

# The Science Talent Search

Innovation and Passion

# Science Talent Search students are "the nation's crown jewels."

Dr. Leon Lederman, winner of the 1988 Nobel Prize in physics and keynote speaker at the 1989 Gala Awards dinner

# Our Journey

The Science Talent Search has been identifying and celebrating the best and brightest young scientific minds for 75 years.



For the first time, three top winners were named. Noah Golowich, Andrew Jin and Michael Winer each received awards of \$150,000.



2014

Intel Science Talent Search 2014 finalist Sara Sakowitz's project studied a novel way to treat breast cancer. Sara was surprised on the Ellen Show with a \$50,000 scholarship for her research.

2013

2012

In 2010, Otana Jakpor from Riverside, California was named a finalist at the Intel Science Talent Search for her environmental sciences project that analyzed emission levels of paraffin and soy candles to determine their contribution to indoor air pollution. In 2013, Otana was named one of *Glamour* magazines' top ten college women.

2011



2009

2010

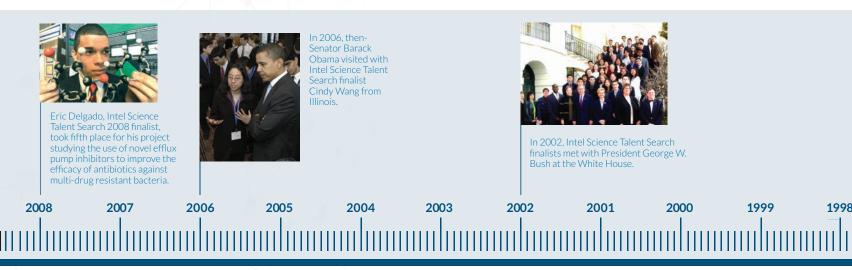
Since 1942, first with the sponsorship of Westinghouse — and since 1998 with Intel — Society for Science & the Public has provided a national stage for the country's best and brightest young scientists to present their original research and demonstrate their exceptional scientific potential.

2015

Now, seven decades since its launch, the Science Talent Search has recognized almost 3,000 finalists with more than \$14 million in awards. Alumni include holders of more than 100 of the world's most coveted science and math honors including five National Medal of Science winners, three Breakthrough Prize awardees, twelve MacArthur Foundation Fellows, two Fields Medalists and eight Nobel Laureates.

### Entering the Science Talent Search – Completing the Application

The application, which students complete online, requires significant thought and time and includes not only information about the project, but also questions about the student's motivation and previous work. It is submitted with an academic paper describing their research. Applicants must also arrange for corresponding paperwork (transcripts, scores and recommendations from their teachers and mentors) to reach the Society before the deadline, typically in November.



### Top Quality Research

Some students may work with their teachers and/or mentors in an area of science that interests them; others may work independently. Team submissions are not permitted. Often the application describes graduate school level research and some students are already published in peer reviewed journals.

#### **Passing Muster**

In 2015, almost 1,800 entrants representing 489 high schools in 45 states, the District of Columbia, and seven overseas schools successfully passed this review.

# "This is the Super Bowl of Science."

President George H.W. Bush

# PROBLEM

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BACKGROUND RESEARCH



Science Talent Search 1991 finalist Susan Criss of Pittsburgh, now a senior scientist at Procter & Gamble, discusses her project with President George H.W. Bush

#### **Top 300 Young Scientists**

More than 100 evaluators, experts in a variety of STEM disciplines, review every completed application and choose the top 300 honored young scientists. Each top honored student receives a \$1,000 award, as does their school, to support STEM education.

#### **Top 40 Finalists**

Judges meet to examine the applications and papers and choose the 40 finalists. Each finalist receives a minimum award of \$7,500 and an all expense-paid trip to Washington, DC to compete for the top awards. Starting in 2015, the Science Talent Search offered three top awards of \$150,000. Medals of Distinction were provided for students who show exceptional scientific potential in three areas: Basic Research, Global Good and Innovation. In addition, three second place awards of \$75,000 and three third place awards of \$35,000 were given in these areas.

#### A Week in Washington

The intense schedule in Washington gives finalists a wide range of experiences including interviews with judges, meetings with Members of Congress and often the President of the United States, and visits to places of historical or scientific interest. Finalists have met personally with eleven Presidents, as well as esteemed scientists working in the nation's capital. Students display and discuss their project exhibits with the general public, most recently at the National Geographic Society, fielding inquiries from visitors of all ages. Equally important, the students take time to get to know each other - celebrating relationships that can last a lifetime.



1996

1997

Science Talent Search finalists visit Capitol Hill in 1996.

1995



Science Talent Search finalists meet with President Bill Clinton and Vice President AI Gore at the White House in 1994.

1993

1992

1991

1990



In 1988, Sen. John Kerry of Massachusetts met with Science Talent Search finalists Leonardo Hsu and Michele Gilbert.

1989

1988

The forty student scientists are the focus of the formal Awards Gala attended by Washington's elite in science and education. The keynote speech provides the audience with perspectives on the students' achievements, and representatives from the sponsor and the Society jointly award the top awards amid much pomp and a celebratory balloon drop. Keynote speakers have included General Colin Powell, Oceanographer Sylvia Earle, Author Walter Isaacson, Dixy Lee Ray, the first female governor of Washington, Secretary of Education Margaret Spellings and Kip Thorne, physicist and advisor to the film Interstellar. Afterwards, members of the press interview winners and dignitaries in the audience, while students celebrate the experience with family and friends. It is an incredible evening that will be remembered for a lifetime.

1994





1987



Maxwell Brothers of Bloomington, Indiana, meets with Sen. Dan Quayle in 1984.

1983



1980 Science Talent Search finalist Brian Greene is a professor of physics and mathematics at Columbia University, founder of the World Science Festival and author of four New York Times best-selling



1977 Science Talent Search finalist Paul J. Maddon is Founder and Vice Chairman of Progenics Pharmaceuticals, Inc. and serves as Secretary of the Society's Board of Trustees.

1978

In 1987, Sen. Edward Kennedy met with Science Search Talent finalist Andrew Heafitz of Newton, Massachusetts.

1986 1985 1984

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PROCEDURE



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# MARY SUE COLEMAN

1979

1980

In 1961, Mary Sue Coleman was the firstever finalist from the state of Iowa. She has shared with younger students and finalists what it was like to meet President John F. Kennedy and how the STS experience impacted her life. A biochemist, she became the first woman to serve as President of University of Michigan. Now retired, she continues to advocate at the national level for higher education and scientific research support and diversity. Dr. Coleman also serves on the Society's Board of Trustees.



In 2009, President Barack Obama met with the Science Talent Search finalists at the White House

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# History, Challenges and Aspirations

# From its beginning, the Science Talent Search has been no ordinary science competition.

The Science Talent Search has always sought to discover scientific talent and encourage interest in scientific research and study among students and the public alike. Our alumni have done amazing things, including winning prestigious awards, pursuing innovative and entrepreneurial careers, making incredible discoveries and educating and inspiring countless future young scientists and researchers.



In 1972, Nina Tabachnik (now Dr. Nina Schor) was the first woman to win the first-place award in years when only one top award was given; since then many young women have followed her to the front of the stage.



In 1967, Science Talent Search finalist and future Nobel Laureate Frank Wilczek met with Sen. Hubert Humphrey.

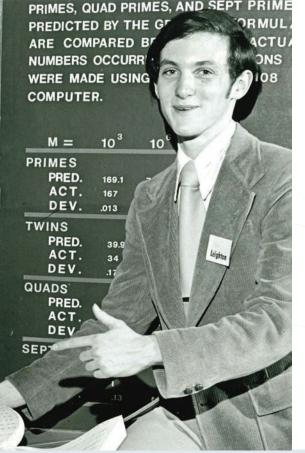
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# 1942: Humble beginnings

The Science Talent Search competition was the brainchild of two men who met at the 1939 New York World's Fair, where the Westinghouse exhibit housed a science fair. Soon they were lamenting the state of the nation's science education—the country's 25,000 high schools employed fewer than 1,000 trained science teachers.

The two proved to be a productive team. Watson Davis was head of a nonprofit organization called Science Service (forerunner of today's Society for Science & the Public) dedicated to the promotion of science education, and G. Edward Pendray, a former newspaper science editor, successfully solicited financial support from his employer, the Westinghouse Electric Corporation, to sponsor the first competition. This partnership would remain in affect for 57 years as Westinghouse thrived as a company.

To encourage interest among a wide range of high school seniors, the first competition featured a simple application and required that students take a written test and submit a 1,000-word essay describing "what the student is doing or plans to do in science." Judges evaluated the submissions and selected 40 finalists to attend judging and activities in Washington, DC with all expenses paid. There, one boy and one girl were each selected by a board of judges to receive a four-year scholarship of \$2,400 (\$600 per year). The dual prize structure continued until 1949 when all students began competing on an equal footing.



# TOM LEIGHTON

Tom Leighton won second place at the 1974 Science Talent Search. Dr. Leighton is a Professor of Applied Mathematics at Massachusetts Institute of Technology and CEO/Co-Founder of Akamai Technologies. He was the first winner of the Machtey Award in 1981 and is a Fellow of the American Academy of Arts and Sciences. Dr. Leighton is also a member of the National Academy of Engineering. In 2008, he became a member of the United States National Academy of Sciences and in 2012, he became a fellow of the American Mathematical Society. He is also currently a member of the Society's Board of Trustees.



1965 Science Talent earch finalists met President Lyndon Johnson and his dog "Him" at the White House



1963 Science Talent Search finalist Sarah Elgin (nee Roberts) of Salem, Oregon, meets Sen. Maurine Neuberger



Science Talent Search finalists meet President Dwight Eisenhower in the White House in 1959.



# **Intel Corporation Steps In**

In 1998, the Intel Corporation assumed sponsorship of the prestigious competition and significantly boosted the program's award structure. Each award was significantly increased and new awards for the 300 honored young scientists and their schools enhanced the attention that the Science Talent Search received from students, teachers and the general public.

Intel will continue its sponsorship of the competition through March 2017.

#### **Top Awards Increased**

In late 2014, Society for Science & the Public and Intel Corporation announced a new awards system with three top awards of \$150,000 each. Medals of Distinction are provided for students who show exceptional scientific potential in three areas: Basic Research, Global Good and Innovation. In addition, three second-place awards of \$75,000 and three third-place awards of \$35,000 are awarded in these areas.

The new awards structure is designed to celebrate scientific and engineering skill and aptitude by emphasizing three different approaches, all equally deserving of high distinction.

Over the history of their sponsorship, Intel has increased the annual awards for schools and students from \$207,000 in 1998 to \$1,612,500 in 2015.

# A Few Notable Science Talent Search Alumni



### NANCY DURANT-EDMONDS-1944

Nancy Durant-Edmonds, from Plainfield, New Jersey, competed at the 1944 Science Talent Search with her project "Highly flammable draperies and other objects caused the Coconut Grove Fire to spread rapidly." In only the third year of the competition, the Science Talent Search hosted its first student of underrepresented ethnicity. Dr. Durant earned her MD at Boston University School of Medicine and practiced as a Board-certified Psychiatrist specializing in Child & Adolescent Psychiatry and Pediatric Psychiatry.



#### WALTER GILBERT-1949

Walter Gilbert, from Washington, DC, competed in the 1949 Science Talent Search with his project "Photographic Observation of Solar Phenomena with Original, Homemade Equipment." Dr. Gilbert attended Harvard University for undergraduate and graduate studies, earning a baccalaureate in chemistry and physics in 1953 and a master's degree in physics in 1954. He is a co-founder of the biotech companies Biogen and Myriad Genetics, and was the first chairman on their respective boards. He received his PhD in physics at the University of Cambridge. Dr. Gilbert won the Albert Lasker Award in 1979 and the Nobel Prize in Chemistry in 1980.



#### LEROY HOOD-1956

Leroy Hood, from Shelby, Montana, competed in the 1956 Science Talent Search with his project "Birth of a Mountain Range." He earned his BS from Caltech, his MD from Johns Hopkins School of Medicine and his PhD at Caltech. Dr. Hood is Co-Founder for the Institute for Systems Biology in Seattle, Washington. Dr. Hood has been the recipient of numerous awards, including the Albert Lasker Basic Medical Research Award, the Kyoto Prize in Advanced Technology, and was named number six among the Top 100 Biotech Visionaries Worldwide in 2015 by *Scientific American*.



# JANE RICHARDSON-1958

Jane Richardson, from Teaneck, New Jersey, won third place at the 1958 Science Talent Search with her project "Calculation of the Orbit of Satellite 1957 Alpha from Amateur Observations." In July 1985, she was awarded a MacArthur Fellowship for her work in biochemistry. She was also elected to the National Academy of Sciences and the American Academy of Arts and Sciences in 1991 and to the Institute of Medicine in 2006. Dr. Richardson is currently a James B. Duke Professor of Biochemistry at Duke University.



### ROGER TSIEN-1968

Roger Tsien from Livingston, New Jersey, won first place at the 1968 Science Talent Search at just 16 years old with his project "Bridge Orientation in Transition-Metal Thiocyanate Complexes." In 2008, Dr. Tsien won the Nobel Prize in Chemistry and returned to the Science Talent Search in 2010 as the alumni speaker. He is currently a Howard Hughes Medical Institute Investigator and is also a professor of pharmacology at the School of Medicine at the University of California, San Diego and a professor of chemistry and biochemistry at the University of California, San Diego.



# THOMAS ROSENBAUM-1973

Thomas Rosenbaum from Forest Hills, New York, competed in the 1973 Science Talent Search with his project "The Structure of Atmospheric Small Ions." Dr. Rosenbaum is the ninth president of California Institute of Technology. He was formerly the John T. Wilson Distinguished Service Professor of Physics at the University of Chicago. He received his bachelor's degree in physics with honors from Harvard University and a PhD in physics from Princeton University.



# ERIC LANDER-1974

Eric Lander from Brooklyn, New York, won first place at the 1974 Science Talent Search for his mathematics project "Quasiperfect Numbers." In 2004, Professor Lander was named one of *Time* magazine's 100 most influential people of our time for his work on the Human Genome Project. Dr. Lander is President and Director of the Broad Institute of Harvard and MIT, and has been awarded numerous prizes, including a 1987 MacArthur Fellowship, the Woodrow Wilson Award for Public Service in 1998, the Gairdner Award in 2002, the Harvey Prize in 2012 and the Breakthrough Prize in Life Sciences in 2013.



# SCOTT MCGREGOR-1974

Scott McGregor from Wilmington, Delaware, competed in the 1974 Science Talent Search with his project "Crystalline Allotropes of the Sulfur Family." Mr. McGregor received a BA in Psychology and a MS in Computer Science and Computer Engineering from Stanford University. Mr. McGregor is currently President and Chief Executive Officer at Broadcom and is also Chairman of the Board of Broadcom Foundation. He is the Vice Chairman of the Global Semiconductor Alliance Board of Directors and serves on the board of Ingram Micro. In 2013, Mr. McGregor received UCLA's Information Systems Executive Leadership Award.



# LORRAINE PILLUS-1975

Lorraine Pillus from Cocoa, Florida, won ninth place at the 1975 Science Talent Search with her project "Modifications in the Virulence of the Highly Infective CC10 Strain of *Rhizobium trifollii*." Dr. Pillus is chair in the department of molecular biology and runs the Pillus Lab in the Division of Biological Sciences at the University of California, San Diego. Her postdoctoral research was supported by a John D. and Catherine T. MacArthur Foundation Fellowship of the Life Sciences Research Foundation; she has been named a Pew Scholar and a National Science Foundation New Young Investigator and has received several teaching excellence awards.



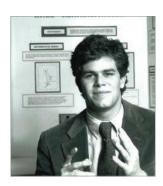
# GEORGE YANCOPOULOS-1976

George Yancopoulos, from Elmhurst, New York, won fourth place at the 1976 Science Talent Search for his project "Molecular Basis of Regeneration in *Blepharisma*." Dr. Yancopoulos earned his MD and PhD at Columbia College. He left academia in 1989 to become the scientific founder of Regeneron Pharmaceuticals, where he is currently President of Regeneron Laboratories and Chief Scientific Officer. Dr. Yancopoulos has authored more than 350 scientific manuscripts, and, according to a study by the Institute for Scientific Information, was the eleventh most highly cited scientist in the world during the 1990s. In 2004, he was elected to the National Academy of Sciences.



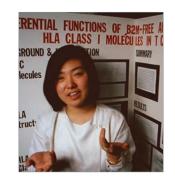
### LISA RANDALL-1980

Lisa Randall from Fresh Meadows, New York, tied for first place at the 1980 Science Talent Search with her project "Perfect Gaussian Integers." Dr. Randall, a theoretical physicist, is the Frank B. Baird, Jr. Professor of Science on the physics faculty of Harvard University. She was the first tenured woman in the Princeton physics department and the first tenured female theoretical physicist at Harvard. In 2005, Professor Randall was featured in *Newsweek* magazine's "Who's Next in 2006" as "one of the most promising theoretical physicists of her generation."



# Peter Asnis-1990

Peter Asnis from Port Washington, New York, competed in the 1990 Science Talent Search with his project "A Prototype Ergometer Designed to Expedite Knee Rehabilitation." Dr. Asnis is currently Head Team Physician, Boston Bruins. Head Team Orthopaedic Surgeon, Boston Red Sox and Team Physician, New England Patriots. He earned his undergraduate degree at Harvard and his MD at Cornell University Medical Center.



# SOOJIN RYU-1990

Soojin Ryu, from the Bronx, New York, won fourth place at the 1990 Science Talent Search with her project "Differential Functions of B2M-free and B2Massociated HLA Class I Molecules on T-cell Activation." At the Max Planck Institute for Medical Research, Dr. Ryu leads her own research group, Developmental Genetics of the Nervous System with the long-term goal of understanding the mechanisms that underlie the development and function of the stress circuit both at a physiological and behavioral level and how it becomes malfunctional in certain individuals. Soojin earned her BA in biology at Harvard University and her PhD from the University of California, Berkeley.



# NATALIE PORTMAN-1999

In 1999, Natalie Portman from Jericho, New York, competed in the 1999 Science Talent Search for her project "Simple Method to Demonstrate the Enzymatic Production of Hydrogen from Sugar." Ms. Portman completed her undergraduate degree at Harvard University in psychology and is also an Academy Award-winning actress, having appeared in numerous movies. In 2008, she served as the youngest member of the 61st Annual Cannes Film Festival jury.



### NATALIA TORO-1999

Natalia Toro from Boulder, Colorado, won first place at the 1999 Science Talent Search at the age of 14, becoming the youngest first-place winner in history, with her project "Independent Analysis of Evidence for  $v\mu < -> v\tau$  Oscillations in the Super-Kamiokande Atmospheric Neutrino Data." Natalia returned to the Science Talent Search in 2015 as the alumni speaker. Dr. Toro is currently a faculty member at the Perimeter Institute for Theoretical Physics in Canada.



### KAVITA SHUKLA-2002

Kavita Shukla of Ellicott City, Maryland, competed in the 2002 Science Talent Search with her project "Food Preservation Technology Utilizing Fenugreek (*Trigonella foenum-graecum*)." Kavita is the Founder & CEO of Fenugreen, a social enterprise taking on the massive global challenge of food waste with a simple innovation, FreshPaper. Kavita holds four patents, and has received several international honors as an inventor, designer, and entrepreneur. Her work has been featured by CNN, *The New York Times, The Washington Post*, Bloomberg, *Oprah Magazine, Glamour*, and The Today Show. Kavita was also recently featured as one of the "Seven Entrepreneurs Changing the World" by Fast Company and on *Forbes* "30 under 30" list.



# Lester Mackey-2003

Lester Mackey of Wheatley Heights, New York, won sixth place at the 2003 Science Talent Search for his project "A Combinatorial Proof of Seymour's Conjecture for Regular Oriented Graphs with Almost Regular Outsets O'<sub>a</sub> and O"<sub>a</sub>." Dr. Mackey is an assistant professor of Statistics and by courtesy Computer Science at Stanford University. He earned his PhD in Computer Science and an MA in Statistics from University of California – Berkeley and his BSE in Computer Science from Princeton University. In 2009, Dr. Mackey was part of a team that took second place in the \$1 million Netflix Prize.



# YIN YIN WU-2007

Yin Yin Wu from Louisville, Kentucky, competed in the 2007 Science Talent Search with her project "Sonochemical Degradation of CuPc in Aqueous Solution." Yin Yin earned her BS from Stanford University in Computer Science, where she also worked as a theoretical chemistry researcher. She is the co-founder of Oven Labs and Double Labs, where she has worked on Echo, an Android lock screen which acts as a priority inbox for notifications, and Prim, a same-day laundry pick-up and delivery service.



# SUJAY TYLE-2009

In 2009, Sujay Tyle from Pittsford, New York, competed in the 2009 Science Talent Search with his project "The Sustainable Development of Ethanol from Biomass via Genes of *Clostridia.*" Sujay was one of the first Thiel 20 under 20 fellows, and was on the Founding Team and COO of Hired.com. Afterwards, Sujay spent time as an Investor at Sherpa Ventures. He was named to *Forbes* 30 under 30 list and is a prolific speaker around the world. Sujay took a leave from Harvard University, where he matriculated at fifteen years old. He is a published scientific author, was DuPont's youngest employee at thirteen years old, and has been featured on CNBC, *60 Minutes*, ABC, NBC, and FOX.



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Eleanor Roosevelt.

#### About Society for Science & the Public

Society for Science & the Public is a nonprofit 501(c)(3) membership organization dedicated to public engagement in scientific research and education. Our vision is to promote the understanding and appreciation of science and the vital role it plays in human advancement: to inform, educate and inspire.

The Society is proud to involve our global community in the essential, everchanging world of science. We strive to inspire endless possibilities by engaging students, educators and the public in science. Since 1921, the Society has conveyed the excitement of science and research directly to the public through its awardwinning publications and world-class science education competitions. Edward W. Scripps, a renowned journalist, and William Emerson Ritter, a California zoologist, founded the organization with the goal of keeping the public informed about scientific achievements.

Scripps and Ritter accomplished their goal by distributing the latest science research to the public through a news service for reporters. *Science News (SN)* has been published by the Society since 1922. In 2003, the Society launched *Science News for Students (SNS)*, an online, freely accessible youth edition to *SN*.

For decades, the Society has offered many of the most revered science education programs in the world: the Intel Science Talent Search, formerly the Westinghouse Science Talent Search; the Intel International Science and Engineering Fair, formerly the National Science Fair; and the nation's premier competition for middle school students, now known as Broadcom MASTERS (Math, Applied Science, Technology and Engineering for Rising Stars). "It was the most inspiring evening I've had in DC in 20 years... It left me feeling that maybe Alice Wei Zhao of North High School in Sheboygan...was right when she told the audience: 'Believe me, our future is in good hands."

Thomas L. Friedman, The New York Times



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# The Society's Executive Team

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