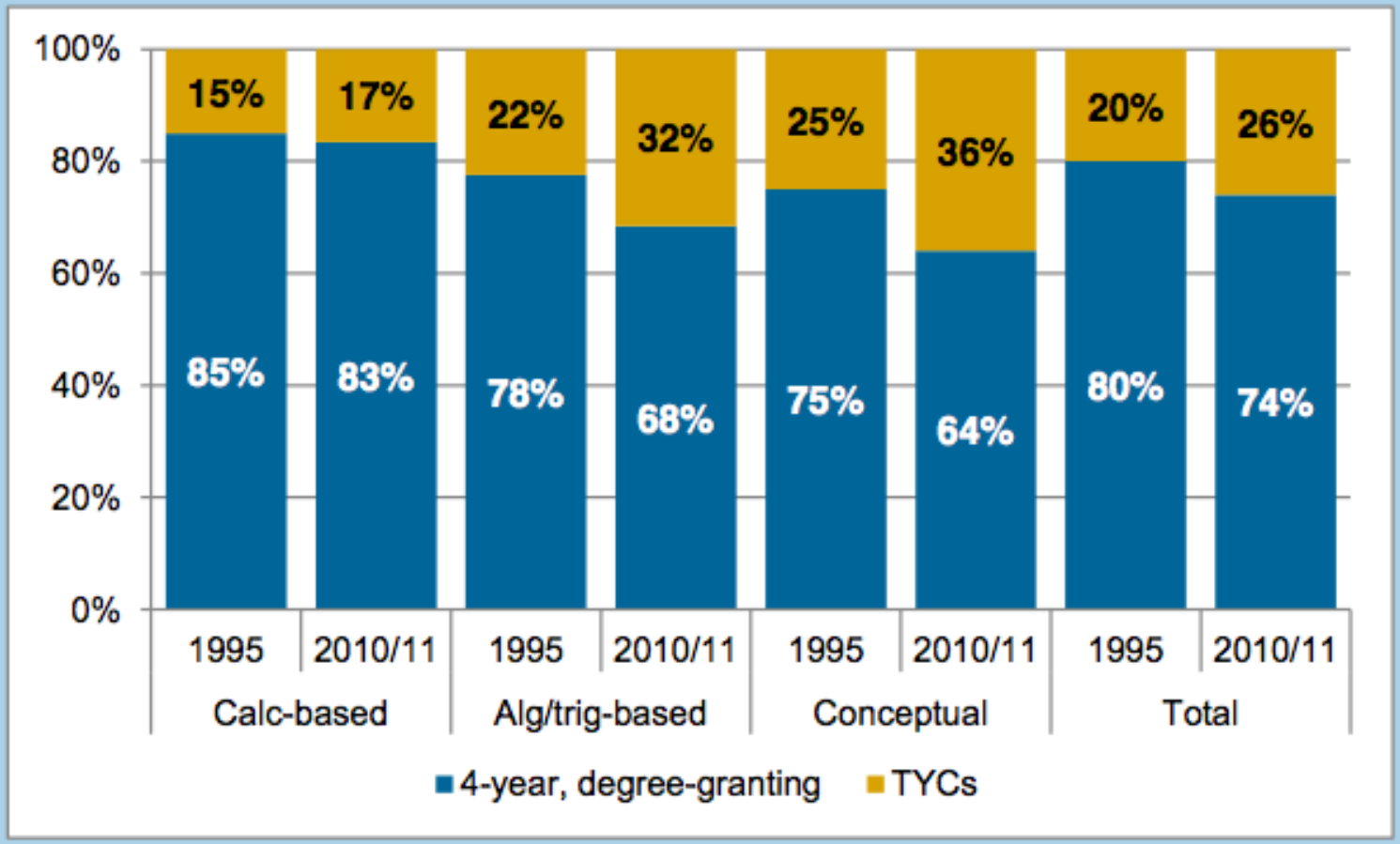


‡ Includes physical science courses that are at least 50% physics
*Includes Technical / applied physics
** Includes physical science and physics for education majors

1995 data represents the 1995-1996 academic year
2011 data represents the 2011-2012 academic year

http://www.aip.org/statistics

Total Student Enrollment in Physics Courses
by Type of Institution

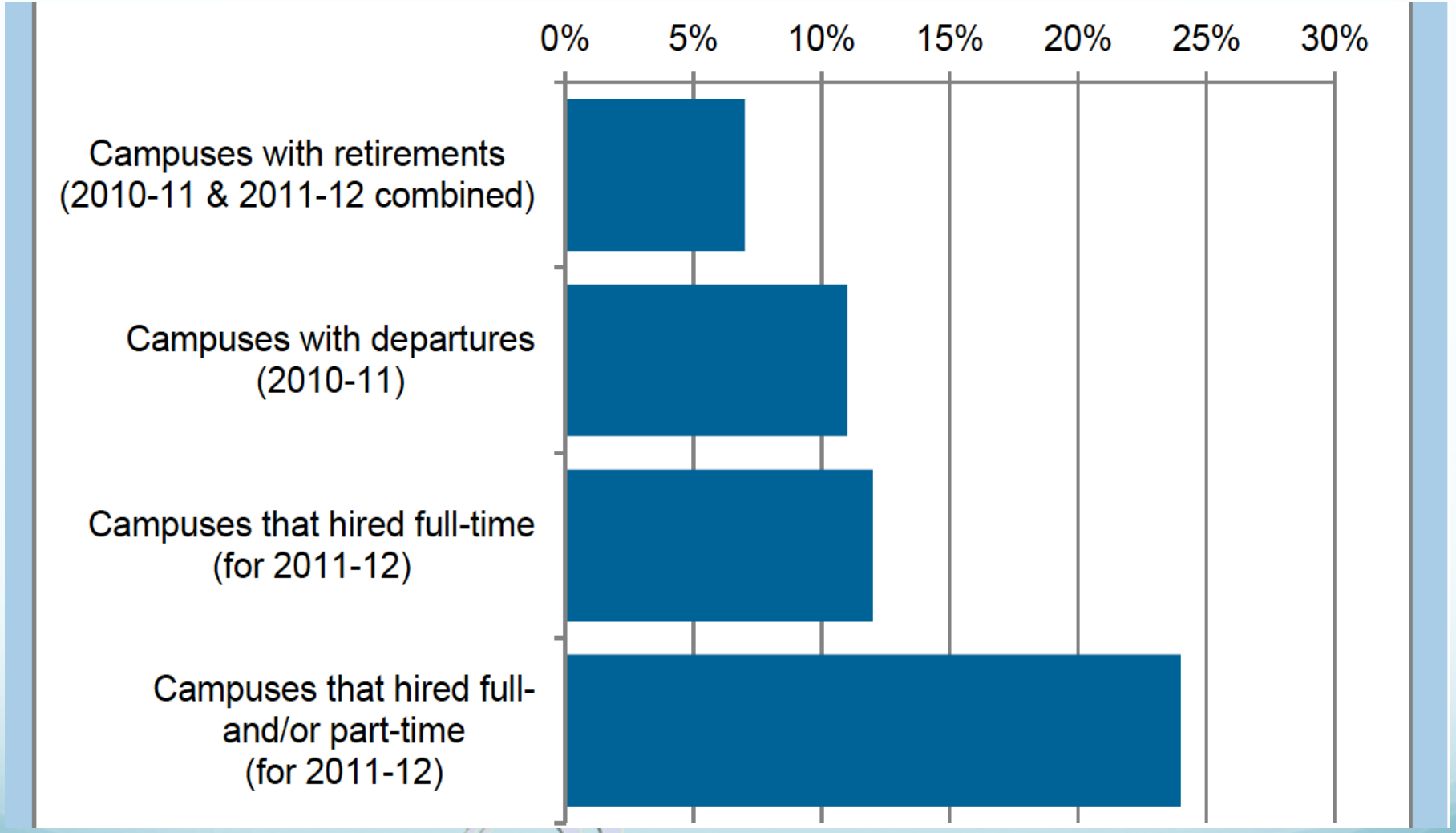


The enrollment data for four-year schools is for physics-degree-granting departments only.

The 2010/11 data is 2010 data for 4-year schools and 2011 data for TYCs.

http://www.aip.org/statistics

Availability of Physics Positions (preliminary data)



Availability of Physics Positions

- Estimated 100 to 150 full-time physics/astronomy positions at TYCs during each of the next few years

- More than double that number for adjunct positions in physics and astronomy
  - You might consider this if you want teaching experience and to see if you like TYC physics teaching
  - A big plus for applying at a TYC

AIP Statistical Research Center – www.aip.org/statistics

- "focus on "Physics Enrollments in Two-Year Colleges" by Susan White and Raymond Chu, April 2013
- "focus on Number of Physics Faculty in Two-Year Colleges" by Susan White and Raymond Chu, June 2013
- "focus on Faculty Turnover in Two-Year Colleges" by Susan White and Raymond Chu, August 2014

Opportunities and Challenges

or

Some Personal Thoughts and Comments

Successful Candidate – What Can Your Expect?

- Teaching Load ~ 3 lecture/lab classes or 18 contact hours per week; overloads
  - Big plus – I get to work with students, with a class maximum of 24
  - Big plus – I get to teach lab (interactive engagement), design lab activities, write curriculum, create courses,
- ~100+ students per semester (preparing, grading, labs)
  - Big plus – I usually have ~60 students per semester
- Challenges – teaching load and number of students

Successful Candidate – What Can Your Expect? II

- Variety of courses - Calculus-based; Algebra-Trigonometry based; conceptual based; astronomy; physical science; technical physics, others
  - Big plus – I get to teach a variety of courses and am not "locked into" one and only one type of course
- Running the Physics program
  - Ordering equipment, repairing/replacing equipment, college functions, …
  - Super big plus – I am in charge
- Challenges – so many courses and running the program

Successful Candidate – What Can Your Expect? III

- Be professionally active
  - Such as, join AAPT and the local section of AAPT and participate
  - State and/or local organizations
- Do not isolate yourself
- Others
- Challenges – so much to do, so little time