NSSC Education in Nuclear Science, Technology, and Policy

Prof. Bethany Goldblum
University of California, Berkeley

October 18, 2023
The NSSC Model

We attract the best and brightest students from our 11 partner institutions.

Match their interests to 1 of our 6 Academic Focus Areas and Crosscutting Areas:

- Nuclear Physics and Nuclear Data
- Radiochemistry and Nuclear Chemistry
- Nuclear Material Science
- Radiation Detection
- Nuclear and Chemical Engineering
- Computing and Optimization in Nuclear Applications

In collaboration with our 5 National Lab Partners:

- Los Alamos National Laboratory
- Lawrence Livermore National Laboratory
- Sandia National Laboratories
- Oak Ridge National Laboratory
- Berkeley Lab

Transition students into careers at the national labs supporting the NNSA’s National Security Agenda!
The NSSC Educational Experience

LAB ENGAGEMENT
- Lab Mentors
- In-Residence Research
- Topical Seminars

ACADEMIC SUPPORT
- Academic Advisor
- Sponsored Courses

LAB INTERNSHIPS
- Internships available at all 5 partner laboratories!
- NSSC-LANL Keepin Program
- NSSC-LLNL Summer Experience

SUMMER SCHOOLS AND BOOTCAMS
- Nuclear Data and Analytical Techniques Summer School
- Nuclear Inspector School at LANL
- Public Policy and Nuclear Threats Boot Camp (PPNT)

PROFESSIONAL DEVELOPMENT
- University Program Review Meeting
- Academic Conferences
- NSSC-LLNL Nonproliferation Workshop

CAREER SUPPORT
- NSSC Lab Connections
- Opportunities Mailing
- Network of Alumni
NSSC3 Webinars and Seminars (2022-2023)

NSSC3: A NEW FRONTIER (AY22-23 WEBINAR SERIES)

NSSC IN-PERSON CO-SPONSORED TALKS

Dr. Mark B. Chadwick (LANL)
Dr. Andrea Kritcher (LLNL)
Dr. Jason Reinhardt (SNL)

NSSC Co-Sponsored Keynote Speaker Event with Amb. Gottemoeller

Scan this QR Code to sign up for our mailing list!
The NSSC hosted a successful UPR meeting on June 6-8, 2023 in Berkeley, CA!

- Over 275 participants
- Four DNN R&D consortia: NSSC, MTV, ETI, and CNF
- Visit from NNSA DNN Deputy Administrator Corey Hinderstein

- Best Oral Presenter: Jenna Garcia (TAMU)
- Best National Laboratory Collaboration: Benjamin Walusiak (GWU)
- Best Poster Presenter: Dominic Lioce (UCB)
2023 Nonproliferation Consortia Workshop

Fast Facts:
- Held in conjunction with UPR meeting
- Co-hosted by NSSC and LLNL
- 20 participants from across the DNN R&D Consortia
- Hands-on experimental modules

Participants per DNN R&D Consortium

<table>
<thead>
<tr>
<th>Consortium</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSSC</td>
<td>7</td>
</tr>
<tr>
<td>ETI</td>
<td>6</td>
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Lead: Ram Venkataraman - Safeguards
Lead: Bonnie Cannion - Arms Control
Lead: Brian Jennings - Smuggling Detection
Lead: Pete Marleau and Erik Brubaker - Radiological Search & Characterization

Dr. Kim Budhil, Director of LLNL, provided participants with an overview of the LLNL capabilities and mission.

LLNL-Photo-851394
Program Dates: June 12 - June 16, 2023
Features lectures and hands-on activities in nondestructive assay of uranium and plutonium bearing materials using gamma-ray and neutron measurement techniques
8600 ft² facility w/ radiological and nuclear materials
Thirty-one NSSC scholars from all eleven NSSC universities participated in an internship at one of our five partner National Laboratories, where they conducted research on-site with a lab mentor.
2023 Keepin Nonproliferation Summer Program

8-week research internships at LANL and SNL

- **Program Dates**: Jun 19 - Aug 11, 2023
- 85% research, 15% enrichment
- Visits to Nevada National Security Site and the National Criticality Experiments Research Center (NCERC)

“There is no other summer program like it and it is extremely career-shaping!”

![Graph showing skills development](image)

- Overall Experience
- Knowledge of Lab Mission
- Knowledge of Nuclear Science
- Professional Development
NSSC3 Scholar Research Highlights

Kate Joshi (UTK)
Intern at Lawrence Livermore National Lab

Research focus: Enhancing radiation sensing materials to detect, identify, and prevent the diversion of special nuclear materials

NSSC Experience:
- 2022 NSSC NAT Program Participant
- 2023 NSSC-LLNL Workshop Participant

Lab Mentor: Steve Payne (LLNL)
Advisor: Prof. Chuck Melcher (UTK)

John Leland (UIUC)
Research at NCERC/LANL

Research focus: Optimizing a high-efficiency gamma-ray imager based on ASIC readout

NSSC Experience:
- 2023 NSSC-LLNL Workshop Participant
- 2023 NSSC INDAT Program Participant

Lab Mentor: Jesson Hutchinson (LANL)
Advisor: Prof. Angela Di Fulvio (UIUC)

Dominic Lioce (UCB)
Intern at Sandia National Laboratories

Research focus: Modeling neutron and thermal radiation transport in turbulently mixed materials

NSSC Experience:
- 2022 NSSC-LANL Keepin Participant
- 2023 UPR Poster Presentation

Lab Mentor: Aaron Olson (SNL)
Advisor: Prof. Jasmina Vujic (UCB)

Rebecca Manns (UNLV)
Intern at Lawrence Livermore National Lab

Research Focus: Characterization of post-detonation and synthetic glassy debris by gamma spectroscopy

NSSC Experience:
- 2023 LANL NDA Program Participant
- 2023 NSSC-LLNL Workshop Participant

Lab Mentor: Dr. Jennifer Shusterman (LLNL)
Advisor: Prof. Daniel Koury (UNLV)
Fusion of the Nuclear Analytical Techniques & Nuclear Data Summer Schools

- Program Dates: Jun 21 - Jun 29, 2023
- Lectures and hands-on activities
- Visits to McClellan Nuclear Research Center, Crocker Nuclear Laboratory, and LLNL's High Explosives Applications Facility

“I really appreciated learning more topics in nuclear physics since I’m a nuclear chemist.”
Provides the knowledge needed to contribute to future U.S. nuclear policy discussions

- **Program Dates:** July 9 - July 29, 2023
- Co-hosted by NSSC and IGCC, UC San Diego
- Features lectures, panel discussions, hands-on enrichment activities, and policy simulations

“This program has **shifted my post-grad job search already.**”

**Speakers included:**
- Ambassador Linton Brooks (NNSA)
- Sig Hecker (LANL)
- Stephen Kung (DOE-NE)
- Elaine Bunn (DASD/NMD)
- Mark Schanfein (IAEA/INL)
- Bruce Goodwin (LLNL)
- Newell Highsmith (State)
- Rolf Mowatt-Larsen (CIA)
- Laura Rockwood (IAEA)
- and more …
Austin Mullen  
University of California, Berkeley  
- Attended NSSC LANL Program in 2021 under the mentorship of Madison Andrews  
→ Now a **Staff Scientist** in the XCP-7 group at LANL

Elizabeth Rubino  
Michigan State University  
- Attended the Data Science Summer Institute at LLNL in 2021  
→ Now a **Staff Scientist** at LLNL

Aaron Nowack  
University of Tennessee Knoxville  
- Conducted in-residence research at SNL-Livermore in 2019  
→ Now research staff at SNL-Livermore

Jyothisraj Johnson  
University of California, Davis  
- Conducted research under the mentorship of Carl Grace at LBNL  
→ Now an **Integrated Circuits Design Engineer** at LBNL
Research in advanced materials and additive manufacturing

NSSC Prof. Peter Hosemann wins the 2023 LLNL Faculty Sabbatical Program Award

- Connecting with national laboratory experts to initiate new research projects and facilitate existing ones
- Deepened University-Lab connections
- Participation in seminars, lectures, and tours for broad exposure to the nuclear security mission

Prof. Raluca Scarlat at LANL in 2022
A New Cadre of Nuclear Scientists and Engineers!

Since 2011, 165 NSSC Fellows & Affiliates placed into careers at the National Laboratories and other government agencies
This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003996.
A New Cadre of Nuclear Scientists and Engineers!

Since 2011, 165 NSSC Fellows & Affiliates placed into positions at US DOE National Laboratories and other government agencies

NSSC Cumulative Pipeline

- Academia
- Industry
- National Lab or Other Gov

NSSC1Yr1: 1, 3, 12, 20, 33, 40, 48, 54, 62, 64, 70, 74
NSSC1Yr2: 1, 6, 23, 32, 57, 63, 83, 81, 98, 101, 106, 110
NSSC1Yr3: 5, 13, 30, 63, 73, 104, 126, 143, 157, 165