

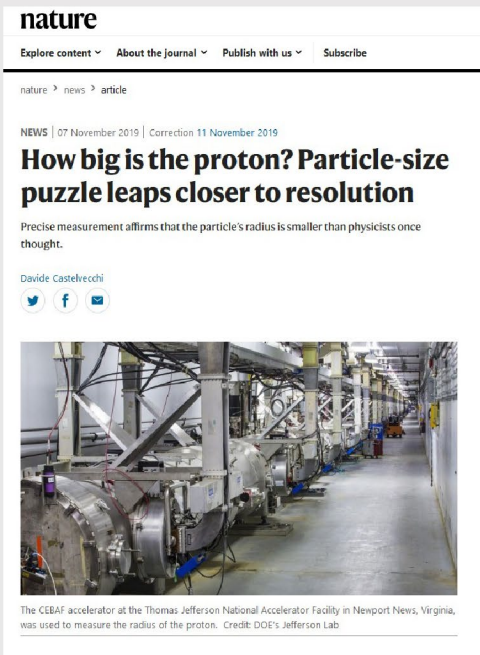
# Advancing Innovation Along the I-64 Corridor: Jefferson Lab

Presented to the  
**Convergence 2023**

**Stuart Henderson**  
Director, Jefferson Lab  
Newport News, Virginia  
September 28, 2023

# Jefferson Lab's Impact

## SCIENCE



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NEWS | 07 November 2019 | Correction 11 November 2019

### How big is the proton? Particle-size puzzle leaps closer to resolution

Precise measurement affirms that the particle's radius is smaller than physicists once thought.

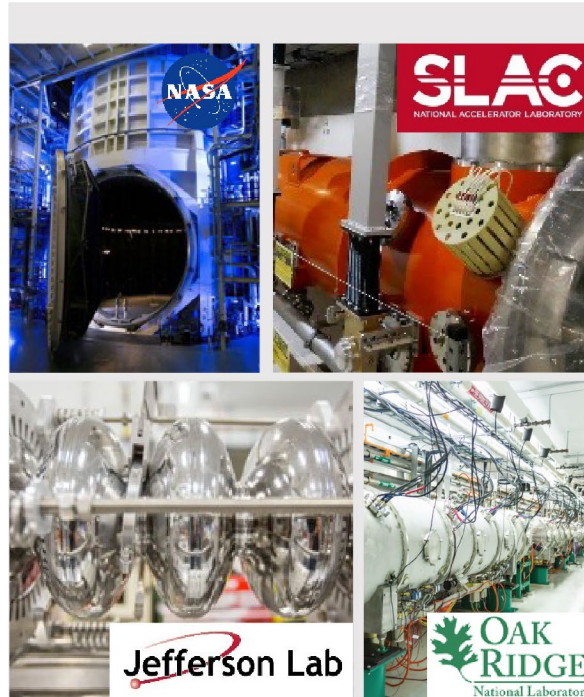
Daide Castelvecchi



The CEBAF accelerator at the Thomas Jefferson National Accelerator Facility in Newport News, Virginia, was used to measure the radius of the proton. Credit: DOE's Jefferson Lab

We are the world's center for fundamental physics of protons, neutrons and nuclei

## TECHNOLOGY



NASA

SLAC NATIONAL ACCELERATOR LABORATORY

Jefferson Lab

OAK RIDGE National Laboratory

We are the nation's expert in specialized particle accelerator and detector systems

## WORKFORCE



We inspire and train the next generation of scientists and engineers

- 1/3 of U.S. PhDs in Nuclear Physics carried out their research at Jefferson Lab
- Long-standing and highly effective engagement with higher-education partners, including 25 Joint and bridge faculty with 12 universities

## OUR REGION



We are central to the economy and development of Virginia and Hampton Roads

- More \$550M economic output and 3,450 jobs nationally, more than half in Hampton Roads
- Research and Technology Partnerships Office to build and grow partnerships focused on regional needs
- Highly regarded K-12 STEM programs serve 12,000 students & 1,000 teachers annually

# Research and Innovation

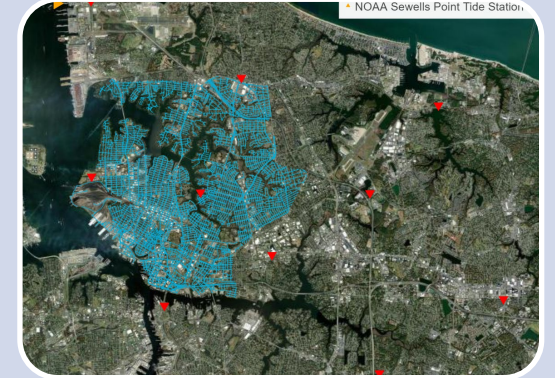
- As a Federally Funded Research and Development Center (FFRDC) we have a special role in long-term basic research in the National interest.
- **Basic research:** “...experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view”
- “The **research system** is defined by the breakthrough discoveries that occur when many talented researchers and institutions generate knowledge in all scientific fields through basic and applied research.”
- “The **innovation system** produces advances—some of which may be revolutionary—both within the research system and beyond, relying on networks of institutions and researchers to integrate, transform, and disseminate discoveries in diverse fields. The innovation system also encompasses aspects of development, ...the production of new technologies, products, processes, and other innovations of economic value.”



# Innovation at Jefferson Lab



**BRIC**



## Particle Accelerator Technology

Large-scale and compact accelerators for industry, environmental applications, semiconductor applications

## Biomedical

Nuclear medicine  
Medical Imaging  
Cancer therapy

## Advanced Computing

High Performance Data Facility  
R&D on Artificial intelligence, streaming data

## Data Science

Artificial Intelligence & data analytics for fundamental science  
Regional challenges in climate and health