

TEAM_UP Report: The Time is Now Charting a Course to 2030

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How Physicists Approach Challenging Problems

- 1) Identify the goal: Make a Bose-Einstein Condensate (BEC).
- 2) Do not blame the atoms for not organizing themselves into a BEC under whatever conditions feel most “natural” to me. (This is a deficit model of the atoms.)
- 3) Understand that it is my job to create the environment necessary for the atoms’ success.

How Physicists Approach Challenging Problems

4) Use *data*, not stories about what you think is happening, to guide you and gauge your progress and next steps.

- Temperature and density of rubidium gas

5) Be resourceful, imaginative, and tenacious in achieving the goal; learn from the successes and setbacks of others pursuing similar goals.

- Other groups working with similar systems

How Physicists Approach Challenging Problems

6) Use every tool at your disposal to build the environment you need for success; then invent some more tools. Success is iterative.

- High vacuum technology
 - Laser cooling
 - Magneto-optical trap (MOT)
 - Evaporative cooling
 - Compressed MOT

How Physicists Approach Challenging Problems

7) Celebrate Success

- Nobel Prize

8) Build on Success

- Rebirth of AMO physics

TEAM_UP Report and Recommendations

1) Identify the Goal:

Double the number of African American students earning bachelors degrees in Physics and Astronomy by 2030.

2) Don't use a deficit model:

- African American students are successfully earning B. A. degrees in other quant-heavy STEM fields.
- They are interested in and capable of majoring in physics and astronomy.

TEAM_UP Report and Recommendations

3) Create the environment for success:

For undergraduates, their experience in the home department is paramount in persisting and thriving in the major and in college.

- Courses
 - Interactions with faculty, staff, and peers
 - Physics-related work opportunities
 - Social integration

TEAM_UP Report and Recommendations

4) Use data: *The student experience is the data* (not what we think *about* the student experience).

What TEAM-UP learned:

Four essential factors to foster the persistence and success of African American students

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I) BELONGING:

Students must develop a strong sense of belonging, defined as an individual's feeling of being a welcomed and contributing member of the department and larger physics community.

II) PHYSICS IDENTITY

To persist, students must perceive themselves, and be perceived by both peers and more senior members of the discipline, as future physicists and astronomers.

Four essential factors to foster the persistence and success of African American students

III) ACADEMIC SUPPORT

Students need effective

- Classroom teaching
 - Auxiliary support for classroom learning
 - Advising
 - Mentoring

delivered from a perspective that centers the student's capabilities and strengths in approaching challenges.

Four essential factors to foster the persistence and success of African American students

IV) PERSONAL SUPPORT

Involves acknowledging and celebrating the whole student including their interests and concerns beyond physics:

- Commitment to family
 - Commitment to community
 - A sense of purpose beyond attaining formal knowledge
 - Financial stressors
 - Physical and mental health and wellness

and addressing challenges by helping them use resources effectively and increase self-advocacy.

TEAM_UP Report and Recommendations

5) Be resourceful and tenacious/ learn from others.

6) Bring many approaches/tools to bear.

- Read the TEAM_UP report as a department.
- Use the department self assessment rubric in Appendix 8.
- Commit to several readily attainable and several aspirational goals.
- Use the resources in Appendix 10 to learn from others.
- Consider university-wide or regional collaborations to support your and neighboring institutions' progress.

TEAM_UP Report and Recommendations

7&8) Celebrate success, Build on success

- Acknowledge and reward this as essential departmental work.
- Garner support and recognition from other campus offices and administrators.
- Work with professional societies to elevate this initiative and acknowledge leaders in the work.

Thank you