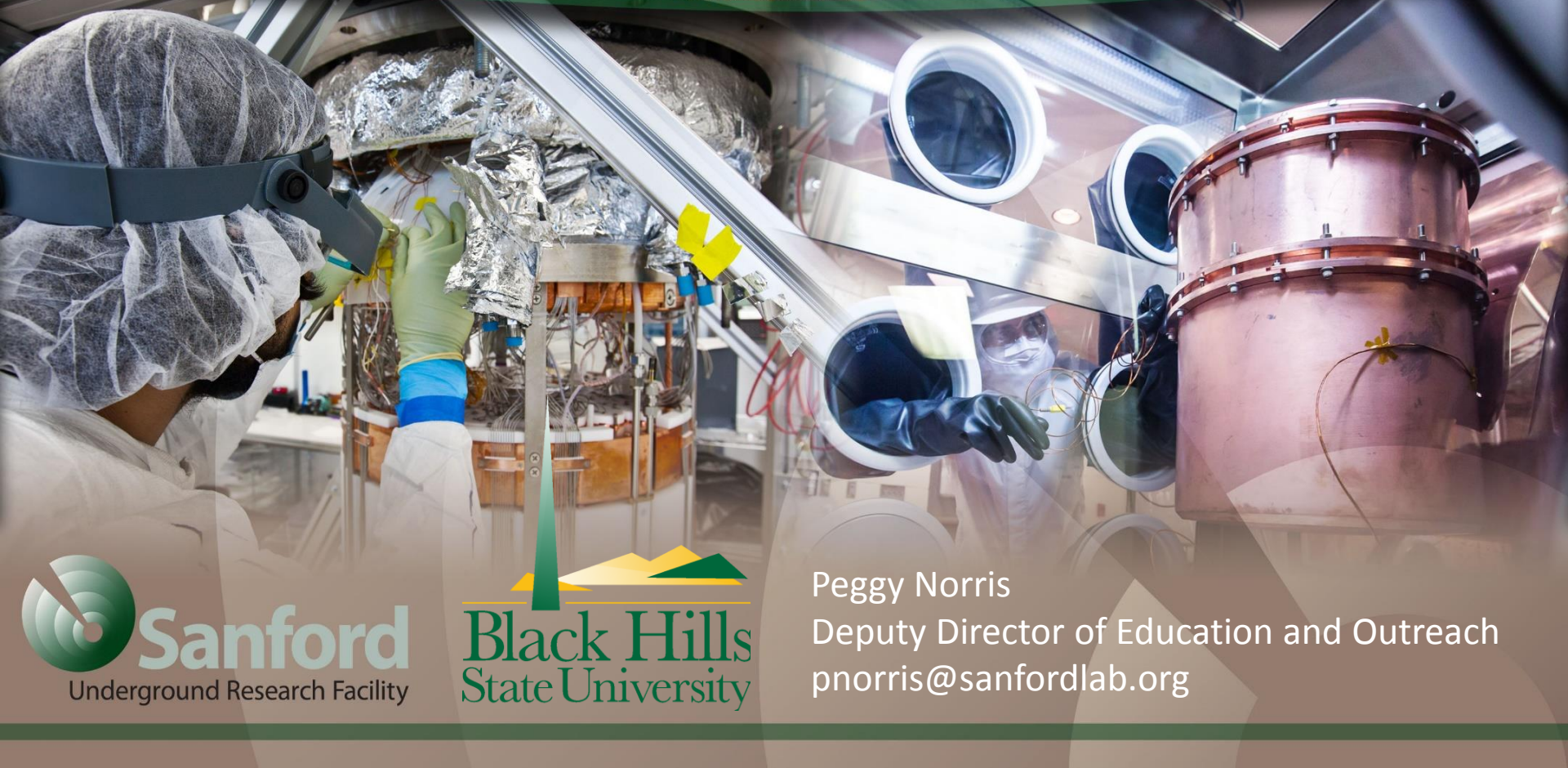
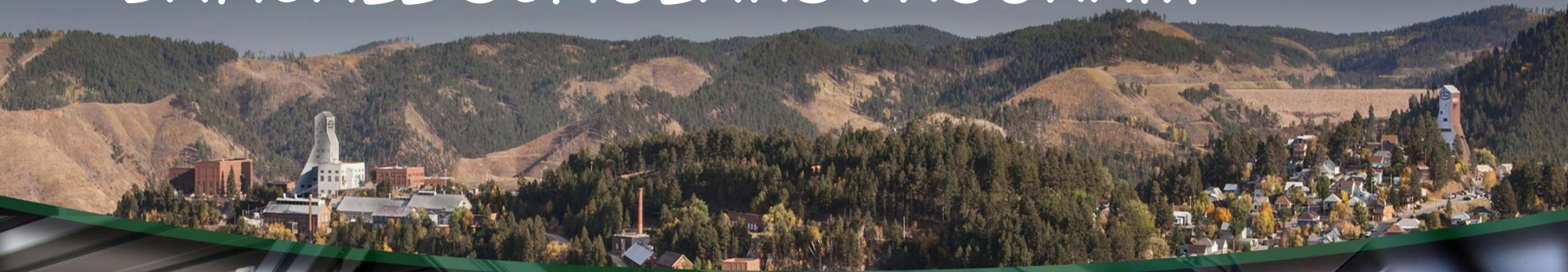
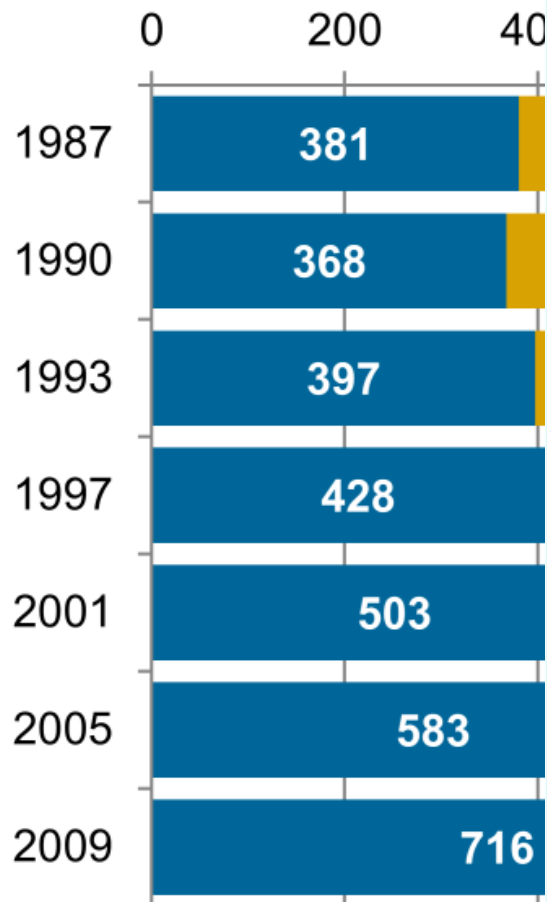


THE SOUTH DAKOTA DAVIS- BAHCALL SCHOLARS PROGRAM

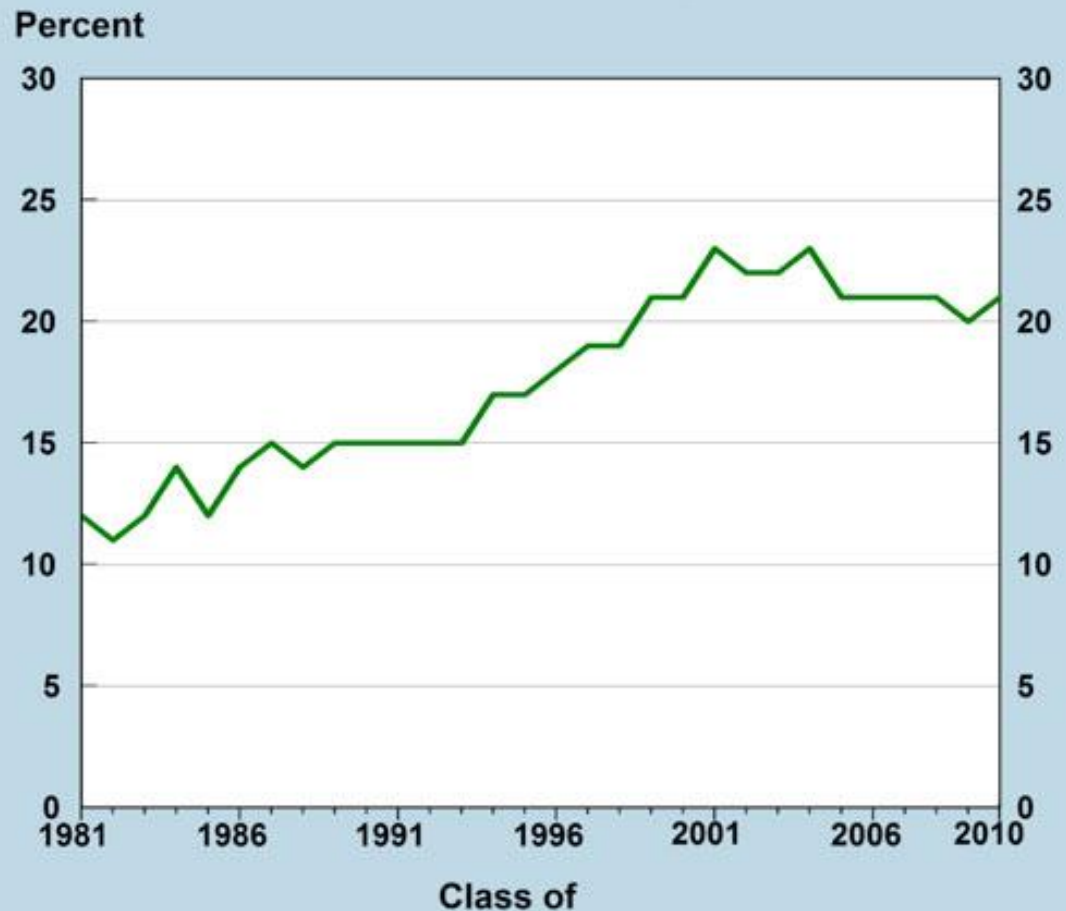


Peggy Norris
Deputy Director of Education and Outreach
pnorris@sanfordlab.org

WOMEN IN PHYSICS

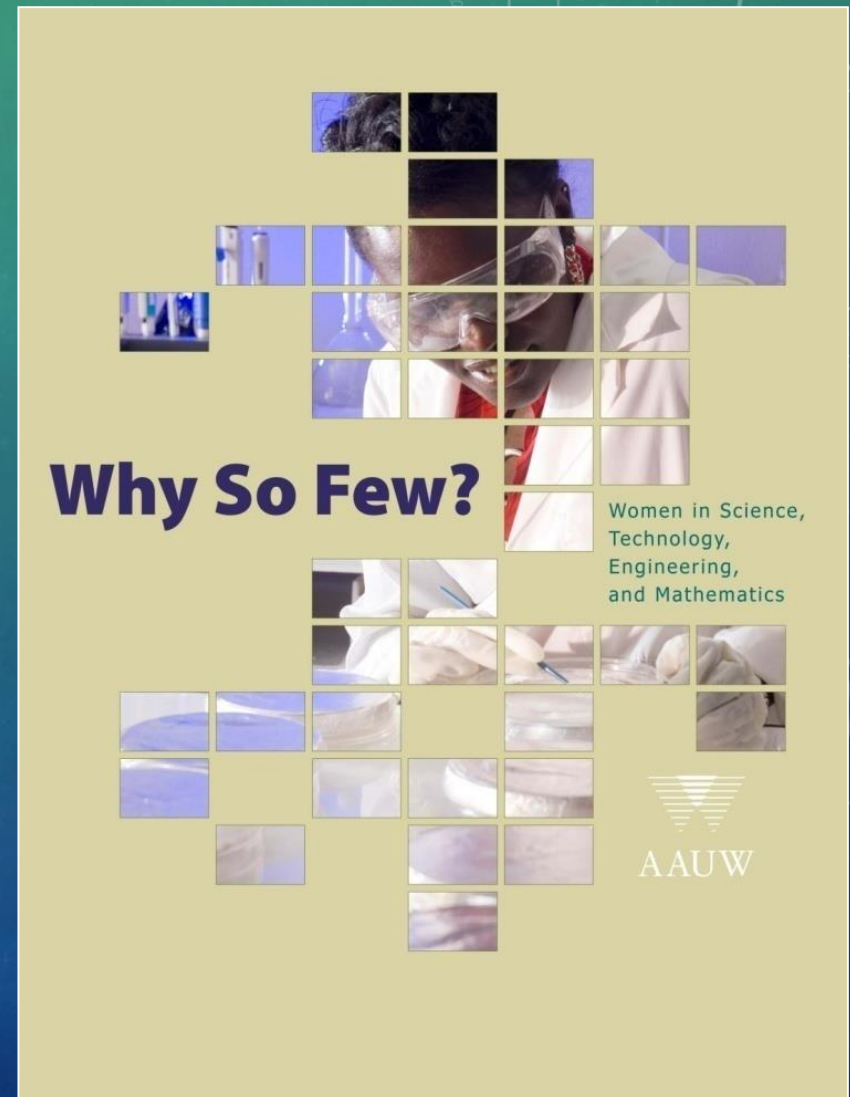


Percent of Physics Bachelor's Degrees Earned by Women, Classes of 1981 through 2010.



GENDER EQUITY

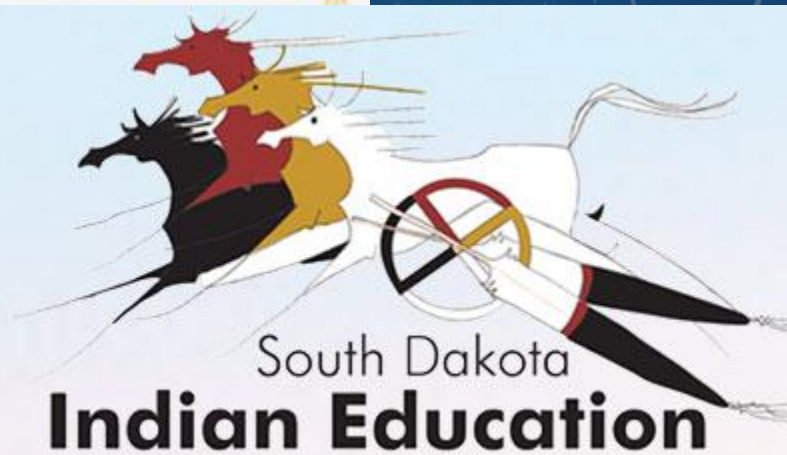
- Eight research findings in three areas:
 - How social and environmental factors shape girls' achievement and interest in math and science
 - The climate of college and university science and engineering departments
 - Continuing influence of bias
- The issues cut across cultures:
 - Stereotype threat
 - Imposter syndrome
 - Growth versus Fixed Mindset





Great Plains Region

- 13 Regional Programs
- 12 Agencies
- 16 Tribes
- 6 million Acres
- 6 Education line offices
- 7 Tribally-Controlled Community Colleges
- 6 Tribal Organizations



THE DAVIS-BAHCALL SCHOLARS PROGRAM

- Started as a pilot in 2008 when the National Science Foundation first chose the former Homestake Mine as the site of the Deep Underground Science and Engineering Laboratory
- Summer program of 4-6 weeks; variously, through the years, students have visited:
 - Princeton
 - Gran Sasso Nazionale Laboratoire
 - CERN
 - Frascati
 - Fermilab
 - Argonne National Lab
 - Brookhaven National Lab
 - Soudan Mine
 - NOvA Experiment
 - University of Chicago
 - University of Notre Dame
 - University of Wisconsin
 - 3M Corporation
 - Microsoft Corporation
- Most years, one high school teacher also participates



2013: Installing a muon detector at the 4850L at SURF.

FUNDING

- 3M Corporation (2009 - 2015)
- Black Hills State University
- First Premier Bank (2016)
- SD Governors' Office (2008-2010)
- SD EPSCoR
- SD Science and Technology Authority
- SD Space Grant Consortium
- SD Governors' Office of Economic Development
 - Short internships statewide for students who need to earn some money during the summer

SOME CONSIDERATIONS

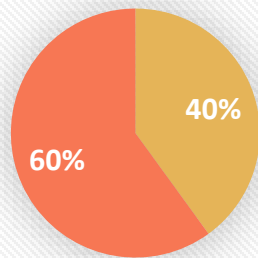
- There are not a lot of physics programs in South Dakota (although it has grown immensely with the presence of SURF)
 - Undergraduate majors in physics degrees are offered at two state universities (SDSMT and USD) and one private university (Augustana).
 - Other campuses offer majors with an emphasis in physics.
 - The Masters Program in Physics started in 2010.
 - The PhD program in physics started in 2013.
- For the Davis-Bahcall program we choose students planning to major in any STEM major; we strive for a balance in gender, geography, size of high school, those planning to leave SD for school and those staying, etc.
- Very few Native Americans have applied although we do our best to encourage them
 - Those who are interested often face resistance from family and tribes, and financial barriers (e.g. passport fees).

DEMOGRAPHICS

- From 2008 - 2016, 105 South Dakota students have participated:

Gender

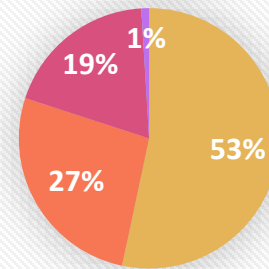
2008 - 2016



Female Male

Size of school

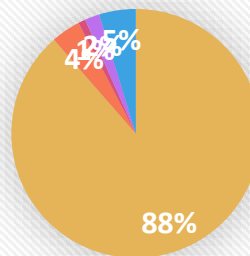
2008 - 2016



L M R H

Ethnicity

2008 - 2016



Cauc AI AA Hisp Asian

TRACKING INTERNSHIPS

- Our students go back to places they visited for undergraduate internships:
 - Argonne National Lab (HEP Computing)
 - Brookhaven National Lab
 - Fermilab (Theory)
 - Lawrence Berkeley National Lab (Neutrinos)
 - Sanford Underground Research Facility
 - University of Notre Dame (Nuclear Physics)

TRACKING CAREERS

- Several students are now studying physics in graduate school:
 - Creighton University
 - Drexel University
 - Rochester Institute of Technology
 - University of Colorado
 - University of Minnesota
 - University of Notre Dame
- Others are in grad school in related fields
 - Berlin Mathematical Schools (Mathematics)
 - University of Illinois (Computer Engineering)
 - Purdue University (Materials Science)

SOME CAREER PATHS

Adam Caldwell

Lead-Deadwood High School, Class of 2010

Senior research project
on cosmic ray
detectors.

SDSMT- Chem Eng, 2010-2015

- Davis-Bahcall Scholar 2010
- Sanford Lab Intern 2011
- SDSMT Student Researcher (MJD)- 2011-2014

Purdue University

PhD Program in
materials Science

Bryce Frentz

Sioux Falls Washington High School, Class of 2010

Concordia College (MN), Physics, 2010-2014

- Davis-Bahcall Scholar 2010
- Univ. of Notre Dame REU program, 2013

Notre Dame

PhD Program in
nuclear astrophysics
(theory)

SOME CAREER PATHS

Sophia Elia

RC Stevens High School, Class of 2012

Volunteer research assistant
2011

UC Berkeley

- Davis-Bahcall Scholar 2012
- Sanford Lab Intern 2013
- UC Berkeley Student Researcher (MJD)- 2013-2016

Berlin Mathematical School

PhD Program in
mathematics, starting Fall
2016

Kenneth Umenthum

RC Central High School, Class of 2011

Univ of Illinois, Computer Eng, 2011-2015

- Davis-Bahcall Scholar 2011
- Argonne Intern program (Atlas computing), 2013
- Intern at Intel, 2014

Univ of Illinois

Graduate program in
electrical and
computing
engineering

SUMMARY

- What works
 - Students learn the value of internships; they start applying early.
 - Students get an idea of what their textbook learning could lead to in a variety of settings.
 - The students who are most successful find a mentor at their college to guide them along.
- What hasn't worked
 - This program targets high achieving students so it does not address retention in undergrad years among students at risk.
 - Generally, students coming from the American Indian community generally do not come in with big dreams and they don't shift their thinking because of the program. They also may have trouble fitting in with rest of the group. Internships work better for this community.