



The 2002 Alan T. Waterman Award

NOMINATION AND REFERENCE DEADLINE:
Postmarked by December 31, 2001

NATIONAL SCIENCE FOUNDATION

Congress established the Alan T. Waterman Award in August 1975 to mark the 25th anniversary of the National Science Foundation and to honor its first Director. The annual award recognizes an outstanding young researcher in any field of science or engineering supported by the National Science Foundation. In addition to a medal, the awardee receives a grant of \$500,000 over a three year period for scientific research or advanced study in the mathematical, physical, medical, biological, engineering, social, or other sciences at an institution of the recipient's choice.

In 1951, when President Truman was searching for someone with impeccable credentials to be the first director of the newly established National Science Foundation (NSF), the country was fortunate that a person of Alan T. Waterman's towering reputation was available. Dr. Waterman's far-seeing, statesman-like efforts on behalf of science had earned him the high esteem of the scientific community, and his appointment was widely praised not only in this country but in foreign nations as well. During his long tenure as NSF Director, he worked tirelessly in the cause of basic research and education in the sciences. His leadership was finely balanced between a sympathetic understanding of the purposes and needs of the scientific community and the responsibilities of the Federal government. His efforts were critical to the successful launching and firm early establishment of NSF, the subsequent strengthening of scientific and engineering research, and the improvement of science education.

Born on June 4, 1892, at Cornwall-on-the Hudson, New York, Alan T. Waterman completed his undergraduate and graduate work at Princeton University, where he received a Ph.D. in physics in 1916. He then became an instructor of physics at the University of Cincinnati. During World War I, Dr. Waterman spent two years in the military service with the Science and Research Division of the Army Signal Corps. At the end of the war, he joined the faculty at Yale University.

His many years at Yale instilled in him the standards of excellence in research and education that he held firmly throughout his long and distinguished career.

From 1941 to 1945, Dr. Waterman was associated with the Office of Scientific Research and Development, created by an Executive Order of the President. From 1946 to 1951 he served as Deputy Chief and Chief Scientist at the newly established Office of Naval Research.

On April 6, 1951, Dr. Waterman was appointed by President Truman for a six-year term as NSF Director. He was reappointed to the post in 1957 by President Eisenhower. Although he reached compulsory retirement age prior to the expiration of his second term, he continued to serve in this post until June 1963 at the request of President Kennedy.

Dr. Waterman was honored several times for distinguished service to his country. In December 1963 President Johnson awarded him the nation's highest civilian award, the Presidential Medal of Freedom.

Dr. Waterman's dedicated career of public service ended with his death in 1967.

THE ALAN T. WATERMAN AWARD COMMITTEE

NATIONAL SCIENCE FOUNDATION

4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

August 21, 2001

Dear Colleague:

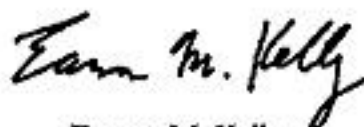
The Alan T. Waterman Award Committee invites you to nominate candidates for the 27th Waterman Award, which will be presented in May 2002. This Award is presented annually by the National Science Foundation and National Science Board to an outstanding young researcher in any field of science or engineering funded by the National Science Foundation. The 2002 Award consists of a citation, a bronze medal, and a nonrestrictive grant of \$500,000 over a 3-year period for scientific research or advanced study in the biological, mathematical, medical, engineering, physical, social or other sciences at the institution of the recipient's choice.

Candidates must be U.S. citizens or permanent residents and must be 35 years of age or younger or not more than 7 years beyond receipt of the Ph.D. degree by December 31 of the year in which they are nominated. Candidates should have completed sufficient scientific or engineering research to demonstrate, through personal accomplishments, outstanding capability and exceptional promise for significant future achievement. In addition, candidates should exhibit originality, innovation, and significant impact on the field.

The regulations, procedures, and background of the Award are on the following pages of this brochure. Questions concerning the procedures or requests for additional information or nomination forms should be directed to the Committee's Executive Secretary, Mrs. Susan Fannoney, at the above address or by telephone (703-292-8096). In order for candidates to be considered for the 2002 Award, nominations and references must be postmarked by December 31, 2001.

The Alan T. Waterman Award Committee appreciates your participation in this prestigious Award program.

Sincerely,



Eamon M. Kelly
Member, *Ex Officio*, and
Chairman
National Science Board



Rita R. Colwell
Member, *Ex Officio*, and
Director
National Science Foundation

REGULATIONS AND PROCEDURES

1 Selection Criteria

The Award seeks to identify the most outstanding young scientist or engineer in the country.

- (a) Candidates must be U.S. citizens or permanent residents and must be 35 years old or younger, **or** not more than seven years beyond receipt of the Ph.D. degree by December 31 of the year in which they are nominated.
- (b) Candidates should have demonstrated exceptional individual achievements in scientific or engineering research of sufficient quality to place them at the forefront of their peers. Criteria include originality, innovation, and significant impact on the field.

2 Nomination Procedures and Deadline for Submission of Nomination

- (a) The enclosed form must be used for all nominations and renominations, with a separate nomination form for each candidate (photocopies of the form can be used).
- (b) The nomination form must be typewritten using a font no smaller than 12 characters per inch.
- (c) Renominations may be submitted via an updated nomination form or by letter to the Committee's Executive Secretary requesting renomination of the candidate using the existing nomination and references.
- (d) Candidates identified for final review by the selection Committee, and who remain eligible under criteria above, will be automatically considered in the next year's review cycle.
- (e) All nominations and renominations must be in conformance with the eligibility requirements stated above.
- (f) Nominations and renominations **must be postmarked by December 31, 2001** and returned to the address shown on the nomination form.
- (g) Nominations and references may be faxed in order to meet the deadline date. However, the original signed document must be received by the Executive Secretary in order for the document to be reviewed by the Committee.

3 Reference Forms

- (a) Editions of the reference form dated prior to 7/97 may not be used because of changes to the form.
- (b) The names of four references not from the nominee's home institution are required for each nomination. **References must be requested by the nominator.** All nominations will be considered regardless of receipt of references.
- (c) Completed reference forms must be postmarked by December 31, 2001 and returned to the address shown on form.

**NOMINATION FOR
THE ALAN T. WATERMAN AWARD**

Nominee

Name:

Address:

Telephone:

Nominator

Name:

Address:

Telephone:

Biographical Data:

1. Year and place of birth:

Please check if ☐ U.S. Citizen ☐ Permanent Resident

2. Education (Degrees, institution and year awarded):

Major Discipline(s):

3. Positions Held (Title, institution and years of service):

4. Honors (Awards, Fellowships, Prizes):

**NOMINATION FOR
THE ALAN T. WATERMAN AWARD**

Narrative Statement Describing Nominee's Qualifications for the Waterman Award (Limit to 1 page)

**NOMINATION FOR
THE ALAN T. WATERMAN AWARD**

List of Pertinent Contributions and/or Publications (Limit to 20 or less)

NOMINATION FOR THE ALAN T. WATERMAN AWARD

Proposed Citation (Limit to 1 or 2 concise sentences describing nominee's research)

References (Limit to 4 persons familiar with technical aspects and not from the nominee's home institution or organization)

Name:

Address:

Telephone:

Name:

Address:

Telephone:

Name:

Address:

Telephone:

Name:

Address:

Telephone:

Nominator's Signature

Date

The information requested on this nomination is solicited under the authority of the National Science Foundation Act of 1950, as amended, and will be used and disclosed to reviewers and possibly members of the National Science Board in connection with the selection of qualified applicants.

Instructions for Nominations:

1. Provide all information requested on the nomination form.
2. Completed nomination form must be postmarked by December 31, 2001.
3. **References** are considered privileged information **and must be requested by the nominator**. They should be mailed directly to the address shown below and postmarked by December 31, 2001.

4. Completed nominations, reference letters, and any inquiries about the Waterman Award should be addressed as follows:

Mrs. Susan E. Fannoney, Executive Secretary
Alan T. Waterman Award Committee
National Science Foundation
4201 Wilson Blvd, Room 1225
Arlington, VA 22230
Phone: (703) 292-8096
Fax: (703) 292-9008
Email: sfannone@nsf.gov

Return form to: Alan T. Waterman Award Committee
National Science Foundation
4201 Wilson Blvd, Rm 1225
Arlington, VA 22230

"Must be postmarked by December 31."
Previous editions of this form prior to 1997 cannot be used.

Privileged Information

Reference Form
ALAN T. WATERMAN AWARD

Nominator to fill in A and B:

A. Name of Nominee:

B. Name and Address of Reference:

PLEASE TYPE OR PRINT

Referee to fill in Questions 1-6:

1. HOW LONG HAVE YOU KNOWN THE NOMINEE?

2. IN WHAT CAPACITY(IES)?

3. WHAT HAS THE NOMINEE ACCOMPLISHED? HOW HAS THE NOMINEE CHANGED THE COURSE OF SCIENCE
IN HIS/HER FIELD? WHAT IS THE NOMINEE'S POTENTIAL FOR FUTURE SIGNIFICANT CONTRIBUTIONS?

4. IF THE NOMINEE WORKED AS PART OF A TEAM, SPECIFY HIS/HER ROLE IN THE ACCOMPLISHMENTS AND LEADERSHIP IN ADVANCING THE FIELD OF RESEARCH.

5. ON THE FOLLOWING SCALE OF 1 TO 5, BELOW, PLEASE RANK THE NOMINEE: # _____

1—THE MOST OUTSTANDING PERSON AT THIS CAREER STAGE I HAVE KNOWN IN THE PAST 5 YEARS.

2—AMONG THE TOP 10 YOUNG SCIENTISTS I HAVE KNOWN IN THE PAST 5 YEARS.

3—OUTSTANDING.

4—ABOVE AVERAGE.

5—AVERAGE OR BELOW.

6. OTHER COMMENTS:

Signature of Referee: _____

Date: _____

If the nominee requests a copy of his/her nominations, we will keep your identity and any content that would reveal your identity confidential if you request us to.

Do not release my identity to the nominee.

Date

Previous Awardees

2001

Vahid Tarokh, Associate Professor, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology

For his invention of space-time coding techniques that produce dramatic gains in the spectral efficiency of wireless digital communication systems.

2000

Jennifer A. Doudna, Professor, Department of Molecular Biophysics and Biochemistry, Yale University and Assistant Investigator, Howard Hughes Medical Institute

For innovative research that led to the development of a technique that facilitates crystallization of large RNA molecules; for determining the crystal structures of catalytic RNA molecules and an RNA molecule that forms the ribonucleoprotein core of the signal recognition particle; and for deciphering structural features of those molecules that permit a greater understanding of the mechanistic basis of RNA function in both catalysis and protein synthesis.

1999

Chaitan S. Khosla, Associate Professor of Chemical Engineering, Chemistry and Biochemistry, Stanford University

For his outstanding work in elucidating the mechanisms of enzyme biocatalysis of polyketides, thereby opening an exciting potential route to new drug discovery.

1998

Christopher C. Cummins, Professor of Chemistry, Massachusetts Institute of Technology

For innovative research in transition-metal activation of small molecules, including the discovery of reactions to cleave nitrogen-nitrogen multiple bonds under mild conditions. His revolutionary approach to chemical reactivity has answered key questions and further development in catalyst design and nitrogen fixation.

1997

Eric Cornell, Fellow of Joint Institute of Laboratory Astrophysics, National Institute of Standards & Technology and Adjoint Professor, University of Colorado at Boulder

For his leading role in the creation of Bose-Einstein condensation in a gas, and for innovations in the manipulation, trapping and cooling of atoms that led to the realization of this new state of matter.

1996

Robert M. Waymouth, Associate Professor of Chemistry, Stanford University

For his seminal contributions to the design of well-defined organometallic catalysts for the synthesis of novel polymers, including chiral cyclopolymers and stereoblock polyolefins. The development of catalysts which change their structure as they work has established a new paradigm in the synthesis of block-polymers.

1995

Matthew P. A. Fisher, Institute for Theoretical Physics, University of California-Santa Barbara

For his broad and original contributions to the theory of the quantum dynamics of macroscopic systems and quantum phase transitions, specifically his prediction of a vortex glass phase in high temperature superconductors, his studies of the superconductor-insulator transition and his seminal work on quantum transport in Luttinger liquids.

1994

Gang Tian, Courant Institute of Mathematical Sciences, New York University

For his deep understanding and penetrating insights in the field of complex differential geometry, including his solution of the problem of existence of Kahler-Einstein metrics on complex surfaces, his proof that the moduli space for Kahler-Einstein metrics with zero first Chern class is nonsingular, and his proof of the stability of algebraic manifolds by using differential geometric methods.

1993

Deborah L. Penry, Department of Integrative Biology, University of California-Berkeley

For her innovative applications of chemical engineering principles and chemical-reactor theory in analysis of the process of digestion in marine invertebrates, filling an important gap in existing ecological theory dealing with animal's strategies for acquiring energy and nutrients. Her research is important to understanding the cycling of materials in the sea—in particular the global carbon cycle and global climate change cycles.

1992

Shrinivas R. Kulkarni, Radio Astronomy, California Institute of Technology

For his major contributions to the understanding of diffuse interstellar medium and the physics and evolution of neutron star pulsars and x-ray binary stars. For his leading role in the discovery of fast pulsars, a major new phenomenon, and in the development of optical and radio spatial interferometry.

1991

Herbert Edelsbrunner, Professor of Computer Science, Department of Computer Science, University of Illinois at Urbana-Champaign

For his pioneering research in computational geometry through which he has made fundamental contributions to the theory of computer science and to discrete mathematics. His work has solved open problems, built rich theoretical structures, developed algorithmic paradigms, produced robust implementations of geometric algorithms, and brought computational geometry in close touch with application areas in computer technology.

1990

Mark E. Davis, Professor of Chemical Engineering, Virginia Polytechnic Institute & State University

For his pioneering work in catalytic materials, catalysis, and reaction engineering, including the first synthesis of a molecular sieve with pores larger than 1 nanometer and the invention of supported aqueous-phase catalysts; each of these accomplishments opens up a new and potentially important area in catalytic science and technology, and also has implications for separations technology and environmental control.

1989

Richard H. Scheller, Associate Professor of Biological Sciences, Stanford University

For his work leading to the development of recombinant DNA technologies, and for his current research which has illuminated cellular and molecular mechanisms used to regulate animal behavior. These basic studies will lead to a better understanding of the molecular basis of brain function and should, in the future, help in the understanding of major psychiatric illnesses.

1988

Peter G. Schultz, Professor of Chemistry, University of California-Berkeley

For innovative research at the interface of chemistry and biology, both in the development of new approaches for the study of molecular recognition and catalysis and in the application of these studies to the design of selective biological catalysts.

1987

Lawrence H. Summers, Professor of Economics, Harvard University

For outstanding contributions to economic research on unemployment, taxation of capital, savings behavior and macroeconomic activity. His work combines powerful analytic insights and imaginative econometric methods aimed at subjects of fundamental National importance.

1986

Edward Witten, Professor of Physics, Princeton University

For path-opening contributions to the physics of elementary particles and gravity, to the search unification, and to the imaginative pursuit of the implications for cosmology.

1985

Jacqueline K. Barton, Professor of Chemistry, Columbia University

For her imaginative and significant work in bioinorganic chemistry. Her use of small inorganic molecules to recognize and modify DNA sites in very specific ways has led to two major discoveries—enantiomeric selectivity in binding to DNA helices of different handedness, and Z-DNA “punctuation” at the end of genes—with important implications for drug design and for the theory of gene expression.

1984

Harvey M. Friedman, Professor of Mathematics, Ohio State University

For his revitalization of the foundations of mathematics, his penetrating investigations into the Godel incompleteness phenomena, and his fundamental contributions to virtually all areas of mathematical logic.

1983

Corey S. Goodman, Associate Professor of Biology, Stanford University

For his contributions to our understanding of the development of the nervous system. His imaginative choice of model systems and modern technologies are enabling him to discover how individual nerve cells acquire their unique identities and interact with the appropriate cells during embryogenesis.

1982

Richard Axel, Institute of Cancer Research, Columbia University

For devising a novel procedure for introducing virtually any gene into mammalian cells. Gene transfer now permits the analysis of the mechanisms regulating the expression of genes in an appropriate cellular environment. This information is prerequisite to a rational approach towards gene therapy.

1981

W. Clark Still, Associate Professor of Chemistry, Columbia University

For showing that fundamental conformational principles can be used in organic synthesis to describe nonrigid molecular arrays and for the design of chemical reactions which use such arrays to control the three-dimensional structure of flexible molecules.

1980

Roy F. Schwitters, Professor of Physics, Harvard University

For his contributions to the understanding of the basic structure of matter through experiments that discovered and explored an entirely new collection of subatomic particles. The experiments led to the interpretation of the new particles as being composed of simpler constituents, possessing a new property of matter.

1979

William P. Thurston, Professor of Mathematics, Princeton University

In recognition of his achievements in introducing revolutionary new geometrical methods in the theory of foliations, function theory and topology.

1978

Richard A. Muller, Lawrence Berkeley Laboratory and Space Sciences Laboratory, University of California-Berkeley

For his original and innovative research, which has led to important discoveries and inventions in diverse areas of physics, including astrophysics, radioisotope dating and optics.

1977

J. William Schopf, Professor of Paleobiology, University of California-Los Angeles

For his outstanding research on Precambrian biotas. His work on these delicate and ancient fossil microorganisms will contribute significantly to the knowledge of the origin of life and the evolution of the earliest known biotas of the world.

1976

Charles L. Fefferman, Professor of Mathematics, Princeton University

For his research in Fourier analysis, partial differential equations and several complex variables which have brought fresh insight and renewed vigor to classical areas of mathematics and contributed signally to the advancement of modern mathematical analysis.

Note: Institutions listed are those with which the recipient was affiliated at the time of the Award

Alan T. Waterman Award Committee

Bruce Alberts*, President, National Academy of Sciences

Jeffrey Cheeger, Professor, Courant Institute of Mathematical Sciences, New York University

Rita R. Colwell*, Director, National Science Foundation

Susan L. Graham, Professor of Computer Science, University of California, Berkeley

Kristina Johnson, Dean, School of Engineering, Duke University

Eamon M. Kelly*, Chairman, National Science Board, National Science Foundation

Carol B. Lynch, Dean of the Graduate School and Vice Chancellor for Research,
University of Colorado

Joe L. Martinez, Jr., Director, Division of Life Sciences, University of Texas-San Antonio

Joseph H. Taylor, Jr., James McDonnell Distinguished Professor of Physics and Dean of the Faculty,
Princeton University

Julia Weertman, Walter P. Murphy Professor of Engineering, Northwestern University

Thomas L. Windham, Director, Significant Opportunities in Atmospheric Research & Science,
University Corporation for Atmospheric Research

William A. Wulf*, President, National Academy of Engineering

(four vacancies)

Susan E. Fannoney
Executive Secretary

*Member *Ex Officio*

The National Science Foundation (NSF) is an independent Federal agency—not part of any other Federal department or agency—established in 1950 to promote and advance the progress of science and engineering, as well as education in those areas.

The Foundation is run by a presidentially appointed Director and a National Science Board of 24 scientists and engineers, top university officials, and industry leaders. Outside advisory groups from various disciplines also play a key role.

Since its establishment, NSF has occupied a unique place among Federal government agencies, with responsibility for the overall health of science across all disciplines—in contrast with other agencies that support research directed at specific missions.

NSF accomplishes its task by awarding grants and contracts to academic research institutions, private research firms, industrial laboratories, and major research facilities and centers. About 55,000 experienced researchers and educators from across the country, representing a wide variety of scientific and engineering disciplines, volunteer their time to help NSF staff assess the merits of approximately 30,000 proposals per year.

NSF operates no in-house laboratories but does support the operation of national research facilities and centers, oceanographic research ships, and Antarctic research stations. The Foundation also supports cooperative research efforts by universities and industry and U.S. participation in mutually beneficial scientific cooperative activities. The NSF does not support projects in clinical medicine, the arts and humanities, commerce, or social work.

To encourage young scientists and engineers, NSF provides graduate fellowships and other awards. Laying the groundwork even earlier, the Foundation funds teacher training and materials development in precollege science and mathematics.

Boosting the nation's scientific and technical literacy is a key goal of NSF. It does this by supporting educational activities in informal settings such as museums, television shows and continuing education programs; through projects such as National Science and Technology Week; and through the release of science news and information to the public in the print and electronic media.

Another important function of NSF is to monitor and report on human and fiscal resources for science and engineering. This includes publishing analyses and statistical studies on the supply of, and demand for, personnel and funding in the various scientific and engineering fields.

Because the National Science Foundation is charged by the Congress with strengthening the Nation's science and engineering research potential, it is fitting that NSF should recognize and honor truly outstanding research by a young scientist or engineer and encourage his or her future efforts through support for continued study and research.

The Foundation does this by means of the Alan T. Waterman Award, named for the first Director of the Foundation, a statesman of science who served as Director under three presidents. The prestige of the Award, approved by the National Science Board, bestows on recipients international recognition from their peers. Many young people are making remarkably creative and productive contributions to scientific and engineering progress.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on the application materials is solicited under the authority of the National Science Foundation Act of 1950, as amended. It will be used in connection with the selection of qualified applicants and may be disclosed to qualified reviewers and staff assistants as part of the review process, to government contractors as necessary to complete assigned work, and to a court or party in a court or Federal administrative proceeding if the government is a party. Notice of the agency's decision may be given to nominators, and disclosure may be made of awardees' names, home institutions, and fields of study for public information purposes. See Systems of Records, NSF-12, "Fellowships and Other Awards," 63 Federal Register 265 (January 5, 1998). Submission of the information is voluntary; however, failure to provide full and complete information may reduce the possibility of receiving an award.

The public reporting burden for this collection of information is estimated to average 10 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to:

Suzanne Plimpton
Reports Clearance Officer
Information Dissemination Branch, DAS
National Science Foundation
Arlington, VA 22230

Requests for publications should be addressed to:

NSF Publication Clearinghouse
P.O. Box 218
Jessup, MD 20794-0218
Phone: 301-947-2722
Fax: None
Email: pubs@nsf.gov

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities, and persons with disabilities to compete fully in its programs. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement or contact the program coordinator at (703) 292-6865.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation regarding NSF programs, employment, or general information. TDD may be accessed at (703) 292-5090 or through FIRS on 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this