

COVER PAGE

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ACCOMPLISHMENTS

In **Year 1** of the SPARTAN SPARK program, **ten undergraduate engineering students** were selected to participate. Recruitment began with a **mass email announcement** sent to all students in the **College of Engineering** at SJSU, followed by a **virtual information session**. During this session, the program's goals, structure, application process, and selection criteria were presented in detail, and students had the opportunity to ask questions.

Following the information session, students were invited to **apply online**. Out of approximately **200 students** who attended the session and expressed interest, **132 students submitted complete applications**. The application required personal information, a **statement of purpose**, and an **optional letter of recommendation**.

Each of the 132 applicants was **interviewed individually** by the Program Director (**Liat Rosenfeld**). The interview questions were designed to assess students' readiness and potential for research participation, covering four key areas:

1. **Prior experience** in research or complex projects, including teamwork and independence.
2. **Research interests** and preferred host laboratories, including factors influencing these choices.
3. **Skills and experiences** relevant to contributing effectively within the SPARTAN SPARK program.
4. **Long-term academic and professional goals**, and how the program could support skill development toward those goals.

Each applicant was **evaluated on a 0–5 scale** based on the interview responses. Additional consideration was given to **junior-level students (third-year)**, as this represents their final opportunity to participate before graduation.

After the interviews, the **top 20 scoring candidates** were reviewed by a **selection committee** composed of: **Liat Rosenfeld (SJSU)**, **Nicole Neveu (SLAC)**, **Chytchua Muyco (SLAC)**, and **Cynthia Melendrez (SLAC)**.

From this pool, **10 students** were selected for the **first SPARTAN SPARK cohort**, based on their **academic major, overall evaluation score**, and **demonstrated potential to succeed** in the program.

The **first cohort meeting** of the SPARTAN SPARK program was held in **mid-February 2025**. Throughout the **spring semester (February–June)**, the cohort met **weekly on Fridays** with the Program Director (**Liat Rosenfeld**) to discuss **summer research objectives, career planning, and professional development**.

Four of these sessions featured **guest presentations by SLAC scientists**, introducing students to ongoing research initiatives and potential areas of collaboration. The spring program also included **two guided tours of SLAC National Accelerator Laboratory**, giving students early exposure to the research environment and facilities.

The **summer research internship** phase took place from **June 10 to August 15, 2025**. During this period, students worked **full-time at SLAC** under the supervision and mentorship of **SLAC staff scientists and engineers**, and they were fully integrated into the **SLAC LCLS Undergraduate Internship Program**. Each student conducted an independent or team-based research project aligned with SLAC's scientific mission.

In addition to their research activities, students participated in a variety of **social and educational enrichment events**, including group dinners, networking sessions, and visits to **other national laboratories and science museums**. The program also organized **scientific lectures, career development seminars, and panel discussions** to broaden students' perspectives on energy science careers and graduate education pathways. At the end of the summer internship, the students presented their work at the LCLS poster session.

In the fall semester, the students continue to work on their research projects at a part time capacity.

Surveys and interviews with participating students revealed **strong and consistent positive outcomes** across all key constructs. Prior to the summer research experience, students rated their ability to *"contribute meaningfully to a research project"* at a mean score of **3.89/5**. By mid-summer, that rating had increased to **4.38/5**, reflecting a clear upward shift

from moderate to high confidence. Nearly all participants reported being “*very satisfied*” with the alignment between their assigned projects and research interests.

Mentor feedback further underscored these outcomes, noting students’ increasing **comfort in research environments**, **growth in technical and communication skills**, and **strong engagement throughout the internship period**.

In addition to student development, **Year 1 provided valuable implementation insights**. The program demonstrated the **feasibility and effectiveness** of creating cross-institutional, transdisciplinary mentoring experiences between a **teaching-focused institution (SJSU)** and a **national laboratory (SLAC)**. These collaborations offered major benefits—such as access to advanced instrumentation and authentic research collaborations—while also identifying logistical challenges related to **transportation, housing, and continuation into the fall semester**.

Key achievements during Year 1 include:

- Establishment of a functioning **SJSU–SLAC mentoring network** supporting ten students across five engineering disciplines.
- **Significant increases** in student research self-efficacy, technical competence, and professional identity.
- **High mentor satisfaction** and expressed willingness to continue future participation.
- **Strong alignment** with the Department of Energy’s mission to cultivate a **technically skilled clean energy workforce**.

Overall, the **first year of SPARTAN SPARK achieved its intended short-term outcomes**. Students demonstrated measurable growth in research competence, confidence, and clarity regarding academic and career pathways. With strengthened bridge activities and longitudinal tracking in future years, the program is well positioned to achieve **long-term impact** on the national energy workforce and deepen **SJSU–SLAC collaboration** in energy science and engineering education.

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	1
Principal Investigator/Project Director	1	4
Total Responses	2	5

PARTNERS DETAIL

<p>Partner: SLAC National Accelerator Laboratory, Menlo Park, CA, USA</p>
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IMPACT

In its first year, the SPARTAN SPARK program achieved its intended short-term outcomes: students increased research competence, confidence, and clarity about academic and career pathways. The program's strong institutional partnership, careful design, and faculty engagement position it to deliver long-term impact in cultivating technically skilled engineers prepared for high-level research and clean energy careers.

1. Student Development & Research Competence

- Surveys before and mid-summer indicate the cohort's ability to "contribute meaningfully to a research project" increased from a mean of **3.89** to **4.38**, showing a clear gain in student confidence and self-efficacy.
- Participation included a fully-paid summer internship at SLAC National Accelerator Laboratory, guided by experienced staff scientists/engineers, giving students access to high-end instrumentation and authentic research environments.
- Students not only engaged in research tasks but also presented their work at a symposium at SLAC, strengthening their communication skills and professional identity.

2. Faculty, Mentor & Institutional Network

- The program established a functioning **mentoring network** between San José State University (SJSU) and SLAC — linking faculty, lab scientists, and staff across institutions and across engineering disciplines.
- Mentor feedback reported strong satisfaction and intention to participate in future cohorts, indicating sustainability and institutional buy-in.

3. Cross-Institutional & Transdisciplinary Collaboration

- The SPARTAN SPARK program demonstrated the feasibility of collaboration between a teaching-focused university and a national laboratory, providing a model for bridging undergraduate education and high-level research infrastructure.
- This collaboration benefits students with exposure to both campus-based research and national-lab resources, enriching their learning and career preparation.

4. Alignment with Workforce & National Priorities

- The program helps prepare undergraduates for careers in energy science and engineering, contributing to the "clean-energy workforce" pipeline, aligning with federal and DOE (Department of Energy) objectives.
- By targeting multi-disciplinary engineering students and providing early exposure to high-end research environments, the SPARTAN SPARK program builds capacity for future technical leadership.

5. Implementation Learning & Continuous Improvement

- Year 1 produced valuable lessons in logistics (transportation, housing, continuity into fall semester) and helped refine the design for future years (scale up, recruitment, bridge activities).
- The evaluation report (conducted by an external evaluator) confirms that short-term outcomes have been achieved and sets the stage for longitudinal tracking and longer-term impact assessment.

