

# E.O. Lawrence

The Beginning of a Nobel Legacy  
1939: Physics

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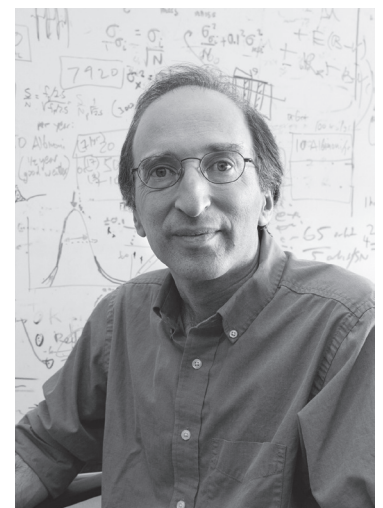
Thirteen Nobel Prizes have been awarded to Berkeley Lab scientists, a tradition of achievement that began when Lab founder Ernest Orlando Lawrence won the 1939 Nobel Prize in Physics for his invention of the cyclotron. Lawrence was a 28-year-old assistant professor, recently recruited to UC Berkeley from Yale, when he envisioned the circular device capable of accelerating nuclear particles to extremely high speeds without the use of high voltage. Small enough to hold in his hands, the original cyclotron ushered in the era of giant “atom smashers” housed under domes here and at particle physics laboratories around the world. Cyclotrons set off a whirl of discovery at Berkeley Lab that included new elements, isotopes, subatomic particles, and the birth of nuclear medicine. His Nobel Prize medal is on exhibit at the Lawrence Hall of Science, a science education museum established in his honor on the hill just above Berkeley Lab in 1968.

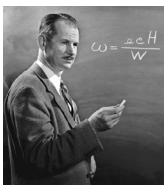
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## Saul Perlmutter

2011: Physics

Berkeley Lab astrophysicist Saul Perlmutter shared the Nobel Prize in Physics with Brian P. Schmidt of the Australian National University and Adam G. Riess of Johns Hopkins University for the discovery—using observations of distant supernovae—that the expansion of the universe was not slowing down, as anticipated, but in fact is accelerating. Perlmutter heads the international Supernova Cosmology Project, which pioneered the methods used to discover the accelerating expansion of the universe, and is a leader in the effort to determine the nature of dark energy, a term used to describe the unknown repulsive force that is driving this phenomenon.





**Glenn T. Seaborg and Edwin M. McMillan**  
1951: Chemistry

Seaborg and McMillan shared the prize for their discoveries in the

chemistry of elements that are heavier than uranium. McMillan discovered the first, neptunium, and developed the synchrotron, the type of particle accelerator used in the discovery of 19 others. Seaborg was co-discoverer of plutonium and nine other transuranium elements.



**Yuan T. Lee**  
1986: Chemistry

Lee shared the Nobel Prize in Chemistry with John C. Polanyi of the University of Toronto and Dudley R. Herschbach of Harvard, for their contributions to

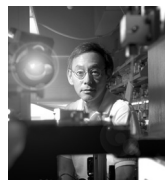
the development of reaction dynamics, the study of the detailed events that occur among colliding molecules during extremely fast chemical reactions.



**Owen Chamberlain and Emilio Segrè**  
1959: Physics

Chamberlain and Segrè shared the Nobel Prize in Physics

for their discovery of the antiproton, a component of antimatter created by collisions of atomic particles in accelerators. An antiproton is identical to a proton, except that its electric charge is negative instead of positive.



**Steven Chu**  
1997: Physics

Chu shared the Nobel Prize in Physics with Claude Cohen-Tannoudji of École Normale Supérieure and William Daniel Phillips of the National Institute

of Standards and Technology for their development of methods to cool and trap atoms with laser light, enabling more precise study of individual atoms and the design of more accurate atomic clocks. Chu was Berkeley Lab director from 2004 until 2009, when he was appointed U.S. Secretary of Energy.



**Donald Glaser**  
1960: Physics

Glaser was awarded the Nobel Prize in Physics for his invention of the bubble chamber. The device is used to trace the tiny bubble tracks of subatomic particles

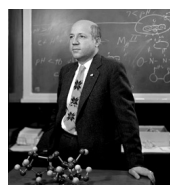
created by the collisions of charged atomic particles from accelerators.



**George F. Smoot III**  
2006: Physics

Smoot shared the Nobel Prize in Physics with John C. Mather of the NASA Goddard Space Flight Center for their discovery of subtle irregularities in

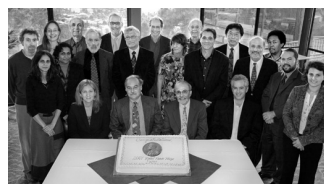
the cosmic microwave background radiation, the faint thermal afterglow from the Big Bang. These irregularities are thought to have led to the condensation of matter into gas clouds, stars, and galaxies as the universe expanded.



**Melvin Calvin**  
1961: Chemistry

Calvin was awarded the Nobel Prize in Chemistry for "his establishment of a sequence of chemical reactions involved when a plant assimilates carbon

dioxide." The "Calvin cycle," as it is known today, is a key step in photosynthesis—the conversion of light, carbon dioxide, and water into plant sugars.



**Intergovernmental Panel on Climate Change**  
2007: Peace

Twenty-three Berkeley Lab employees were

contributors to reports by the United Nations' Intergovernmental Panel on Climate Change, which shared the Peace Prize with former Vice President Al Gore. Their work alerted the world to humanity's role in causing climate change and urged countermeasures to prevent, in the words of the Norwegian Nobel Committee, a crisis "threatening the basis of human life."



**Luis W. Alvarez**  
1968: Physics

Alvarez was awarded the Nobel Prize in Physics for his contributions to elementary particle physics, particularly for his discovery of "resonance states"

within the nucleus of an atom. Alvarez and his geologist son, Walter, were first to find evidence that an asteroid impact 65 million years ago was responsible for the extinction of dinosaurs.

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