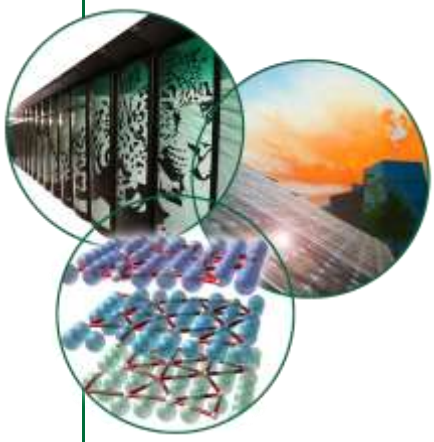
Nuclear Educational Outreach
Nuclear Science and Engineering Directorate (NSED)



U.S. DEPARTMENT OF ENERGY

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

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Current Education Programs

INTERNSHIPS for Students

- Nuclear Engineering Science Laboratory Synthesis (NESLS)
- Science Undergraduate Lab Internship (SULI)
- Pre-Service Teacher (PST) Training Fellowship Program
- Higher Education Research Experiences (HERE)
- Post BS
- Postmasters Research Participation Program
- Postdoctoral Research Associates Program (ORNL)
- Advanced Short-Term Research Opportunity (ASTRO)
- DOE Community College Institute (CCI)
- NRC HBCU
- Department of Homeland Security Fellows/Scholars

INTERNSHIPS for Faculty

Faculty Student Teams (FaST)

DOE Academies Creating Teachers-Scientists (ACTS)

Grass Roots Science Saturdays

Sharing Adventures in Engineering and Science (SHADES)

K-2 Science Clubs

SCIENCE SATURDAYS

A Saturday activity with interactive presentations and hands-on science presented by ORNL staff geared for students Grades 8 - 12

SHaring Adventures in Engineering and Science (SHADES)

•ORNL researcher Peggy Emmett started in the 90's

•Half-day program once or twice a year for 6th and 7th females

• over 25 workshops, 1500 students and 150 teachers

•Covers a variety of science topics

•Teachers participate and get in-service credit

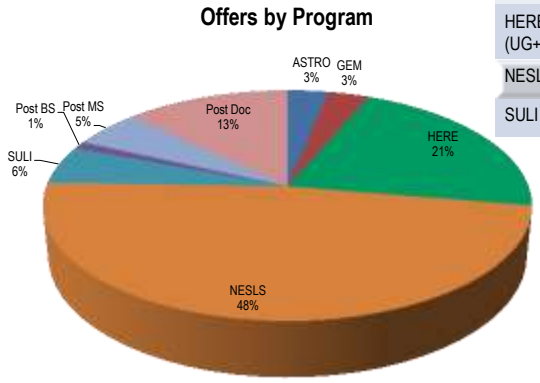
•Design Competition

SCIENCE CLUB

- Science Club - a program to encourage kids to explore science in the world around them
- Program is for ages K-5
- Club was started in January 2006 by ORNL staff members
- Kids perform a series of take-home experiments with their families.
- Currently is a all day event themed on radioactive detection and measurement

Summer 2012 NSED Interns by Program (94)

Student Program	Applications	Offers
ASTRO	69	3
GEM	24	3
HERE (UG+Grad)	524	38
NESLS	269	45
SULI	300	5



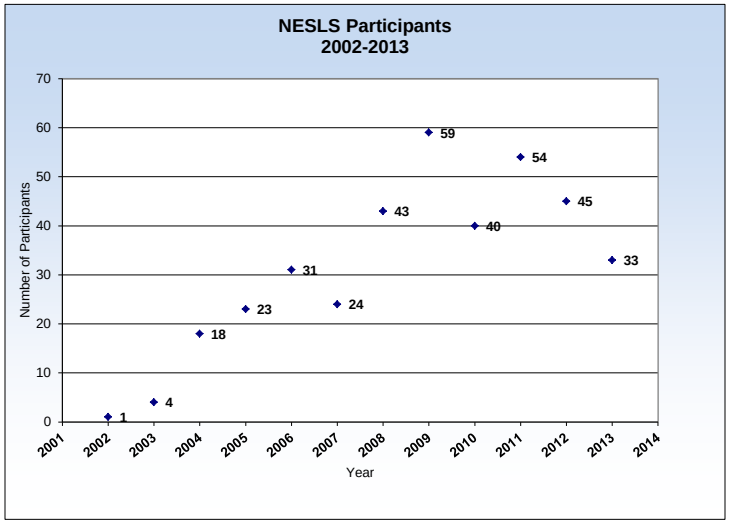
NESLS Internship

NESLS is particularly designed for nuclear applications and will accept students and faculty from other disciplines, including chemical and mechanical engineering, chemistry, and physics, and information analysis and management.

Material protection, control, and accounting	Radiation detection	Safeguards
Transportation technologies	Arms control assessments	Fissile material Detection
Export control	Fissile material disposition	Nuclear threat reduction
Radiation shielding	Systems analysis	Reactor physics
Facility safety	Criticality safety	Risk assessment
Thermal hydraulics	Regulatory support	Nuclear data and codes
System instrumentation and controls	Material and fuel irradiation	Enrichment technology
Advanced space reactors	Nuclear fuels	Heavy element production
Separations science and technology	Nuclear process and equipment design	Stable and radioactive isotopes
Robotics and remote handling	Medical isotope development	Chemical engineering

Class Status*	Stipend/wk
Freshman	$529
Sophomore	$593
Junior	$653
Senior	$726
Graduate	$863
Masters completed	$935

Nuclear Engineering Science Laboratory Synthesis (NESLS)



Summer ACTIVITIES for Students

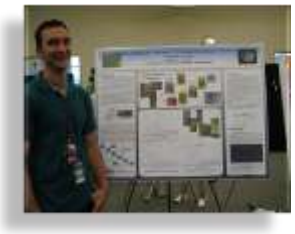
- Facility Tours
- Lecture Series
- Safety Luncheons
- Judged Poster Session

Facility
Spallation Neutron Source
Robotics and Remote Systems
High Flux Isotope Reactor/ Radiochemical Engineering Development Center
High Temperature Materials Laboratory (new)
EVERST/Supercomputers
Aquatics/Ecology Lab (new)
Safeguards Laboratory
Nanophase Materials Sciences (new)
Graphite Reactor
Stable Isotopes
Transportation Security and Package Testing Facility
Consortium for Advance Simulations of Light Water Reactors (new)

Program	Speaker	Title
NESLS	Kevin Clarno, ORNL	Integrated Radiation Transport and Nuclear Fuel Performance for Assembly-Level Simulations
	Rose Montgomery, TVA	Industry Viewpoint on Collaborative Research with National Labs and DOE
	Michael Whitaker, ORNL	Application of International Safeguards at Uranium Enrichment plants
	Predrag Krstic, ORNL	Tuning Nuclear Fusion at the Nanoscale
	Vincent Jodin, ORNL	Post-Detonation Nuclear Forensics
	Cathy Romano, ORNL	Nondestructive spent fuel analysis
NGSI	Justin Reed, LLNL	Introduction to International Safeguards
	David Chichester, INL	Non Destructive Analysis
	Brian Boyer, LANL	Role of the Safeguards Inspector
	Ross Williams, LLNL	Destructive Analysis for Environmental Sampling and Nuclear Forensics
	Adam Williams, SNL	Gulf Nuclear Energy Infrastructure Institute (GNEII) Safeguards and Physical Protection Curriculum
	Hal Undem, PNNL	Tags and Seals for Safeguards
	Mark Schanfein, INL	Unattended Monitoring Systems
	Karen Miller, LANL	Technology Development for Safeguards Applications
	Michael Whitaker, ORNL	Enrichment Plant Safeguards
	Les Fishbone, BNL	Short Notice Random Inspections: 1993-Present
	Martyn Swinhoe, LANL	Modeling and Simulation for Safeguards
	Sarah Frazar, PNNL	Safeguards Infrastructure Development
	Jonathan Essner, LLNL	Syria and Safeguards Noncompliance
	Susan Pepper, BNL	Careers in Safeguards at the IAEA
REDC/ HFIR	Chuck Alexander, ORNL	Nuclear 101-Part 1
	Video	The Search for Heavy Elements
	Emory Collins, ONRL	Fuel cycle R&D
	Bob Wham, ORNL	Pu-238 Production
	Students	Various student presentations

Summer 2012 Judged Poster Session

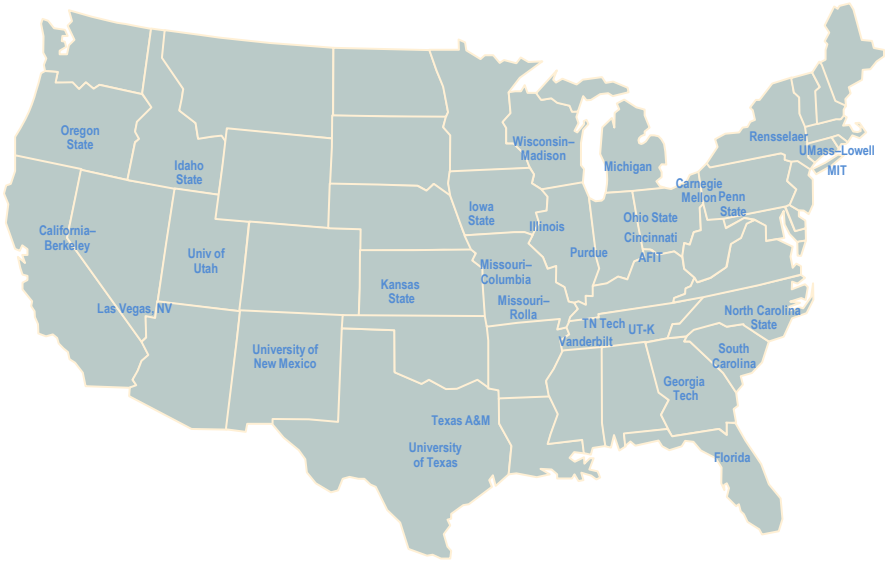
1st Place: Chris Jensen "Separation of ^{249}Bk from ^{252}Cf Using Resin Based Columns"



3rd Place: Mateusz Monterial "Determining Relationships between Fallout Gamma Spectra and Fission Type

2nd Place: Damien Lebrun-Grandi "An Algorithm to Simulate Mechanical contact Between Bodies with Application to Nucelar Fuel Simulations"

Outreach Activities

University visits
Career Fairs
Conferences
- American Nuclear Society Winter Meeting
- ANS Student Conference
- Institute of Nuclear Material Management
- Women In Nuclear

University Visits/Career Fairs