

Promoting University-wide Strategic, Cohesive STEM Education Outreach Programming

CSATS Mission

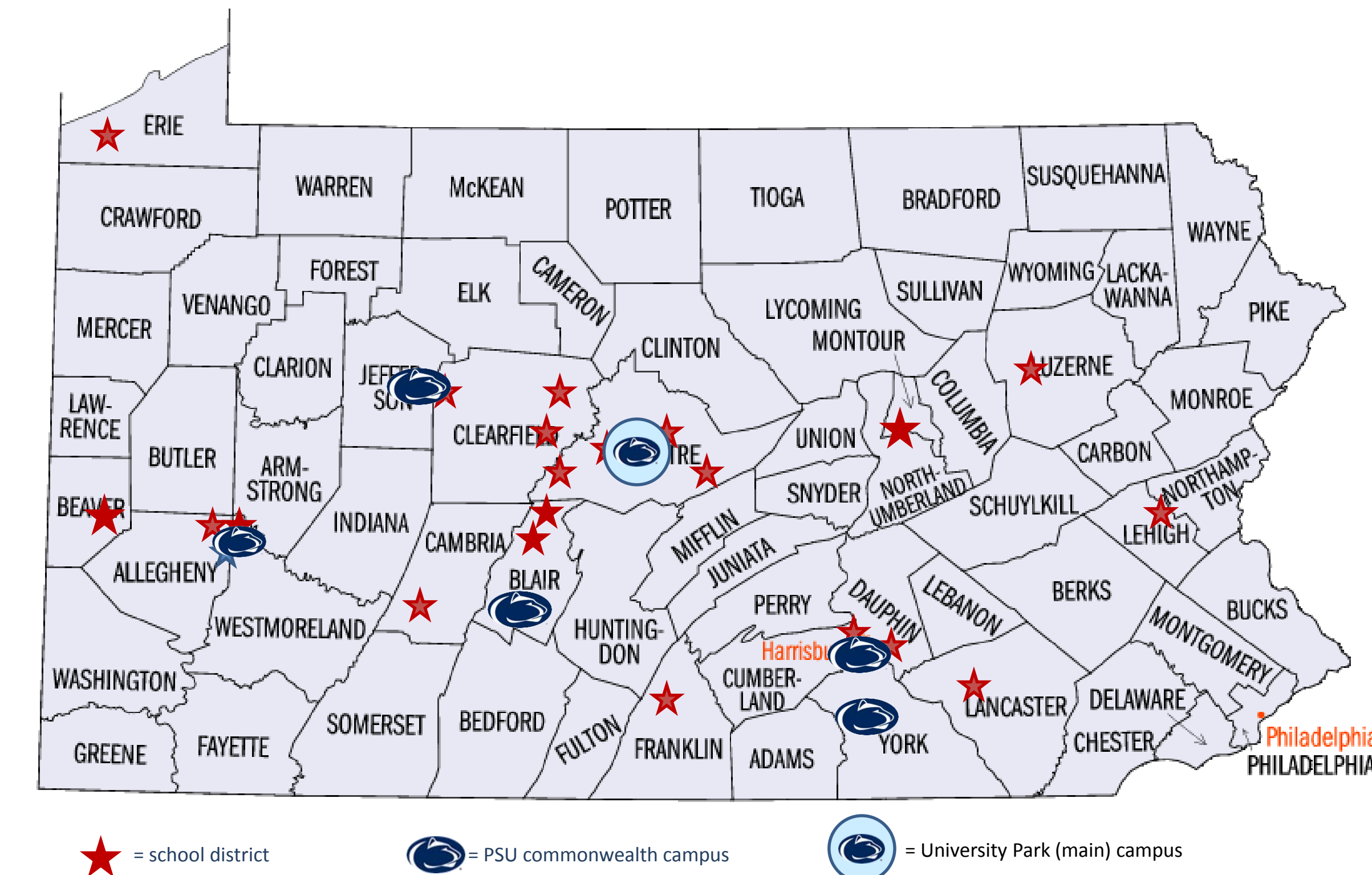
The Center for Science and the Schools (CSATS) at Penn State University works to develop and support mutually beneficial and sustainable relationships between Penn State STEM researchers and outreach providers, and K-12 schools that enhance K-12 science education across Pennsylvania.



Building Trusting Relationships

Engaging teachers in professional development that enhances classroom teaching practice requires confidence on the part of school districts that programs will benefit teachers and students and will be flexible to accommodate school district constraints. CSATS works to build trusting relationships with:

- Districts to understanding their strategic plans to support reform-oriented science teaching.
- Penn State Commonwealth Campuses in order to help them provide balanced programming to school districts in their area.



Capsule Description

CSATS is a university-wide center founded in 2004 that is housed in the College of Education at Penn State's University Park campus. CSATS works with K-12 schools and with Penn State STEM researchers and outreach providers across all STEM colleges and Penn State Commonwealth Campuses to develop and implement goal-driven STEM education outreach programs. CSATS is staffed by STEM education faculty, graduate students, and other professionals with training and experience in science and science education research; K-12 science curriculum, evaluation, teaching, and K-12 administration. Typically, CSATS is involved in 8-10 active funded projects and the development of several new grant proposals.

CSATS Funding

CSATS activities are funded primarily through the Penn State Provost's Office. Additional funds have come from the following:



Enhancing K-16 STEM Teaching Practice through Teacher-Researcher Partnerships

The CSATS project repertoire focuses on PD that builds capacity for K-12 teachers to incorporate discourse and practices of science and engineering into their day to day teaching as emphasized in current academic and teaching standards. The repertoire focuses on the following:

- Provide undergraduate STEM students learning experiences to promote their understanding of teaching theory.
- Involve teacher-researcher partnerships aimed at drawing on the expertise of each partner to the mutual benefit of both.
- Emphasize goal-driven activities and best practices for teacher PD.
- Model reform-oriented teaching practices that incorporate the discourse and practices of science and engineering
- Make connections between content knowledge and scientific practices.
- Develop strategies for helping STEM researchers translate their expertise with science content and science and engineering research to K-12 teachers.



Engaging in Research

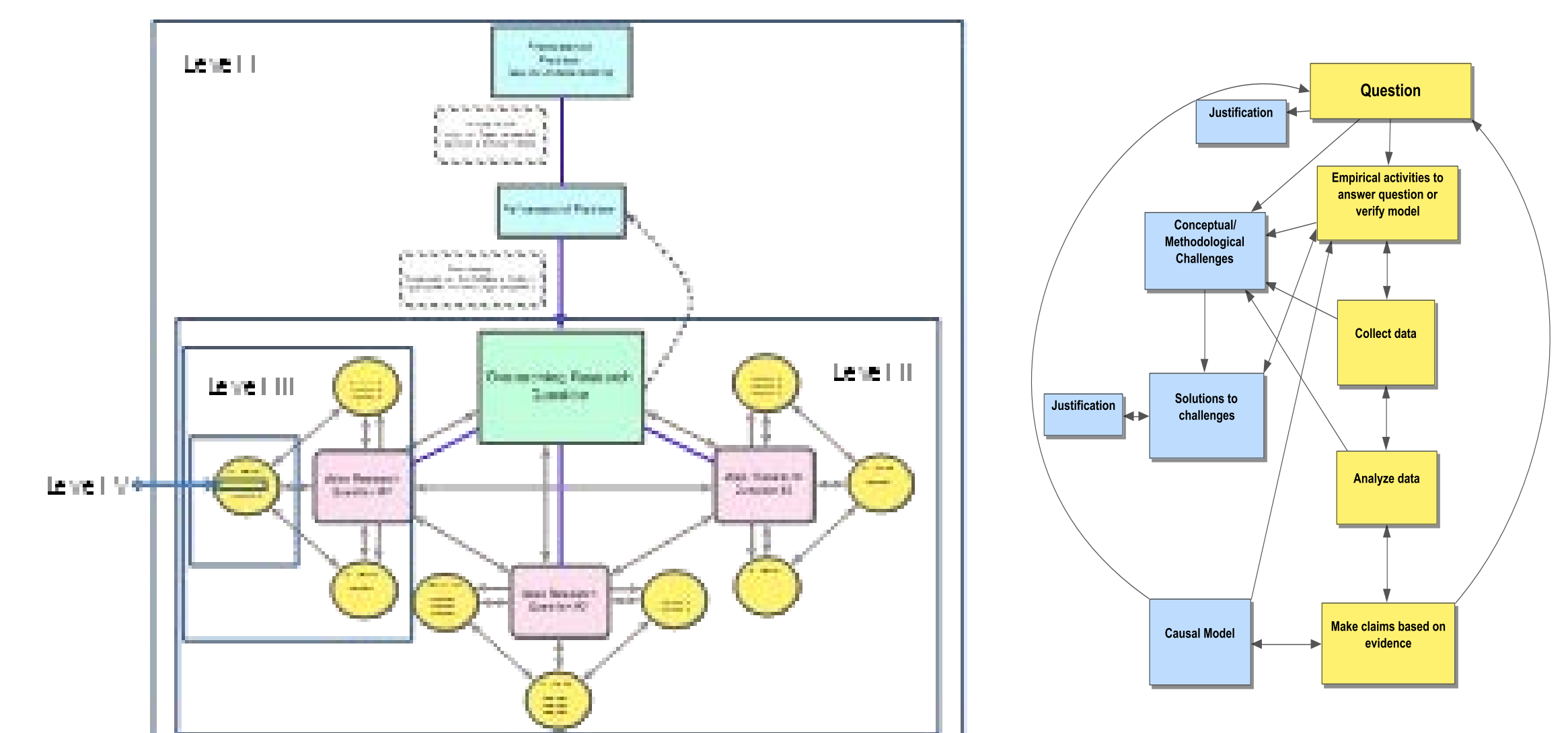
CSATS also engages in research examining aspects of teacher-researcher partnerships that will inform future work and optimize benefits for each partner. This research includes

- understanding how researchers learn the skills needed to design and carry out a research plan,
- identifying gaps in teacher understanding of this process.

One outcome of this research has been the Modeling Authentic Science, Technology, and Engineering Research (MASTER) model.

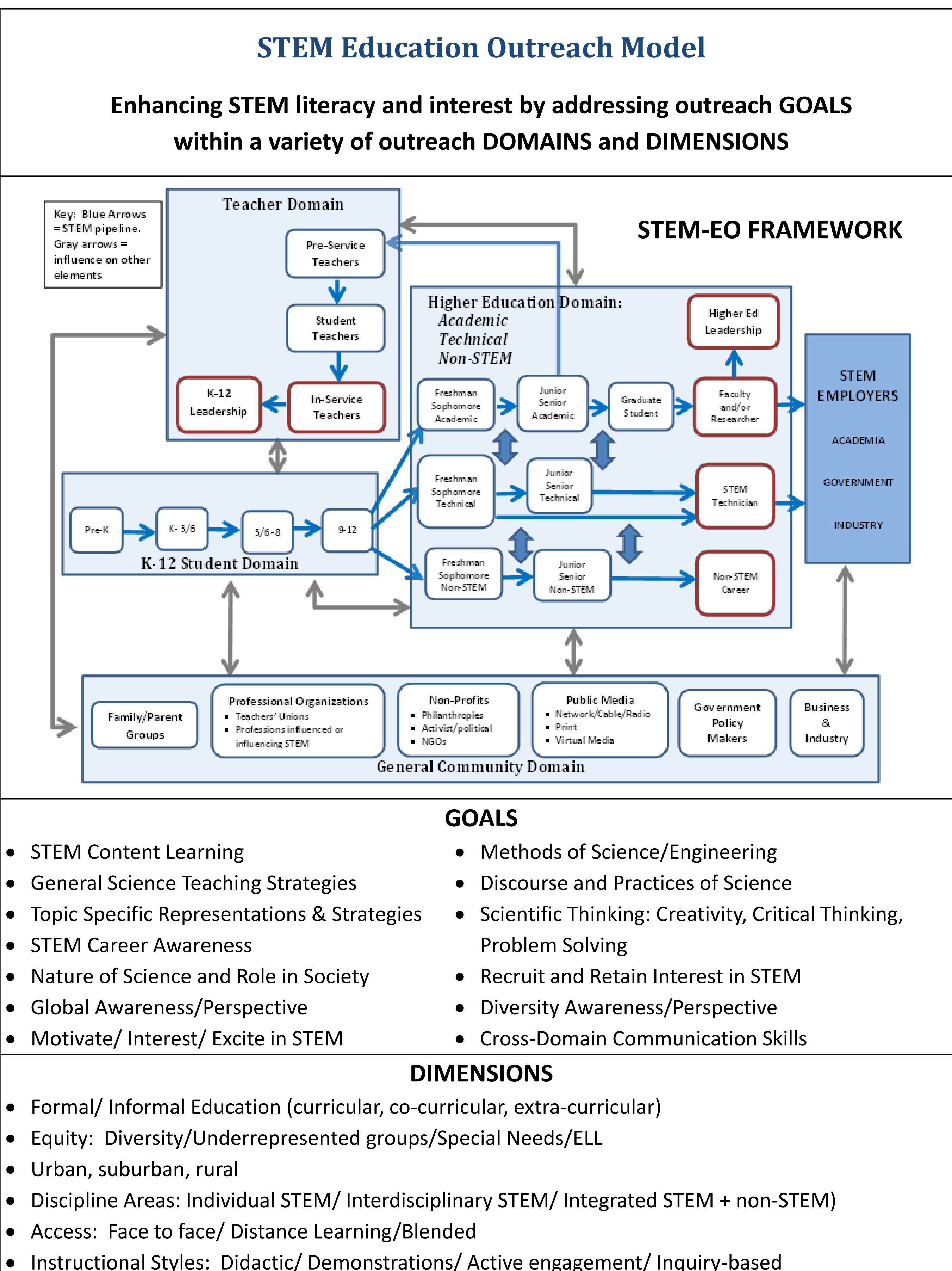
Modeling Authentic Science, Technology Science Research (MASTER) Model

The MASTER model provides a scaffold for helping researchers translate the complexities of their own funded research projects to teachers, who in turn use this scaffold to work with students to design and implement classroom research projects.



Providing Strategic Vision

A key focus of CSATS is to provide leadership for Penn State STEM researchers to develop and execute cohesive and comprehensive pre-college STEM broader impacts proposals and projects that integrate with higher education and diversity. This strategic vision is depicted in the CSATS STEM Education Outreach Model, which uses a systems-based approach for understanding and optimizing university-wide STEM-Education Outreach efforts. It provides a mechanism for aligning outreach programing with target audience needs, cataloging existing outreach efforts to promote collaboration and leveraging, and developing a balanced "menu" of education outreach offerings from which audiences can develop a comprehensive outreach plan.



Supporting and Enhancing Penn State STEM Education Outreach Efforts

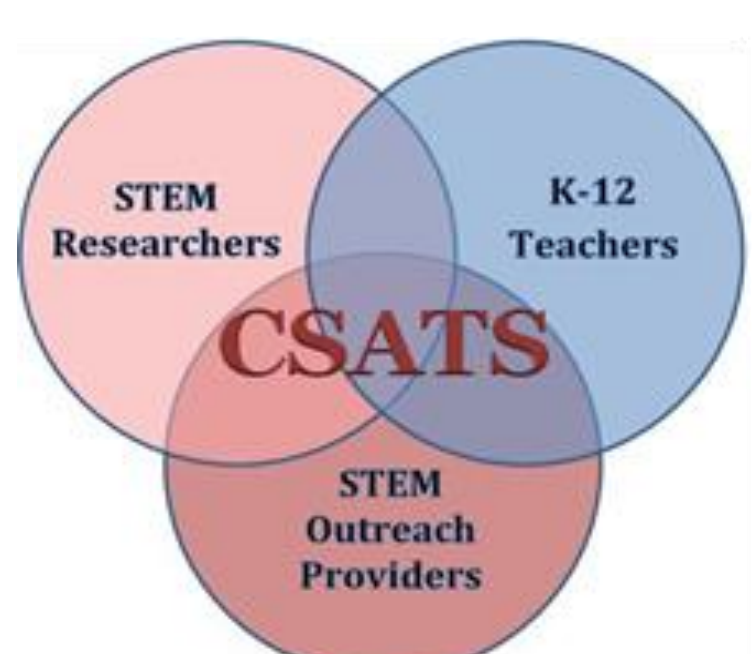
Penn State has a rich tradition of STEM education outreach, reflected in the large number of outreach entities across the STEM colleges and the variety of programs they provide. CSATS strives to support the efforts of these entities while promoting collaboration and leveraging of efforts. We support these goals by providing services and resources as described below.

Services

- ❖ Collaboration on K-12 STEM Education Grant Proposal Development and Project Implementation
- ❖ Information, Communication and Networking Opportunities
- ❖ Curriculum Development and Standards Alignment

Resources

- ❖ Curriculum Center (K-12 Curriculum & Science Education Resources)
- ❖ PSU STEM Outreach Database
- ❖ Commonwealth Campus/School District Outreach Database
- ❖ On-line Digital STEM Education Research Library



Visit: csats.psu.edu

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