**Physics Department Responses to IPBT Questions**

Thank you all for the opportunity to provide more information about our request for a replacement physics position and the opportunity to express the importance of the position to the Department and College

General Questions for all Deans who have requested positions:

1. *What strategies do you have to try to diversify your applicant pool as much as possible?*

* Strategies partially driven by difficulty of attracting physics faculty from traditionally under-represented populations
  + Especially difficult given
    - 1) the relatively low numbers of master’s degree holders among black and brown populations,
    - Under-representation in physics is worst of all U.S. STEM disciplines
    - 2) the intense competition with other institutions to correct imbalance of underrepresented
    - 3) the extreme compensation differential with industry salaries, especially in Silicon Valley.
* However, we have been successful in the past – and the following are some strategies that have assisted us
* Begin with hiring process and position announcement.
  + Announcement makes it very clear that equity issues are fundamental to our mission, and that the Department and College has a deep and sincere commitment to serving all students. Rather than using standard language, “underrepresented applicants are encouraged” and relying on “equity statement” we make it clear that equity minded teaching carries the same import as physics qualifications.
  + Continues throughout hiring interviews;
    - Interviews are two way – tells us about candidate but also communicates to candidates our values and priorities.
* We use targeted recruitment, in addition to standard recruitment sources
  + Advertising in journals, newsletters, and conferences which are likely to have a higher proportion of minority professionals:
    - National Society of Black Physicists
      * <https://nsbp.org/>
      * Like many similar organizations maintains an online Job Board
    - National Society of Hispanic Physicists
      * <https://hispanicphysicists.org/>
    - National Society of Black Engineers
      * <https://www.nsbe.org/>
* Since many Colleges and Universities share our equity values and have recently embarked on programs to increase and retain underrepresented groups, we especially look to the new crop of recent graduates; individual recruiting email to all second year + graduate students (total 219 emails)
  + UC Santa Cruz (an important source for our STEM programs)
  + SJSU
  + UC Berkeley
  + Santa Clara University
* Use personal networking
  + Existing faculty connections
  + Attendance at professional conferences
    - Physics
    - NCore (National Conference on Race and Ethnicity)
  + Dean network
    - PSME Deans of Northern California; 29 community colleges
* Encourage existing part-timers who show commitment to equity minded instruction
* Strategy we have not used, but plan on using in the future, at suggestion of Eduardo Luna
  + Look to De Anza and District Affinity groups; including many people on IPBT, for guidance and assistance

1. *How often do you have large waitlists, but no ability to open new sections due to lack of faculty (FT or PT)? How challenging is it to find part time instructors?*

* How often large wait lists: very often,
* How challenging to find faculty: very challenging
* Spring quarter Example
  + One week after first day of priority registration
    - 10 physics sections full to capacity and full wait lists
  + Just before quarter start
    - 13 physics sections full to capacity and full wait lists
  + Emails from students, faculty, and Christina asking for additional sections
    - 35+ emails from students, faculty, Christina recommending added sections
  + Significant effect on students requiring completion of physics requirements for wide range of STEM disciplines

“I am writing to petition to have one more physics 4C class to be added. Even though I am on the waiting list, the professor has already said that she would only take the first 3 students on each waitlist, which I am not. But I do need this class to transfer. I don't wish to wait another year to stay in De Anza just because I need to finish c 4C. I am so desperately needing a spot in this class so I am hoping that we can get another class for PHY 4C.”

* Challenge to find part-timers
* All FT wishing overloads have been assigned extra classes
* All PT reach maximum yearly load and cannot teach additional by contract
* Recently lost two excellent equity minded faculty to FT positions open in other Colleges
* Competition with other schools with similar needs
* Competition with industry
* Recruiting
* Dean and Department Chair:
  + email 200+ second year and above graduate students at regional universities
  + emailed Department Chairs of regional CC’s
  + Contacted 29 regional Deans
  + Checked Foothill faculty
  + Stole from our math department
* Not only recruiting PTers, but
  + Interview
  + Hiring (Faculty and Staff Resources)
  + Curriculum/Lab
  + Mentoring
  + Evaluating
  + Done by Dean and FT faculty
    - Non replacement would increase faculty burden by 1/3
    - Would further exacerbate difficult in finding and retaining instructors
    - Continuing recruiting quarter after quarter takes its toll

1. *Confirmation that the Program Review data on FT and PT ethnicity is updated and accurate.*

* There was an omission of data for ethnic composition of physics faculty
* Been corrected and updated on IPBT Site:
* <https://www.deanza.edu/gov/ipbt/facultyhiring.html>
* FT next year: 2: 1 Black 1 LatinX
* PT: 10 total, 3 Asian, 1 LatinX, 6 white
* Gender: also important underrepresentation in physics
  + Despite increases in the number of women earning degrees in physics, the proportion of women in this field, averaging about 20% across all degree levels, is the lowest of all the physical sciences.
  + Our part-timers 40% women
  + Was higher, but recently lost two outstanding women teachers to FT opportunities at other schools

**Unique Questions for Physics Department**

1. *Why has there been no FT hiring for so long?*

* + History goes back to 1987 when David Newton (currently retiring) was hired as replacement
  + 3 FT faculty before David; as far as is known, there were 3 since the De Anza founding
  + Last replacement was 2009; Ron Francis (Current Chair)
  + All positions were replacements
  + Recognized the need for additional faculty
    - 4TH FT position approved in 2001 and hiring committee formed
    - Cancelled due to economic factors (.com Bust)
  + Entire campus has very, very few *new* positions
  + Despite net WSCH growth over 15+ years, never added additional FT positions
    - Lost FT Technician in Physics

2. (Consolidated).

*What factors contribute to the low success rates and the "large disparity for underrepresented students in both success rates and the overall numbers of underrepresented students enrolling in Physics classes"?*

* *What are the department commitments, practices, and strategies that will address inequities and how will you assess them*
* *How will the maintenance of 3 FT faculty affect your efforts?*
* Factors that contribute to low success rates and large disparities for underrepresented students:
  + The average success rates for the department are relatively low compared to campus average, though in line with campus averages for other sciences
    - Physics success rates 2019-20 = 68% Equity Gap (19%)
    - Campus success rates 2019-20 = 80% Equity Gap (13%)
  + Global Factors, Success and Equity Rates
    - Very similar to physics programs in other regional Colleges
    - Very similar to Foothill
    - Better than National averages in physics
    - Best studies indicate 50 – 55% success rate in physics/engineering undergraduate
      * Dismal rates everywhere for underrepresented groups
    - Not an excuse
      * Being better than awful does not make something good or right
      * But national issue and attention provides some clues and helps identify key factors and strategies
        + leverage many pre-existing ideas and research; do not reinvent
    - Most studies find that calculus is the major stumbling block for students
* Strategies for change
  + Reflect on our performance
    - Inquiry and Program Review tools: individual faculty; meet and compare
    - Open, non-threatening dialog among faculty
  + First step is self-awareness
* Identifying factors/issues
* Close look at data
  + Though average success rate in physics 68%
  + Non-major Physics 10
    - Success rates are actually good, 83%, significantly above De Anza average
    - Equity Gap Physics 10: 7.8% vs campus 13%
    - What are we doing well in that course
      * Approachable; student centered
      * Big picture approach
  + On other hand, STEM Major physics
    - Physics 2A success (64%) equity (6.7%)
    - Physics 50 succ (62%) equity gap (25%)
    - Physics 4A (64%) equity gap (19%)
    - Physics 4B-D success (64%) equity gap (19%)
  + So factors seem to be calculus based physics
  + Learn from Physics 10
* National Studies
  + - American Institute of Physics Team-Up Research Project
* <https://www.aip.org/sites/default/files/aipcorp/files/teamup-full-report.pdf>
  + - Five Key Elements and recommended strategies:
      * Factor 1: belonging
        + Students need to feel they belong at institution
        + Cohorts; interact with students similar to them (peers); faculty similar to them; opportunity for social interaction (field trips- pandemics)
        + Open house (especially for Black/Latinx groups)
    - Meet the Profs
      * + Club membership
    - Physics and engineering clubs and faculty advisors
    - Faculty sponsorship/advisors
      * + Social Opportunities
    - Physics club

Friday pizza

* + Physical space for students
    - Physics lounge
      * + Integrate with existing affinity groups and learning communities
    - Cohorts
      * Men of color
      * First Year Experience
      * LEAD
      * Puente
      * Factor 2: Physics Identity
        + Do students see themselves as physicists/engineers?
        + Field trips and outreach
    - Stanford Linear Accelerator Lab (SLAC)
    - Lawrence Livermore Labs
    - Planetarium
    - Provide demonstrations/antenna- SETI/application exposure/solar oven to engender interest
    - HS Outreach
      * + Invited Speakers (especially minority professionals)
    - NASA
  + Successful STEM graduates panel
    - Yvette Alva-Campbell, STEM Success Director
    - Very powerful – more so than faculty
      * + Need full-time to outreach
        + Clubs
    - Physics
    - Engineering
      * + MESA Program
    - Incorporate Departmental membership in national organization devoted to encouraging student diversity and achievement in science, technology, engineering and math.
      * <https://mesa.ucop.edu/>
    - Guest speakers
    - Social Opportunities
    - Mentoring
    - Connections to middle and high school programs as well as many CA Universities
      * + Provide named physics scholarships
  + Incorporate contributions of underrepresented groups in curriculum
  + Internships
    - Work-Study Opportunities in Physics
    - Reinforce identity as Physicist/scientist
    - Underrepresented students as role models
      * Factor 3: Academic Support
        + MPS like program (Committed to PPS – physics performance success)

Proven effective in eliminating equity gap and improving all success

Extended hours

In-class tutoring

Embedded counseling.

Cohort both students and instructors

Yvette Alva-Campbell; Director of STEM Success

This year extended MPS to calculus

Common students to both physics and calculus

* + - * + Calculus is prerequisite for physics
  + Reconsideration of Calc Based Physics
    - UC requires calc based physics for most STEM Majors, including BIO-Sciences
    - CSU (SJSU) do not require calc-based physics
    - Consider offering two modes of Phys 2A and B
      * + Adjust thinking from non-successful student to non-successful course
        + Take care to avoid a deficit model for programs and tutoring – characterize programs as being for students who want to succeed in physics rather than for those trying to avoid failure
        + Work closely with Institutional Research to monitor program success
* Factor 4: Personal Support
  + Financial, counseling, transportation, food, etc.
  + Awareness and referral by faculty to student support resources. Faculty recognize and respond to students as unique individuals with a wide range of intersecting social identities and acknowledge that their experiences of being minoritized in physics may impact their academic performance.
  + Financial Aid/Promise
    - Named physics scholarships
    - PT Job opportunities in Department
    - Equity Funding to STEM
* Factor 5: Leadership and Structures
  + Faculty, dean, and other leadership must prioritize creating environments, policies, and structures that maximize underrepresented student success.
  + Lone champion may create a supportive environment, but it is unsustainable without entire department, division, and college united effort
* **In summary; we are requesting maintaining three full-time faculty members for the following reasons:**
* The Department is a key link in providing STEM opportunities for all students
* Despite a significant overall campus decline (-14.3%) in overall WSCH (State supported enrollment) during the past five years the physics WSCH has increased (+1.2%)
  + Students have shifted to higher unit STEM major courses
* The Department has a serious and deep commitment to equity
* The Department has realistic ideas to significantly improve success and equity
* The Department needs at a very minimum three full-time faculty to implement effective programs that will improve student success and equity, we especially need full-time faculty for
  + Curriculum Development and Teaching MPS Style Physics Program
  + Revamping the Physic 2 and Physics 50 curriculum to provide a non-calculus alternative STEM path
  + Introducing and maintaining a local MESA program on campus
  + Providing new ideas and share leadership
  + Reaching out to students in classroom
  + Assisting in the recruiting, mentoring, and evaluation of part-time faculty
  + Meeting high student demand