Nuclear Science and Security Consortium Overview

Prof. Jasmina Vujic
Director, Nuclear Science and Security Consortium
University of California, Berkeley

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The NSSC is a UC Berkeley-led consortium sponsored by the National Nuclear Security Administration (NNSA).

Founded in 2011, the NSSC has engaged over 550 students, postdocs, specialists, and faculty members.

The NSSC’s primary objectives are to:

- **recruit and train top students** in relevant nuclear disciplines
- **connect students with a core set of disciplines** that support the nonproliferation and nuclear security mission
- **expand university / national laboratory collaboration** providing students the opportunity to **engage deeply in BASIC and APPLIED research** under the guidance of academic advisors and lab scientists.
History of the NSSC

The Nuclear Science and Security Consortium was established as the first NNSA academic consortium. The first phase of the NSSC included the partners: UC Berkeley, UC Davis, UC Irvine, UC San Diego, UN Las Vegas, Michigan State University, Washington University in St. Louis, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratory, and Los Alamos National Laboratory. During this phase, NSSC also worked with several Minority Serving Institutions, including Clark Atlanta, Fisk, Hampton, South Carolina State, and UT El Paso.

In 2016, the NSSC recompeted and was awarded funding for an additional five years of support. The NSSC added partners UT Knoxville, Texas A&M University, George Washington University, and Oak Ridge National Laboratory.

During the Summer of 2020, the NSSC will continue their work supporting top students during their academic studies and facilitating career connections at the national laboratories.

The DOE/NNSA awards $25 million to the Berkeley-lead consortium of 11 universities for research and development in nuclear science, engineering, and security.
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NSSC Partners 2021 - 2026

Lawrence Berkeley National Laboratory
University of California, Berkeley
Lawrence Livermore National Laboratory
Sandia National Laboratory (CA)
University of Nevada, Las Vegas
University of California, Davis
University of Illinois, Urbana-Champaign
Michigan State University
Air Force Institute of Technology
George Washington University
North Carolina State University
Oak Ridge National Laboratory
University of Tennessee, Knoxville
Texas A&M University
University of New Mexico
Sandia National Laboratory (NM)
Los Alamos National Laboratory
University of California, Davis
Lawrence Berkeley National Laboratory
University of California, Berkeley
Lawrence Livermore National Laboratory
Sandia National Laboratory (CA)
University of Nevada, Las Vegas
University of Illinois, Urbana-Champaign
Michigan State University
Air Force Institute of Technology
George Washington University
North Carolina State University
Oak Ridge National Laboratory
University of Tennessee, Knoxville
Texas A&M University
University of New Mexico
Sandia National Laboratory (NM)
Los Alamos National Laboratory

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NSSC Organizational Structure

NSSC EXECUTIVE TEAM
PI/Director: Jasmina Vujic - UCB
Executive Director: Bethany Goldblum - UCB
Deputy Executive Director: Jason Hayward - UTK
NNSA Liaison: Kai Vetter - UCB
Lab Liaison: Lee Bernstein - UCB/LBNL

POINT OF CONTACT COUNCIL
UNIVERSITY
James Bevins - AFIT
Chris Cahill - GWU
Sean Liddick - MSU
Djamel Kaoumi - NCSU
Cody Folden - TAMU

LABORATORY
Nina Rosenberg - LANL
John Valentine - LBNL
Scot Olivier - LLNL

National Nuclear Security Administration, Defense Nuclear Nonproliferation R&D
Program Manager Col. Keith McManus

ADVISORY BOARD
Chair - Carol Burns - LANL
Amb Linton Brooks - former DOE NNSA
Elaine Bunn - former DOD DASD
Roger Falcone - UCB
Miriam John - former SNL
Brad Roberts - CGSR, LLNL
Benn Tannenbaum - SNL

NSSC SUPPORT STAFF
Program Manager: Charlotte Carr
Financial Analyst: Derek Johnson
NSSC3 Research

Fundamental Nuclear Sciences Focus Areas

Nuclear Physics and Nuclear Data
Nuclear and Radiochemistry
Nuclear Material Science

Computational and Optimization Methods for Nuclear Applications

Education in Nuclear Science, Technology and Policy

Nuclear and Chemical Engineering for Non-Proliferation
Radiation Detection and Instrumentation

Applied Nuclear Science and Engineering Focus Areas

382 Peer-Reviewed Publications

Luca Pagani "Results from the ARTIE experiment" presented at XIX International Workshop on Neutrino Telescopes

1,321 Oral and Poster Presentations

Jake Tibbetts won the Bulletin of the Atomic Scientists’ 2020 Leonard M. Rieser Award

188 Awards and Honors

“Recent Advances in Nuclear Forensic Chemistry” by NSSC Fellow Mark Straub on the cover of Analytical Chemistry

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Figure 1. Schematic of the research focus and crosscutting areas of the proposed consortium.
The NSSC Educational Experience

**LAB ENGAGEMENT**
- Lab Mentors
- NSSC Webinars
- In-Residence Research

**SUMMER PROGRAMS**
- NSSC LANL Keepin Program
- GWU NSSC Nuclear Policy Boot Camp
- UC Davis NAT Summer School and more!

**ACADEMIC SUPPORT**
- Academic Advisors
- Sponsored Courses
- NSSC Community

**CONFERENCES & TRAVEL**
- University Program Reviews
- NSSC Workshop
- & much more!

**CAREER SUPPORT**
- NSSC Lab Connections
- Opportunities E-Newsletter
- Network of Alums

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NSSC Summer Programs

Summer 2021

The GW Boot Camp on Nuclear Security Policy

NSSC-LANL Keepin Nonproliferation Science Summer Program

NSSC-LLNL Summer Experience

SNL Summer Internship

Nuclear Data Summer School - UCB, UTK, LANL

Radiochemistry Summer School - UCB, LBNL, LLNL

Public Policy and Nuclear Threats Bootcamp - UCB, IGCC

Public Policy & Nuclear Threats Boot Camp (PPNT) at UC San Diego

NSSC3
Every NSSC Fellow is required to have:

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<td>Lab Directed Projects</td>
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<td>In-Residence Research</td>
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To help facilitate each student's involvement in:

- **Kalie Knecht** is working on 3D Compton image reconstruction with scene data fusion using a free-moving gamma-ray detector and auxiliary contextual sensor package.
  
  **Academic Advisor:** Kai Vetter, UCB  
  **Lab Mentor:** Daniel Hellfeld, NSSC Alumni at LBNL

- **Mairead Montague** is taking measurements using the prototype Neutron Emission Tomography System.
  
  **Academic Advisor:** Jason Hayward, UTK  
  (Previously a NSSC undergraduate at UCB)  
  **Lab Mentor:** Paul Hausladen, ORNL
Cumulative Metrics since 2011

**Total Supported Personnel**
- Undergraduates: 249
- Graduate Students: 47
- Postdocs: 63
- Faculty: 17
- Specialists: 176

**Degrees Earned**
- NSSC fellows & affiliates awarded 310 degrees

NSSC has supported 489 undergraduate and graduate students, postdocs and specialists.
The NSSC Pipeline

288 Fellows or Affiliates have completed the NSSC Program. 139 (48%) went to careers in the National Labs or in other government positions.

The majority of our scholars transition to careers at the National Labs. Other Industry includes SpaceX, Silicon Valley (IT), medical and health companies, etc.
Summary

~48% of NSSC Fellows and Affiliates that graduated continued on to careers in the National Laboratories or other government positions.

NSSC Alumni have also gone on to careers in nuclear security related academia and industry.

As the NSSC begins the third phase, NSSC Alumni are now connecting with new NSSC Fellows as Academic Advisors and Lab Mentors.

We look forward to working with our community to continue to develop the next generation of nuclear security experts.
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