

# Top Ten Things

*you didn't know you loved*

## About Nuclear Science

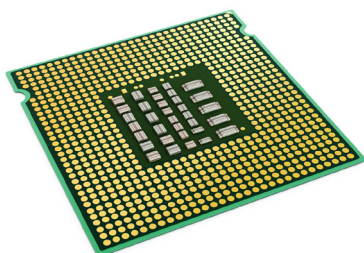
**1 National security:** With modern and advanced radiation technologies, we can monitor materials coming through our borders as well as screen passengers and baggage.

**2 Natural resource exploration:** Water supplies, oil, and gas fields are all commonly explored with radiation sensors and tracers before drilling.

**3 Food preservation:** Used since World War II, gamma rays from radioactive cobalt irradiate food to help eliminate pathogens and extend the shelf life of over 500,000 pounds of food every year.



**4 Modern manufacturing:** Particle beam technology developed for nuclear science in the 50s and 60s is now used to treat or inspect a wide range of products worth over \$500 billion per year.



**5 Better computers:** The thickness of the very thin films used to deposit transistors on microprocessors are regulated by specific sensors that can detect a single atom out of place.

**6 Smoke detectors:** This technology was first created by accident in 1890 during an experiment on light-reflecting properties of ionized gases. Modern versions use an isotope of americium.

**7 Radiocarbon dating:** This technique revolutionized modern archeology and uses the rare isotope carbon-14 to determine the age of fossils and artifacts.

**8 Construction:** Radiation is key for inspectors and builders to detect structural problems invisible to the naked eye. Tires toughened with radiation techniques and engines screened with radioisotopes for wear keep us safe on the roads.

**9 Medical diagnoses:** More than 16 million Americans benefit from diagnostic technologies that use isotopes, including MRIs, X-Rays, and CT scans.



**10 The next big thing:** Right now, a nuclear physics researcher, possibly even a FRIB, JLAB, or RHIC user, is working on research that will lead to the next innovation to change the world! The question that remains is not if, but where.

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