NSSC Virtual Scholar Showcase

Nuclear Science and Security Consortium Program and Metrics

June 2, 2020

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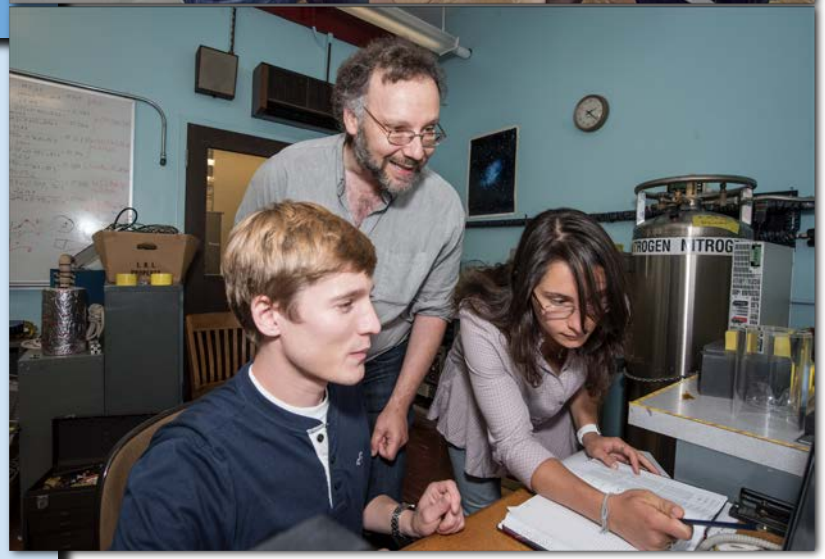
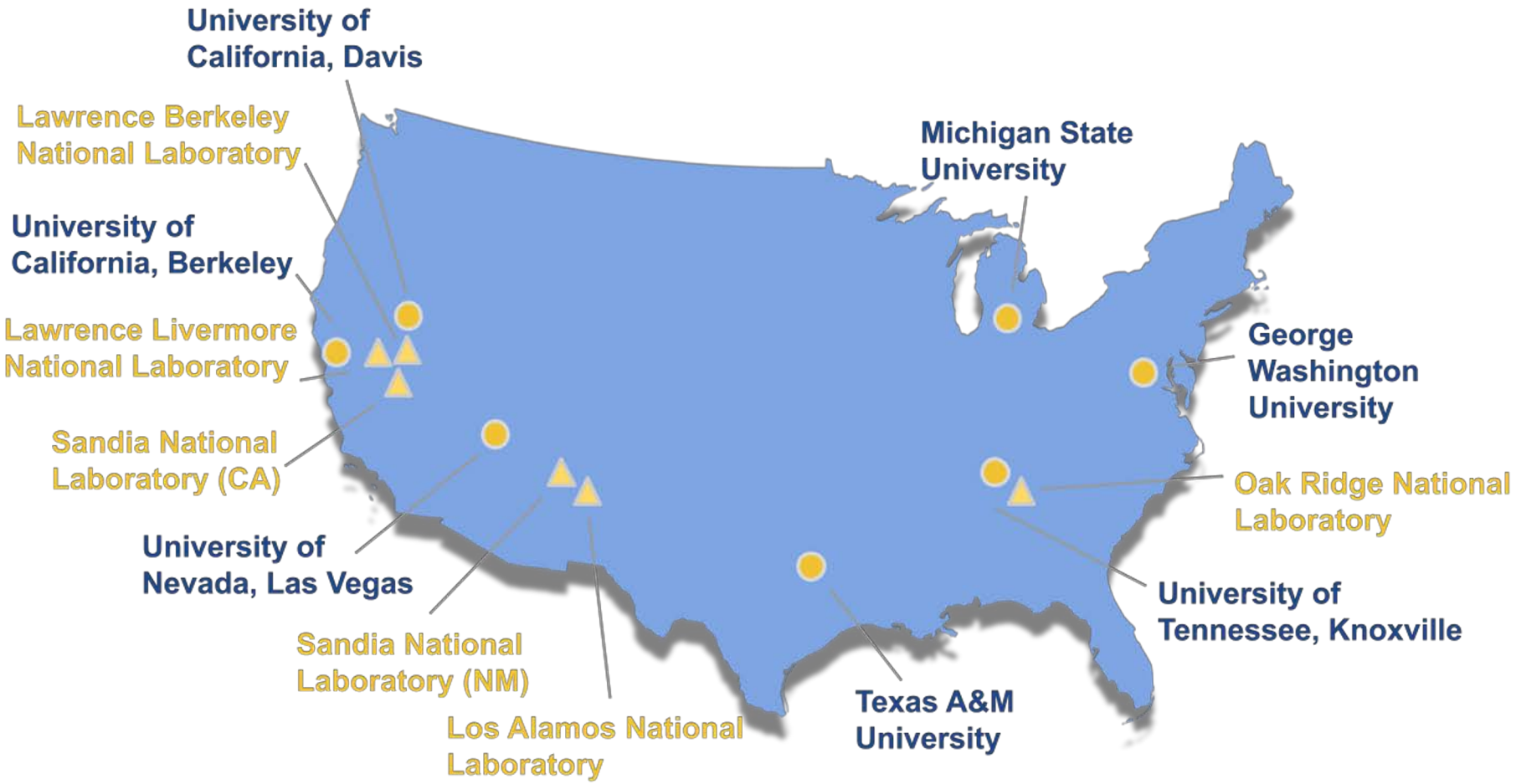
University of California, Berkeley

NSSC Objectives

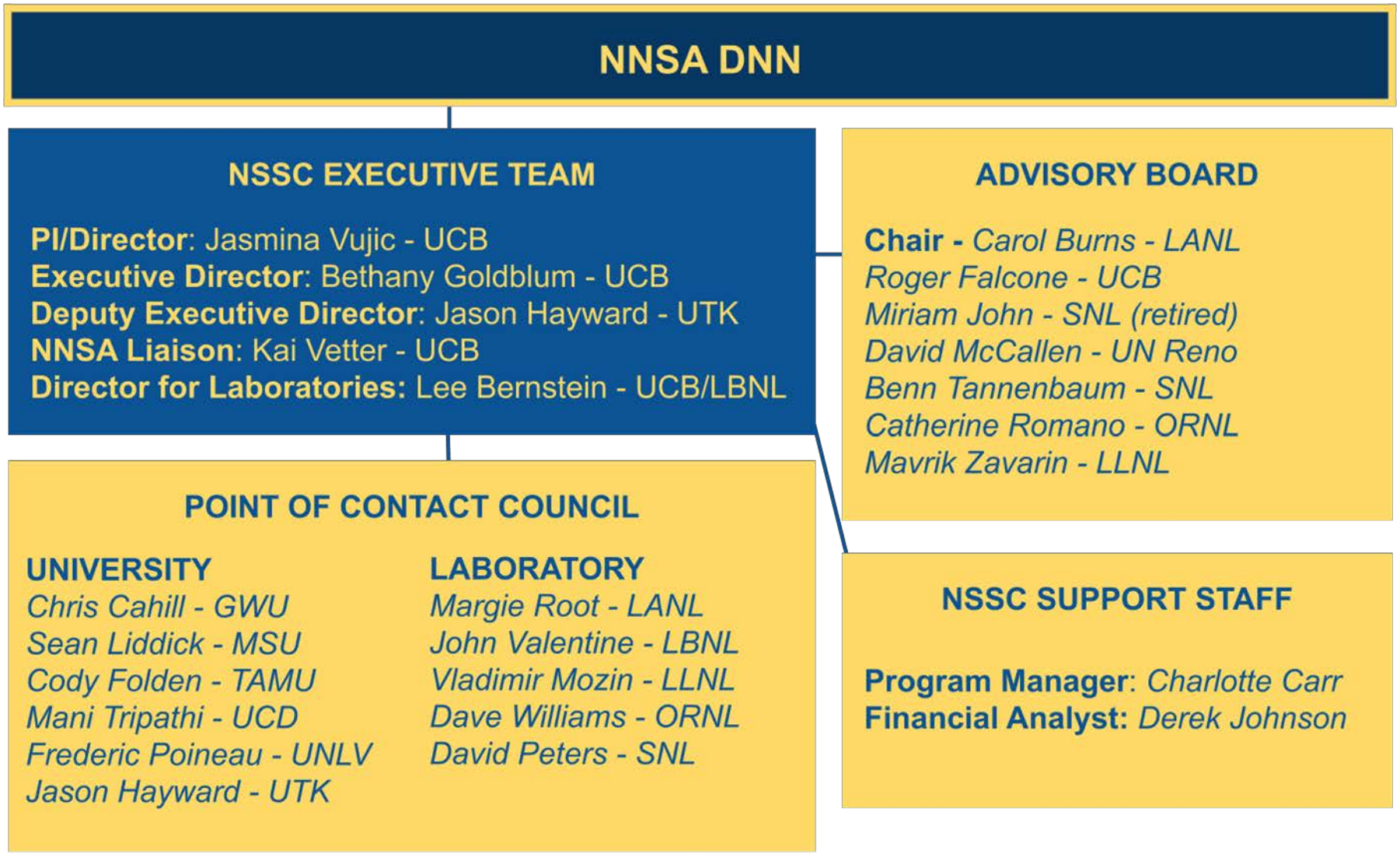
- **Recruit and train top students** in relevant nuclear disciplines
- Connect students with a **core set of disciplines** that support the nonproliferation and nuclear security mission
- **Expand national laboratory collaboration** to provide students the opportunity to **engage deeply in research** under the guidance of lab scientists



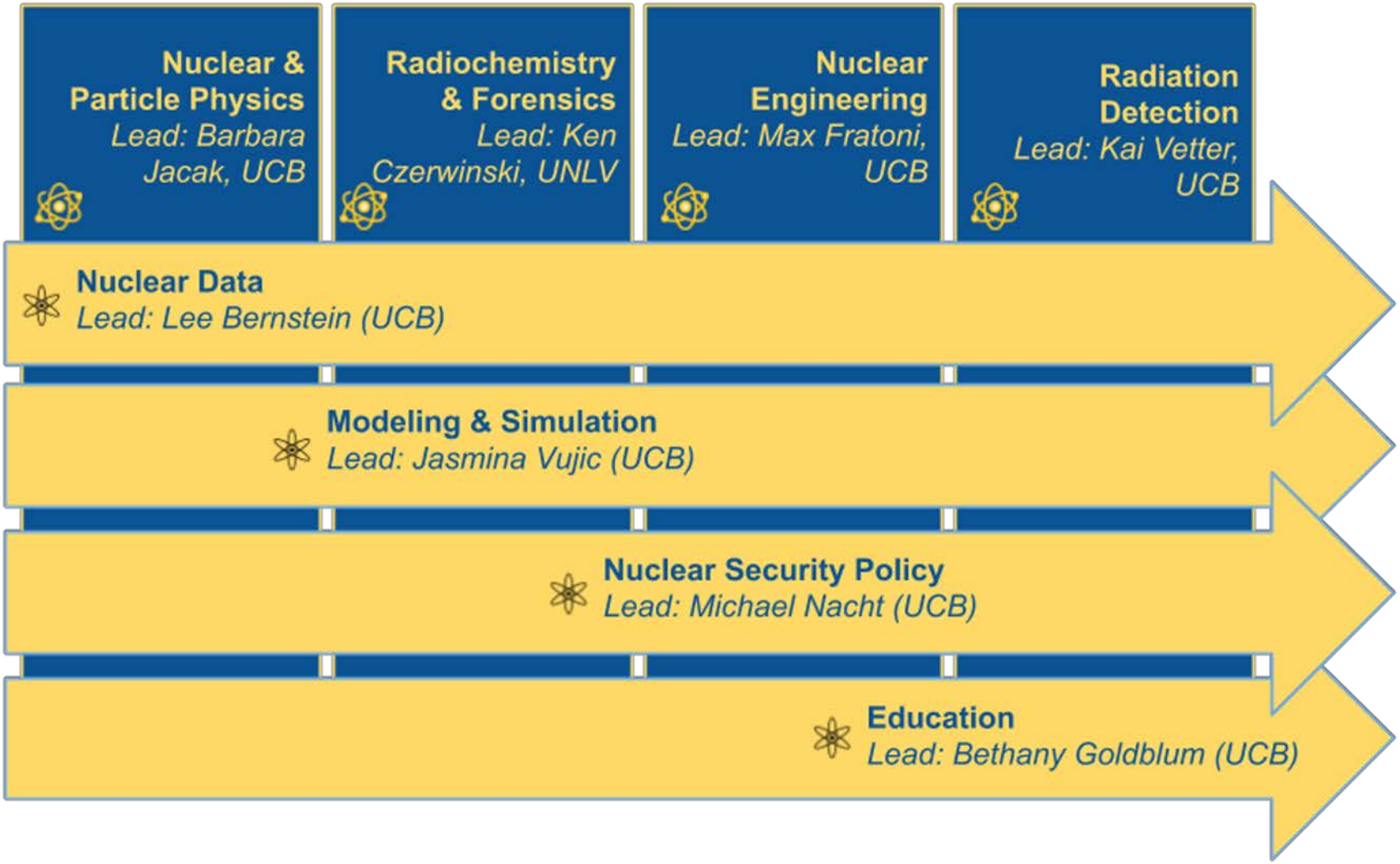
NSSC2 Partner Institutions



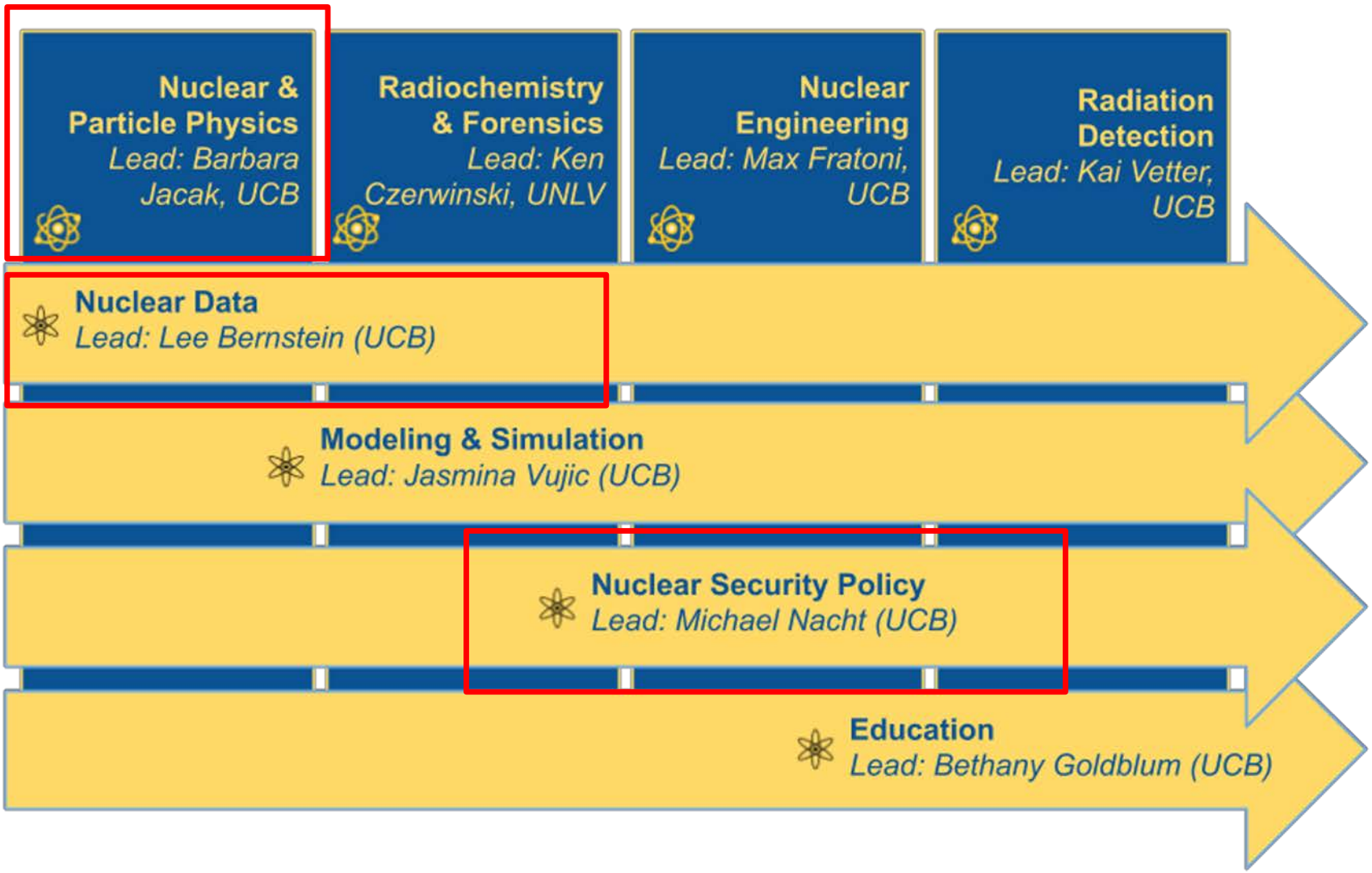
NSSC2 Organizational Chart



NSSC2 Research Focus Areas and Crosscutting Areas

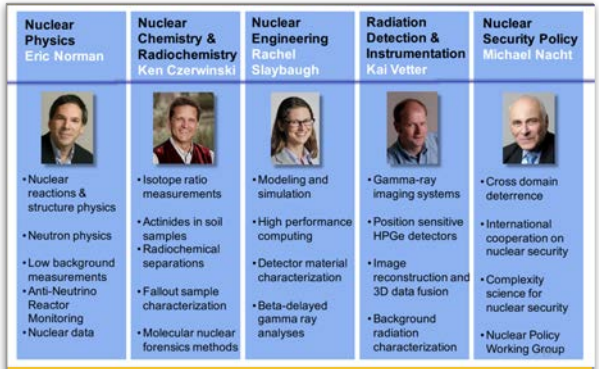


Virtual Scholar Showcase: Day 1 Focus

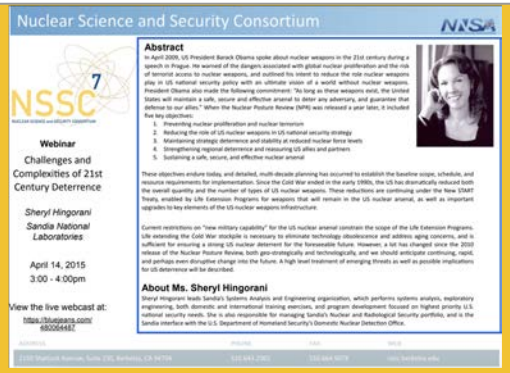


NSSC1 History (2011-2016)

2011 - NSSC established as the first NNSA academic consortium



2012 – New course: Nuclear Security Policy and Technology



2013 – The NSSC webinar series debuts

2014 – NSSC LANL Summer Program partnership begins

2014 – NSSC supports 5 MSIs

2015/16 – NSSC1 concludes having supported:

- 127 Undergraduates
- 139 Grad Students
- 34 Postdocs
- 42 Faculty Members

NSSC2 History (2016-Present)

2016 - NSSC re-competes and is awarded funding for an additional five years

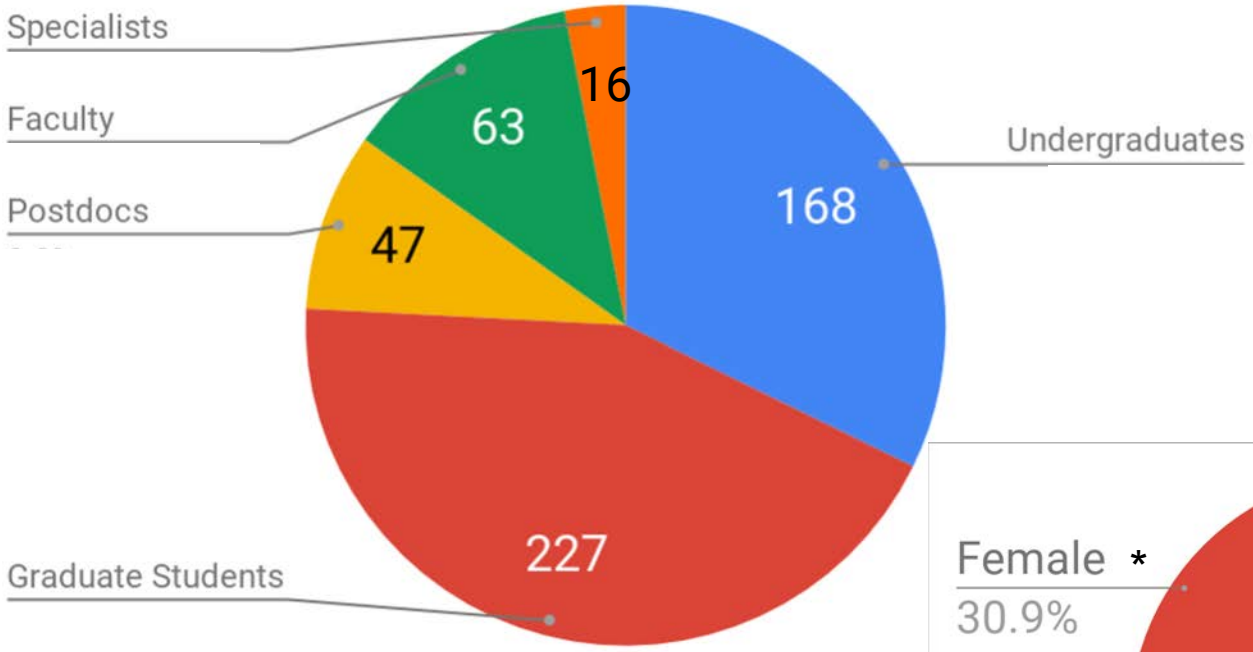
NSSC Phase 2 begins.
New partners UTK, TAMU, GWU & ORNL are introduced.

2017 – NSSC2 holds annual Fall Engagement Workshop and Advisory Board Meeting at LBNL

2018 – NSSC GW Boot Camp on Nuclear Security Policy is held for the first time

2019 – A total of **112** NSSC alumni are working in the national labs or other government positions. The NSSC pipeline to the national labs continues to grow!

NSSC Personnel 2011 - Present

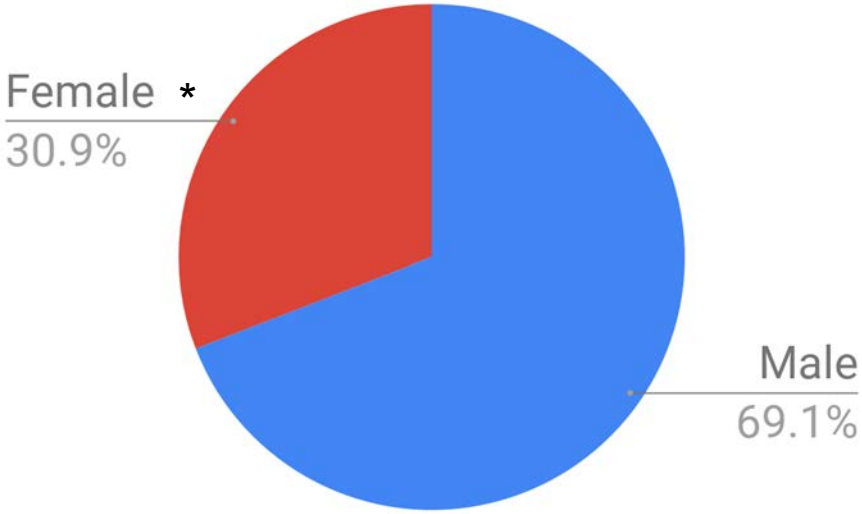


Completed:

108 Ph.D. degrees
67 M.S. Degrees
111 B.S. Degrees

521 people have been supported by NSSC

Gender ratio of NSSC scholars



*The student body of the College of Engineering at UC Berkeley is 28.6% female.

NSSC Metrics Overview 2011 - Present

333 Peer Reviewed Publications

Thibault Laplace (UCB) "Low energy light yield of fast plastic scintillators," Nuclear Instruments and Methods in Physics Research (Oct 2018).

176 Awards

Daine Danielson (UCD) and **Travis Smith (UTK)** won 2019 Innovations in Nuclear Technology R&D Awards

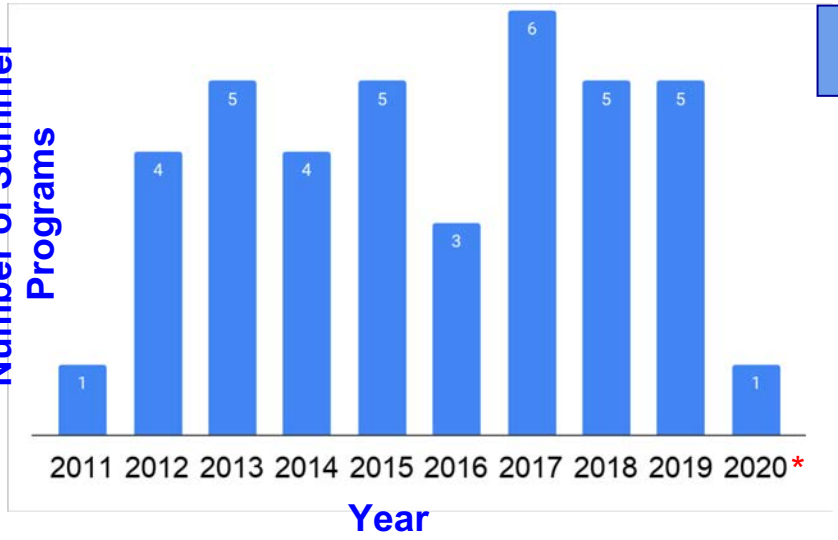
508 Poster Presentations

Kevin Glennon (TAMU) presented "A Forensic Investigation of Legacy Separated Pu" at LANL. Kevin also won Outstanding Presentation in Chemistry at LANL

756 Oral Presentations

Stephanie Lyons (MSU) "β-decay of neutron-rich Co with Total Absorption Spectroscopy" Nuclear Seminar, Technical University Darmstadt, Germany.

NSSC Summer Programs



NSSC has supported 39 Summer Schools

UC Davis Nuclear Analytical Techniques Summer School

GW Boot Camp on Nuclear Security Policy

NSSC LANL Keepin Nonproliferation Science Summer Program

*The majority of summer programs for 2020 have been cancelled due to COVID-19

NSSC-LANL Keepin Nonproliferation Science Summer Program

Dates	NSSC Participants	Other Participants	Total
June 22 - Aug 14, 2020	2	12	**14**
June 17 - Aug 9, 2019	5	11	**16**
June 18 - Aug 8, 2018	14	13	**27**
June 19 - Aug 1, 2017	12	8	**20**

Goals:

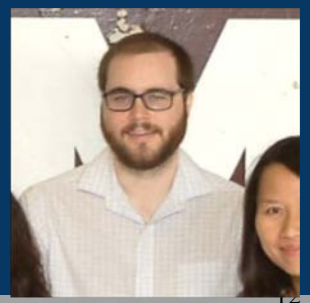
- Create **working relationships** between NSSC students and LANL scientists
- Increase number of students performing **programmatic research** with LANL
- Turn research and training into **careers at the national laboratories**

At the end of the summer program all participants present oral **"lightning presentations"** for LANL personnel on their summer research project

Many participants return to LANL to conduct dissertation research, or in postdoc or staff positions.

Program alumni who have been awarded a Seaborg Summer Fellowship to return to LANL

1. Katherine Luebke (UNLV)
2. James Louis-Jean (UNLV)
3. Kevin Glennon (TAMU)



NSSC 2020 | Innovating Online Remote Summer Program

The NSSC LANL Keepin Nonproliferation Science Summer Program goes VIRTUAL for Summer 2020:

- Program fully supported with all participants working with lab mentors on lab directed projects remotely
- Enrichment activities and lectures moved online
- Plans for onsite opportunities in the future

- For the first time **two days of Keepin program lectures will be available to be audited online** for non-program participants, including members of other NA22 consortia

Kalie Knecht (UCB) working remotely with Caleb Roecker (LANL)

Corey Ahl (UTK) working remotely with Madison Andrews (LANL)

LLNL Remote Learning Experience with Virtual Experiments

Objectives:

- Support the educational process
- Provide data from laboratory demonstrations
- Benefit university research projects

Evaluation of prompt gamma-ray emissions from neutron interrogation of meteorites

Instrumentation:

- **Neutron generators:** DT, DD, Cf, Cm, (α,n)
- **Gamma-ray detectors:** HPGe, $LaBr_3$, CZT, NaI(Tl), etc.
- **Neutron detectors:** ^3He, EJ-301, EJ-309, Stilbene
- **Imaging:** X-Ray and Neutron transmission

Materials:

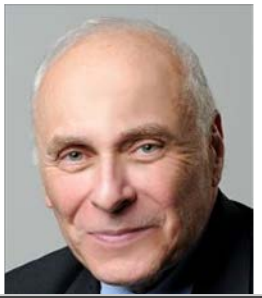
- Gamma-ray and neutron sources
- Low- and high-Z shielding
- Pu material samples
- U mass and enrichment standards
- Containers and enclosures

NSSC Sponsored Courses

NSSC has supported 9 courses held at four partner institutions

Course	Institution
Nuclear Security: The Nexus Between Policy and Technology	UC Berkeley
A Hands-On Introduction to Radiation Detection	UC Berkeley
Special Topics: Nuclear Data	UT Knoxville
Radiochemical Methods in Nuclear Technology and Forensics	UC Berkeley
Radiation Detection and Nuclear Instrumentation Lab Course	UC Berkeley
Advanced Concept for Radiation Detection & Measurements	UC Berkeley
Nuclear Criticality Safety	UC Berkeley
Nuclear and Radiochemistry	UC Irvine
Designed Emphasis in Nuclear Science (DENS)	UC Davis


Special Topics: Nuclear Data
with Prof. Heilbronn and Prof. Sobes

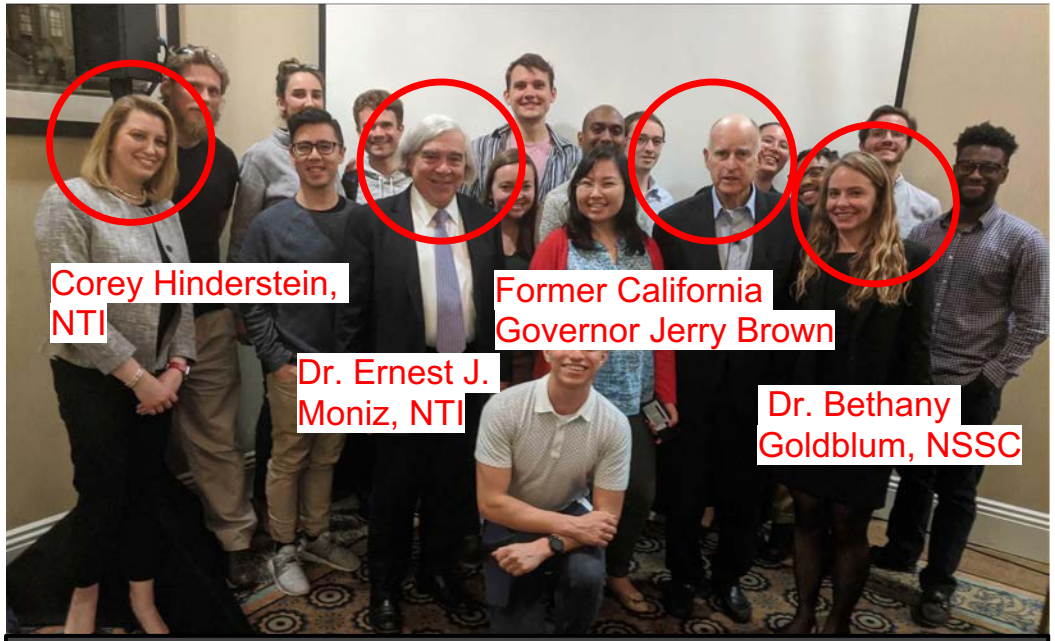



Nuclear Security: The Nexus Between Policy and Technology
with Prof. van Bibber and Prof. Nacht

A Hands-On Introduction to Radiation Detection
with NSSC Specialist Dr. Ali Hanks

NSSC Webinars 2019 - 2020

Since 2013, NSSC webinars have been connecting students to scientists at all of our partner institutions



Former U.S. Secretary of Energy **Dr. Ernie Moniz**, former California Governor **Jerry Brown**, and NSSC Executive Director **Dr. Bethany Goldblum** with students at the panel discussion on "How Close to Doomsday? Nuclear Dangers and Stopping a New Nuclear Arms Race"

Mark Chadwick, ALDX, LANL

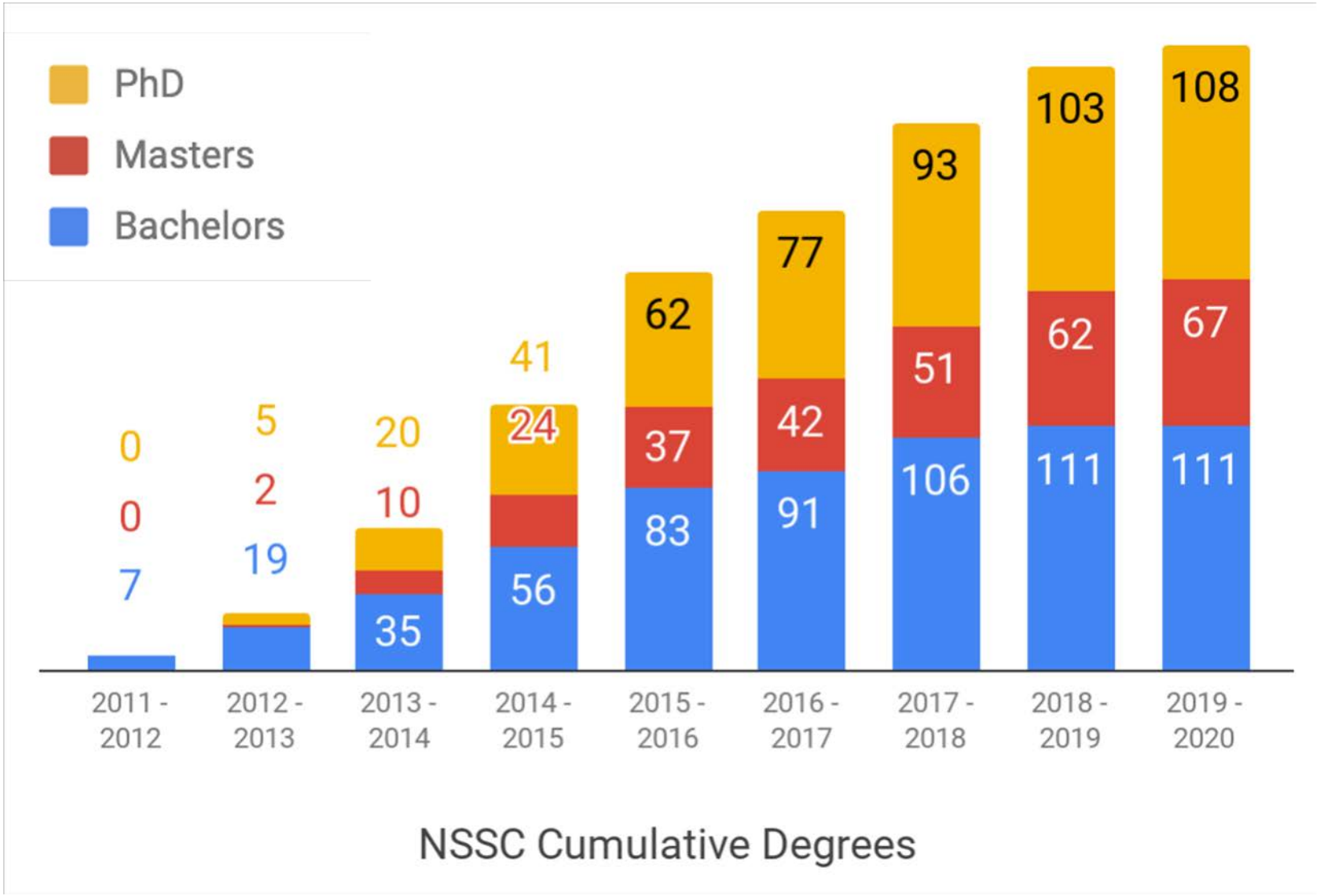
Christine Anderson-Cook, LANL

Yana Feldman, LLNL

Naomi Marks, LLNL

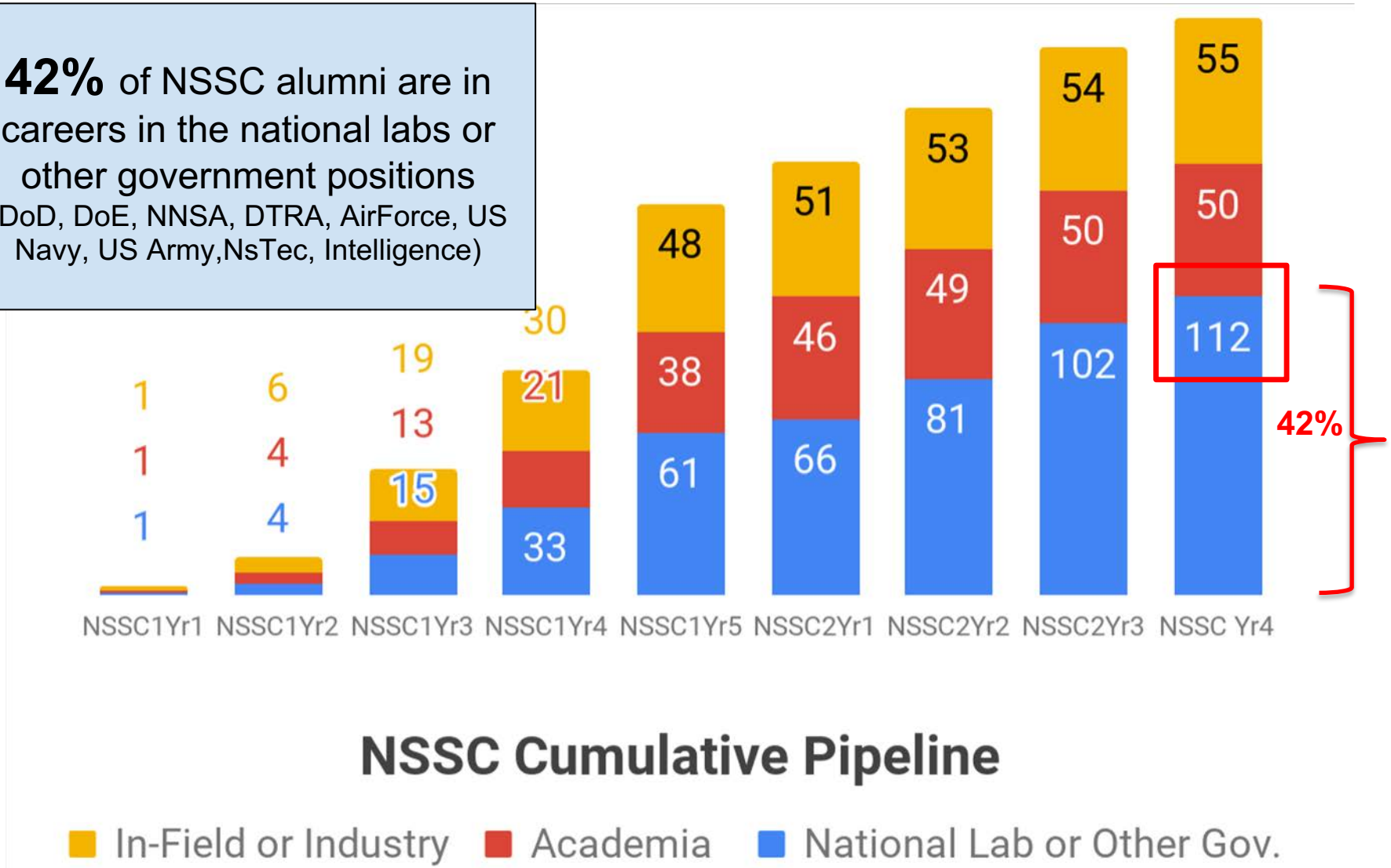
Amb. Linton F. Brooks.

NSSC Cumulative Degrees 2011 - Present



NSSC Cumulative Pipeline 2011 - Present

42% of NSSC alumni are in careers in the national labs or other government positions
(DoD, DoE, NNSA, DTRA, AirForce, US Navy, US Army,NsTec, Intelligence)



NSSC Pipeline to the National Laboratories and Other Government

	LBNL	SNL	LANL	LLNL	ORNL	Other Lab or Gov.	TOTAL
UCB	13	4	4	15	0	18	**54**
UCD	3	2	1	4	0	1	**11**
UCI	0	1	0	2	1	0	**4**
UNLV	0	0	6	5	2	4	**17**
MSU	1	0	2	1	1	10	**15**
TAMU	0	0	0	0	0	0	**0**
UTK	0	0	2	0	2	5	**9**
Fisk	0	0	0	0	0	1	**1**
GWU	0	0	0	0	0	1	**1**
TOTAL	**17**	**7**	**15**	**27**	**6**	**40**	**112**

Acknowledgements

NSSC Fall Workshop at LLNL

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