

## **Education and Outreach (E&O) Status**

### **K-12 Education and Outreach**

#### Professional Development (PD)

- In March through August 2025, the E&O team facilitated a total of 4,036 people hours of professional development for educators. Professional development highlights from March through August are listed below.
- In March 2025, the E&O team presented to K-12 educators and university faculty at the Eastern SD Perkins Grant Consortium conference in Sioux Falls about connections between the STEM work at SURF and the Career & Technical Education (CTE) programs in SD.
- In March 2025, a follow-up virtual session was co-facilitated with the Center for the Advancement of Math & Science Education (CAMSE) staff at Black Hills State University (BHSU) to support teachers from the February Computational Thinking (CT) workshop as they implement CT strategies in their science and math lessons.
- The E&O team hosted an informational booth at the National Conference on Science Education in Philadelphia in March 2025. Team members also facilitated a session highlighting the science of SURF and connections that can be made to K-12 classrooms.
- In June 2025, members of the E&O team presented SURF science and best practices for teaching science to 6-12 educators at the Pedagogies and Learning for Underrepresented Minority Students Using Novel Tools in Online STEM (PLUTO STEM) program at Jackson State University.
- In June 2025, E&O team members facilitated a 3-Day K-2 educator workshop focused on the curriculum unit, Move It. The team also facilitated a 5-Day K-12 educator workshop focused on empowering students through cross-curricular STEM learning, which included time with the group of international researchers who were in Deadwood, SD for the Particle Physics and Cosmology (PPC) conference.
- In July 2025, E&O team members co-facilitated two workshops in partnership with the Cultivating Indigenous Research Communities for Leadership in Education and STEM (CIRCLES) Alliance grant. One of the workshops was held in Pierre, SD and the other at Sisseton-Wahpeton College.
- In July 2025, through a partnership with SD E-CORE and BHSU, E&O team members facilitated a 5-day STEM Educator Leadership Academy in Pierre, SD. This first cohort of the year-long program included 28 educators and will continue with learning sessions in October 2025 at the Journey Museum in Rapid City and in February 2026 at the SD state math and science teachers conference.
- SURF's partnership with Quarknet included a science educator workshop in July 2025 at SURF, which concluded with the participating educators volunteering their time at Neutrino Day to interact with kids and families.
- In August 2025, Chad Ronish represented SURF E&O at the American Association of Physics Teachers (AAPT) conference and the American Association for Physicists in Medicine (AAPM) conference in Washington DC. Chad Ronish was an invited guest who presented two sessions as well as a workshop around the science of SURF and best practices in teaching and communicating science.

#### Curriculum Resources

- In March through August 2025, 10 curriculum units were utilized and returned from districts in South Dakota, impacting the science learning of 721 students for approximately 4,866 student

contact hours. In addition, one engineering challenge was utilized at Fermilab with learners at their summer program, impacting the science learning of 20 high school students.

- Currently there are 17 curriculum units out in classrooms, impacting the learning of 879 students.

#### Classroom Presentations

- In March through August 2025, presentations were made in 22 K-12 schools in South Dakota, Maryland, and Georgia inspiring 4,150 students.

#### Field Trips

- In March through August 2025, there were 22 field trips serving 1,005 students from South Dakota, North Dakota, and New York.

#### Undergraduate

- In March through August 2025, E&O team members worked with 82 undergraduate students from five different institutions, including the South Dakota Area Health Education Centers with an activity that connects physics to the use of medical radiation.
- In June through August 2025, E&O team members facilitated the on-boarding and support program for the Summer 2025 interns and Research Experience for Undergrads (REU) students.
- In June through July 2025, the Davis-Bahcall program provided a broad and successful program for 8 South Dakota students that included experiences at universities in SD and across the Midwest, time at Fermilab, as well as an overseas trip to the United Kingdom and Boulby Underground Lab.

#### Other

- In March through June 2025, E&O staff members, along with support from the SURF science and communications teams, hosted activity booths at the Little Shop of Physics Science Festival at Colorado State University, STEM nights at Newell Elementary School and Central High School, and for the SD School of Mines student recruitment events, interacting with a total of approximately 415 students.
- E&O team members presented sessions for middle school girls at the Women in Science events at both SD Mines and Black Hills State University (BHSU) in March and May, interacting with a total of approximately 168 students.
- In collaboration with the BHSU Cultivating Indigenous Research Communities for Leadership in Education (CIRCLES) Alliance grant, E&O team members attended training facilitated by the Rosebud Assistant Tribal Education Director and educational leaders from schools on the Rosebud Reservation to build relationships, plan future collaborative professional development, and understand the Sicangu Indigenous Principles of Learning.
- E&O team members met with science and outreach staff from Sudbury Neutrino Observatory (SNOLAB), Perimeter Institute, Fermilab, University of Zurich, University of Bern, CERN, the LBNF DUNE Collaboration, Australian Research Council (ARC) Centres of Excellence for Dark Matter and Gravitational Waves, the SD Army National Guard, and Apple to build relationships, share best practices, and ideate about future collaborative work and projects. In addition to expanding the national and international reach of SURF, these meetings have already resulted in shared materials and best practices that will be implemented in the upcoming school year as well as committed funding for a 2026 Teacher Fellow and ideas for future projects over a three-to-five-year timeframe.

- In June through July 2025, E&O presented two sessions to the research scientists attending the Center for Theoretical and Underground Physics and Related Areas (CETUP) conference in Deadwood, SD. Sessions focused on strategies to increase researcher-educator partnerships that provide quality experiences and resources for students.
- Refer to Table 1 below for the annual numbers from fiscal year 2016 to present.

**Table 1. K-12 Students: Fiscal year final numbers (July 1 – June 30)**

	<b>2015-2016</b>	<b>2016-2017</b>	<b>2017-2018</b>	<b>2018-2019</b>	<b>2019-2020</b>	<b>2020-2021</b>	<b>2021-2022</b>	<b>2022-2023</b>	<b>2023-2024</b>	<b>2024-2025</b>
<b>Curriculum Units</b>	934	3504	2286	3598	3236	3384	3718	2554	3965	4171
<b>Presentations</b>	8734	8157	6304	6704	3704	2005	14038	12799	10281	14712
<b>Field trips</b>	595	660	796	1117	254	58	485	972	966	1501
<b>Other</b>	10	891	825	1055	918	298	1468	1596	1368	1729
<b>Total</b>	10273	13212	10211	12474	8112	5745	19709	17921	16580	22113