

Davidson Fellows are outstanding young people who demonstrate the development of their talents with a prodigious piece of work in one of the following submission categories:

Science

A project in a specific area of science, such as physics, biology, chemistry, engineering, earth science, space science, environmental science or medicine.

Technology

A project in a specific area of technology, such as artificial intelligence or computer programming.

Mathematics

A project in a specific area of mathematics, such as calculus, fractals or number theory.

Music

A portfolio that is representative of the applicant's talent as a composer, vocalist, classical instrumentalist or other instrumentalist.

Literature

A portfolio displaying a number of literary styles and genres.

Philosophy

A portfolio presenting analyses of fundamental assumptions or beliefs relating to human thought or culture.

Outside the Box

A project that is university graduate level or comparable and completed with the supervision of an expert or experts.

Davidson Fellows are awarded scholarships of \$50,000, \$25,000 or \$10,000 and are recognized for their achievements at a special awards reception in Washington, D.C.

Davidson Fellows are encouraged to make a personal commitment to support others in the development of their talents by serving as role models and mentors to other profoundly intelligent young people.

Davidson Fellow applicants are individuals who recognize wisdom in the adage, "It's the journey, not the destination." They are passionate about their work and value the opportunity to learn. If you see these qualities in yourself and have been pursuing the development of your talents for an extended period of time, we encourage you to apply.

HOW TO BECOME A DAVIDSON FELLOW

Applicants must submit:

- A detailed project or portfolio that is considered a significant piece of work as outlined in each category's application.
- Essays about the work, such as why and how the work was pursued, the challenges that were encountered, and a description of why the submission is significant.
- A 15-minute DVD, narrated by the applicant, describing and showing the work.
- Three nominating forms: one from a mentor and/or supervising scientist; one from a teacher, tutor or school administrator; and one from a professional in the field who is familiar with the applicant's work.
- A statement of commitment that, if named as a Davidson Fellow, the applicant and a parent/guardian will attend the awards reception in Washington, D.C. in September.

Applicants must be under the age of 18 as of October 1 of the year in which they are applying.

To download an application, please visit www.DavidsonGifted.org/Fellows.

The Davidson Institute must receive Davidson Fellows applications by 5 p.m. Pacific Standard Time on the first Wednesday in March.

Davidson Institute for Talent Development
9665 Gateway Drive, Suite B • Reno, Nevada 89521
Phone: 775-852-3483 • Fax: 775-852-2184
Email: DavidsonFellows@DavidsonGifted.org
www.DavidsonGifted.org

OUR MISSION

The mission of the Davidson Institute for Talent Development is to recognize, nurture and support profoundly intelligent young people and to provide opportunities for them to develop their talents to make a positive difference.

OTHER PROGRAMS AND SERVICES

Davidson Young Scholars

If you know of a profoundly intelligent student between 5 and 16 years old who could benefit from our FREE, individualized services, visit www.DavidsonGifted.org/YoungScholars.

The Davidson Academy of Nevada

If you would like to study with your intellectual peers, consider The Davidson Academy of Nevada. On the campus of the University of Nevada, Reno, the Academy is a public school offering an individualized learning program for each profoundly gifted student. Please visit www.DavidsonAcademy.UNR.edu.

THINK Summer Institute

If you are searching for a challenging summer educational opportunity, consider the THINK Summer Institute - a three-week residential college program for 13 to 16 year olds. Find out more at www.DavidsonGifted.org/THINK.

Educators Guild

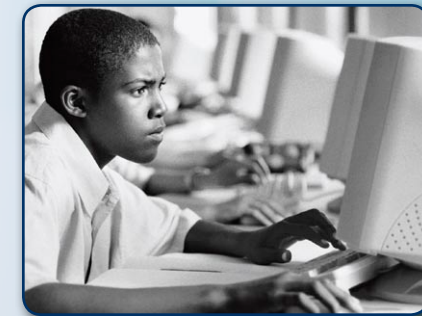
If you are an educator or professional working in the gifted education field and are looking for a place to ask questions, share ideas and connect with other educators who are excited about meeting the needs of gifted students, take a moment to look at www.DavidsonGifted.org/EdGuild.

GT-CyberSource

Learn what is new in gifted education - whether it is finding resources, reading the latest news articles, or learning about gifted policies at www.GT-CyberSource.org.

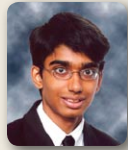
Genius Denied: How to Stop Wasting Our Brightest Young Minds

Learn about this award-winning book that has been praised as "a manifesto for change" for gifted education, in addition to what you can do to help gifted students, by visiting www.GeniusDenied.com.



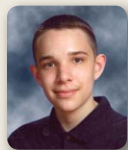
2008 Davidson Fellow Laureates

\$50,000 Scholarship Recipients



Akhil Mathew (*Mathematics*)

A 16-year-old young man from Madison, New Jersey, Akhil Mathew worked on a problem involving the encoding of real numbers into zero-one sequences without reference to an origin. He proved a single filter, or system of weights, can decode only a finite number of rationals. Using analysis and number theory, he connected the representable rationals of one filter with the zeros of its Fourier transform. He also generalized his results to higher dimensions by extending a theorem of Szegő to matrices. Akhil's work is relevant to signal processing, analog-to-digital conversion and representing numbers in an alternative way.



Sikandar Porter-Gill (*Science*)

A 17-year-old young man from Gaithersburg, Maryland, Sikandar Porter-Gill developed a novel process to clean wastewater and produce methane for use as an alternative form of energy. He engineered bio-catalyzed microbial fuel cells in a two-chamber design, connected with a proton conducting membrane, to degrade organic material in wastewater and produce methane, the principal component of natural gas. Sikandar's research is a promising step toward pursuing a cost-effective and environmentally-friendly energy source.



Christine Shrock (*Science*)

A 17-year-old young woman from Setauket, New York, Christine Shrock developed an approach to finding a more effective HIV treatment. She studied a region of the HIV protease, a protein crucial in the replication of HIV, and found that this region is a promising target for drugs to bind to change the shape of the protease, preventing it from performing its function. Christine's research is an important contribution to the development of a new class of drugs to reduce the number of infections and deaths caused by HIV.



Philip Streich (*Science*)

A 17-year-old young man from Platteville, Wisconsin, Philip Streich showed that carbon nanotubes, among the strongest and most conductive materials in the world, are thermodynamically soluble, contradicting the generally held assumption that they were universally insoluble. Using the Debye light scattering theory, Philip determined the Flory Huggins parameter to calculate solubility. To accurately detect the light scattered, he designed and custom-built a unique photon-counting spectrometer, more sensitive and precise than any commercially available. Philip's work has broad applications in the field of nanotechnology engineering.



Conrad Tao (*Music*)

A 14-year-old young man from New York, New York, Conrad Tao began playing the piano at 18 months. Today, he makes classical music relevant to younger generations through his performances that display a vast knowledge, deep understanding and mature interpretation of the repertoire. A composer, pianist, and violinist attending The Juilliard Pre-College Division, he has been featured on NPR's "From the Top," performed at Carnegie Hall and has received five consecutive American Society of Composers, Authors and Publishers (ASCAP) Morton Gould Young Composer Awards.

2008 Davidson Fellows

\$25,000 Scholarship Recipients



Michael Cherkassky (*Technology*)

A 16-year-old young man from Minneapolis, Minnesota, Michael Cherkassky applied computer machine learning methods to computer-aided medical diagnosis. He compared the application of several machine learning methods to real-life medical data sets in order to understand the generalization capability of the estimated models, advancing the current predictive diagnostic model. Michael also compared the diagnostic accuracy of two classification methods, allowing physicians to obtain more accurate diagnostic conclusions while advancing patient treatment and care.



Hilda Huang (*Music*)

A 12-year-old young woman from Palo Alto, California, Hilda Huang is determined to change the way people feel about Johann Sebastian Bach in her portfolio, "I Love Bach." Performing on the harpsichord and piano, Hilda aims to bring Bach to everyone, especially young people who may be unfamiliar with his music. Hilda hopes to start a series of "I Love Bach" concerts all over the world to fulfill her mission. Her many accomplishments include performances on NPR's "From the Top" and at Carnegie Hall.



Jasmine Miller (*Literature*)

A 17-year-old young woman from Nashville, Tennessee, Jasmine Miller examines her generation's interactions with technology, as well as the impact of digital media on our identities, in her portfolio, "The Digital Identity of Contradiction." Consisting of a one-act play, creative essays, and a novel excerpt, Jasmine's portfolio is an expedition into the uncharted minds of the current generation of American youth. Through an examination of digimedia and pop culture, Jasmine hopes to bridge the mindsets of different generations.



Saraswathi Shukla (*Outside the Box*)

A 17-year-old young woman from Princeton, New Jersey, Saraswathi Shukla conducted an in-depth study of sound and music in Franz-Anton Mesmer's theory of animal magnetism. Combining history, music, language, and literature, she examined the role of music in Mesmer's therapeutic séances in the context of broader changes in the popular perception of sound in pre-Revolution Paris. The importance of sound in mesmerism indicates that music played a greater role in the history of medicine than previously thought and presents new ways to analyze scientific theories of this period.



August Siena Thomas (*Literature*)

A 17-year-old young woman from Montague, Massachusetts, August Siena Thomas examines the ways in which personal and political histories are purposefully re-imagined and rewritten in her portfolio, "Rewriting History." Through a historical novel, literary reflection, drama and historical interpretation, August observes the manners in which interpretation of history remains fluid. She employs themes of power, betrayal, redemption, and choice in her stories, and reflects on how writers have used malice, ambition, flattery and imagination through the ages to shape the way history is written.



Vijay Venkatesh (*Music*)

A 17-year-old young man from Laguna Niguel, California, Vijay Venkatesh views music as a gift to move the world, serving as a common link to touch the humanity in us all. He demonstrates this in his piano portfolio, "Magic through Music." Winning the grand prize at the Los Angeles Music Spotlight Awards and the second prize at the Virginia Waring International Piano Solo Intermediate Competition, Vijay believes it is his duty as a performer to assure the audience of the joy and love that transcend life's struggles.



William Yuan (*Science*)

A 12-year-old young man from Beaverton, Oregon, William Yuan invented a novel solar panel that enables light absorption from visible to ultraviolet light. He designed carbon nanotubes to overcome the barriers of electron movement, doubling the light-electricity conversion efficiency. William also developed a model for solar towers and a computer program to simulate and optimize the tower parameters. His optimized design provides 500 times more light absorption than commercially-available solar cells and nine times more than the cutting-edge, three-dimensional solar cell.



Charles Zhang (*Science*)

A 17-year-old young man from Rochester, Michigan, Charles Zhang researched and developed a prototype for renewable battery power that harvests energy from mechanical vibrations. Charles found that by using asymmetric air-spaced cantilevers, mechanical energy present in the environment could generate AC voltage. The magnitude of the AC voltage generated is much larger and helps to increase the efficiency when converting the AC voltage into DC voltage. His prototype can be used as a primary power source in wireless structural monitoring sensors for bridges, implantable medical devices, tire pressure monitoring systems and portable devices.

\$10,000 Scholarship Recipients



Nathan Georgette (*Science*)

A 17-year-old young man from Ponte Vedra Beach, Florida, Nathan Georgette developed a novel mathematical model intended to reduce the costs of stopping viral disease outbreaks in impoverished nations. He used mathematical modeling to generate a formula with which the minimum number of vaccines needed to stop a measles outbreak can be calculated in real time during the outbreak. His research represents a new approach to understanding the dynamic effects of infectious disease spread and gradual immunization.



Molly Hensley-Clancy (*Literature*)

A 16-year-old young woman from Minneapolis, Minnesota, Molly Hensley-Clancy explores the primal human instinct of storytelling through the eyes and minds of young girls in her portfolio, "Seized as Beauty." Molly demonstrates that geographic and linguistic differences do not change the universality of dreams, thoughts and troubles. She believes the more we notice the commonalities that bind us together as human beings, rather than what sets us apart, the less we will be able to ignore those who are suffering among us.



Kyle Hutzler (*Outside the Box*)

A 16-year-old young man from Huntingtown, Maryland, Kyle Hutzler created a substantial policy paper incorporating analysis and editorials to serve as the groundwork for education reform. The policy paper recommends that successful school reform must incorporate choice, autonomy, and accountability, of which testing can only be one part, along with the empowerment of parents, students and teachers. His work articulates a vision for restructuring with specific proposals ranging from classroom organization and curriculum, to funding and teacher pay.



Michael Leap (*Philosophy*)

A 17-year-old young man from Okemos, Michigan, Michael Leap tackles one of the largest philosophical debates of our time – the role of science in society. In his portfolio, Michael examines this relationship by synthesizing and applying several complex philosophical concepts to basic questions about science in everyday life. With a unifying thesis that conventional views of science, truth, and nature only function from a self-referential viewpoint, he presents new, transversal perspectives in hopes that this critical examination will lead to a greater understanding of the world at large.



Divya Nag (*Science*)

A 17-year-old young woman from El Dorado Hills, California, Divya Nag developed a thermal analysis technique to quantify the effects of forest fires and a novel ratio to determine organic matter loss in on-site situations. Wildfires have proven to be a problem of high economic loss and great environmental impact. By using differential scanning calorimetry, thermogravimetry and x-ray diffraction, Divya determined soil ignition temperatures and soil compositions before and after burning. These techniques can be used in evaluating the efficacy of prescribed burning and forest management.



Avanthi Raghavan (*Science*)

A 17-year-old young woman from Orlando, Florida, Avanthi Raghavan studied mechanisms of protein transport critical to the survival and pathogenicity of the malaria parasite, *Plasmodium falciparum*, which infects human red blood cells. *Plasmodium falciparum* is the most virulent causative agent of malaria and causes an estimated two million deaths annually. By using confocal microscopy, Avanthi characterized the role of the SNARE proteins PfSec22 and PfBet1, thus identifying potentially exploitable targets for the future development of parasite-specific drugs.



Sarah Walianny (*Science*)

A 16-year-old young woman from Arcadia, California, Sarah Walianny discovered that expression of the gene t-Darpp can make Her-2 positive breast tumor cells become resistant to the drug Herceptin. Sarah demonstrated that t-Darpp alters a critical signaling pathway that regulates growth and survival in cells. Her-2 positive breast tumor cells are very aggressive and Herceptin-resistance is found in 50 to 70 percent of cancer patients. Sarah's work shows that blocking the t-Darpp gene can eventually lead to more effective breast cancer treatment.