A PhysTEC Capacity -Building Project

Building a Local College –High School Physics Teaching Partnership

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CSAAPT Meeting, Fall 2026

PRESENTERS & PROJECT LEADS

Qi Lu (Delaware State University)

Michael Price (Dover High School)

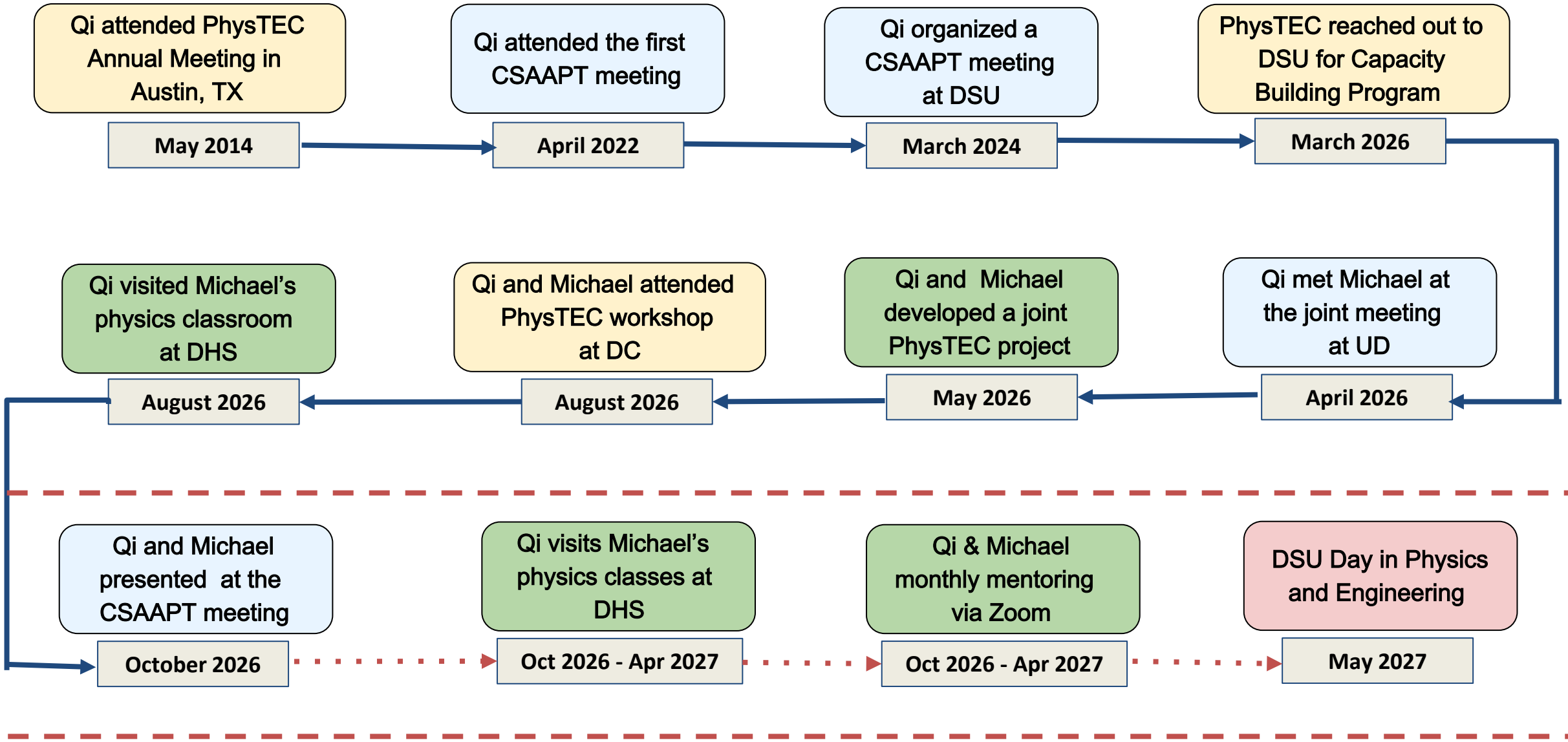
PhysTEC Physics Teacher Education Coalition

Vision : A national culture that universally values evidence - based and collaborative physics teacher education.

Primary thrust : Eliminating the teacher shortage

- A task force initiated by the American Institute of Physics (AIP) and endorsed by its member societies, such as APS and AAPT
- Launched in 2001 to address the severe shortage of qualified physics teacher in the US
  - Only 43% of 1,400 new high school physics teachers each year have a physics-related degree.
  - Two-thirds of institutions prepared an average of zero physics teachers over a three-year period.
- Funding PTE (Physics Teacher Education)
- Supporting workshops, capacity building, pilot projects, etc.

DSU-DHS Partnership Timeline



Project Core Components



PASSIONATE EDUCATOR

An early-career teacher with a physics degree is determined to transform physics education at Dover High School (DHS).



DHS STEM SUPPORT

A STEM coach (DHS) helps secure funding, administrative support, facility space, and educational resources.



MENTORSHIP

A mid-career physics professor (DSU) is committed to sustained mentorship and collaborative support.



DSU RESOURCES

An established engineering physics program (DSU) provides departmental resources as needed.

Project Gaps and Barriers

Systemic Gaps at DHS

- No dedicated physics teacher since 2014
- Physics teaching support structure not yet established
- A heavy focus on CTE (career and technical education) pathways leaving advanced sciences, particularly physics, underfunded

Institutional Barriers at DSU

- Physics education degree program eliminated about a decade ago
- Institutional prioritization of engineering and data science led to a strategic shift away from physics and physics education
- Reduced departmental capacity in support of physics education

Project Objectives & Strategic Goals

- **Elevate Secondary Physics Engagement:** Cultivate student passion for physics and promote physics education and physics engineering as viable, high-impact career pathways for secondary students.
- **Establish a Pipeline:** Construct a direct recruitment and transition pipeline between Dover High School (DHS) and Delaware State University (DSU) for the Engineering Physics program.
- **Pilot Collaborative Model:** Pilot an innovative model of sustained mentorship between high school educators and university faculty to enhance physics instruction and student preparation.
- **Disseminate Regional Best Practices:** Share findings, outcomes, and scalable frameworks from this collaborative model at regional physics and STEM education conferences to encourage adoption across other school districts.

Three Pillars of Collaboration



AP Physics Launch

Rigorous high school course offering.



Teacher Mentorship

Class visits and monthly meeting



DSU Campus Pipeline

Direct university lab immersion.

ACADEMIC CURRICULUM

Pillar 1: Advanced Placement Physics Expansion



Course Creation

Establishing AP Physics at DHS

Co-Design Curriculum

Joint lesson planning

Interactive Physics Labs

Hands-on inquiry experiments

FACULTY ENGAGEMENT

Pillar 2: Early - Career Teacher Support

Monthly Meetings

Coaching with DSU physics faculty

Classroom Visits

Co-teaching and observations

Pedagogical Resources

Sharing kits and demonstrations



CAMPUS IMMERSION

Pillar 3: DSU Day in Physics & Engineering



Lab Tours

Direct exposure to research facilities.



Engineering Design

Hands-on prototyping workshops



Faculty Engagement

Interactions with faculty and researchers

PROJECT IMPACT

Key Measurable Outcomes

AP Physics Enrollment

Expanded student participation in high school physics.

DSU STEM Applications

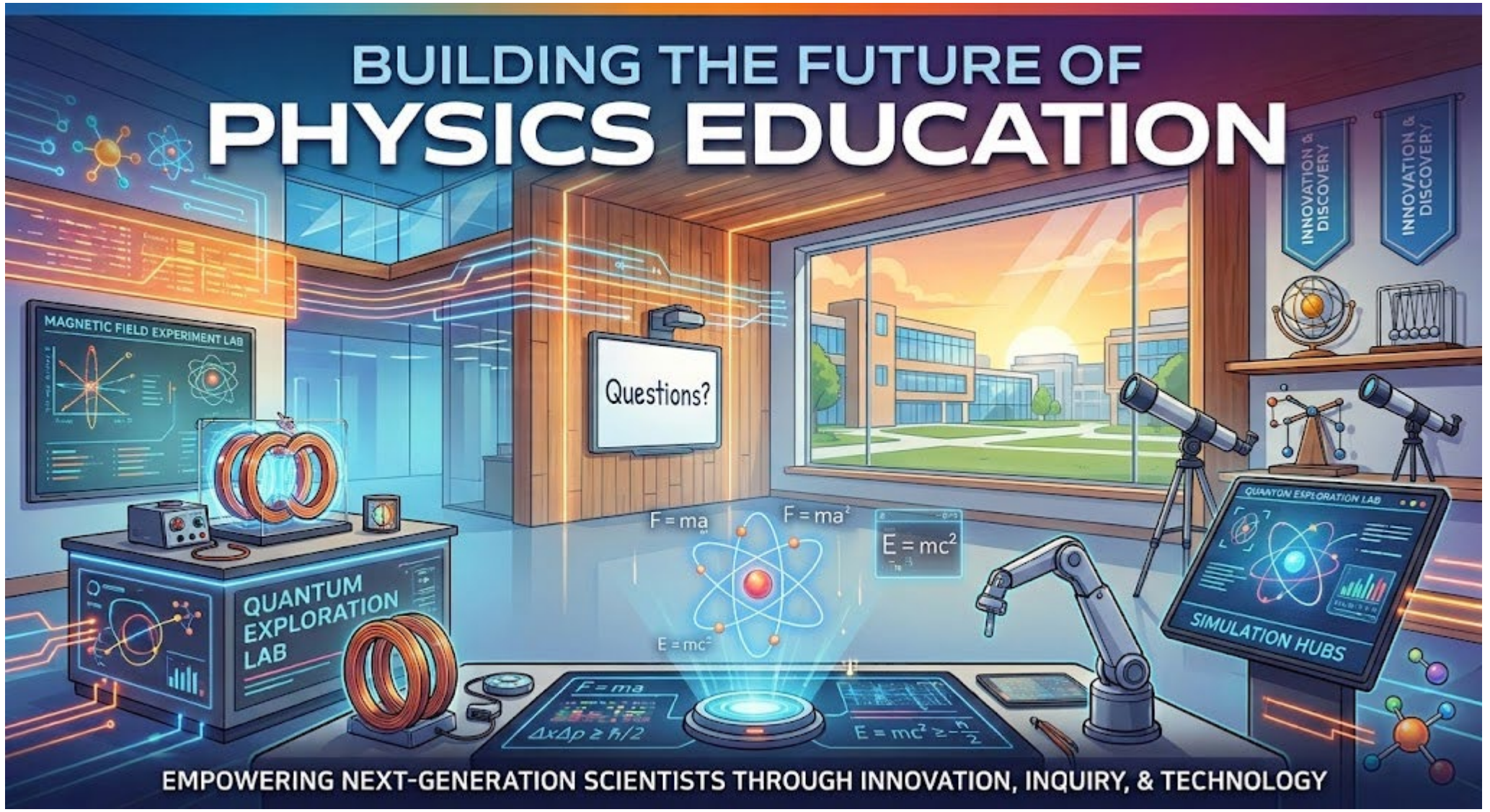
Increased college applications to DSU STEM programs.

Teacher Retention

Stronger mentorship for early-career physics teacher.

Replicable Model

Scalable framework for regional learning communities.


BUILDING THE FUTURE OF
PHYSICS EDUCATION
MAGNETIC FIELD EXPERIMENT LAB
Questions?
INNOVATION & DISCOVERY
INNOVATION & DISCOVERY
QUANTUM EXPLORATION LAB
F = ma
F = ma²
E = mc²
E = mc²
QUANTUM EXPLORATION LAB
SIMULATION HUBS
F = ma
ΔxΔp ≥ ħ/2
E = mc² ≥ -ħ/2
EMPOWERING NEXT-GENERATION SCIENTISTS THROUGH INNOVATION, INQUIRY, & TECHNOLOGY