

# DOE R&D Accomplishments

[www.osti.gov/accomplishments](http://www.osti.gov/accomplishments)

## Significant Outcomes from DOE Research and Development

The outcomes featured have had significant economic impact, have improved peoples' lives, or have been widely recognized as a remarkable advance in science.

The content spans from the historical Manhattan Project era (beginning in the 1940s) through more recent accomplishments, including the latest Nobel Laureates associated with DOE.

## Free online access to the public

### Searchable Database

specially-selected documents about  
noted accomplishments

### Featured Topic pages

renowned scientists and their research;  
significant DOE research disciplines

### Nobel Laureates

researchers associated with DOE and  
predecessor agencies

### Enrico Fermi Laureates

scientists receiving Presidential Award

### Snapshots

quick pictures, introductions, overviews  
or synopses of DOE accomplishments

### Insights

unique, interesting, and wide-ranging

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U.S. Department of Energy

A  SCIENCE Accelerator Resource

# Interesting Insights into DOE researchers

[www.osti.gov/accomplishments/insights.html](http://www.osti.gov/accomplishments/insights.html)

- discovered over eight elements on the Periodic Table
- decoded three DNA chromosomes
- developed the battery that powered the lunar lander module and other spacecraft
- discovered the first binary pulsar
- created pre-Pong video game
- contributed to nuclear medicine
- discovered the phenomenon called the Lamb Shift
- discovered the K-meson
- discovered the tau lepton
- discovered asymptotic freedom in the theory of strong interaction
- discovered the fullerenes molecule (*Buckyball*)
- discovered blackbody form and anisotropy of the cosmic microwave background radiation
- invented the cyclotron (*an early accelerator*)
- invented the calutron (*an isotope separator*)
- invented the bubble chamber
- developed the Eightfold Way, a theory of Strong Interaction Symmetry
- developed the 'electroweak' theory
- developed the nuclear shell model
- developed the neutron diffraction technique
- developed Ultra Violet Waterworks
- first detected solar neutrinos
- first detected the neutrino
- first observed the top quark
- provided evidence as to why dinosaurs are extinct
- provided the concept of the Cooper pairs
- provided the Bloch Equations
- provided the Feynman Diagrams
- created the first self-sustaining nuclear chain reaction
- established international computer communication in 1970
- formulated the process for adenosine triphosphate
- confirmed the third branch of life (the microbe Archaea)