

Bringing Big Science into the Classroom
Connecting students, technology and research

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"Attracting future workforce from schools and universities"

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Big Science
Business
Forum
2026



International Union of Pure and Applied Physics

PERIIA



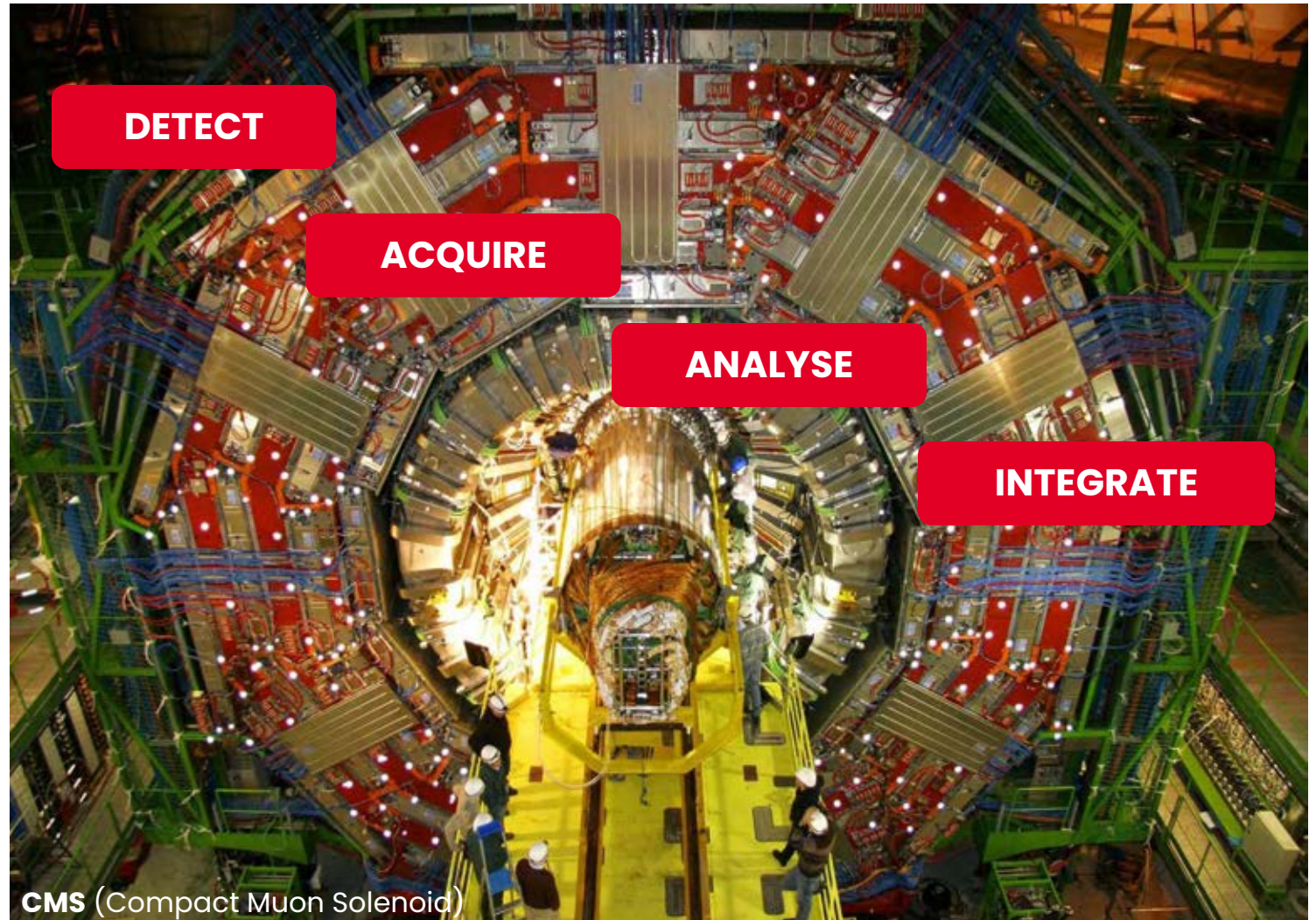
Big Science needs more than scientists

Behind every major scientific discovery, there is an ecosystem of people, technologies and companies working together.

Large-scale scientific experiments rely on complex instrumentation to turn physical phenomena into measurable data.

- **Detectors and sensors**
- **Electronics and data acquisition**
- **Firmware, software and data analysis**

Scientific breakthroughs depend not only on scientific ideas, but also on the people who design, build and operate the technologies behind them.



CMS (Compact Muon Solenoid)

The Big Science ecosystem is huge

Behind the world's major scientific experiments, there is a network of specialised companies turning scientific challenges into technological solutions.



Design & develop

Sensors, detectors & electronics



Build & integrate

Hardware, firmware & software



Solve challenges

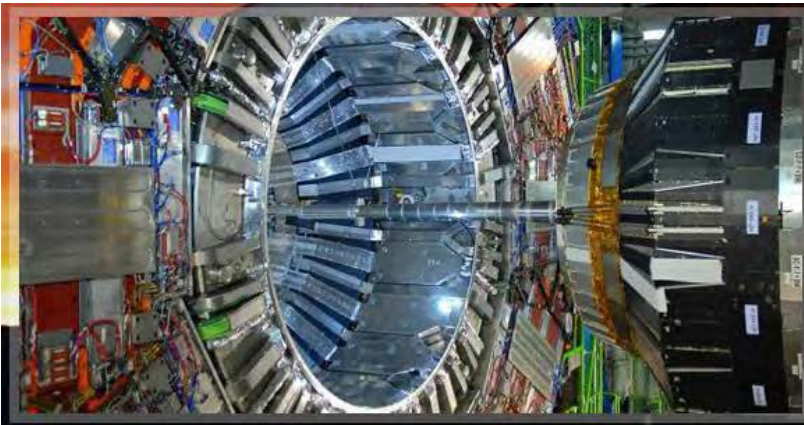
Research needs into working tech



Enable discoveries

Experiments at science's frontiers

You don't need to work inside a large research laboratory to contribute to Big Science.



CAEN S.p.A.

Founded in 1979, CAEN S.p.A. (Costruzioni Apparecchiature Elettroniche Nucleare) is an important industrial spin-off of the INFN.

Core business: Electronic Instrumentation for physics experiments
(world leader)

For more than 45 years CAEN has been providing Scientists and Engineers with the most advanced electronic instrumentation for any particle or radiation detectors. Strong of an extremely close collaboration with the world major research laboratories.

CAEN is proud to produce the best tools for:

- High Energy Physics
- Astrophysics
- Neutrino Physics
- Dark Matter Investigation
- Nuclear Physics
- Material Science
- Medical Applications
- Homeland Security
- Industrial Applications

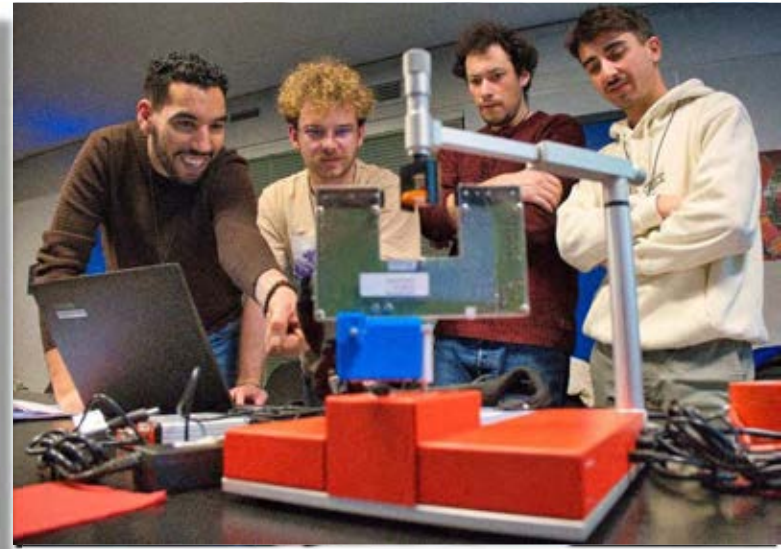
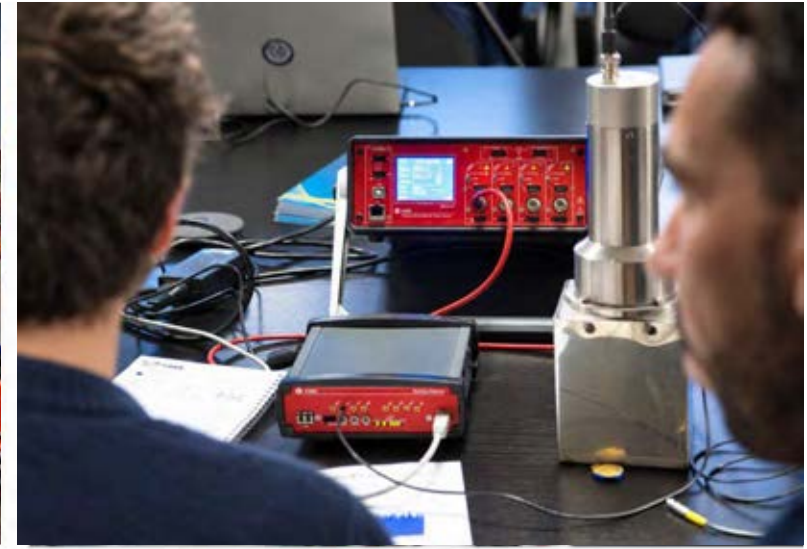


Viareggio, Tuscany, Italy



Why does CAEN invest in education?

Because the future of science depends on the people we inspire and equip today.



INSPIRE CURIOSITY

Make modern physics tangible.



BUILD PRACTICAL SKILLS

Connect theory, instruments and data.



CONNECT EDUCATION & RESEARCH

Bring real scientific methods into the classroom.



We share our know-how because tomorrow's scientists and engineers start as today's students.

CAEN's commitment to education

Products, training and outreach that bring Big Science into the classroom.



Educational Products

Hands-on kits spanning nuclear & particle physics, silicon detectors and electronics.



Courses, Seminars & Training

Summer & Winter Schools since 2018 with international universities — from FPGA to nuclear imaging.



Activities & Outreach

PhD schools, masterclasses, high-school labs and teacher training.



What skills does a real experiment require?

A successful experiment combines scientific knowledge with practical and collaborative skills.



Physics & problem-solving

Understanding phenomena, formulating hypotheses and interpreting results.



Electronics & instrumentation

Understanding detectors, signals and measurement systems.



Data acquisition & analysis

Using software to acquire, process and interpret data.



Teamwork & communication

Sharing responsibilities and explaining results clearly.

Real experiments bring all these skills together.

Young recruits: needs and surprises

Moving from academic knowledge to real-world challenges.



WHAT THEY NEED

- Strong fundamentals
- Hands-on experience
- Hardware & software integration
- Understanding user requirements

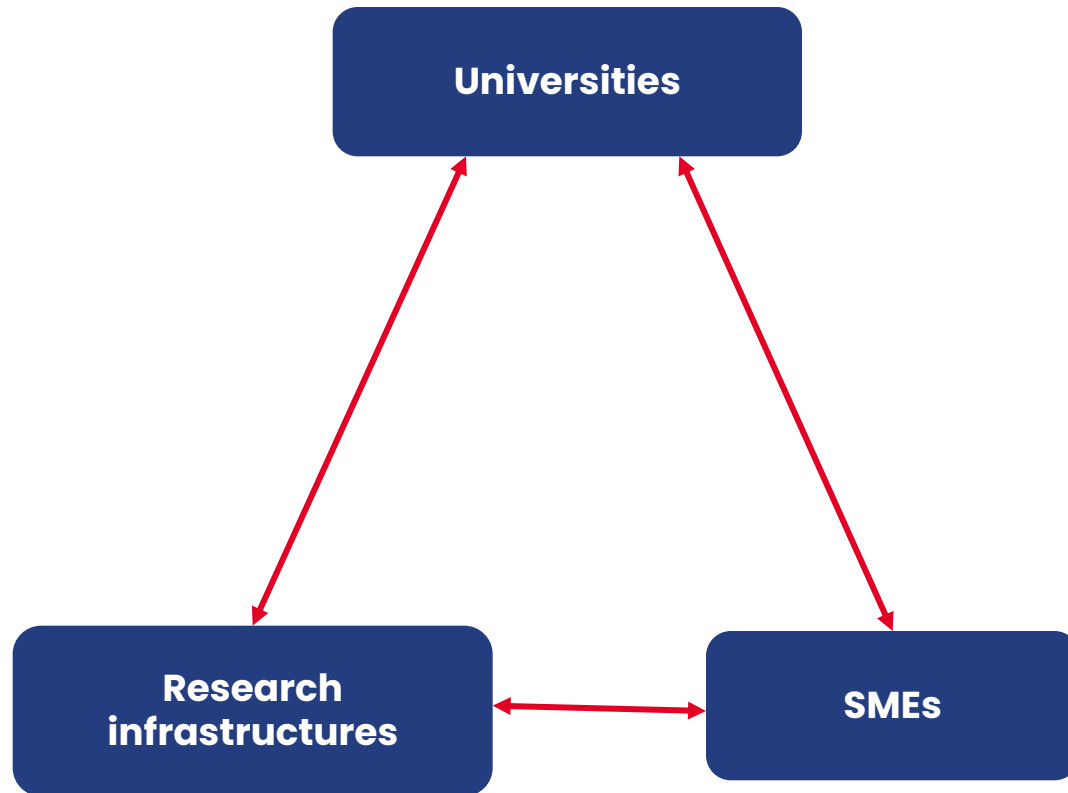


WHAT MAY SURPRISE THEM

- Real problems rarely have textbook solutions
- Systems must work reliably as a whole
- Cross-disciplinary collaboration is essential
- Their work can support frontier research

The challenge is not only to know the science, but to make things work.

Make collaboration easier and more accessible



An open, two-way ecosystem

How can we build stronger connections between universities, research infrastructures and technology companies?

Shared educational programmes

Joint workshops, demonstrations and outreach across universities, labs and SMEs.

Accessible industry experience

Internships, thesis projects and hands-on training with tech companies, incl. SMEs.

Educational investment

Accessible funding for equipment, teaching materials and teacher training.

Visible technology careers

Show students Big Science careers also exist in specialised companies.

Today's students. Tomorrow's scientific innovators.



Let students experience Big Science — not just learn about it.

Education

Practical skills

Industry collaboration



Thank you for your attention!

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Visit www.caen.it

www.edu.caen.it