

COVER PAGE

Project Title: Developing an Interdisciplinary Fusion Workforce Hub and building STAR_Lite at Hampton University	
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Principal Investigator Information: Shibabrat Naik	Recipient Organization: Hampton University 200 William R. Harvey Way Hampton, VA 23669-4561 Country: USA UEI: KSJKE3KVNBB4

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ACCOMPLISHMENTS

During the last reporting period, from January 1, 2025, to October 6, 2025, we accomplished the following tasks:

- a. Finalized the optimized modular coil design for the STAR_Lite stellarator,
- b. Recruited our first cohort of undergraduate research assistants from various disciplines - electrical and computer engineering, mathematics, computer science, chemical engineering, biology, and
- c. Conducted a summer internship for 10 students, including 3 non-HU students, during May - July/25.

We learned that there are three critical components to establish a fusion energy research and workforce development facility: project/lab manager, research personnel, and equipment. Any weakness in one or more of these three pillars can lead to an inefficient operation and, consequently, a delay in meeting the key performance parameters. We have also learned that talent acquisition and retention, as well as equipment purchase, are heavily influenced by subtle changes in the national political landscape. We also learned that there is a serious need for a comprehensive technical training and development program, such as mechanical engineering, with an apprenticeship program to meet the workforce needs of future fusion power plants.

PRODUCTS

The products shown below include only Publications with a 'Published' status and Intellectual Properties with a 'Granted' status. Products with other statuses are not included in this report. The Revision Type indicates whether a product is New (newly added), Updated (existing product modified), or No Change (existing product reported without modifications) during the current budget period. Note that 'Updated' statuses may appear more frequently as products progress through the publishing process. All products listed have been reported for the current project period of this award.

PUBLICATIONS

There are no publications to report.

INTELLECTUAL PROPERTIES

There are no intellectual properties to report.

PARTICIPANTS AND OTHER COLLABORATING ORGANIZATIONS

The table below only contains participants who have identified an affiliation with the Awardee Institution. Participants from any associated subawards may not be included in this count.

PARTICIPANTS DETAIL

Project Role	Number of People	Total Person Months Worked
Co-Investigator	1	9
Other	2	18
Principal Investigator/Project Director	1	9
Total Responses	4	36

PARTNERS DETAIL

Partner: Flatiron Institute, New York, NY, USA
Partner: HSX group, University of Wisconsin – Madison, Madison, WI, USA
Partner: Type One Energy, Woburn, MA, USA

IMPACT

Fusion energy science faces three significant challenges: the need for technological breakthroughs, the rapid prototyping and testing of critical components for a fusion reactor, and the development of a skilled workforce. This project will address all three challenges by establishing a fusion experiment facility, STAR_Lite — a university-scale optimized stellarator. By building modular coils using recently developed techniques for optimizing stellarator designs and employing a spine wound with copper cables, this project contributes to technical breakthroughs and rapid prototyping. Additionally, by training and educating undergraduate students from related disciplines, this project addresses the future workforce development needs of fusion reactors. 8.3% of the award's budget was spent in foreign countries.