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Title: Enhancing Project Leadership Through Mentorship: Taking Advantage of a Talented Student Pipeline

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Enhancing Project Leadership Through Mentorship:
Taking Advantage of a Talented Student Pipeline

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NEN-2
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A-1
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NEN-1

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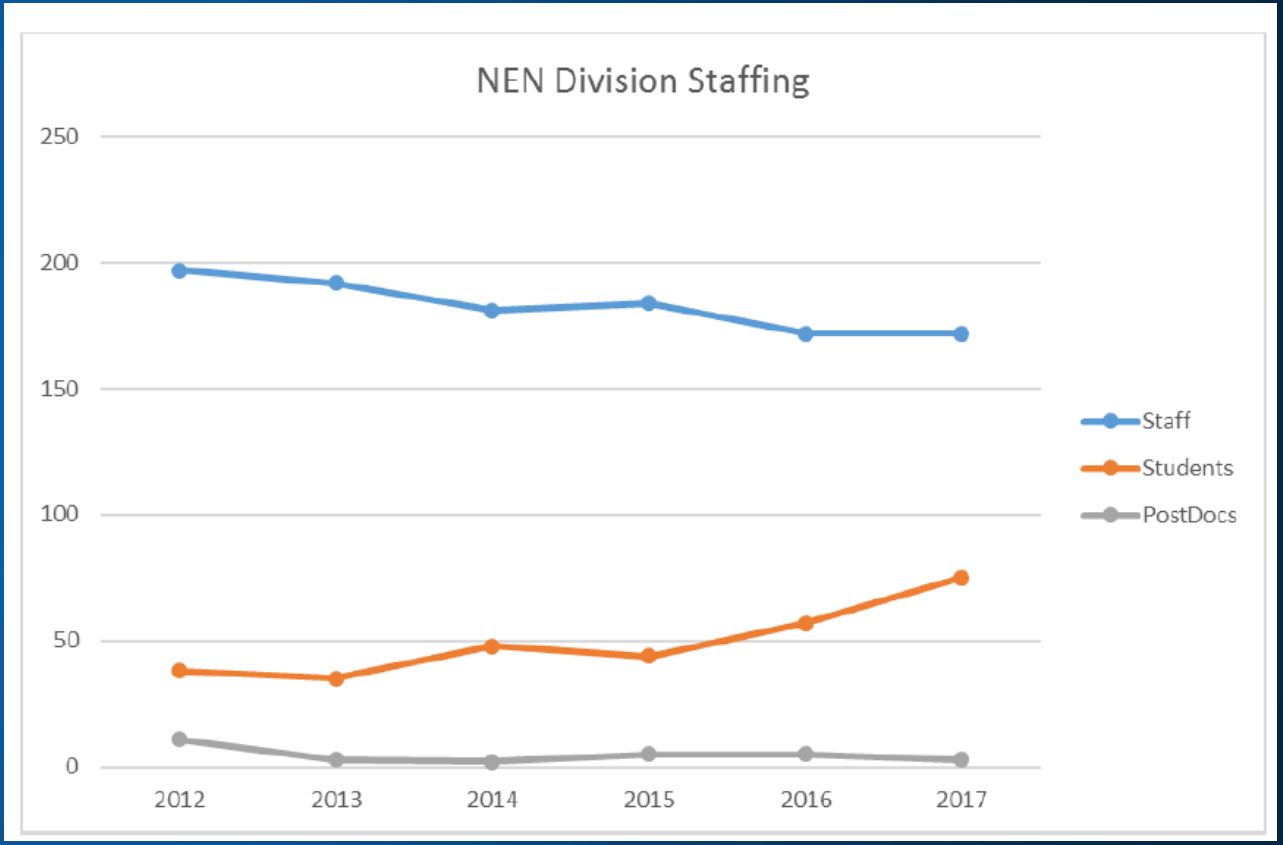
Introduction

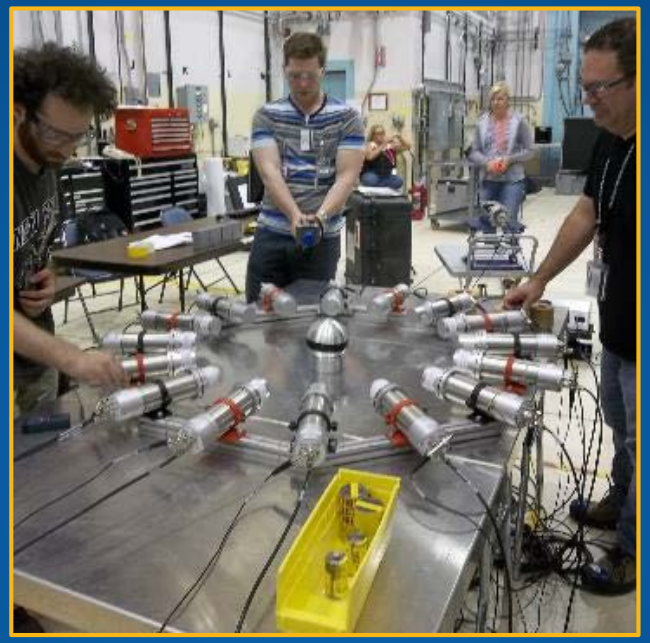
- **Types of students**
- **How can they help me as a project leader?**
  - How does this help me as a staff member (in addition)
- **Where do you find them?**
- **Discussion**



Types of Students

- **Level:**
  - High School
  - Undergrad
  - Post-Bac
  - Post-Masters
  - Grad Student (MS or PhD)

- **Duration**:
  - Summer (typical)
  - Spring/Fall (off-cycle)
  - Year-Round (in-residence)
  - Remote



Student Cost

- **<u>Some Come “Fully” Funded:</u>**
  - Consortia (CVT/CNEC/NSSC + Keepin*)
  - Internal Fellowships (Seaborg)
  - DHS
  - Minority Serving etc…
  - Information Science and Technology Institute (ISTI) summer schools
  - DOE/NNSA fellowships
  - Science Undergraduate Laboratory Internship (SULI)
  - NSF and other academic fellowships

- **<u>Most Would Need Funding (from active project)</u>:**
  - For most NEN codes (NA-20) ~$20-$70/hour
  - 25K for a summer is a good estimate
  - Partial funding is an option!

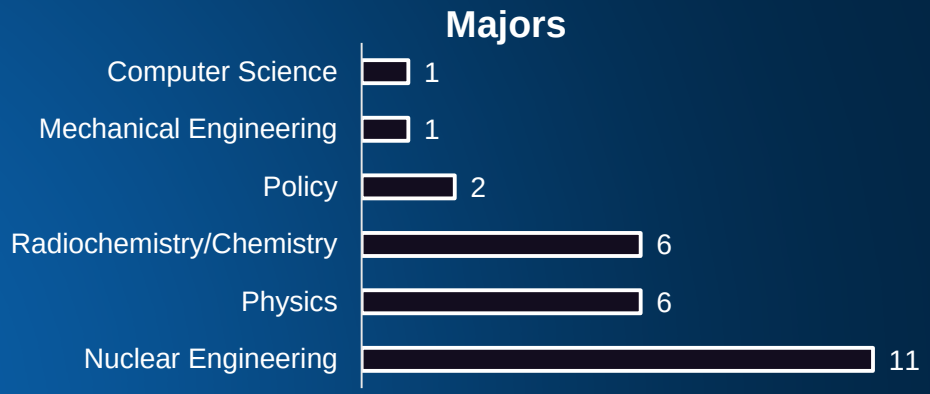
The Nonproliferation University Consortia

- **NA-22 established three large university-led consortia for multi-disciplinary R&D, education, and training in nuclear nonproliferation:**
  - Nuclear Science and Security Consortium (NSSC)
  - Consortium for Verification Technology (CVT)
  - Consortium for Nonproliferation Enabling Capabilities (CNEC)

- **LANL provides students and faculty access to unique technical capabilities (facilities, expertise) helping them understand and tackle dynamic national security challenges through game-changing science and engineering.**

- **Educational Opportunities**
  - Keepin Summer Program
  - Seminar Speakers

- **Technical Collaborations**
  - Student Internships
  - Collaborative Research
  - Utilizing Unique Facilities
    - NCERC, LANSCE, etc…
  - Hosting a LANL scientist



Universities Partner with Los Alamos for a Unique Hands-On Experience

Majority of mentors have rated students 5 out of 5

How does this help me as a project leader?

- **Return on Investment <u>varies</u> widely (with time)**
  - Student Cost
  - Student Productivity
  - Project Availability
  - Mentor/Management Support

- **Carving out the right portions…**

How does this help me as a staff member?

- Project Execution Productivity
- Fill a knowledge or Capability Gap
- Publications
- Future Proposal Fodder (for funded students)
- Bringing in the next generation (into your group)
- Professional Development via Mentoring (collaborations, Theses Committees)
- Recognition by Management
- Helping and enabling others is rewarding

Best Practices (Discussion)

Where do you find them?

- University Relationships / Collaborations
- University Consortia
- Other Groups
- Conferences
- Ask Group Management
- University Engagement e.g. Senior Design, INITIAL
- Career Fairs
- Technical Collaborations

Key Strategy Elements

- **Seize additional opportunities to reach students**
  - Contributing to Senior Design Capstone Projects – GOOD
    - Provides SME mentorship throughout academic year
    - Exposes students to real-world design needs
    - Integrated into undergraduate curricula
    - Previous years resulted in useful technical designs and student internship placement
    - Current projects (NEN-2, NEN-5):
      - Safeguards by Design (UT Austin)
      - Design of a fast burst reactor (NCSU)
      - Design of an integral intermediate energy critical experiment for nuclear data validation (RPI)

  - Departmental Seminars and Guest Lectures should be our primary vehicle to reach students and stimulate interest -- BETTER
    - Generally speaking, seminars are more impactful than job fairs
    - Allows us to take advantage of pre-existing staff collaborations to facilitate seminar opportunities
    - Parallel effort to target key Universities and/or Departments for seminar opportunities
    - "Self-selection" is a useful tool
      - Students self-select to attend seminars
      - Students self-select to engage speaker post-presentation (these are the students with sincere interest)
    - Provide thoughtful feedback on NEN priorities to enhance the potential value of these activities
    - Provide advertising materials with focused NEN message (under revision)

Path Forward

- **Develop target universities list**
  - Identify key faculty relationships
  - Prioritize (high, middle, low)
- **Create engagement map**
  - Correlate priorities to university consortia engagements
  - Correlate priorities to planned staff travel (existing collaborations)
- **Identify gaps and resources required**
  - Leverage existing relationships/alumni
  - Prioritize early to mid career champions (where possible) at key university programs; **students can serve as conduits in order to continue engagements and start new ones**
    - Departmental seminars, guest lectures, and technical exchange visits
    - Student mentoring and thesis committee participation
    - Adjunct faculty appointments
    - Collaborative programmatic research
  - Highlight current mission successes and emphasize them when reporting to NA-20 and other sponsors
  - Better identify and pair LANL mentors for student internships

Building an Army.. Rian Bahran, Critical Experiments Team (NEN-2)

Full:

Jennifer Arthur (U Mich)

Miriam Rathbun (MIT)

Tony Shin (U Mich)

Adrian Beard (NCA&T)

Jordan Bakerman (NCSU)

Chloe Verschuren (TAMU)

Katie Mummah (U Wisc)

Partial:

Nicholas Thompson (RPI)

Dominik Fritz (RPI)

Pippa Chadwick (Bard)

Robby Weinmann-Smith (Florida)

Paul Mendoza (TAMU)

Alex McSpaden (U Mich)

Alexis Trahan (U Mich)

George McKenzie (UIUC)

Phoebe DeVos-Cole (Chapman)

Meghan McDonald (VTech)

Annelise Plooster (MIIS)

2018 Snapshot:
Students/Postdocs with mentors/co-mentors from Critical Experiments Team

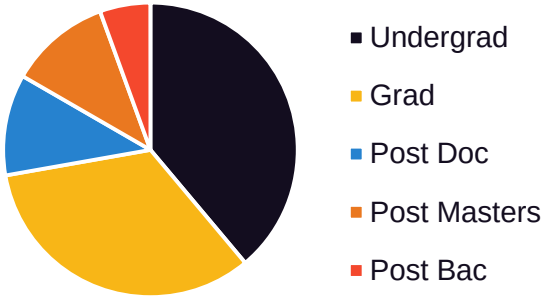
Jessica Elder	WPI	Crit Exp Tool Development	T. Grove J. Hutchinson	UGS	Summer 2018	Study Center
Nick Thompson	RPI	Clustering and Nuclear Data	R. Bahran J. Hutchinson	P-Doc	In-residence	Study Center
George McKenzie	ILLINOIS	Rossi-Alpha	W. Myers T. Grove	GRA	In-residence	NISC
George Steinkamp	UNM	Active Interrogation	W. Myers	UGS	Summer 2018	Study Center
Victoria Hagopian	UF	GODIVA Simulations	J. Goda	GRA	Summer 2018	Study Center
Jennifer Arthur	M	Subcrits for Validation	R. Bahran J. Hutchinson	GRA	In-residence	NISC
Dominik Fritz	RPI	URR Design	T. Cutler R. Bahran	P-BS	Summer 2018	Study Center
Alex McSpaden	M	Subcritical Neptunium	M. Smith-Nelson J. Hutchinson	P-MS	In-residence	Study Center
Katie Mummah	W	KEEPIN/ KRUSTY	R. Bahran R. Sanchez	GRA	Summer 2018	Study Center
Kelsey Amundson	Berkeley UNIVERSITY OF CALIFORNIA	ZEUS-Pb Benchmark	J. Goda J. Hutchinson	MS	Fall 2018	Remote

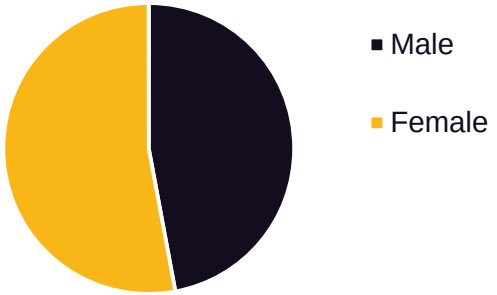
2018 Snapshot:
Students/Postdocs with mentors/co-mentors from Critical Experiments Team

Kristin Smith	KRUSTY	R. Sanchez T. Cutler	UGS	Summer 2018	Study Center
Michael Hua	Rossi-alpha Uncertainty	J. Hutchinson M. Smith-Nelson	UGS	Summer 2018	Study Center
Roberto Rico	Crit Exp Tool Development	R. Sanchez	UGS	Summer 2018	Study Center
Daniel Timmons	Simulations near DC	M. Rising (XCP-3) T. Cutler	GRA	Summer 2018	Study Center
Chloe Verschuren	KEEPIN, INITIAL	L. Limback (NEN-1) R. Bahran	P-MS	In-residence	TA-66
Meghan McDonald	KEEPIN	J. Whitton (A-2) R. Bahran	UGS	Summer 2018	Otowi
Pippa Chadwick	KEEPIN, INITIAL, DAF	R. Bahran C. Verschuren (NEN-1)	UGS	Summer 2018	Study Center

By the numbers….

Total Students: 17
Universities: 12
Critical Experiments Team Mentors: 8





Other Things to Consider

- **Foreign nationals**
- **Cleared vs. uncleared work**
- **Short-term vs long-term commitments**
  - Is your group hiring?
  - Is your funding steady?
- **Contingency plan**
  - What if the student doesn't work out?
- **Consider *not* monopolizing your student, especially if you're interested in potential conversion.**
- **Don't overwhelm yourself by taking on too many students.**
  - You must allow regular time in *your* schedule to be involved with your students.
- **Consider your needs vs. the student's capabilities.**
  - The kind of work you'll give a postdoc is obviously very different than for a high school student.

Thank you for your attention.

Questions?