



Consortium for Enabling Technologies and Innovation

Anna Erickson
Georgia Tech

November 19, 2022



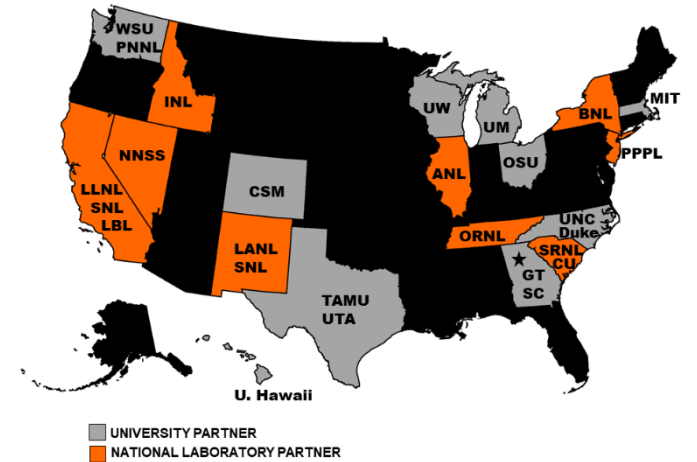
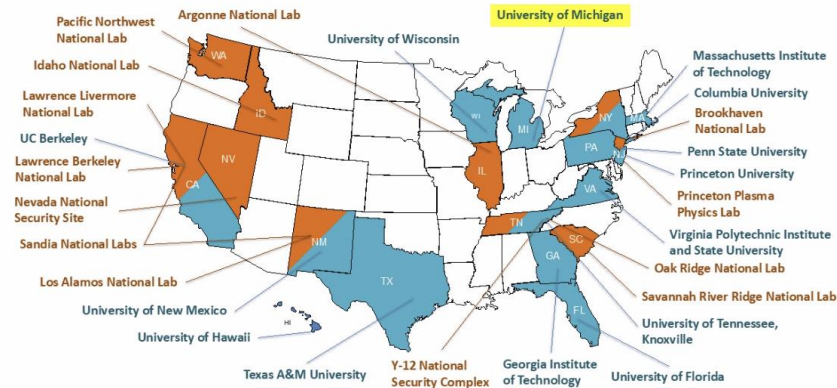


Welcome to Georgia Tech!

 Nuclear Science and Security Consortium

 MICHIGAN ENGINEERING
CONSORTIUM FOR MONITORING, TECHNOLOGY, AND VERIFICATION

 CONSORTIUM FOR
ENABLING TECHNOLOGIES AND INNOVATION

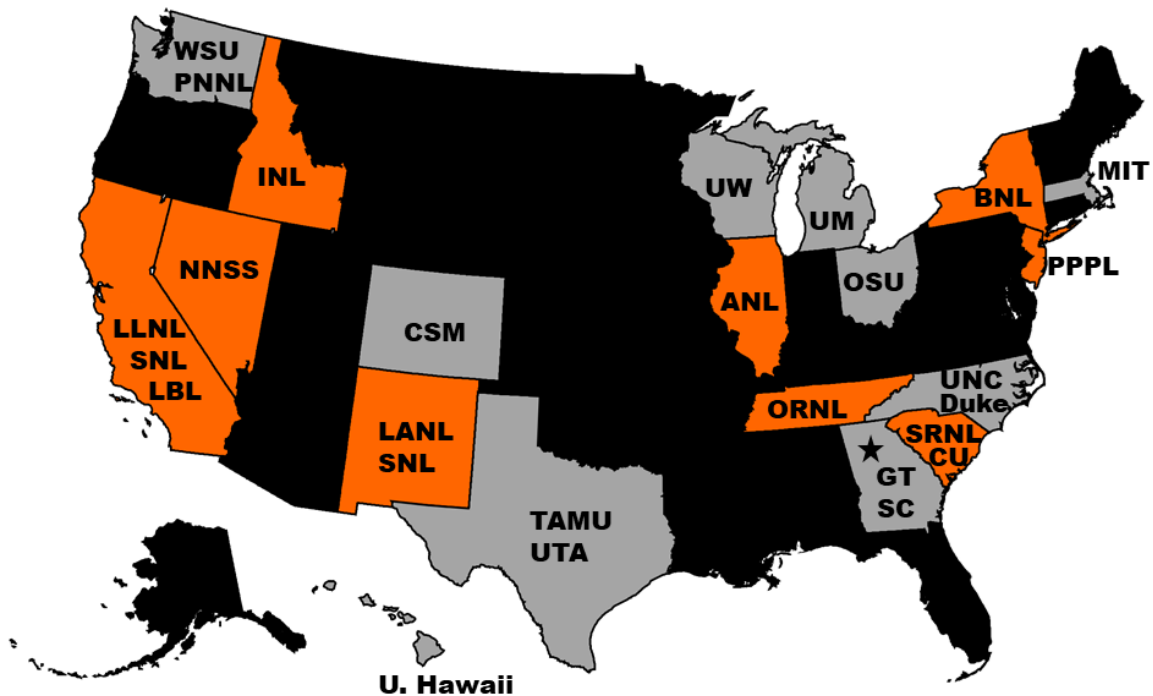
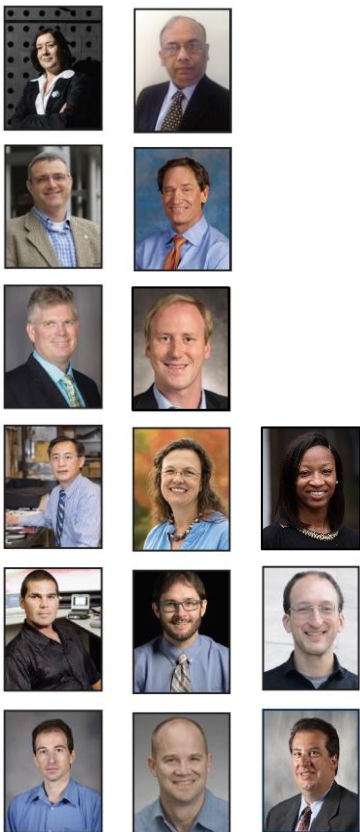


University Program Review 2021

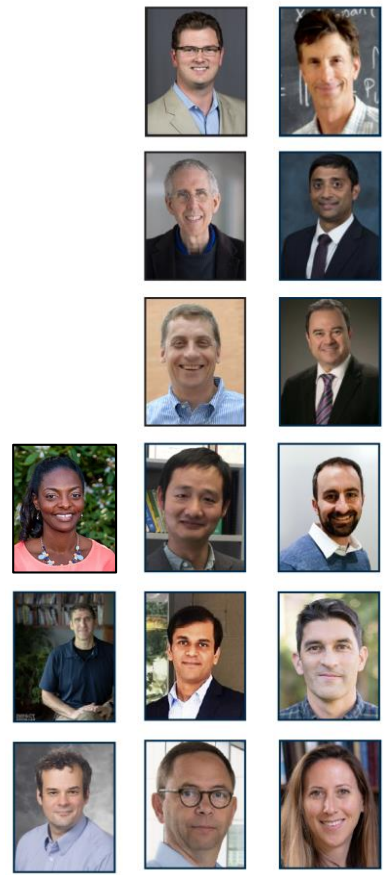




ETI Team



UNIVERSITY PARTNER
 NATIONAL LABORATORY PARTNER

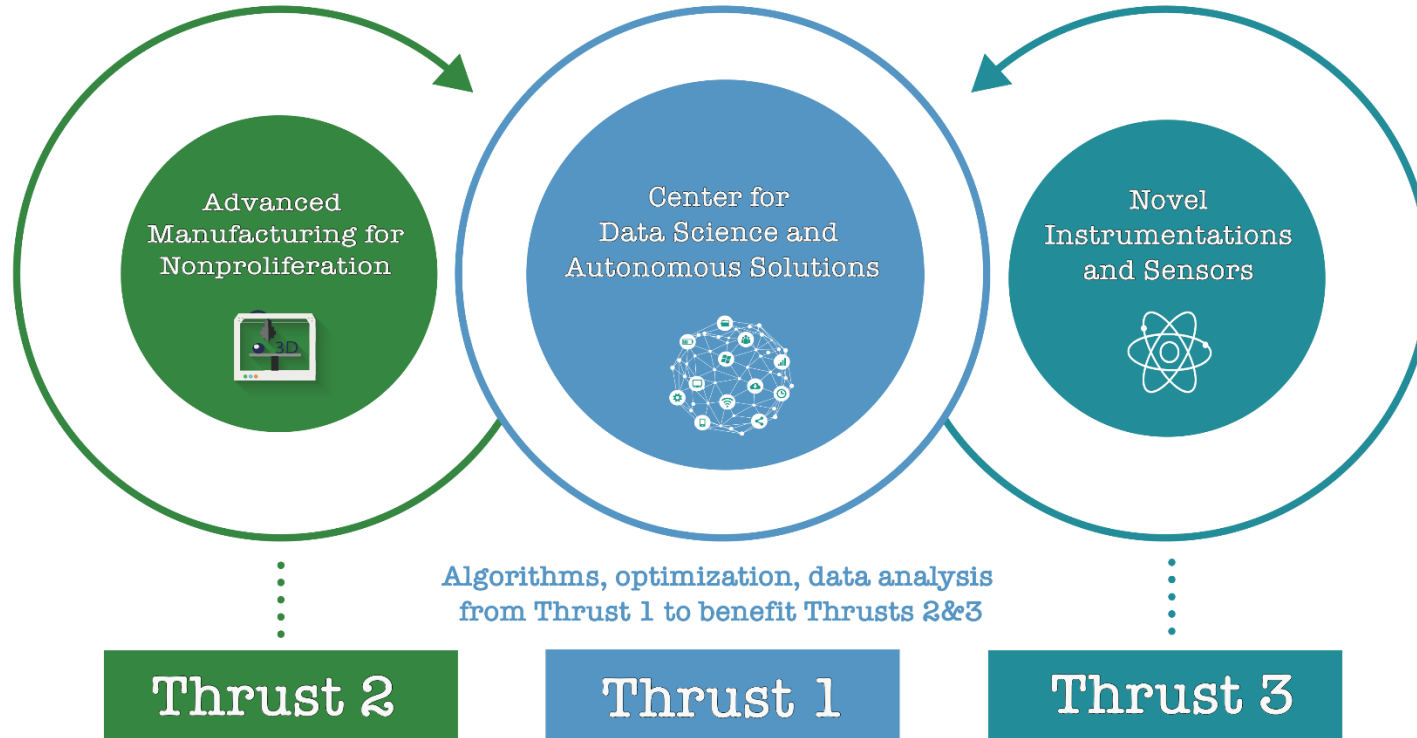




ETI Structure and objectives

Data sets from maker communities, signatures, and manufacturing methods

Data sets from sensors, biota and robotic instruments



- ▶ To direct the research and innovation to enable the technologies that support the NNSA's mission and to bridge the gap between the university basic research and national laboratories mission-specific applications.
- ▶ To create a research and education environment to support cross-cutting technologies across three core disciplines.
- ▶ To support education, development, and transition to national laboratories or NNSA of students and postdocs.

ETI Mission: To direct the research and innovation to enable the technologies that support the NNSA's mission and to bridge the gap between the university basic research and national laboratories mission-specific applications.



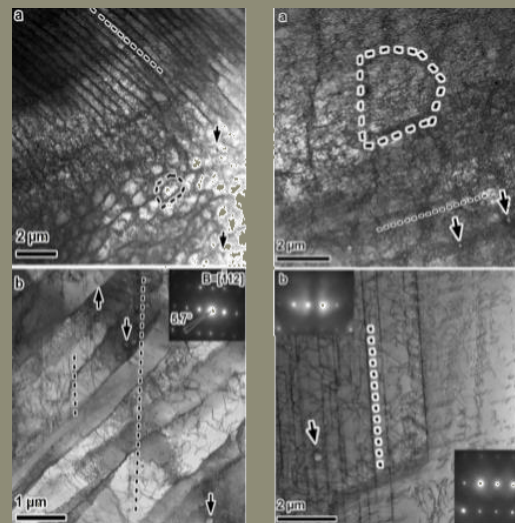
Thrust Area 2: Additive Manufacturing (AM) for Nonproliferation.

Material scientists, nuclear engineers and specialists in maker communities with a goal to address the most pressing needs in enabling technologies to determine unique signatures resulting from use of advanced manufacturing. Results will be a foundation for policy formulation to address these concerns.

Lead: S. Biegalski, GT

SLM

DED

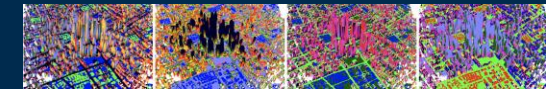
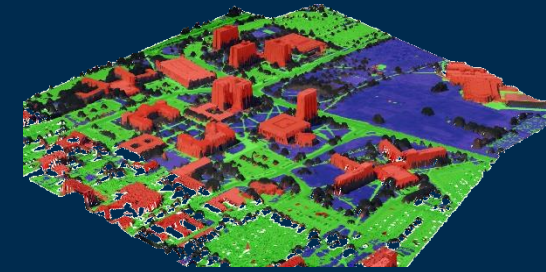


D. Thoma (UW)

Thrust Area 1: Computer and Engineering Sciences for Nonproliferation (CESN).

A multidisciplinary team composed of computer and data scientists, nuclear and aerospace engineers, chemists and biologists to take advantage of new-age computational and hardware capabilities in data science and remote detection.

Lead: P. Wilson, UW

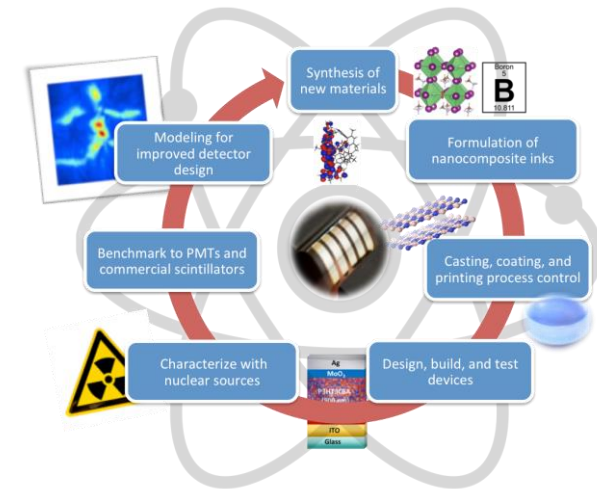


J. Fisher (MIT)

Thrust Area 3: Novel Instrumentation (NI) for Nuclear Fuel Cycle Monitoring.

The aim is to integrate into MTV Consortium solutions and national laboratories' research using expertise from nuclear engineering, material scientists, chemists and electrical and computer engineers.

Lead: R. Cao, OSU

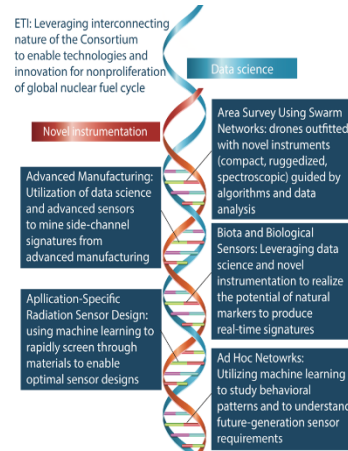


B. Kippelen (GT)

Technical Education, Outreach and Workforce Development

Goals of the educational program

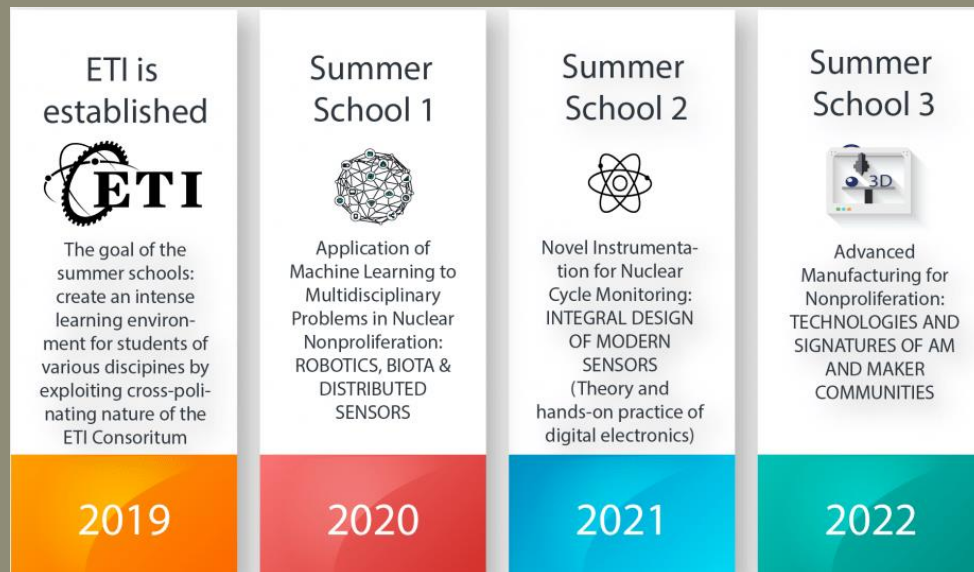
- Provide NNSA with a continuous supply of highly trained scientists
- Provide opportunities for the ETI students to do research at national laboratories.
- Assemble strong university-lab research and education bridges
- Build the next generation of leaders



Laboratory and Site/Complex Internship and Rotations

- Laboratory and Site/Complex Rotations: in addition to student-targeted internship funding, ETI will support student-faculty and student-postdoc pairs to participate in 4-8 week laboratory rotations.
- Laboratory Dissertation Committee Members: each graduate student will include a thesis committee member from a national laboratory

Interdisciplinary Curriculum Development, Summer School



Engagement of students from MSI

- Provide students with an opportunity to intern at a PhD-granting institution
- Provide opportunities for the students to develop relationships with the future grad school advisor
- Provide educational and networking opportunities
- Fellowships and scholarships
- Current partners: Claflin University, Spelman University

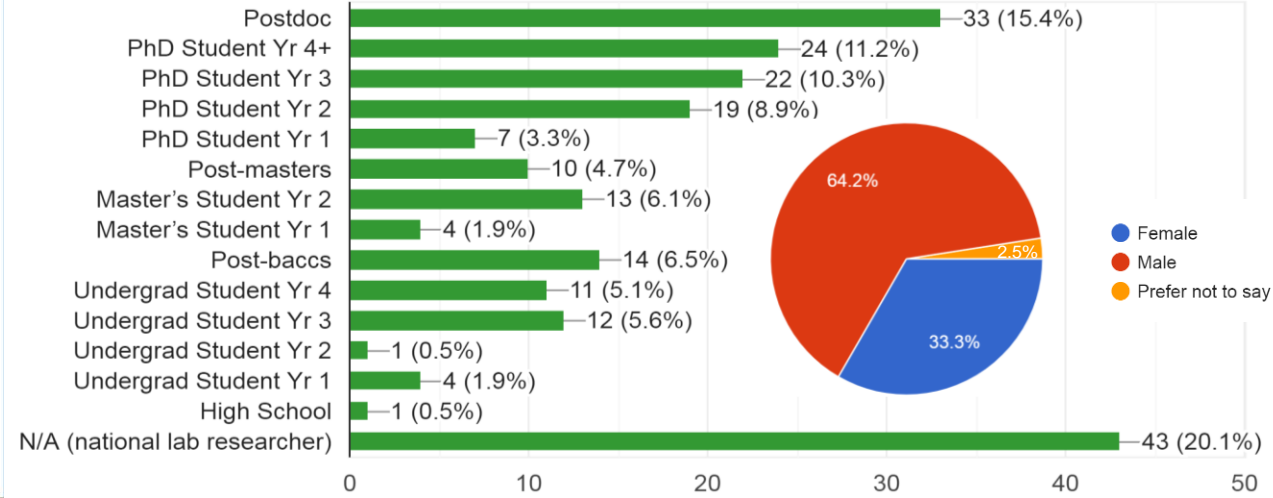


Major Events 2020-2021

- July 2020 — ETI Virtual Summer Meeting for Young Researchers
- August 2020 — ETI Annual Summer School (Data Science and Engineering), Virtual
- October 2020 — ETI Annual Workshop, Virtual
- January—May 2021 — ETI 101: Fundamentals of Nuclear Science and Engineering for Nonproliferation
- April 2021 — UK-US Academic Network in Nuclear Security and Nonproliferation Skills
- July 2021 — ETI Annual Summer School (Novel Instrumentation and Sensors), Virtual

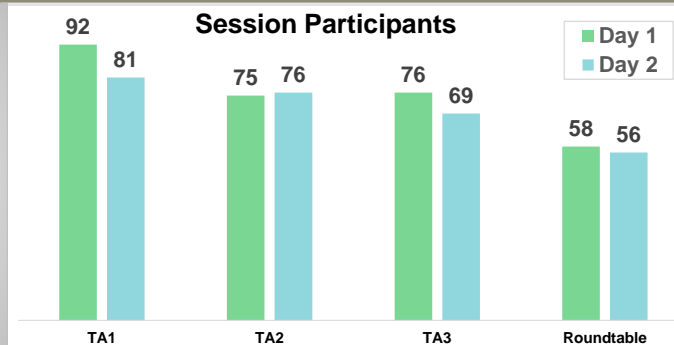
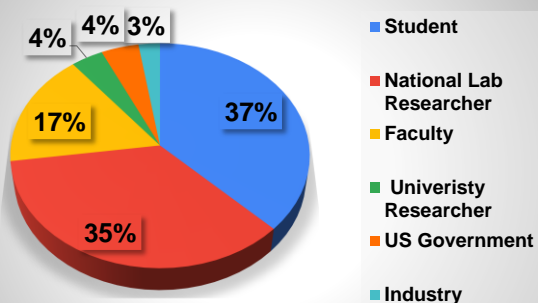
2020 ETI Annual Summer School Data Science and Engineering

- August 24-28, 11am-5pm (ET), WebEx
- Over 210 registrations



2020 ETI Virtual Summer Meeting for Young Researchers

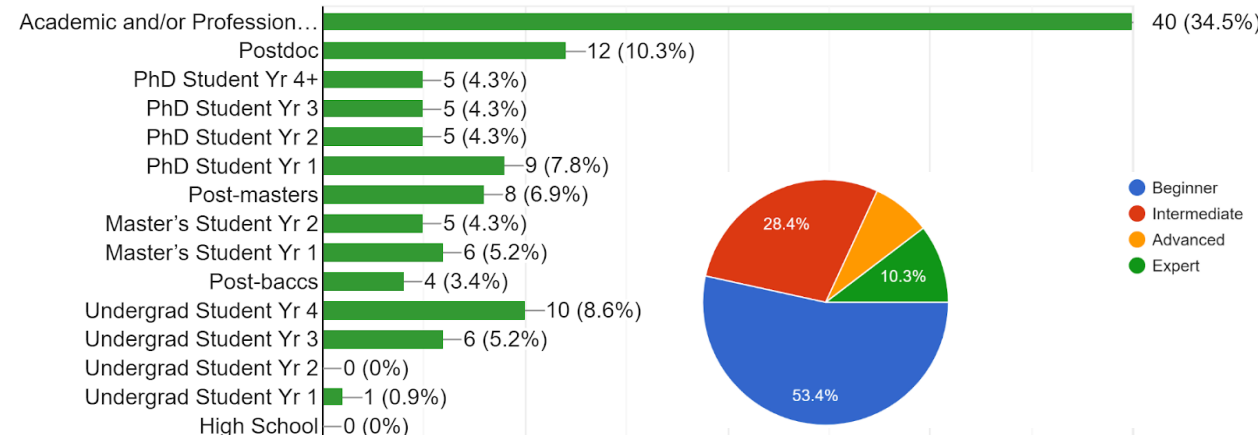
- July 7-8, 11am - 4pm (ET)
- Co-host with LLNL via WebEx
- 28 oral presentations
- 2 roundtable sessions
- Exchange of research and innovation between NLs and IHEs
- Integration of cross-cutting projects
- NNSA feedback, social interactions



2021 ETI Annual Summer School

Novel Instrumentation and Sensors for Nuclear Fuel Cycle Monitoring

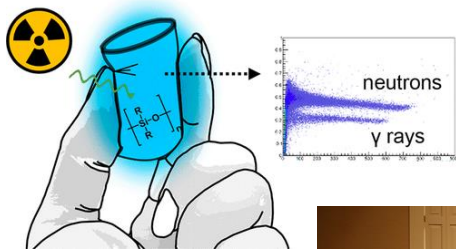
- July 12-15, 2021, WebEx
- Over 116 registrations



Major Achievements

Products

- 4 book chapters
- 50 peer-reviewed journal articles
- 50 courses developed
- 23 conference papers
- 140 other presentations (invited talks, posters, seminars)



Educational Resources



Consortium for Enabling Technologies and Innovation

2021 SUMMER SCHOOL

Novel Instrumentation & Sensors for Nuclear Fuel Cycle Monitoring

ETI SUMMER SCHOOL 2020

Two-Part Workshop on Data Science and Engineering

ETI VIRTUAL SUMMER MEETING FOR YOUNG RESEARCHERS

July 7-8, 2020

ETI 101 Course: Fundamentals of Nuclear Science and Engineering for Nonproliferation

- Semester-long introductory course: January 12 – May 6, 2021
- 4 Modules (34 lectures)
- 19 speakers/lecturers from 13 institutions (6 national labs)
- Over 470 participants, 802 video views

Module 1: Nuclear science of radiation interactions and applications (8 lectures)

Module 4: Overview of nuclear security and nonproliferation (10 lectures)

Module 2: Nuclear engineering of reactors and systems (8 lectures)



Module 3: Nuclear fuel cycle and waste management (8 lectures)





Thank you!

This work has been supported through the Consortium for Enabling Technologies and Innovation by the Department of Energy/National Nuclear Security Administration under Award DE-NA0003921.

