The Ernest Orlando Lawrence Award

Awarded by the U.S. Department of Energy

Invitation to Nominate

Nomination and Selection Procedures

The Ernest Orlando Lawrence Awards honor scientists and engineers, at mid-career, showing promise for the future, for exceptional contributions in research and development supporting the Department of Energy and its mission to advance the national, economic and energy security of the United States.

One Lawrence Award is given in each of the following seven fields:

• Chemistry • Materials Research • Environmental Science and Technology • Life Sciences (including Medicine) • Nuclear Technologies (Fission and Fusion) • National Security and Non-Proliferation • High Energy and Nuclear Physics

The objectives of the Ernest Orlando Lawrence Awards are:

- to encourage excellence in nuclear science and technology;
- to inspire people of all ages through the examples of Ernest 0rlando Lawrence and the Lawrence Award laureates;
- to highlight for the general public the accomplishments of the U.S. scientific community.

Lawrence Award recipients receive:

- a citation signed by the Secretary of Energy,
- a 14 karat gold medal bearing the likeness of E.O. Lawrence, and
- a $50,000 honorarium.

Criteria

- Recipients must be in their mid-careers (defined as within 20 years of receiving a Ph.D.).
- The award is given for a relatively recent achievement (rather than for a lifetime of achievements).
- Recipients must be citizens of the United States.
- Nominations will be judged primarily on the scientific and technical significance of the work to its field (rather than for leadership ability).

Nomination Materials

- Nomination is made by a letter of justification, curriculum vitae, and a bibliography of significant publications. Please omit secondary publications and meetings. Do not include complete articles by the nominee.
- Indicate clearly the field for which the person is being nominated: Chemistry; Materials Research; Environmental Science and Technology; Life Sciences (including Medicine); Nuclear Technologies (Fission and Fusion); National Security and Non-Proliferation; and High Energy and Nuclear Physics.
- A few letters supporting the nomination from individuals who are familiar with the work are helpful. (Please limit to no more than six).

Deadline for Submission

- Nominations should be sent no later than January 31, 2006.
- Send nominations to: Mr. Peter M. Lincoln, SC 1-1, U.S. Department of Energy, 1000 Independence Avenue S.W., Washington, DC 20585.
- If you have questions, contact Mr. Lincoln at the above address, by telephone at (202) 586-9010, or by email at peter.lincoln@science.doe.gov
- Nominations are not active for more than the current award cycle.

Selection

Approximately 4000 research organizations and individuals are invited to nominate candidates for the Lawrence Awards. The recipients are chosen in a multi-step review process. For each award category, a screening panel of esteemed scientists and engineers representing National Laboratories, universities, and private-sector research organizations reviews the nominations and makes recommendations to the Interagency Awards Committee. The Committee, comprised of senior science executives from major Federal research organizations, reviews the screening panel's recommendations and, in turn, makes recommendations to the Secretary of Energy through the Director, Office of Science. The Secretary of Energy gives the award on behalf of the Department of Energy.

The Ernest Orlando Lawrence Award

October 2005

Dear Colleague:

The Department of Energy invites you to nominate candidates for the Ernest Orlando Lawrence Awards, among the oldest and most prestigious science and technology awards given by the U.S. Government.

The Lawrence Awards honor U.S. scientists and engineers, at mid-career, showing promise for the future, for exceptional contributions in research and development supporting the Department of Energy and its mission to advance the national, economic and energy security of the United States.

Nominees must be U.S. citizens in mid-career and show promise for continued exceptional achievements. We encourage the nomination of women and minority candidates. Detailed information about the nomination procedure is included in this brochure.

The Award consists of a citation signed by the Secretary of Energy, a gold medal, and a $50,000 honorarium. An award is given in each of the following fields: Chemistry, Materials Research, Environmental Science and Technology, Life Sciences (including Medicine), Nuclear Technologies (Fission and Fusion), National Security and Non-Proliferation, and High Energy and Nuclear Physics.

The Lawrence Award was established in 1959 by the Atomic Energy Commission and President Dwight D. Eisenhower in honor of a scientist who helped elevate American physics to world leadership. Over the past forty-six years, there have been 194 recipients, who are all listed in this brochure. These men and women are among this country's most brilliant and productive scientists and engineers. To learn more about them and their work, please visit the Ernest Orlando Lawrence Award home page at: http://www.science.doe.gov/lawrence

Nominations for the award should be sent no later than January 31, 2006. You will find procedures and background information in this brochure.

Thank you for participating in this prestigious awards program.

Sincerely,

Raymond L. Orbach

Director, Office of Science

Shortly after E.O. Lawrence's death in August 1958, John A. McCone, Chairman of the Atomic Energy Commission, wrote to President Eisenhower suggesting the establishment of an Ernest O. Lawrence Memorial Award. The President replied, "Such an award would seem to me to be most fitting, both as a recognition of what he has given to our country and to mankind, and as a means of helping to carry forward his work through inspiring others to dedicate their lives and talents to scientific effort." The Ernest Orlando Lawrence Memorial Award was established in November 1959.

E.O. LAWRENCE

PHYSICIST, ENGINEER, STATESMAN OF SCIENCE*

"Ernest Orlando Lawrence's scientific accomplishments and influence on science are almost unique in his generation and rank among the most outstanding in history. His cyclotron was to nuclear science what Galileo's telescope was to astronomy. A foremost symbol of the rise of indigenous American science in the 20th century, Lawrence, perhaps more than any other man, brought engineering to the laboratory, to the great benefit of scientific progress. He originated a new pattern of research, of the group type and on the grand scale, which has been emulated the world over. Rarely, if ever, has any person given so many others, in such a small span of years, the opportunity to make careers for themselves in science. Lawrence was a leader in bringing the daring of science to technology, in wedding science to the general welfare, and in integrating science into national policy."

Lawrence was born in Canton, South Dakota, on August 8, 1901, the son of educated Norwegian immigrants. He received his B.A. degree from the University of South Dakota and his M.A. in physics from the University of Minnesota. He continued his studies at the University of Chicago for two years, then transferred to Yale, where he received his Ph.D. in 1925. In 1928, Lawrence went to the University of California as an associate professor and in 1930, at the age of 29, he became the youngest full professor on the Berkeley faculty. His doctoral thesis was in photoelectricity. Later, he made the most precise determination, to that time, of the ionization potential of the mercury atom. With J.W. Beams, he devised a method of obtaining time intervals as small as three billionths of a second, and he applied this technique to study the early stages of electric spark discharge. He originated a new and more precise method for measuring e/m which was perfected by F.G. Dunnington.

"In 1929 young Lawrence, who for some time had been contemplating the problem of accelerating ions, chanced while scanning the literature, upon a sketch in a German publication. He forthwith formulated, within minutes, the principles of the cyclotron and the linear accelerator and so set himself upon a course that was to influence, fundamentally, scientific research and human events. Between the brilliant, simple concept and operating machines lay engineering barriers not previously encountered. Lawrence's willingness to tackle new engineering problems and his success in solving them, as he reached for successively new energy ranges, was a departure in scientific research that is an important part of his contribution. The hard road he chose was recognized when W.D. Coolidge, presenting the National Academy of Science's valued Comstock Prize in 1937, said in part, 'Dr. Lawrence envisioned a radically different course ... [which] called for boldness and faith and persistence to a degree rarely matched.' By 1936 the scale of research and supporting engineering development was so large that the Radiation Laboratory was created at the University of California ... The prototype of the big laboratory had been born."

Lawrence championed interdisciplinary collaboration: he strongly encouraged physicists to work with biologists, and he set up his own radioisotope distribution system, supplying isotopes to hundreds of doctors and numerous institutions in the prewar period. With his brother John, director of the University's medical center, he used the cyclotron to irradiate malignant tissues with neutrons.

In July 1958, Lawrence traveled to Geneva to take part in developing an agreement on means for detecting nuclear weapon tests. In the midst of negotiations, he became ill and was forced to return to Palo Alto, California, where he died following surgery for ulcerative colitis on August 27, 1958.

Lawrence received many awards, including the Nobel Prize for 1939, the Hughes Medal of the Royal Society, the Medal for Merit, the Faraday Medal, the American Cancer Society Medal, the Enrico Fermi Award, and the first Sylvanus Thayer Award. He was a member of the National Academy of Sciences and the American Philosophical Society and recipient of many honorary degrees and memberships in foreign societies.

** This sketch was excerpted from "E.O. Lawrence-Physicist, Engineer, Statesman of Science," by Glenn T. Seaborg, IEEE Nuclear and Plasma Sciences Society News, June 1992.*

Ernest Orlando Lawrence Award Recipients

2004

Nathaniel J. Fisch
Bette T. Korber
Claire E. Max
Fred N. Mortensen II
Richard J. Saykally
Ivan Schuller
Gregory W. Swift

2002

C. Jeffrey Brinker
Claire M. Fraser
Bruce T. Goodwin
Keith O. Hodgson
Saul Perlmutter
Benjamin D. Santer
Paul J. Turinsky

1998

Dan Gabriel Cacuci
Joanna S. Fowler
Laura H. Greene
Steven E. Koonin
Mark H. Thiemens
Ahmed H. Zewail

1996

Charles Roger Alcock
Mina J. Bissell
Thom H. Dunning
Charles V. Jakowatz, Jr.
Sunil K. Sinha
Theofanis G. Theofanous
Jorge Luis Valdes

1994

John D. Boice, Jr.
E. Michael Campbell
Gregory J. Kubas
Edward William Larsen
John D. Lindl
Gerard M. Ludtka
George F. Smoot
John E. Till

1993

James G. Anderson
Robert G. Bergman
Alan R. Bishop
Yoon Chang
Robert Moyzis
John W. Shaner
Carl Weiman

1991

Zachary Fisk
Richard Fortner
Rulon Linford
Peter Schultz
Richard Smalley
J. Pace VanDevender

1990

John J. Dorning
James N. Norris
S. Thomas Picraux
Wayne J. Shotts
Maury Tigner
F. Ward Whicker

1988

Mary K. Gaillard
Richard T. Lahey, Jr.
Chain T. Liu
Gene H. McCall
Alexander Pine
Joseph S. Wall

1987

James W. Gordon
Miklos Gyulassy
Sung-Hou Kim
James L. Kinsey
J. Robert Merriman
David E. Moncton

1986

James J. Duderstadt
Helen T. Edwards
Joe W. Gray
C. Bradley Moore
Gustavus J. Simmons
James L. Smith

1985

Anthony P. Malinauskas
William H. Miller
David R. Nygren
Gordon C. Osbourn
Betsy M. Sutherland
Thomas A. Weaver

1984

Robert W. Conn
John J. Dunn
Peter L. Haglestein
Siegfried S. Hecker
Robert B. Laughlin
Kenneth N. Raymond

1983

James F. Jackson
Michael E. Phelps
Paul H. Rutherford
Mark S. Wrighton
George B. Zimmerman

1982

George F. Chapline
Mitchell J. Feigenbaum
Michael J. Lineberry
Nicholas J. Turro
Raymond E. Wildung

1981

Martin Blume
Yuan T. Lee
Fred R. Mynatt
Paul B. Selby
Lowell L. Wood

1980

Donald W. Barr
B. Grant Logan
Nicholas P. Samios
Benno P. Schoenborn
Charles D. Scott

1977

Dean A. Waters
F. William Studier
John L. Emmett
Gareth Thomas
James D. Bjorken

1976

A. Phillip Bray
James W. Cronin
Kaye D. Lathrop
Adolphus L. Lotts
Edwin D. McClanahan

1975

Evan H. Appleman
Charles E. Elderkin
William A. Lokke
Burton Richter
Samuel C.C. Ting

1974

Joseph Cernev
Harold P. Furth
Henry C. Honeck
Charles A. McDonald
Chester R. Richmond

1973

Louis Baker
Seymour Sack
Thomas E. Wainwright
James R. Weir
Sheldon Wolff

1972

Charles C. Cremer
Sidney D. Drell
Marvin Goldman
David A. Shirley
Paul F. Zweifel

1971

Thomas B. Cook
Robert L. Fleischer
Robert L. Hellens
P. Buford Price
Robert M. Walker

1970

William J. Bair
James W. Cobble
Joseph M. Hendrie
Michael M. May
Andrew M. Sessler

1969

Geoffrey F. Chew
Don T. Cromer
Ely M. Gelbard
F. Newton Hayes
John H. Nuckolls

1968

James R. Arnold
E. Richard Cohen
Val L. Fitch
Richard Latter
John B. Storer

1967

Mortimer M. Elkind
John M. Googin
Allen F. Henry
John O. Rasmussen
Robert N. Thorn

1966

Harold M. Agnew
Ernest C. Anderson
Murray Gell-Mann
John R. Huizenga
Paul R. Vanstrum

1965

George A. Cowan
Floyd M. Culler
Milton C. Edlund
Theodore B. Taylor
Arthur C. Upton

1964

Jacob Bigeleisen
Albert L. Latter
Harvey M. Patt
Marshall N. Rosenbluth
Theos J. Thompson

1963

Herbert J.C. Kouts
L. James Rainwater
Louis Rosen
James M. Taub
Cornelius A. Tobias

1962

Andrew A. Benson
Richard P. Feynman
Herbert Goldstein
Anthony L. Turkevich
Herbert F. York

1961

Leo Brewer
Henry Hurwitz
Conrad L. Longmire
Wolfgang K.H. Panofsky
Kenneth E. Wilzbach

1960

Harvey Brooks
John S. Foster, Jr.
Isadore Perlman
Norman F. Ramsey
Alvin M. Weinberg

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U.S. Department of Energy

Washington D.C. 20585

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