

Report of the Committee of 2023 Visitors For the Office of Workforce Development for Teachers and Scientists (WDTS) September 19-20, 2023

Presented to the Basic Energy Sciences Advisory Committee by Simon
R Bare, SSRL, SLAC National Accelerator Laboratory

COV Chair

December 12, 2023



U.S. DEPARTMENT OF
ENERGY

Office of
Science

[Energy.gov/science](https://www.energy.gov/science)

COV Members

- **Dr. Simon R. Bare** (Chair), Distinguished Scientist, SLAC National Accelerator Laboratory
- **Dr. Tabbetha Dobbins*** (co-Chair), Dean, School of Graduate Studies and Professor, Dept. of Physics & Astronomy, Rowan University
- **Mr. Noel Blackburn**, Chief Diversity, Equity, and Inclusion Officer, Brookhaven National Laboratory
- **Dr. Joan Broderick***, Department Head and Professor, Chemistry and Biochemistry, Montana State University
- **Dr. Padmaja Guggilla***, Chair and Professor, Associate Dean of Student Success, Alabama A&M University,
- **Dr. Emily Smith**, Professor, Department of Chemistry, Iowa State University and Chemical and Biological Sciences Division Director, Ames National Laboratory, Ames, IA
- **Dr. Andrew Stack**, Group Leader, Geochemistry and Interfacial Sciences, Oak Ridge National Laboratory

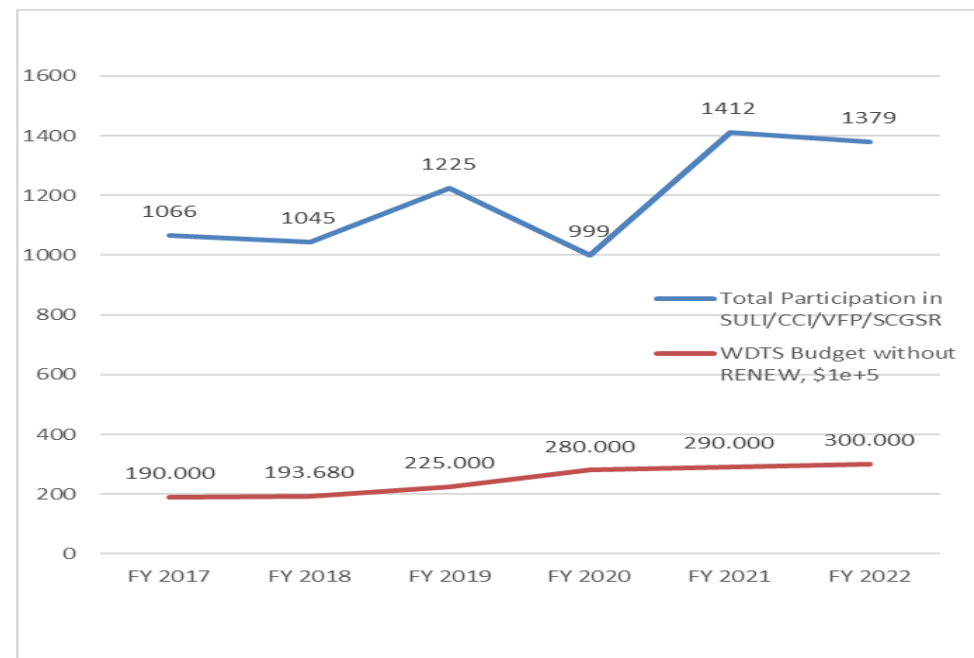
* Current BESAC Member

Charge to the COV

- The COV was asked to assess (1) the efficacy and quality of the processes used to solicit, review, recommend, monitor, and document application, proposal, and award actions; and (2) the quality of the resulting portfolio, including its breadth and depth and its national standing, benchmarked with other comparable Federal Science, Technology, Engineering, and Math programs.
- ***In addition to this standard charge, please comment on the effectiveness of the online technology development and evaluation activities in support of WDTS programs and outreach efforts to enhance the diverse and inclusive participation in WDTS programs that include:***
 - The Science Undergraduate Laboratory Internships (SULI)
 - The Community College Internships (CCI)
 - The Visiting Faculty Program (VFP)
 - The Office of Science Graduate Student Research Program (SCGSR)
 - The National Science Bowl® (NSB)
 - The Albert Einstein Distinguished Educator Fellowship (AEF)

WDTS By numbers (FY 2017 – FY 2022)

- ❑ 7,126 Total Participations in SULI/CCI/SCGSR/VFP from 879 Unique Institutions of Higher Educations, including 36 HBCUs, 3 TCUs, and 221 MSIs
- ❑ 2,739 Scientist/Engineer Mentors or Collaborators from 17 DOE national labs, plus GA/DIII-D
- ❑ Project Scope: DOE S&T, including all SC research and R&D programs/areas and scientific user facilities
- ❑ 83 AEF Fellows from 33 States/Jurisdictions in 9 Federal Agencies
- ❑ National Science Bowl (NSB): 72,852 students from 3,034 high and middle schools competed in 339 regional and national events across 50 U.S. states, District of Columbia, Puerto Rico, and Virgin Islands



MSI Type	MSI Desc	Participants	% Participants
AANAPISI	Asian American and Native American Pacific Islander-Serving Institution	657	9.3%
ANNH	Alaskan Native-Serving or Native Hawaiian-Serving Institution	9	0.1%
HBCU	Historically Black College or University	141	2.0%
HSI	Hispanic-Serving Institution	894	12.5%
NASNTI	Native American-Serving Nontribal Institution	6	0.1%
PBI	Predominantly Black Institution	24	0.3%
TCU	Tribal College or University	3	0.0%
Total	All MSIs	1,370	19.2%

WDTS Organization, Staffing, and Management

**Workforce Development
for Teachers and Scientists (WDTS)**
Ping Ge, Office Director (05/2020)



Pre-college Programs

National Science Bowl (NSB)



Jan Tyler
Kelly Day
(08/2022)
Yolanda White

Albert Einstein District Fellowship



Jan Tyler
Kelly Day
Amy Szczepanski (AEF Fellow, 08/2023)

Lab-Based Workforce Training Programs

Science Undergraduate Laboratory Experiences (SULEX) Management



Yolanda White

Evaluation

Ping Ge (Acting)
(from 07/23)

Vacancy-Ongoing recruitment

Outreach

Team Management with lead for each type of activities

SC Graduate Student Research Program (SCGSR)



Igor Slowing
(07/2022)

Program & Adm Support



Sheila Johnson



Ray Irwin
(from 4/2023)

Incredible (small) group of passionate, knowledgeable and dedicated staff

New Activity: WDTS RENEW (as part of SC RENEW Initiative starting FY 2022)

*The Lead Federal Employee for each program or activity is underlined.

WARS (WDTs Application and Review System)

- COV had full access to the WARS staging site
- All information for all the programs was readily available
- Easy to navigate, east to drill down to see all information.
- Sharepoint site prepared with all presentations to the COV

The screenshot displays the WARS (WDTs Application and Review System) interface. The top navigation bar includes 'System Administration', 'AEF', 'CCI', 'LEDP', 'NSB', 'SCGR', 'SULI', 'VFP Faculty', 'VFP Student', and 'WARS DAV'. The main content area is titled 'SULI Administrator Dashboard' and features a 'Summer 2022' filter. Below this, there are sections for 'Applications' and 'Eligibility/Compliance'. A 'Deliverables Summary' table is visible, listing various programs and their modification dates. On the right, there are sections for 'All Terms' and 'Reports', with a 'Choose a report to view:' dropdown menu. The bottom part of the dashboard shows a 'WDTS COV 2023' table with columns for 'Name', 'Modified', and 'Modified By'. The table lists various programs and their modification dates, such as 'Albert Einstein Distinguished Educator Fellowship - AEF' (July 17) and 'WDTs RENEW Pathway Summer Schools' (August 3).

Major Recommendations: Science Undergraduate Laboratory Internships (SULI)

- The COV recommends that the WDTS and hosting Labs work together to develop and implement strategies to increase the number of SULI mentors.
- Mechanisms could include greater emphasis on DEIA, the inclusion of mentoring in annual performance reviews at the Labs, improved communications, and encouragement from Lab management to the scientific staff, and the implementation of excellence in mentoring / distinguished mentoring awards.



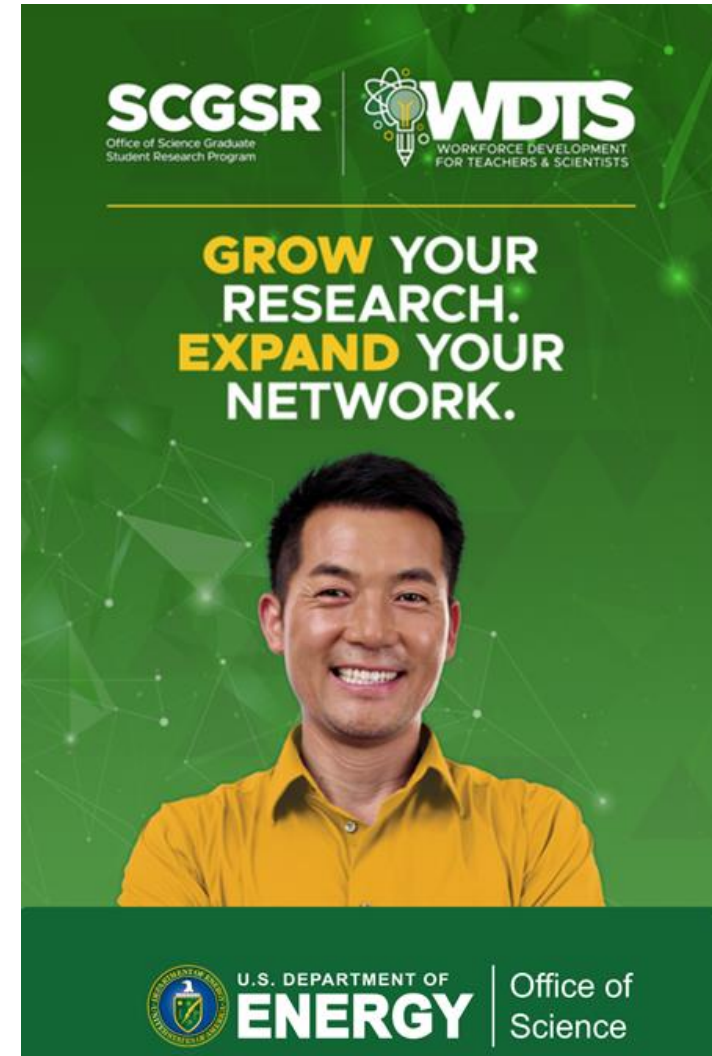
Major Recommendations: Community College Internships (CCI)

- The COV strongly encourages increased outreach efforts to reach the schools and students, to make them aware that there are outstanding opportunities for technical careers at the National Labs.
- The COV recommends emphasizing the technician mentor model for CCI so that it is leading to a skilled technical workforce.
- The COV suggests WDTS consider extending the acceptance of recently graduated community college students up to 2 years upon graduation into the CCI program, if not attending a 4-year institutions.



Major Recommendations: SCGSR

- There should be a concerted effort to increase the number of applications to the SCGSR program.
- The proposed effort could include encourage more female scientists to participate, and capitalizing on RENEW Recruitment from e.g., Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs), and Minority Serving Institutions (MSIs).



Major Recommendations: NSB and AEF

- National Science Bowl (NSB): Broadening participation remains a challenge overall, and for underserved communities, low participation is even more pronounced. The COV recommends the WDTS to explore strategies on recruitment to expand the pool of participants.
- Albert Einstein Distinguished Educator Fellowship (AEF): The COV recommends increasing the applicant pool. An increase in stipend commensurate with other competing fellowship opportunities may help.

Major Recommendations

WDTS Application and Review System (WARS)

- The COV recommends that WDTS work with ORISE to simplify and standardize application procedures, where practical, and focus on ease-of-use more generally, particularly for mentors and applicants who may use the system only infrequently.

Budget

- The COV fully supports increasing the WDTS budget:
 - For additional staff to allow the programs to grow
 - To allow an increase in participant stipend
 - To allow the full development of WARS 2.0
 - To provide travel for the WDTS staff (particularly with regards to outreach, recruitment for the programs)
 - To sustain the RENEW initiative, including the potential for adding new staff

Major Findings

- The size of the SULI program is limited by mentor capacity, space, and/or the ability to safely train and supervise the undergraduate student researchers, depending on the specific lab.
- The labs enthusiastically support the SULI program, and several of the Laboratory Education Directors, LEDs (or their equivalent title) indicated that further growth in the program would be welcome.
- Stipends and support for participant housing in SULI program have increased twice in the past few years, and stipends are equitable across the board regardless of host lab.
- Participation in the CCI program is significantly smaller than the SULI program. According to WDTS staff the CCI program size is limited in part by the number of lab mentors who are willing to mentor CCI trainees. There is a shortage of trained technical staff at the National Labs and the CCI program could be one source of the needed trainees.
- The success rate for applicants through the SCGSR program is close to 100%. It is likely that the program in its current form does not appeal to all graduate students given the nature of the program – i.e., that the student commits to spending extended time away from their home institution and thus their support structure.

Major Findings

- The NSB is a prestigious program that brings visibility to the STEM disciplines and to energy sciences.
- In 2023, more than 800 schools in nearly 280 congressional districts participated. This is a well-run program with the potential to have a major impact on students and communities. The deficiencies and needs for improvement are centered around increasing the number of participants, volunteers, and staff members.
- The Albert Einstein Distinguished Educator Fellowship is a successful program that is having a strong impact on the careers of the teachers that participate. Approximately half of the participating teachers go into administration or other teaching support/advisory roles after completing the fellowship, with the other half going back into the classroom.
- WARS is the main functionality used by WDTS for performing proposal submission, ranking and selection, supplemented by PeerNet for peer-review. The committee was impressed by the recent addition of functionality to WARS to automatically redact personally identifiable information (PII) from college transcripts and other sources. This is viewed as a critical tool, especially for students who may lack the software tools to be able to do this on their own.

Changes in the Charge of the 2023 WDTS COV

- Inclusion of the Pre-college Programs in our review (AES and Science Bowl)
- Commenting on WARS as a data collection platform
 - Since the 2016 COV WARS has been fully utilized for participant and mentor data utilization and data visualization, enabling data-driven program evaluation and fully informed planning and decision making by WDTS.
 - The COV strongly congratulates WDTS for leveraging the copious amounts of data collected by WARS to produce reliable analytics from the various programs and encourages them to use the data to their full extent to aid in the evaluation of the various programs.”
- Commenting on Impact of COVID-19

Impact of COVID-19 on SULI, SCGSR, and CCI

- COVID 19 had a significant impact on all WDTS programs.
- By the time of the COVID shutdown in March 2020, SULI offers had already gone out to successful summer applicants.
- SULI applicants were given the option of either participating in SULI during the 2020 summer in a virtual format or deferring to the following summer. SCGSR Awardees were given three options: to postpone the project, to conduct the research remotely via a hybrid mode, or to modify the project scope.
- Despite these blips in participation numbers due to COVID impacts, the SULI and CCI programs have continued to grow in the years since the last COV.
- ***The COV commends WDTS and participating Lab staff for the exceptional work they pursued to minimize the negative impact of COVID on WDTS programs and to safely ensure the wellbeing of their interns.***

Impact of COVID-19 on National Science Bowl

- Pandemic caused a large drop in participation. In 2020, a fast pivot to virtual for all except five (5) regional events had to occur. The competitions in 2021 and 2022 were fully virtual. The virtual competitions are score-based and not “head-to-head” because the buzzer systems online could not be relied upon for delivering timely results.
- Prior to the pandemic, regional competitions required travel support by the schools. The pandemic exposed the need for online participation, which reduced this cost barrier.
- In 2023, thirty (30) out of the 115 regional competitions were held online. There were twenty-one (21) new schools added in 2023 potentially due to the opportunity to participate virtually.
- The virtual option increased participation and may set a useful structure for onboarding new teams from low-income communities.

Thanks

- The COV is greatly appreciative of Dr. Ping Ge and all the WDTS staff
- Linda Horton, Adam Kinney, Kerry Hochberger for facilitating the delivery and review of the Charge
- The staff at ORISE who made our convening in person easy, comfortable, and pleasant:
 - Jody Crisp
 - Julie Webber
 - Austin Olhasso
 - Bruce Warford