

W. M. KECK FOUNDATION  
2021 ANNUAL REPORT

...



ADVANCING  
**OPPORTUNITIES**

W. M. KECK FOUNDATION  
2021 ANNUAL REPORT

*Cover photo:*  
SSu-Ying Chen holding a nanofluidic device on a chip

LEADERS' MESSAGE



Robert A. Day  
Chairman



Joseph Day  
Co-Chief Executive Officer



Stephen M. Keck  
Co-Chief Executive Officer

As we continue to grow the Foundation my grandfather started in 1954 and advance opportunities for medicine, science and our community, I'm pleased that Joseph Day and Stephen Keck, as our new Co-Chief Executive Officers, are increasingly leading our efforts.

Robert A. Day  
*Chairman, W. M. Keck Foundation*

This year, in our Annual Report entitled *Advancing Opportunities*, we are pleased to highlight a few of our grantees who are pushing for advancement in myriad of ways.

At Texas Children's Hospital, Dr. Houda Zoghbi has opened a new field of deep brain stimulation for childhood development disorders through her study of the learning and memory circuit deficits associated with autism. At the University of California, Santa Cruz, the Keck Foundation's strategy of enabling technology development that has a multiplier effect came true when Dr. Haussler and his team created a graph-based data repository that names, identifies and analyzes all common variations of the human genome. A husband-and-wife team at the New Jersey Institute of Technology and Yeshiva University is using the mathematics of topology to understand and control vibrations in natural and artificial materials. The pair's discoveries are having widespread impact in biology, physics, and engineering, and they are opening new bridges of dialogue with the mathematics community.

While research in itself is incredibly important for scientific discovery, it also opens new worlds to so many involved in the enterprise. For example, researchers at the University of San Diego borrowed from biology to create programmable autonomous materials. At the same time, they are strengthening a research culture at the university and introducing undergraduates to new career opportunities in cutting edge fields. In fact, all the projects featured in this report positively impacted the students in these laboratories. Many are recruited by academia and industry for their skills. This is one reason our belief in undergraduate education in the sciences remains strong. In 2022, we awarded Pepperdine University \$10 million to launch its data science initiative, Occidental College \$5 million to modernize its chemistry facility, and California State University at Long Beach \$2 million to attract and retain first-year students in STEM majors.

Higher education offers opportunities for economic mobility. In the last 15 years, the Keck Foundation has awarded \$4.5 million to expand the capacity of college access and success programs for students living in under-resourced communities in the Los Angeles basin. These grants range from College Bound at the Boys and Girls Clubs of the Los Angeles Harbor to College Track's college transition and mentorship programs.

In 2021, we wanted to balance our regular research grantmaking with our ongoing support of so many Angelenos affected by the pandemic. Our 2020 grants enabled USC and UCLA to continue finding ways in 2021 to mitigate the impact of the disease, especially in our most vulnerable communities. Our Southern California grants put \$5.4 million more to work healing and supporting the region. We also streamlined our application process to allow our grantees to focus on their communities rather than our paperwork.

Our Directors continue to provide invaluable expertise gained from all three National Academies, leading industry, finance and law, as well as stewardship of many philanthropies. Dr. Edward Stone, as the retiring Chair of our Science & Engineering Committee after twenty-four years, has been an unmatched guide and resource. Luckily, Ed is continuing to lend his experience as our Director and our Advisor on materials science and astrophysics grants. Dr. Edward Stolper, another Caltech leader, is now chairing the Science & Engineering Committee. We want to extend a special thank you to Nelson Rising, who retired from our Board in 2021. We appreciate Nelson's service on the Foundation's Executive and Audit Committees for 15 years.

We were saddened by the February 2022 passing of our cousin, Charisse Keck. Charisse served for 11 years as a Member of the W. M. Keck Foundation established by her great grandfather. We will remember fondly Charisse's vibrancy, creative writing and love for her family.

After distributing \$74 million during the year, our endowment stood at \$1.8 billion on December 31, 2021. While the markets have been volatile since the beginning of 2022, we continue to invest for the future.

In 2022 and beyond, we look forward to working together to advance high risk, high reward medical and scientific research and community building.

Joseph Day  
Co-Chief Executive Officer  
W. M. Keck Foundation

Robert A. Day  
Chairman  
W. M. Keck Foundation

Stephen M. Keck  
Co-Chief Executive Officer  
W. M. Keck Foundation

TEXAS CHILDREN'S HOSPITAL

# UNDERSTANDING DEFICITS

## in Learning and Memory Circuits

▲ Sameer Bajikar, PhD, Postdoctoral Associate

Across the globe and in the United States, intellectual disabilities and autism spectrum disorders represent a huge health care burden. In 2021, the CDC reported that approximately one in forty-four children in the United States is diagnosed with an autism spectrum disorder, with enormous personal and economic impact.

Estimates indicate that 40% of people with autism are non-verbal, and roughly 30% have a significant intellectual disability. Roughly 1% of people in the United States have moderate to severe intellectual disability.

In 2011, the W. M. Keck Foundation awarded a grant to a Texas Children's Hospital's Neuroscience Research Institute team of six investigators led by Huda Zoghbi, MD, a professor at Baylor College of Medicine and a Howard Hughes Medical Institute Investigator. The group used electrical recordings and deep brain stimulation (DBS) to understand the deficits in the learning and memory circuits in mice with genetic changes that cause intellectual disabilities similar to autism. At that time, we knew that many genes, with diverse molecular functions cause these disorders when mutated, deleted, or duplicated. The challenge was to understand how these various genetic changes can result in similar symptoms and how to develop more effective therapeutic strategies. Dr. Zoghbi and her team proposed that some gene mutations can alter brain network activity and lead to impaired learning.



▲ Dr. Huda Zoghbi with former graduate student Wei-Hsiang Huang

Roughly 1% of people in the United States have moderate to severe intellectual disability.



► Matthew McGinley, PhD; Assistant Professor, Neuroscience

They also proposed that bypassing the gene dysfunction by directly manipulating the circuit through interventions such as deep brain electrical stimulation could prove effective, as it has done for Parkinson's disease patients.

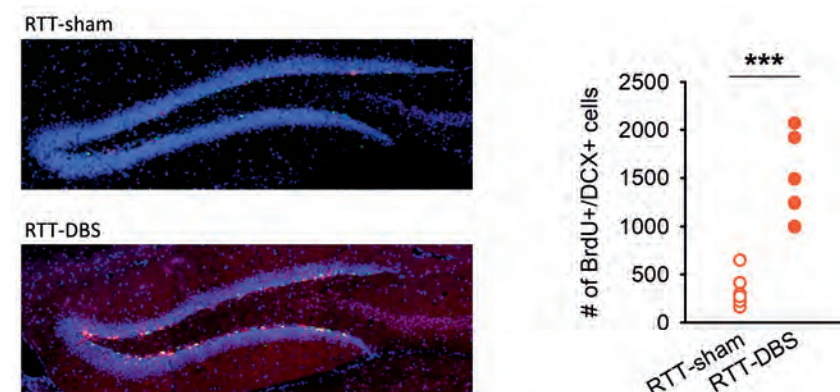
The team chose to study brain activity in mice that have a mutation in the gene that causes Rett syndrome in humans. Dr. Zoghbi has been studying Rett syndrome since 1983, when she encountered a girl with Rett syndrome at Texas Children's hospital and learned about this disorder from an article just published by Dr. Bengt Hagberg and colleagues from Europe. Rett syndrome is a regressive intellectual and motor disability disorder, which Dr. Zoghbi and her collaborators found to be caused by mutations in the *MeCP2* gene in humans. They recorded neural activity and learning and behavior in mice in which they mutated the *MeCP2* gene. The team's work, supported by this Keck funding, found specific cellular deficits and neuronal network abnormalities in the Rett syndrome mice. They went on to show that deep brain stimulation of the fornix restores function to the hippocampal region of the brain, specifically improving learning and memory in the Rett mutant mice. Subsequent studies by the team have targeted additional areas of the Rett brain in their animal models to restore other functions, especially motor phenotypes.

After the funding period of this Keck grant, Huda Zoghbi and her group have continued their work on the genetics of neurological diseases, including the spinocerebellar ataxias, using mouse and *Drosophila* models. Her group also continues their work on Rett and the many functions of the *MeCP2* gene in different neural cell types. Inspired by their findings from deep brain electrical stimulation studies, they tested the hypothesis that intense behavioral training during the presymptomatic period of the disease will also improve neuronal plasticity and function. To their surprise they found that repeated behavioral

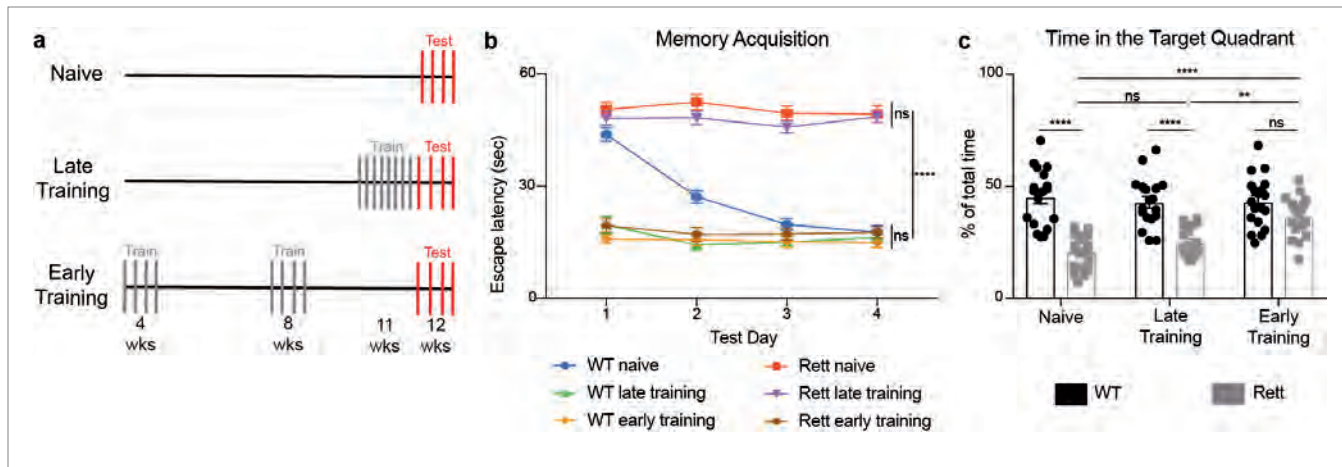


▲ Jianrong Tang, PhD and lab members who performed DBS experiments

Rett syndrome is a regressive intellectual and motor disability disorder, found to be caused by mutations in the *MeCP2* gene in humans.



◀ DBS stimulates the generation of nerve cells in the brain of Rett syndrome mutant mice. (top) no stimulation, (bottom) with stimulation. These induced neurons develop and function.



▲ Repeated training mimics some of the effects of DBS. (a) DBS improves performance in a maze task. (b, c) late trained Rett mutant mice underperform.

The team chose to study brain activity in mice that have a mutation in the gene that causes Rett syndrome in humans.

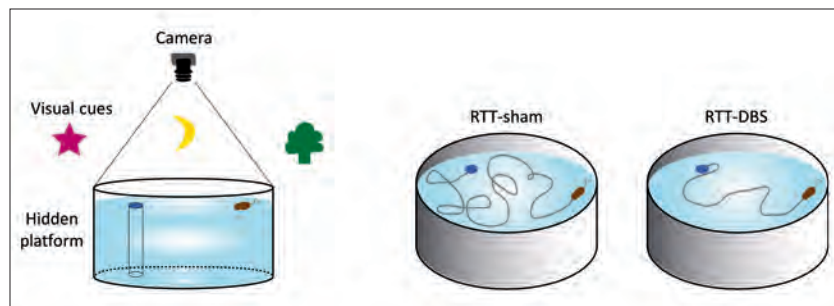


training in the presymptomatic but not postsymp-tomatic phase restored the ability of the Rett mice to learn a task. The team she worked with has also studied the effect of DBS on another form of intellectual disability caused by mutations in the CDKL5 gene and found that deep brain electrical stimulation improved hippocampal learning. These results may be grounds for optimism that these devastating diseases may eventually yield to direct therapeutic interventions.

Professor Zoghbi commented on the medical impacts of her 2011 Keck funded project: “It really started a new field of deep brain stimulation for childhood developmental disorders....now others are discussing plans to test DBS in models of childhood diseases.... we are working with surgeons to explore translation.” She also told us that she: “... would have never done this using my other funding, it was too risky, so I would not have risked my funding renewal doing the experiments—although at the end they were a smashing success, but odds were not high when we started.”

Since the time of this Keck Foundation support, Dr. Zoghbi has been honored with the Breakthrough Prize in Life Sciences (in 2017) and the Brain Prize (in 2020), among others. ■

► Mice were trained in a water-maze task, where they learn to find an island by recognizing markings on the walls. After repeated training, DBS improves the speed of learning in Rett mutant mice.



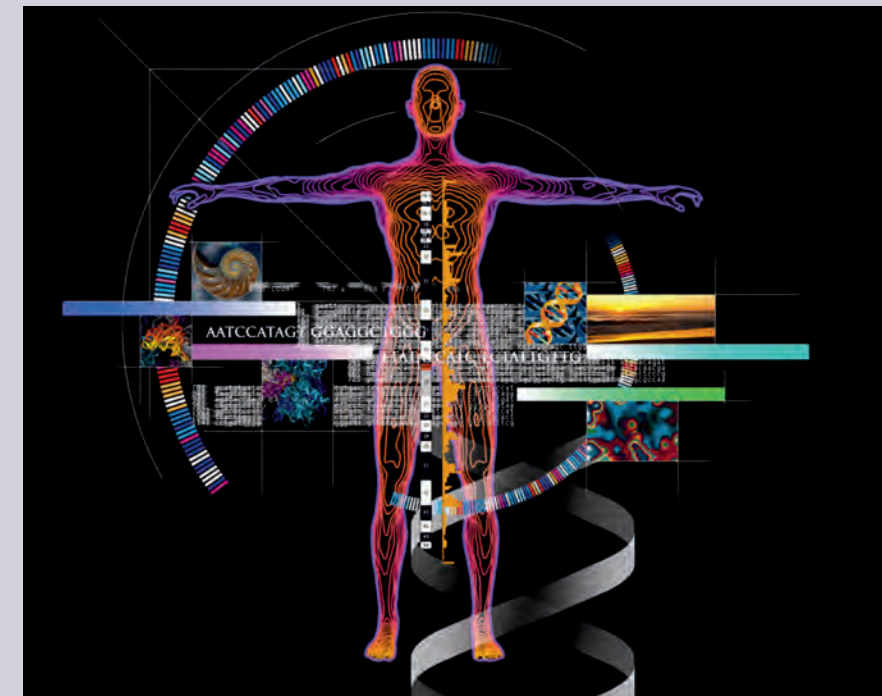
▲ Cages and apparatus used for the DBS experiments with mice

# HUMAN GENOME Variation Map

**IN 2000, PROFESSOR DAVID HAUSSLER AND HIS TEAM CONTRIBUTED TO THE ASSEMBLY OF THE FIRST WORKING DRAFT OF THE HUMAN GENOME.** While sequencing the standard human genome led to the identification of many genes, a critical problem has been understanding the many mutations (“genetic variations”), some of which cause disease. This 2015 grant from the Keck Foundation funded Professor Haussler, his colleague Professor Benedict Paten (at University of California, Santa Cruz and others, at four other collaborating institutions), to develop the Human Genome Variation Map, which provides a comprehensive representation of human genome variation to advance opportunity through medical research and the basic life sciences. **This graph-based data repository names, identifies, and analyzes**



▲ Professor David Haussler, the principal investigator



▲ Variations in the human genome's DNA sequence code for human variety

**all common variations, precisely and reproducibly, which has led to a revolution in genomics, redirecting the course of the human genome reference project at the National Institutes of Health.** The project has inspired global participation through the Global Alliance for Genomics and Health (a nongovernmental group of over 170 collaborating institutions in more than 40 countries). This grant exemplifies the Keck Foundation’s strategy to support technology development to allow many researchers to advance scientific opportunity and accelerate discovery for human impact. Today, Drs. Haussler, Paten and their teams continue their pioneering work in the field of genomics. ■

NEW JERSEY INSTITUTE OF TECHNOLOGY

# WAVE PROPAGATION

## in Natural and Engineered Topological Materials

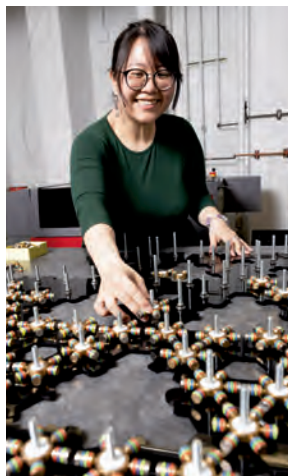
▲ Lattice for sound steering

Imagine a material that can redirect sound or heat and even store energy in vibrational modes with fully controlled frequency and spatial localization. This is the realm of mechanical metamaterials – natural and artificial materials with mechanical properties defined by their structure rather than their composition.

Camelia Prodan at the New Jersey Institute of Technology (NJIT) and her spouse, Emil Prodan, at Yeshiva University, supported by a 2016 Keck Foundation award, are using the mathematics of topology to understand and control vibrations, also called phonons, in these metamaterials. The pair's discoveries are having widespread impact in biology, physics, and engineering, while opening new bridges of dialogue with the mathematics community. The project has also positively impacted their students, who are recruited by both academia and industry for their skills.

The researchers and their students built large scale models to demonstrate the ability to control the motion and storage of vibrational energy out of fidget spinners with magnets on each arm. As expected, all the spinners along a one-dimensional chain wiggle in unison when all neighboring magnets are set to

▼ Assembling a fractal lattice for vibration control. (left) Magnetically coupled spinners allows for visualization of vibration propagation. (right)



► Acoustic lattice with sinusoidal connections for sound trapping



attract, as the end spinner is oscillated back and forth. However, by simply changing the strength of the attraction at some point in the chain, the vibration can be damped along the chain only to reappear at the far end. One and two dimensional experimental and theoretical platforms opened new venues for wave-steering, sensing, energy storage and manipulation, and supplied a fresh set of principles that were quickly adopted by the metamaterial community.

Fun, but what does this have to do with real materials? Scientists are using the mathematics of topology to understand the surprising behavior of electrons in materials such as insulators that conduct electricity on their surface. These materials retain their same basic properties even as the materials are deformed. This allows the quantum wave nature in materials, which normally occur at the coldest temperatures, to persist at room temperature. The Prodans have been able to apply topological arguments to phonons in materials. Just as in the above example of surface conduction of electrons, topologically protected edge modes exist for phonons. At a specific frequency, sound vibrations only pass around the “edges” of a sample and not through its interior. The team has made exceptional progress in the theoretical understanding of topological phonon modes in materials. They were able to build a classification table charting all



▲ Biologists, physicists and engineers came together to NJIT for a workshop on Topological Dynamics in 2017. The workshop was fully supported by the Keck grant.



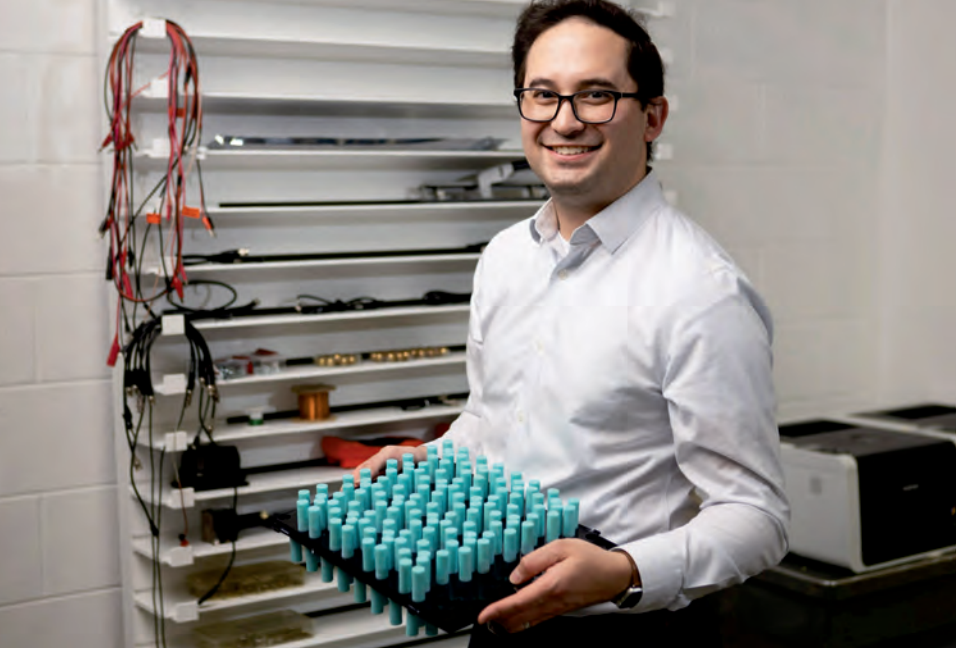
◀ The PI got an expansive lab, after receiving the Keck grant. (David Apigo, Ssu-Ying Chen, Camelia Prodan and Wenting Cheng)

the possible symmetries of phonon modes in direct analogy with topological electronic modes in crystals, first discovered in 2005. In addition, they developed mathematics to construct a map that takes any quantum topological material and transforms it into a phononic topological material. Both phonons and quantum mechanics are wave phenomena. Still, it is surprising that the same mathematics hold at vastly different length and temperature scales.

In 2009, the Prodans wondered whether biological structures could support topological phononic edge modes. Microtubules are nanoscale tubes that help shape cells and drive cell division. They are made of dimer proteins

The Prodans are using the mathematics of topology to understand and control vibrations, also called phonons, in metamaterials.





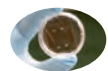
◀ Sliding the top layer with respect to the bottom one allows for sound steering within the structure (David Apigo)

layered in helical strands. The topology of the microtubules was predicted to confine phonons to the ends of microtubules and store energy, hence providing an alternative mechanism for the observed but not fully understood polymerization/de-polymerization cycles of microtubules, vital for their functioning. The team reported the experimental measurement of

the phonon spectrum in microtubules for the very first time. To their surprise and that of the biology community, they found that the microtubules are pre-stressed beams, like those used in modern construction projects such as bridges, buildings and railroads. Pre-stressed beams allow for longer span while reducing the thickness and are more resistant to damage compared to regular beams. Microtubules are the railroads of the cell with motor proteins constantly walking on them, transporting cargo within the cell. Microtubules are thin (25 nanometers), but they have to extend to around 20-50 micrometers (1000 times their thickness) to support the cellular transport. The team learned how to control the growth of single microtubules and to load them in microfluidic chambers in conditions found in cells. Definitive experiments to understand the role of phonons in the polymerization/de-polymerization cycles are ongoing. This new technique, dubbed phonon microscopy, is being used to compare microtubules in cancer cells to healthy ones, which may lead to new therapies.

The success of the project allowed the team to secure additional support from the National Science Foundation. They've created an outstanding research environment for undergraduate/graduate students, and postdoctoral scholars at NJIT and Yeshiva. ■

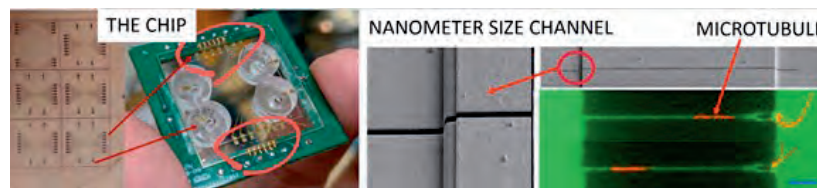
Both phonons and quantum mechanics are wave phenomena.



▲ Close up of nano-chips for protein studies



▲ Magnetically coupled spinners are excellent for visualization of wave propagation



▲ Trapping a 25 nano meter wide microtubule requires careful engineering in a cleanroom

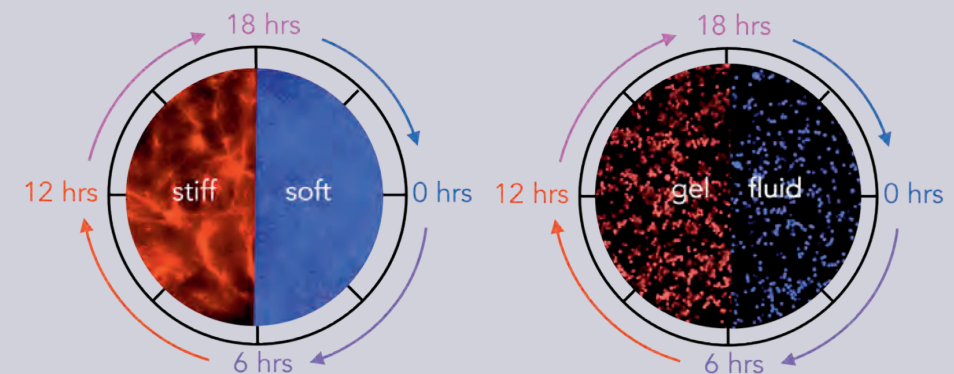
UNIVERSITY OF SAN DIEGO

# BORROWING from BIOLOGY to Create Programmable Autonomous Materials

**AN INTERDISCIPLINARY TEAM OF PHYSICISTS AND BIOLOGISTS BASED AT THE UNIVERSITY OF SAN DIEGO, SUPPORTED BY A 2018 KECK FOUNDATION GRANT, IS BUILDING TUNABLE ACTIVE MATERIALS USING MACHINERY FROM CELLS.**

The team recently demonstrated the ability of networks of microtubules and actin filaments, extracted from eukaryotic cells, to self-generate a range of forces to undergo contraction, extension, and rearrangement. These forces are produced by motor proteins that crosslink, push and pull on the filaments by converting chemical to mechanical energy. In cells, these motors drive both large-scale locomotion and internal motions as in mitosis. The team is now programming and automating force-generation and reconfigurability using circadian clock proteins – biochemical

feedback loops that generate 24-hour rhythms in organisms. Here, clock proteins from blue-green algae are repurposed to control network crosslinking, changing the material stiffness from soft to hard and back again. The team has also demonstrated clock-driven mechanical changes in commercial nanoparticle suspensions. **To characterize these futuristic materials, the team developed new microscopy, rheology, and computational analysis technologies and made them freely available to other researchers.** This grant led directly to a recent \$1.8 million award from the National Science Foundation to expand and fast-track the development of these autonomous materials for applications such as viral sensing and filtration. Importantly, the project is also building a strong research culture at the University of San Diego, and the undergraduate students there are finding exciting new career opportunities. ■



▲ Circadian oscillators stiffen/gel and soften/fluidize biopolymer (left) and microsphere (right) materials on daily rhythms

# COLLEGE ACCESS

Higher education offers opportunities for economic mobility. Two-thirds of estimated jobs in the United States now require a college degree. But too few students are benefitting from the prosperity a degree can provide. Less than 10% of low-income students of color earn a bachelor's degree by their mid-20s, compared with 77% of their wealthier peers.

Navigating the complex college admissions process is daunting for students, many of whom are the first in their families to go to college. These young people need extra guidance and support on their journey to and through college. With high school counselors stretched thin, many youth-serving organizations have stepped in to help students prepare for college, apply to the best-fit universities, and secure financial aid.

In the last 15 years, the Keck Foundation has awarded \$4.5 million to expand the capacity of college access and success programs for students living in

▼ College Bound Seniors, Carolina Nuno (USC) and Pilar Reynoso (UCLA), and case managers at College Signing Day



▲ College Bound students visit California State University, Northridge during a summer campus tour

under-resourced communities. This funding has supported trusted community-based providers who have a deep understanding of students' interests, talents, and needs.

In the early 2000s, just half of students living in Los Angeles were graduating from high school. The Boys & Girls Clubs of the Los Angeles Harbor (the Clubs) set out to change this by launching College Bound. This program introduces all youth, regardless of their academic standing or challenges, to the idea that a college degree is attainable and prepares them to apply. Two of the Foundation's early college access grants expanded College Bound to the Clubs' Port of Los Angeles and Wilmington sites and built out space for a Teen Center at the latter location where youth participate in college preparatory activities.

One distinctive aspect of College Bound is the intensive case management provided to ensure each student is on track academically for acceptance to a college or university and has applied for financial aid. During the expansion, College Bound participants quadrupled to a total of 1,100 middle and high schoolers. Ninety-eight percent of participating seniors graduated, and an equivalent percentage enrolled in college, with half attending a four-year school.

Getting kids into college is just the first step. Many college access programs like College Track have added mentoring and other supports to help students successfully transition to college and earn their degree in a timely manner (see Sidebar on page 15).

As the field has evolved, many providers also homed in on doing a better job of matching youth with the "best fit" college. Research has shown that high-achieving students who attend moderately to highly selective, four-year colleges are more likely to graduate and earn a higher starting salary. Unfortunately, just 15% of students from the lowest income families enroll in these top-tier institutions, compared to nearly two-thirds of students from higher-income families.



▲ Horace Mann UCLA Community School graduate, Amari DeFrance, celebrates with Assistant Principal, Carla Estes

Many college access programs like College Track have added mentoring and other supports to help students successfully transition to college and earn their degree in a timely manner.





▲ (top) Helped by the Keck College Center at Horace Mann, graduate Isabel Gonzales attains college acceptance. (bottom) InnerCity Struggle youth leader Joaquin Gonzalez (middle) with friends on graduation day.

College Match provided supports on par with what students at elite private schools receive.



▼ College Match students explore private liberal arts college, Occidental College



A Keck Foundation grant to College Match Los Angeles helped increase the number of low-income students accepted to and graduating from top-tier colleges and universities. Working with motivated, academically strong juniors and seniors attending high schools in East and South Los Angeles, College Match provided supports on par with what students at elite private schools receive. Of the 485 participating seniors who graduated over a three-year period, 71 percent were accepted by at least one Top 25 ranked college or university. These included Brown, Carleton, Smith, Vassar, and the University of California, Berkeley. The six-year graduation rate for students from the class of 2012 was 94%, far exceeding the national average.

Low academic expectations, limited school resources, and a lack of rigorous coursework are equity issues that Inner City Struggle (ICS) addresses on the Eastside of Los Angeles. Youth and community residents trained by the organization advocated for change. Now college-prep courses are required for all Los Angeles Unified School District students along with support to complete the coursework needed for acceptance to four-year institutions. A Keck Foundation grant supported construction of the agency's first permanent headquarters allowing ICS to continue its educational advocacy.

But not all schools have the capacity to create a college-going culture. Our funding for staff dedicated to college access services at the Horace Mann UCLA Community School addressed this issue at one of the most under resourced schools in South Los Angeles. In spring 2021, all seniors graduated, and 54% enrolled at four-year institutions, including Historically Black Colleges and Universities and University of California campuses. The remaining students are attending community colleges. To ensure these students successfully transitioned to college and persisted through the first year, every senior participated in a summer bridge program, received a laptop, and was matched with a UCLA mentor.

The pandemic has intensified the gaps in educational attainment along race and class lines. Since Fall 2019, undergraduate enrollment across all institution types has declined 8% and community colleges, where most low-income students start, have lost 15% of their enrollment. Our grant making will remain focused on ensuring that the next generation of diverse leaders is academically prepared to pay it forward. ■

SOUTHERN CALIFORNIA

# COLLEGE TRACK

## Fulfills the Promise of a Higher Education



▲ College Track Watts scholars partake in programming at Jordan High School

**UNIQUE AMONG COLLEGE COMPLETION PROGRAMS, COLLEGE TRACK DEMONSTRATES THE IMPACT OF A COLLEGE DEGREE IN THEIR SOCIAL MOBILITY REPORT.** In a survey of over 600 College Track alumni nationwide,

**79% were employed within six months of college graduation**, which is higher than the national average of 64%. In their first job, 53% earned more than their parents, and, by the time they were 30, that number increased to 92%.



▲ College Track scholars from Boyle Heights will be the first in their family to graduate college

Because of the program's track record, the Keck Foundation made two grants to expand College Track's reach in Los Angeles. The first grant in 2013 enabled the program at Roosevelt High School in Boyle Heights to grow from 65 to 448 high school and college

students. A second grant in 2018 established the program at Jordan High School in Watts, growing it to serve 260 students by the end of the 2020-21 academic year. That year, across both program sites, **the college matriculation rate was 89%, with 86 graduating seniors** enrolling in a four-year college.

In college, students work with the program's college completion advisor who connects them to on-campus resources, monitors their progress, and supports them in managing academic, financial, and social-emotional challenges. Older undergraduates are paired with new college students at the same campus to increase persistence. Fifty students supported by the Boyle Heights Center have completed their bachelor's degrees, becoming the first College Track alumni in Los Angeles. **Over 75% of all participants are on track to graduate** from college within six years or less. ■



▲ will.i.am celebrates College Track scholars as they launch to college

# W. M. KECK FOUNDATION DIRECTORS, COMMITTEES, MEMBERS AND OFFICERS FOR 2022



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1954 – 1964



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*Chairman and CEO*  
1964 – 1994



Robert A. Day  
*Chair and CEO*  
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Dr. Justin Gallivan  
*Senior Program Director*

Dr. Kevin Moses  
*Senior Program Director*

Dr. Thomas Rieker  
*Senior Program Director*

Dr. Jean Kim  
*Program Director*

### SENIOR MEDICAL ADVISOR

Dr. James S. Economou

### INDEPENDENT PUBLIC ACCOUNTANTS

Ernst & Young  
*Los Angeles, California*

2021 REPRESENTATIVE GRANTS

2021 REPRESENTATIVE GRANTS

MEDICAL RESEARCH

**Georgia Institute of Technology**  
Atlanta, GA  
\$1,000,000  
*To understand the function of RNA incorporation in the human DNA genome.*

**Oregon Health & Science University**  
Portland, OR  
\$1,000,000  
*To develop pointilized microscopy: Creating tools to visualize and control molecular dynamics across a single cell.*

**Rice University**  
Houston, TX  
\$1,000,000  
*To design and build neural circuits in the animal Hydra vulgaris.*

**Salk Institute for Biological Studies**  
La Jolla, CA  
\$1,000,000  
*To develop a novel molecular technology to control gene expression for neuroscience.*

**Stanford University**  
Stanford, CA  
\$1,000,000  
*To engineer integrated materials within living organisms.*

**University of California, Davis**  
Davis, CA  
\$1,000,000  
*To develop new fluorescent molecules to detect fundamental neuromodulator signals in the deep brain of living animals.*

**University of California, Irvine**  
Irvine, CA  
\$1,000,000  
*To understand how lipid droplets control cartilage function.*

**University of California, Irvine**  
Irvine, CA  
\$1,000,000  
*To develop luminescent RNAs to study neural circuits.*

**University of Colorado Denver | Anschutz Medical Campus**  
Aurora, CO  
\$1,000,000  
*To study the control of cell division by RNA bound to the centrosomes.*

**University of Florida**  
Gainesville, FL  
\$1,200,000  
*To study pathogens in wildfire smoke.*

**University of Michigan**  
Ann Arbor, MI  
\$1,000,000  
*To develop a new computational platform for predicting single cell behavior.*

**University of Washington**  
Seattle, WA  
\$1,000,000  
*To evaluate the role of mechanical cues in liver regeneration.*

SCIENCE AND ENGINEERING RESEARCH

**Arizona State University**  
Tempe, AZ  
\$1,000,000  
*To explore chirality, spin coherence, and entanglement in quantum biology.*

**California Institute of Technology**  
Pasadena, CA  
\$1,100,000  
*To develop four technologies for increased efficiency and precision of high-resolution infrared spectroscopic characterization of exoplanets.*

**Case Western Reserve University**  
Cleveland, OH  
\$1,200,000  
*To disentangle the drivers of human evolution: tectonics, climate and habitat.*

**Colorado School of Mines**  
Golden, CO  
\$1,000,000  
*To create a solid-state quantum simulator with widely tunable long-range interactions.*

**Duke University**  
Durham, NC  
\$1,000,000  
*To synthesize proteins that exhibit controlled charge bifurcation flow.*

**Stanford University**  
Stanford, CA  
\$1,000,000  
*To image dynamic photochemistry at the atomic and molecular scale.*

**University of California, Davis**  
Davis, CA  
\$1,000,000  
*To develop room temperature solid state THz and IR sources based on Cherenkov radiation.*

**University of California, San Diego**  
San Diego, CA  
\$1,000,000  
*To explore polariton amplification of stimulated-enhancement of reactions (PASERs).*

**University of California, Santa Barbara**  
Santa Barbara, CA  
\$1,300,000  
*To search for time symmetry violation in tabletop experiments.*

2021 REPRESENTATIVE GRANTS

University of Central Florida

Orlando, FL  
\$1,000,000  
*To accelerate dielectric particles using light.*

University of Southern California

Los Angeles, CA  
\$1,000,000  
*To unravel the mechanisms of centimeter scale electronic conduction in cable bacteria.*

University of Texas at Austin

Austin, TX  
\$1,500,000  
*To explore sediment deposition at the base of glaciers and its effect on ice retreat.*

SOUTHERN CALIFORNIA

Arts and Culture

Destination Crenshaw

Los Angeles, CA  
\$500,000  
*To develop a series of parks and public art installations as part of a community revitalization initiative in South Los Angeles.*

Civic and Community

All Peoples Community Center

Los Angeles, CA  
\$250,000  
*To improve access for people with disabilities by renovating the agency’s family service center in South Los Angeles.*

Children Now

Los Angeles, CA  
\$300,000  
*To implement a new urgent response system for foster youth and their caregivers in Los Angeles County.*

Homeboy Industries

Los Angeles, CA  
\$350,000  
*To create a youth re-entry center by renovating two properties in Boyle Heights and providing positive youth development programming.*

Hope of the Valley Rescue Mission

Mission Hills, CA  
\$300,000  
*To support the acquisition of an interim housing facility for homeless individuals in the San Fernando Valley.*

Liberty Hill Foundation

Los Angeles, CA  
\$500,000  
*To create a comprehensive system for youth development by providing capacity building services to grassroots organizations.*

Root & Rebound

Los Angeles, CA  
\$300,000  
*To provide legal assistance for justice-involved youth re-entering society.*

Step Up On Second

Los Angeles, CA  
\$200,000  
*To address veteran homelessness by furnishing and equipping 122 units of permanent supportive housing on the West Los Angeles Veterans Administration campus.*

Think Together

Los Angeles, CA  
\$200,000  
*To sustain and expand after school learning programs to serve 10,000 students at 47 school campuses.*

Whole Child

Los Angeles, CA  
\$250,000  
*To provide integrated services for at-risk and homeless families by building an access center.*

Early Childhood

Casa Colina Hospital & Centers for Healthcare

Pomona, CA  
\$250,000  
*To provide novel therapeutic interventions for children with disabilities by creating an interactive musical playground.*

Long Beach Day Nursery

Long Beach, CA  
\$500,000  
*To increase quality care and early education for young children by expanding facilities.*

Save the Children

Los Angeles, CA  
\$200,000  
*To prepare young children for school success by expanding an early education program in the Antelope Valley.*

Health Care

Arroyo Vista Family Health Center

Los Angeles, CA  
\$200,000  
*To increase access to health care by equipping an expanded primary care clinic in Northeast Los Angeles.*

Children’s Clinic

Long Beach, CA  
\$500,000  
*To expand health and wellness services by constructing a clinic in a new affordable housing complex.*

John Tracy Center

Los Angeles, CA  
\$250,000  
*To expand the speech language pathology program to children with normal hearing.*

Los Angeles Trust for Children’s Health

Los Angeles, CA  
\$300,000  
*To expand the Data xChange to identify health trends and service gaps for LAUSD students and the impact on academic achievement.*

Vision to Learn

Los Angeles, CA  
\$250,000  
*To provide free eye exams and glasses via mobile health clinics to students in three school districts in Los Angeles County.*

Westside Infant-Family Network

Los Angeles, CA  
\$300,000  
*To identify children at risk for toxic stress and connect them and their families to mental health and basic needs resources.*

Precollegiate Education

EduCare Foundation

Van Nuys, CA  
\$300,000  
*To improve academic outcomes by expanding a year-round social-emotional learning support program to four local high schools.*

EnCorps

Los Angeles, CA  
\$200,000  
*To recruit and train STEM professionals to serve as teachers and tutors in Title I and charter schools.*

Get Lit - Words Ignite

Los Angeles, CA  
\$250,000  
*To enhance and expand an online poetry, literacy, and youth empowerment program to 190 middle and high schools.*

Partnership for Los Angeles Schools

Los Angeles, CA  
\$250,000  
*To support the continued transformation of Jordan High School by providing professional development and coaching to school leaders and teachers.*

UNDERGRADUATE EDUCATION

California State University

Long Beach

Long Beach, CA  
\$2,500,000  
*To allow freshman and sophomore students to engage in original research experiences through newly designed courses.*

Occidental College

Los Angeles, CA  
\$5,000,000  
*To renovate space in the Norris Hall of Chemistry to create the W. M. Keck Foundation Research Center for student and faculty research.*

Pasadena City College

Pasadena, CA  
\$1,000,000  
*To establish the Keck Biotechnology Program.*

Pepperdine University

Malibu, CA  
\$10,000,000  
*To establish the Keck Data Science Institute to support instruction, research and infrastructure in disciplines vital to STEM education.*

University of California, Los Angeles

Los Angeles, CA  
\$2,000,000  
*To support undergraduate research in the humanities, social sciences and the arts.*

# 2021 FINANCIAL STATEMENTS

## REPORT OF INDEPENDENT AUDITORS

The Board of Directors  
W. M. Keck Foundation

### Opinion

We have audited the financial statements of the W. M. Keck Foundation (the Foundation), which comprise the statements of financial position as of December 31, 2021 and 2020, and the related statements of activities and cash flows for the years then ended, and the related notes (collectively referred to as the “financial statements”).

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Foundation at December 31, 2021 and 2020, and the results of its operations and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

### Basis for Opinion

We conducted our audits in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditor’s Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Foundation and to meet our other ethical responsibilities in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free of material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Foundation’s ability to continue as a going concern for one year after the date that the financial statements are available to be issued.

### Auditor’s Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free of material misstatement, whether due to fraud or error, and to issue an auditor’s report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Foundation’s internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Foundation’s ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Ernst & Young LLP

May 12, 2022

December 31 (in thousands)	2021	2020
<b>Assets</b>		
Cash and cash equivalents	\$ 54,723	\$ 51,026
Interest and dividends receivable	1,528	1,606
Prepaid federal excise taxes	195	165
Investments	1,799,223	1,567,906
Receivable from brokers	17,753	12,360
Right-of-use asset	3,592	3,981
Other assets	1,580	1,094
Total assets	\$ 1,878,594	\$ 1,638,138
<b>Liabilities and net assets</b>		
Payable to brokers	\$ 35,293	\$ 24,801
Accounts payable and accrued expenses	2,116	1,833
Lease liabilities	3,715	4,029
Grants payable	31,690	26,493
Deferred federal excise taxes payable	10,998	8,373
Total liabilities	83,812	65,529
Net assets	1,794,782	1,572,609
Total liabilities and net assets	\$ 1,878,594	\$ 1,638,138

See accompanying notes.

STATEMENTS OF ACTIVITIES

Year Ended December 31 (in thousands)	2021	2020
<b>Revenues, income, and gains (losses):</b>		
Net investment income and (losses) gains:		
Interest	\$ 5,202	\$ 6,598
Dividends	7,851	6,507
Net realized gains on investments	119,026	56,718
Change in net unrealized gains	188,855	265,826
Investment management expenses	(9,597)	(7,799)
Taxes withheld	(100)	(85)
Total net investment income and gains	311,237	327,765
Other Income	28	30
Total revenues, income, and gains	\$ 311,265	\$ 327,795
<b>Expenses:</b>		
Grants	\$ 78,548	\$ 54,280
Salaries, employee benefits, and payroll taxes	3,206	3,777
Professional services, contract services, and other management and general services	2,568	2,157
Federal excise tax provision	4,770	4,847
Total expenses	\$ 89,092	\$ 65,061
Change in net assets	222,173	262,734
Net assets, beginning of year	1,572,609	1,309,875
Net assets, end of year	\$ 1,794,782	\$ 1,572,609

See accompanying notes.

STATEMENTS OF CASH FLOWS

Year Ended December 31 (in thousands)	2021	2020
<b>Operating activities</b>		
Change in net assets	\$ 222,173	\$ 262,734
Adjustments to reconcile change in net assets restrictions to net cash used in operating activities:		
Depreciation and amortization	573	559
Net realized gains on investments	(119,026)	(56,718)
Net change in unrealized gains on investments	(188,855)	(265,826)
Changes in operating assets and liabilities:		
Interest and dividends receivable	78	101
Prepaid federal excise taxes	(30)	502
Other assets	(613)	90
Receivable from brokers	(5,393)	(12,360)
Payable to brokers	10,492	24,667
Accounts payable and accrued expenses	283	(149)
Lease liabilities	(314)	(284)
Deferred federal excise taxes payable	2,625	3,695
Grants payable	5,197	(7,549)
Net cash used in operating activities	(72,810)	(50,538)
<b>Investing activities</b>		
Purchases of investments	(472,389)	(482,276)
Proceeds on disposition of investments and return of capital	548,953	548,038
Acquisition of fixed assets	(57)	(224)
Net cash provided by investing activities	76,507	65,538
Net increase in cash and cash equivalents	3,697	15,000
Cash and cash equivalents, beginning of year	51,026	36,026
Cash and cash equivalents, end of year	\$ 54,723	\$ 51,026
<b>Supplemental disclosures</b>		
Taxes paid during the year	\$ 2,175	\$ 650

See accompanying notes.

NOTES TO FINANCIAL STATEMENTS

December 31, 2021

1. Organization

Formation and Goals of the Foundation

W. M. Keck established the W. M. Keck Foundation (the Foundation) as a charitable trust in 1954. In 1959, Mr. Keck changed the trust entity to a corporate entity by forming the W. M. Keck Foundation as a Delaware corporation and transferring the trust’s assets, and eventually by bequeathing the residue of his estate, to the corporation. It is this Delaware corporation that exists today and continues to be known as the W. M. Keck Foundation. The Foundation’s goals are principally to identify and support university and college research and education programs in the areas of science, engineering, and medicine. In addition, the Foundation gives some consideration to promoting liberal arts education and, in Southern California, to supporting community services, health care, pre-collegiate education, and the arts. Operations are funded by the Foundation’s returns on its investment portfolio.

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Grant Payments

In accordance with accounting standards for not-for-profit entities, unconditional grant payments are recognized as an expense in the period in which they are approved. If these grants are to be paid over a period exceeding one year, they are recorded at the net present value of the future cash payments, using an applicable Treasury Bill rate. Grants that are conditioned upon a future and uncertain event are expensed when these conditions are met. A conditional promise to give is considered unconditional if the possibility that the condition will not be met is remote.

Cash and Cash Equivalents

Cash and cash equivalents are defined as liquid investments with remaining maturities of three months or less at time of purchase.

Investments

Investments in equity securities with readily determinable fair values and all investments in debt securities are measured at fair value in the statements of financial position. Fair value is established based on quoted prices from recognized securities exchanges.

Investments in private equity funds and hedge funds are measured at fair value, using the net asset value (NAV) as a practical expedient, which is based on NAVs reported by the fund managers. Pursuant to provisions of Accounting Standards Update (ASU) 2009-12, *Fair Value Measurements and Disclosures (Topic 820): Investments in Certain Entities That Calculate Net Asset Value per Share (or its Equivalent)*, the Foundation believes that the NAV of these investments as of December 2021 and 2020, approximates their fair value as of that date. However, because of the inherent uncertainty of valuation, the estimated fair values for these securities and interests may differ from the values that would have been used had a ready market for the investments existed, and the differences could be material.

Purchases and sales of securities are recorded on the trade date. Dividend income is recorded based upon the ex-dividend date. Interest income is recorded as earned on an accrual basis. Realized gains and losses are recorded upon disposition of securities based on the specific identification method. Unrealized gains and losses are included on the statements of activities and represent the net change in fair value for investments held at the end of the year.

Fair Value of Financial Instruments

The Foundation’s statements of financial position include, but are not limited to, the following financial instruments: cash and cash equivalents, accounts payable, and accrued liabilities. The Foundation considers the carrying amounts of these assets and liabilities on the statements of financial position to approximate the fair value of these financial instruments because of the relatively short period of time between origination of the instruments and their expected realization.

Concentrations of Credit Risk

Financial instruments that potentially subject the Foundation to concentrations of credit risk consist of cash and cash equivalents and investments. The investment portfolio is managed within the Foundation’s established investment guidelines.

Fixed Assets

Fixed assets are carried at cost, less accumulated depreciation, and are included in other assets on the statements of financial position. Depreciation is computed on the straight-line method over the estimated useful life of each type of asset or the term of the related lease, whichever is shorter. The depreciable lives for leasehold improvements are ten years, for furniture and equipment five years, and for software three years.

Leases

Under ASC 842, the Foundation determines if an arrangement is a lease at inception based on whether the Foundation has the right to control the asset during the contract period and other facts and circumstances. The Foundation has obligations as a lessee for office space and office equipment with initial noncancelable terms in excess of one year. The Foundation classified these leases as operating leases. Operating leases are included in right-of-use (ROU) assets and lease liabilities on the statements of financial position. ROU assets represent the Foundation’s right to use an underlying asset for the lease term, and lease liabilities represent the Foundation’s obligation to make lease payments arising from the lease, both of which are recognized at the commencement date based on the present value of future lease payments over the lease term. For this purpose, the Foundation considers only payments that are fixed and determinable at the time of commencement. The office space lease contains a renewal option of five years. Because the Foundation is not reasonably certain to exercise the renewal option, the optional periods are not included in determining the lease term, and associated payments under the renewal option are excluded from lease payments. As the implicit rates for the Foundation’s leases were not readily determinable, the Foundation’s incremental borrowing rate was used in determining the present value of lease payments. The Foundation’s incremental borrowing rate is a hypothetical rate based on the rate of interest the Foundation would have to pay on a collateralized basis to borrow an amount equal to the lease payments under similar terms and in a similar economic environment. The office space lease agreement contains variable costs such as common area maintenance, insurance, real estate taxes, or other costs. Variable lease costs are expensed as incurred on the statements of activity. Leases with a lease term of 12 months or less at inception are not recorded on the statements of financial position and are expensed on a straight-line basis over the lease term in the statements of activities. The Foundation’s lease agreements generally do not contain any residual value guarantees or restrictive covenants.

Fair Value of Measurement

The Foundation applies the principles of ASC 820, *Fair Value Measurement*, for all financial assets and liabilities that are recognized or disclosed at fair value in the financial statements. This standard defines fair value, establishes a consistent framework for measuring fair value, and expands disclosure for each major asset and liability category measured at fair value on either a recurring or nonrecurring basis. The standard clarifies that fair value is an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering such assumptions, the Foundation establishes a three-level fair value hierarchy that prioritizes the inputs used in measuring fair value as follows:

- Level 1 – Assets that have readily observable prices (quoted prices in active markets accessible at the measurement date for assets). The fair value hierarchy gives the highest priority to Level 1 inputs.
- Level 2 – Assets that are based on quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-based valuation techniques for which all significant assumptions are observable in the market or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Financial assets and liabilities in this category generally include asset-backed securities, corporate bonds and loans, municipal bonds, forward contracts, future contracts, interest and credit swap agreements, options, and interest rate swaps.
- Level 3 – Assets whose fair value cannot be determined by using observable measures and can only be calculated using estimates or risk-adjusted value ranges, when little or no market data is available. The inputs into the determination of fair value require management’s judgment or estimation of assumptions that market participants would use in pricing the assets or liabilities. The fair values are, therefore, determined using factors that involve considerable judgment and interpretations, including, but not limited to, private and public comparable, third-party appraisals, discounted cash flow models, and fund manager estimates. The fair value hierarchy gives lowest priority to Level 3 inputs.
- Assets and liabilities measured at fair value are based on one or more of three valuation techniques noted below:
- (a) *Market approach.* Prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities.
  - (b) *Cost approach.* Amount that would be required to replace the service capacity of an asset (replacement cost).
  - (c) *Income approach.* Techniques to convert future amounts to a single present amount based on market expectations (including present value techniques, option-pricing, and excess earnings models).

The Foundation’s assets measured at fair value on a recurring basis at December 31, 2021, were as follows (in thousands):

	Level 1	Level 2	Investments at NAV	Total
Assets:				
Common and preferred stock	\$ 781,851	\$ –	\$ –	\$ 781,851
Corporate bonds	–	31,980	–	31,980
Municipal bonds	–	3,569	–	3,569
Government bonds	31,395	43	–	31,438
Foreign investments	74,185	32,101	–	106,286
Mortgage- and asset-backed securities	–	78,117	–	78,117
Mutual funds	344,211	–	–	344,211
Private equity funds	–	–	394,684	394,684
Hedge funds	–	–	27,087	27,087
Total	\$ 1,231,642	\$ 145,810	\$ 421,771	\$ 1,799,223

The Foundation’s assets measured at fair value on a recurring basis at December 31, 2020, were as follows (in thousands):

	Level 1	Level 2	Investments at NAV	Total
Assets:				
Common and preferred stock	\$ 670,761	\$ –	\$ –	\$ 670,761
Corporate bonds	–	45,347	–	45,347
Municipal bonds	–	5,524	–	5,524
Government bonds	25,699	82	–	25,781
Foreign investments	67,883	34,702	–	102,585
Mortgage- and asset-backed securities	–	83,528	–	83,528
Mutual funds	281,584	–	–	281,584
Private equity funds	–	–	328,053	328,053
Hedge funds	–	–	24,743	24,743
Total	\$ 1,045,927	\$ 169,183	\$ 352,796	\$ 1,567,906

The Foundation has classified its mutual funds, equity securities, preferred stock, and certain of its government bonds and foreign investments that have quoted prices in active markets as Level 1 within the fair value hierarchy. These securities are valued under the market approach using inputs observable in active markets for identical securities. The Foundation has classified certain of its government bonds, corporate bonds, municipal bonds, foreign bonds, and mortgage- and asset-backed securities as Level 2 investments. The fair value of these assets is valued under the market approach using inputs observable in active markets for similar assets. The Foundation has measured its investments in hedge funds and private equity funds at fair value using the NAV as a practical expedient, which is based on NAVs reported by the fund managers. These investments that use NAV as a practical expedient are not classified in the fair value hierarchy. The fair value of the underlying assets in private equity funds is valued under the income approach using discounted cash flows and other inputs not observable in active markets. The hedge funds in which the Foundation is invested hold a mix of Level 1, 2, and 3 instruments.

NOTES TO FINANCIAL STATEMENTS (continued)

3. Liquidity and Availability of Resources

The Foundation's financial assets available within one year of the statements of financial position date for general expenditure are as follows (in thousands):

Year Ended December 31 (in thousands)	2021	2020
Cash and cash equivalents	\$ 54,723	\$ 51,026
Interest and dividends receivable	1,528	1,606
Liquid investments (excludes private equity)	1,404,539	1,239,853
Total financial assets available to management for general expenditure within one year	\$ 1,460,790	\$ 1,292,485
Supplemental disclosure		
Grant commitments due within one year	\$ (23,375)	\$ (15,625)

Liquidity Management

The Foundation has \$1,460,790,000 of financial assets available within one year of the balance sheet date to meet cash needs for general expenditure. None of the financial assets are subject to donor restrictions that make them unavailable for general expenditure within one year of the statements of financial position date. The Foundation maintains a policy of structuring its financial assets to be available as its general expenditures, liabilities, and other obligations come due. In addition, the Foundation invests cash in excess of daily requirements in short-term investments.

4. Investments

The cost and fair value of investments are as follows (in thousands):

	Year Ended December 31, 2021		Year Ended December 31, 2020	
	Cost	Fair Value	Cost	Fair Value
Common and preferred stock	\$ 334,821	\$ 781,851	\$ 322,318	\$ 670,761
Corporate bonds	28,395	31,980	38,741	45,347
Municipal bonds	2,734	3,569	4,371	5,524
Government bonds	31,823	31,438	25,738	25,781
Foreign investments	68,725	106,286	65,998	102,585
Mortgage- and asset-backed securities	79,567	78,117	83,098	83,528
Mutual funds	282,479	344,211	191,503	281,584
Private equity funds	146,000	394,684	200,315	328,053
Hedge funds	33,500	27,087	33,500	24,743
	\$1,008,044	\$ 1,799,223	\$ 965,582	\$ 1,567,906

The change in net unrealized gains on investments is reflected on the statements of activities and is summarized as follows (in thousands):

Year Ended December 31 (in thousands)	2021	2020
Net unrealized gains, beginning of year	\$ 602,324	\$ 336,498
Net unrealized gains (losses) on investments for the year	188,855	265,826
Net unrealized gains, end of year	\$ 791,179	\$ 602,324

The Foundation has made total capital contributions (net of distributions/return of capital) of \$179,500,000 to private equity funds and hedge funds it held as of December 31, 2021. The hedge fund can be redeemed on a quarterly basis after a one-year lock-up and are invested in Level 1, Level 2, and Level 3 investments. The private equity funds are primarily invested in assets valued using Level 3 inputs and, as of December 31, 2021, are subject to lock-up provisions up to nine years subject to certain further extension adjustments. The Foundation had total future capital commitments related to private equity funds of \$85,089,000 as of December 31, 2021.

5. Taxes

The Foundation qualifies as a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code and, accordingly, is not subject to federal income taxes. However, the Foundation is classified under the Internal Revenue Code (IRC) as a private foundation and, as such, was subject to a flat rate 1.39% federal excise tax on net investment.

During 2021 and 2020, the Foundation accrued a 1.39% excise tax on net investment income.

Private foundations are required to distribute annually, in qualifying charitable distributions, an amount equal to approximately 5% of the average fair market value of the Foundation's assets (the minimum distribution). If the Foundation does not distribute the required minimum distribution, a one-year grace period is granted to distribute the undistributed income.

The Foundation uses the liability method for accounting for excise taxes. The federal excise tax provision consists of the following (in thousands):

Year Ended December 31 (in thousands)	2021	2020
Current	\$ 2,145	\$ 1,152
Deferred	2,625	3,695
	\$ 4,770	\$ 4,847

Deferred federal excise taxes arise primarily from the net unrealized appreciation in the fair value of investments and the Foundation uses the maximum federal excise tax rate of 1.39% for the years presented for years after December 31, 2021.

The Foundation completed an analysis of its tax positions, in accordance with ASC 740, *Income Taxes*, and determined that there are no uncertain tax positions taken or expected to be taken. The Foundation has recognized no interest or penalties related to uncertain tax positions. The Foundation is subject to routine audits by the taxing jurisdictions; however, there are currently no audits in progress for any tax periods (tax years 2017 through 2021 remain open and subject to selection for such routine audits).

6. Functional Classification of Expenses

Functional expenses present expenses by function and natural classification. Expenses directly attributable to a specific functional area of the Foundation are reported as expenses of that functional area. Indirect or shared costs are allocated between Program Services and Management and General Services based on the proportion of full-time employee equivalents of a program or other supporting service versus the total organizational full-time employee equivalents.

NOTES TO FINANCIAL STATEMENTS (continued)

The following is a functional classification of the Foundation's expenses:

Year Ended December 31, 2021 (in thousands)	Program Services	Management and General	Total
Grants	\$ 78,548	\$ —	\$ 78,548
Salaries, employee benefits, and payroll taxes	2,857	349	3,206
Professional services, contract services, and other management and general services	2,189	379	2,568
Total functional expenses	\$ 83,594	\$ 728	\$ 84,322

Year Ended December 31, 2020 (in thousands)	Program Services	Management and General	Total
Grants	\$ 54,280	\$ —	\$ 54,280
Salaries, employee benefits, and payroll taxes	3,436	341	3,777
Professional services, contract services, and other management and general services	1,948	209	2,157
Total functional expenses	\$ 59,664	\$ 550	\$ 60,214

7. Grants Payable and Conditional Grant Commitments

Grants payable and conditional grant commitments as of December 31, 2021, are as follows (in thousands):

	Unconditional	Conditional
2022	\$ 23,375	\$ —
2023	3,000	18,000
2024	3,000	15,500
2025 and thereafter	2,700	122,250
	\$ 32,075	\$ 155,750
Less present value discount	(385)	—
	\$ 31,690	\$ 155,750

Projected timetable and payment amounts shown above for conditional grants are estimated. Conditional grants will be recorded as an expense in the period when the conditions to the grant are met. These grants are conditioned upon other donors matching the amounts contributed by the Foundation, receipt of building permits and other regulations, and compliance with budget, timetable, and grant agreement requirements.

8. Lease Commitments

The Foundation has operating leases related to office space and office equipment. New leases commenced for office space and for office equipment in 2019. Statement of financial position information related to operating leases are as follows (in thousands):

Year Ended December 31 (in thousands)	2021	2020
ROU asset	\$ 3,592	\$ 3,981
Lease liabilities	3,715	4,029

As of December 31, 2021, the Foundation's leases have original lease periods expiring between 2022 and 2029. The office space lease includes an option to renew for an additional five years.

The components of lease costs, lease term, and discount rate are as follows (in thousands):

Year Ended December 31 (in thousands)	2021	2020
Operating lease cost	\$ 546	\$ 546
Variable lease cost	345	361
Total operating lease cost	\$ 891	\$ 907

Year Ended December 31 (in thousands)	2021	2020
Weighted average remaining lease term for operating leases	7.91 YEARS	8.89 YEARS
Weighted average discount rate for operating leases	4.05%	4.04%

The following table summarizes the maturity of the Foundation's operating lease liabilities as of December 31, 2021 (in thousands):

Year Ended December 31 (in thousands)	
2022	\$ 487
2023	500
2024	520
2025	541
2026	563
Thereafter	1,772
Total operating lease payments	\$ 4,383
Less imputed interest	(668)
Present value of operating lease liabilities	\$ 3,715

Supplemental cash flow information related to leases are as follows (in thousands):

Year Ended December 31 (in thousands)	2021	2020
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flow from operating leases	\$ 473	\$ 455
ROU assets obtained in exchange for lease obligations:		
Operating leases	\$ —	\$ —
Reductions to ROU assets resulting from reductions to lease obligations:		
Operating lease	\$ (388)	\$ (377)

9. Employee Retirement Plan

The Foundation maintains a qualified 401(k) Profit Sharing Plan (the Plan) for eligible employees. Employees can contribute a percentage of their pretax compensation subject to Internal Revenue Service (IRS) limitations. The Foundation matches 200% of the employee’s deferral, but not more than 6% of the employee’s compensation in total until IRS compensation limits are reached. The Foundation’s matching contributions to the Plan were approximately \$280,000 and \$278,000 for the years ended December 31, 2021 and 2020, respectively.

10. Uncertainties

In March 2020, the World Health Organization recognized the novel strain of coronavirus, COVID-19, as a pandemic. The coronavirus outbreak has severely restricted the level of economic activity. As a result, there has been significant volatility in equity and debt markets. Any public health emergency, including the outbreak of COVID-19 or other epidemic diseases, and the resulting financial and economic market uncertainty could have a significant adverse impact on the Foundation, including the fair value of investments. Given the uncertainty of the spread of the coronavirus, the related financial impact to the Foundation, if any, cannot be determined at this time.

11. Subsequent Events

The Foundation’s management has evaluated subsequent events through May 12, 2022, which is the date these financial statements were available to be issued.

Management has determined that no other material subsequent events have occurred during that period that would require the Foundation to either recognize the financial impact of such events in the accompanying financial statements or disclose any such events to ensure the financial statements are not misleading.

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