

JLab Science Education – Fortifying the STEM Pipeline



Chesapeake Section of the
American Association of Physics Teachers
Spring 2023 Semi-Virtual Meeting
April 1, 2023 @ **JAMES MADISON UNIVERSITY.**

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Science Education Team Lead



Science Education Goals

- Develop local and state **partnerships** to advance STEM education
- Improve the quality of K-12 instruction by **enhancing teachers' content** knowledge
- Immerse graduate, undergraduate, and high school students in a **world-class facility research environment** to prepare the nation's next generation of leaders

Science Education Pipeline

As a world-class research facility, Jefferson Lab is a valued partner to the local, regional, and national education community. Jefferson Lab's long-term commitment to science education continues to focus on increasing the number of teachers with a substantial background in math and science, strengthening the motivation and preparation of all students and addressing the serious underrepresentation of minorities and females in science, math, engineering and technology careers.

STEM Educator Professional Development

- JLab Science Activities for Teachers (JSAT)
 - Grades 5, 6, and 8
- Region II Annual Teacher Night

Annually serves >940 teachers

K-12 Programming

- Becoming Enthusiastic About Math and Science (BEAMS)
- High School Summer Honors Program (HSSHP)
- Summer Residential Governor's School (SRGS) in Engineering
- JLab Mentorship Program

Annually serves >13,000 students

Undergraduate Programming

- Science Undergraduate Laboratory Internship (SULI)
- Research Experience for Undergraduates (REU)
- Community College Internship (CCI)
- Mexican Physical Society (MPS)
- Undergraduate Physics Research (UPR) Program
- Minority/Female Undergraduate Research Assistantships (M/FURA)

Supports >45 undergraduate students/year

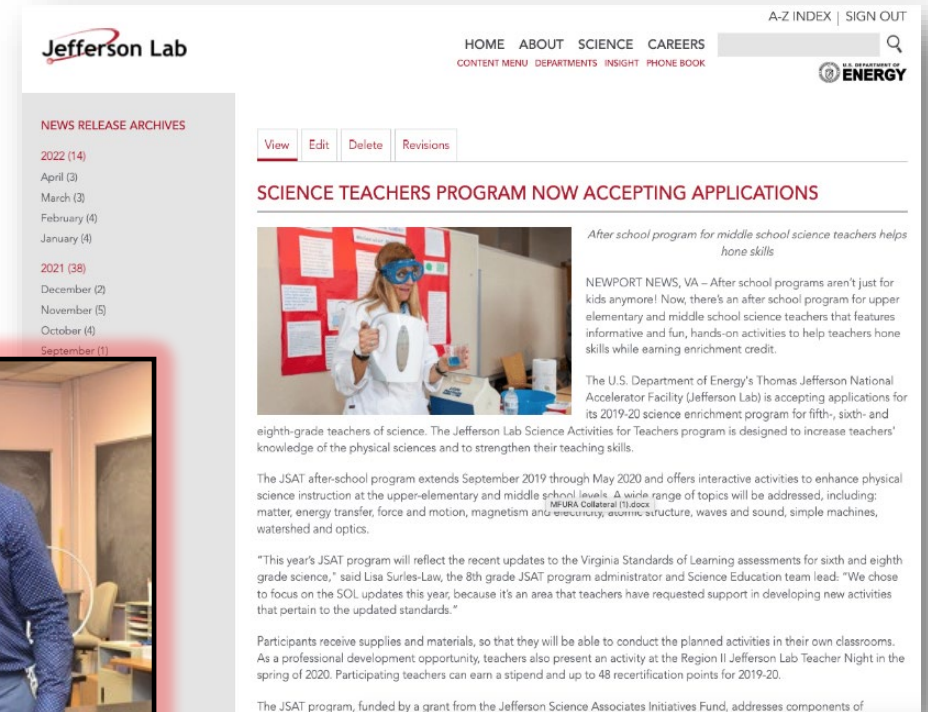
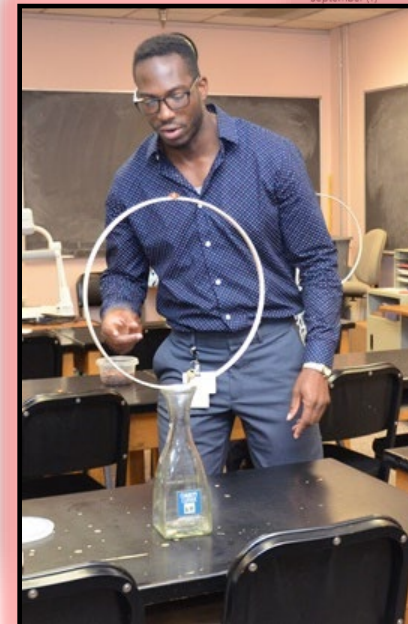
Graduate Research

- Office of Science Graduate Student Research (SCGSR) Program

Supports >100 graduate students/year

JLab Science Activities for Teachers (JSAT)

JSAT places JLab as the community's leader in providing needed professional development for local teachers through SOL-based content and STEM applications, during the school year.



JLab Science Activities for Teachers (JSAT)

APPLY HERE



<https://rb.gy/xszx>

<https://education.jlab.org/jsat/>

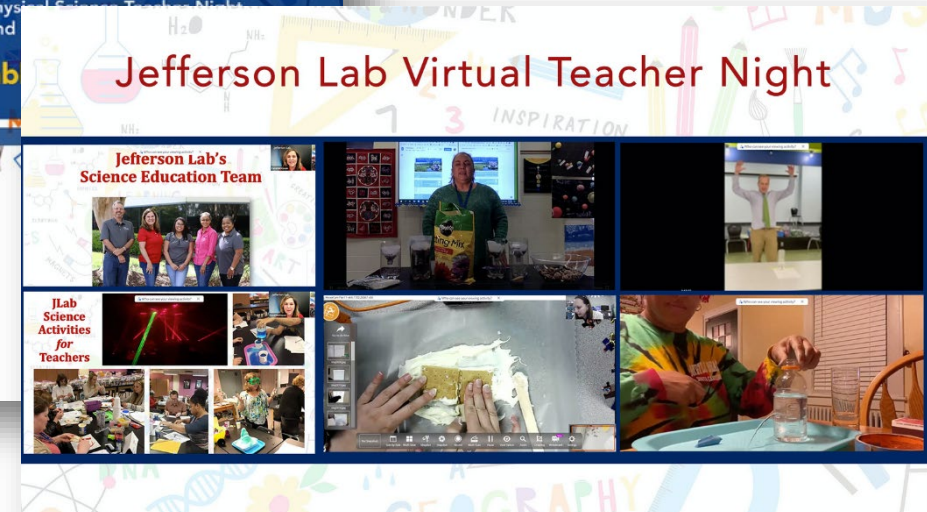
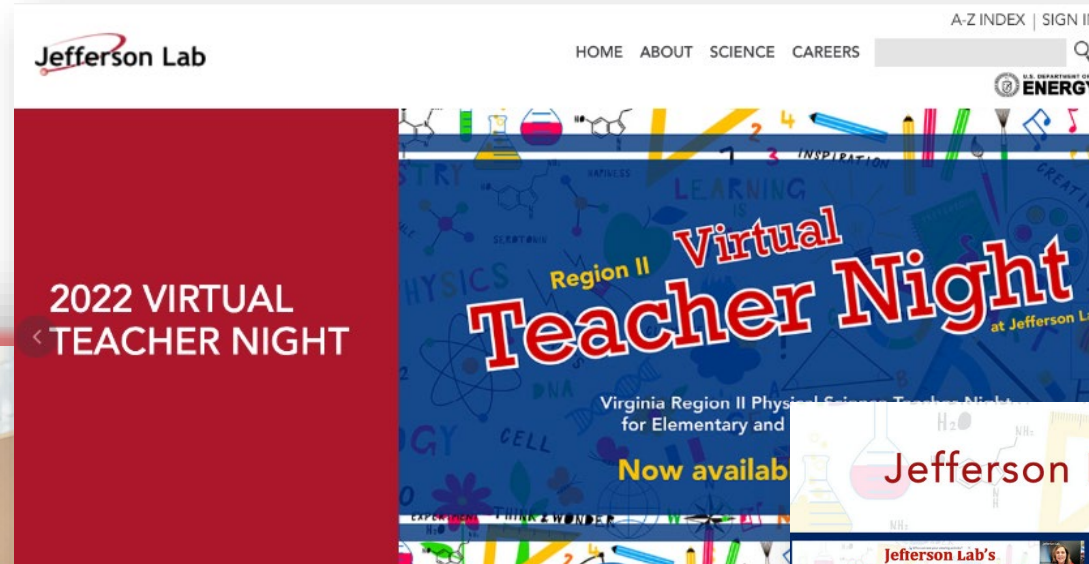
- **Jefferson Lab Science Associates **Teacher Development Initiative****
- **5th, 6th & 8th grade cohorts**
- **Meet twice monthly**
- **Receive classroom equipment and supplies to conduct activities**
- **48 teacher education recertification points**
- **Participation stipend**



Region II Annual Teacher Night

Teachers from the JSAT (Jefferson Lab Science Activities for Teachers) program share science-themed classroom activities, focused on upper elementary and middle school students.

REGISTER HERE:



~ April 19th, 2023 ~

Mentorships and Internships

JLab staff and users encourage and prepare high school and undergraduate students to pursue advanced degrees in experimental/theoretical physics and accelerator science.

Jefferson Lab supports ~40 undergraduate students/year and ~30 high school students/year.

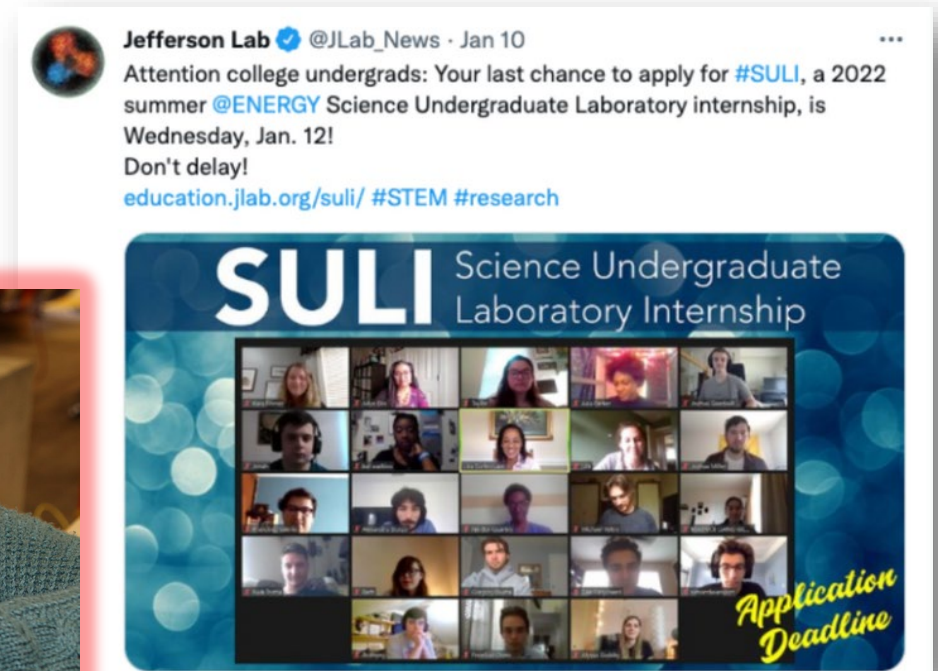


Programs by the numbers:

- 23 Science Undergraduate Laboratory Internship (SULI) students for FY22
- 8 NSF-Funded Research Experience for Undergraduates (REU) students via Old Dominion University for Summer 2022
- 4 Community College Internship (CCI) students for FY22
- 12 High School Summer Honors Program (HSSHP) students for Summer 2022
- 12 Summer Residential Governor's School (SRGS) in Engineering students for Summer 2022
- 9 High School Mentorship students for FY22
- 2 Mexican Physical Society Awardee Interns
- 3 M/FURA Assistantship Positions

Mentorships and Internships

Programs match students with mentors in scientific or technical areas, creating experiences that cement classroom content into practical applications in math, science, and/or computer science.



Virginia Regional Science Bowl

Jefferson Lab is a regional host for the U.S. Department of Energy (DOE) National Science Bowl® middle and high school academic competition.

<https://science.osti.gov/wdts/nsb>

Jefferson Lab  @JLab_News · Feb 8
Thomas Jefferson High School for Science and Technology @TJAnnB took top honors in the 2022 Virginia Regional High School Science Bowl! 2nd place @Chantilly_HS, 3rd place @BASISIndMcLean and 4th place @YorktownHS round out the top teams. #STEM @DOE_SC_NSB bit.ly/34hd7Z2



High School – February
Middle School – March

Registration begins Oct 1

Outreach & Community Engagement

Opportunities, such as the virtual field-trip, Frost Bite Theater at Home and the SOL Practice Tests website, engage the community in the science promoted at Jefferson Lab and the world of STEM that supports it.



<https://www.jlab.org/vft2021>

Impact by the numbers:

- **BEAMS**
 - 1,300 Title I students, 80 teachers
- **Physics Fest**
 - 5,000 students, 175 teachers
- **Other school visits and workshops**
 - 5,000 students, 800 teachers
- **Jefferson Lab's YouTube Channel**
 - >320,800 subscribers
 - 300,000 monthly average views

Science Education Website Resources

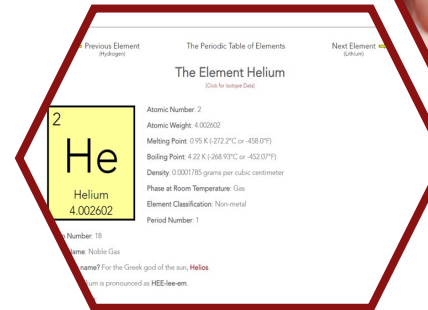
Educational resources for students and teachers: interactive periodic table of elements, engaging “Science at Home!” video series, Frostbite Theater video series, STEM virtual games, and SOL Review Practice Tests

On-line Games and Puzzles

(Show Descriptions)

Element Balancing Game
Element Concentration
Element Crossword Puzzles
Element Flash Cards
Element Hangman
Element Matching Game
Element Math Game
Element Word Scramble
Jefferson Lab Coloring Book
Looking for the Top Quark
Mystery Math
The Nim Number Game

Place Value Game
Reading Comprehension
Science Crossword Puzzles
Science Vocabulary Hangman
Scrambled Science Words
SpeedMath Deluxe
SpeedMath - Add and Subtract
SpeedMath - Multiply and Divide
SpeedMath - Inequalities
VA SOL Practice Tests
Who Wants to Win \$1,000,000?



*Interactive Periodic
Table of Elements*

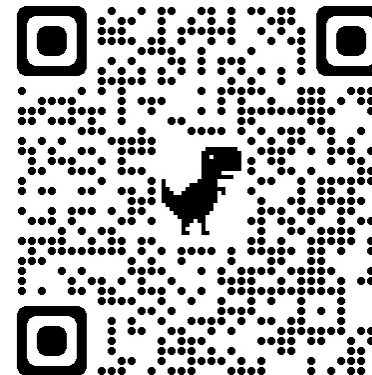


*Science at Home!
UV Detectives*



Fun with Static Electricity


<https://education.jlab.org>



Science Education Website


Science Education at Jefferson La x +

education.jlab.org



HOME TEACHERS STUDENTS GAMES VIDEOS VA SOL PROGRAMS

Search...



SCIENCE AT HOME EXPERIMENTS:

[Cold Stuff](#)
[Electromagnets](#)
[Mystery Materials](#)
[UV Detectives](#)

QUICK LINKS:

[All About Atoms](#)
[Periodic Table of Elements](#)
[SOL Practice Tests](#)
[Who Wants to Win...](#)
[Questions and Answers](#)
[Science Vocabulary Hangman](#)
[Frostbite Theater](#)
[Surprise me!](#)

Thank you for joining us today!

QUESTIONS?

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education @jlab.org



SCAN TO RECEIVE SWAG