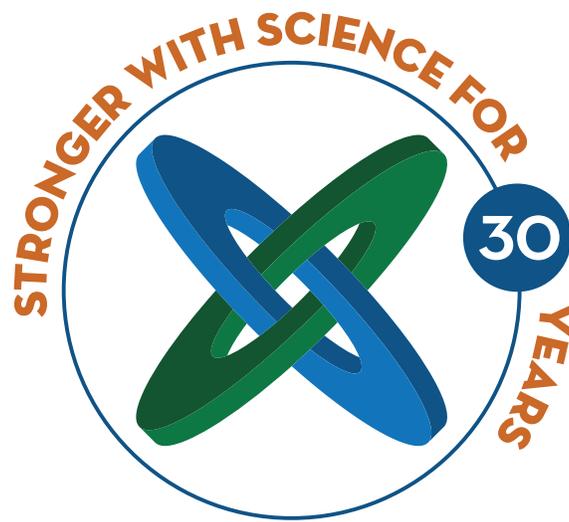


CCST ANNUAL REPORT 2017



CCST
CALIFORNIA COUNCIL ON
SCIENCE & TECHNOLOGY

1988 – 2018
THIRTY YEARS OF MAKING CALIFORNIA'S POLICIES
STRONGER WITH SCIENCE

1988

JUNE 30, 1988
Assembly Concurrent Resolution 162 (Assemblymembers Farr, Quackenbush, Eastin, and Duplissee; Senator Garamendi as coauthor) offered.

1988

AUGUST 26, 1988
The Assembly votes to adopt ACR 162.

1988

AUGUST 31, 1988
ACR 162 is read for a third time and presented by Senator Garamendi on August 31. Roll was called, and the resolution was adopted by the State Senate, 38-0.

1988

SEPTEMBER 15, 1988
ACR 162 is filed into record with the Secretary of State, formally chartering CCST.

1989

The first meetings of the CCST Board and Council are held.

1995

MAY 19, 1995
Susan Hackwood, Founding Dean of Engineering at UC Riverside, was appointed Executive Director of CCST by the University of California Board of Regents, appointment effective July 1st.

1997

SEPTEMBER 1997
The CCST Senior Fellows program is launched with funding from the Hewlett Foundation, bestowing the title upon 54 California leaders in science and technology.

1999

NOVEMBER 1999
CCST releases the final component of the twelve-part California Report on the Environment for Science and Technology (CREST). It culminates a multi-year effort and the first comprehensive assessment of the state's science and technology indicators, and offers recommendations for how industry leaders, academic administrators, and state policymakers can plan more effectively for a high-tech economy in the future.

2003

The CCST Science & Technology Policy Fellowship (CCST Science Fellows) program is proposed, originally conceptualized as the California Science and Technology Experts in Residence (CASTER).

2004

The National Academies and CCST enter into a memorandum of understanding agreeing to cooperate to their mutual benefit.

SCIENCE AT YOUR SERVICE

LOOKING BACK ON **THREE DECADES** OF **CCST** COLLABORATIONS AND CONVERSATIONS ADVISING STATE LEADERS

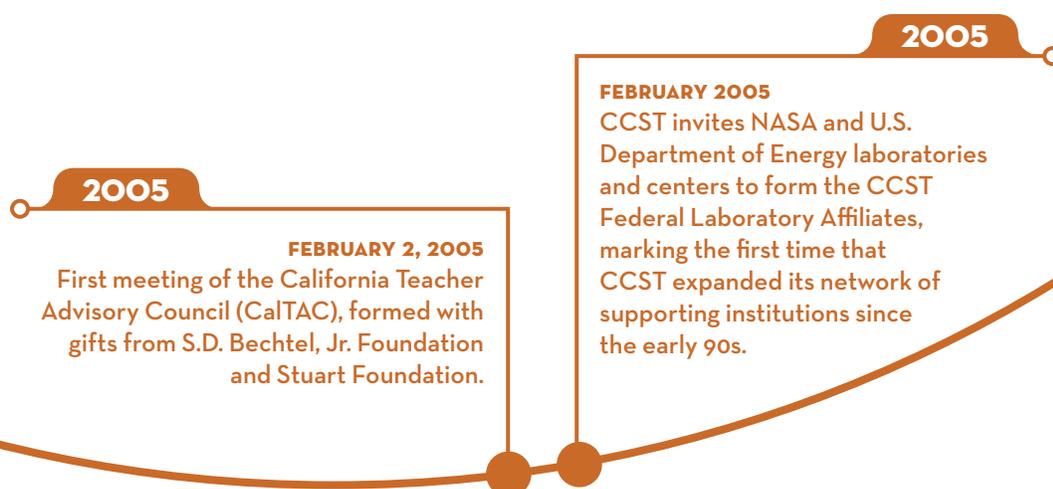
The California Council on Science and Technology (CCST) is a nonpartisan, nonprofit organization established via the California State Legislature in 1988. CCST responds to the Governor, the Legislature, and other state entities who request independent assessment of public policy issues relating to science and technology that affect the State of California.

In 1988, a coalition of policymakers and institutional leaders were seeking ways to catalyze the role of science and technology in California’s future direction in research, industry, and policy. The effort resulted in Assembly Concurrent Resolution 162 – championed by then-Assemblymember Sam Farr and then-Senator John Garamendi – calling for the creation of CCST.

California has seen great advances and new challenges since then, and CCST has been invited as a voice of counsel at each turn. Over the past three decades, CCST has been asked to report on the state’s R&D competitiveness, STEM education, energy production, and water future, among many other timely topics.

CCST itself has evolved as well: it added the **CCST Science & Technology Policy Fellowship** program to train more scientists for public policy careers, and it added the **Federal Laboratory Affiliates** to enhance its network of in-state experts – complementing CCST’s sustained partnership with the **University of California, California State University, California Community Colleges, Stanford, and Caltech**.

California’s leadership in technology, environmental stewardship, biomedicine, and other critical fields relies on its policymakers having access to clearly communicated, scientifically informed advice. With this need in mind, CCST will continue to engage leading experts in science and technology to advise State policymakers – ensuring that California policies are strengthened and informed by scientific knowledge, research, and innovation.





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THE CALIFORNIA COUNCIL ON SCIENCE AND TECHNOLOGY

MAKING CALIFORNIA'S POLICIES STRONGER WITH SCIENCE

OUR MISSION

To engage leading experts in science and technology to advise State policymakers — ensuring that California policy is strengthened and informed by scientific knowledge, research, and innovation.

OUR VISION FOR THE GOLDEN STATE

That California enhances its global leadership in science, technology, and innovation — guiding our State, our Nation, and our world towards a healthy economy, society, and environment.

CCST is a nonpartisan, nonprofit organization established via the California State Legislature in 1988 to provide objective advice from California's best scientists and research institutions. **We respond to the Governor, the Legislature, and other state entities** who request independent assessment of public policy issues affecting the State of California relating to science and technology.

California's policies are stronger with science, and CCST is uniquely qualified as an organization created via the Legislature to convene a statewide network of experts across disciplines and institutions. As this coordinating body, CCST can provide **impartial expertise that extends beyond the resources or perspective of any single institution**. We offer state policymakers the increased ability to conduct analytical assessments — and to arrive at informed decisions on complex science and technology issues affecting California and its citizens.

5

CCST is modeled after the **National Academies of Sciences, Engineering, and Medicine** — the official scholarly body serving the United States of America — to provide the State of California with a parallel network of institutional and individual advisors. Following this model, CCST operates in partnership with, as well as receives financial and mission support from, a vibrant network of public, private, and federally funded research institutions:

OUR STATE SUSTAINING INSTITUTIONS

The University of California (UC) System
The California State University (CSU) System
California Community Colleges (CCC)
Stanford University
California Institute of Technology (Caltech)

OUR FEDERAL LABORATORY AFFILIATES

NASA Ames Research Center
NASA Jet Propulsion Laboratory
Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Sandia National Laboratories-California
SLAC National Accelerator Laboratory
National Renewable Energy Laboratory

CCST OPERATIONS AND FELLOWSHIPS ARE ALSO MADE POSSIBLE BY THE
GENEROUS SUPPORT OF MANY PHILANTHROPIC INDIVIDUALS AND FOUNDATIONS
THROUGH OUR ANNUAL GIVING AND MAJOR GIFTS PROGRAMS.

LETTER FROM THE BOARD CHAIR AND THE EXECUTIVE DIRECTOR

Science and technology lie at the core of California's identity. At all stages of our state's history, scientific discoveries and technological innovation have led to engines of prosperity as well as lessons of humility. The knowledge generated by California's researchers and inventors have done much to inform the decisions of our leaders and policymakers — shaping the economy, society, and environment of the Golden State, decade after decade.

For the past 30 years, CCST has proudly served as the conveners and translators of scientific and technological knowledge for California's leadership. The very creation of the California Council on Science and Technology was called for by state legislators themselves — a coalition led by then-Assemblymember **Sam Farr** and then-Senator **John Garamendi**, who in 1988 recognized the need for science to help inform policy.

Indeed, science has been at your service ever since. Governor after governor, legislative session after legislative session, CCST has been called upon to help state leaders answer complex policy questions affecting the citizens of California.

These requests reflect the urgencies and uncertainties facing our state and the world at each moment in time. In the 1990s and early 2000s, many of our requests were focused on assessing the status of California's innovation competitiveness, and on strategies to energize California's

workforce via investments in STEM education resources for K-12 students. Later in the 2000s, emerging topics like nanotechnology came to the fore. In the early 2010s, attention turned towards the spectre of greenhouse gas emissions, and preparations for California's energy future and water future. In recent years, current events called for assessments of technologies such as underground natural gas storage and hydraulic fracturing — and roadmaps to leverage promising trends such as the Maker Movement for K-14 education.

We are also extremely proud of our **CCST Science & Technology Policy Fellowship**, launched in 2009 with the support of premier philanthropic institutions as well as family foundations and individuals, with nearly 80 PhD scientists now trained through the program. That we will be placing our 10th class in 2018 — and have inspired at least nine other states to explore similar fellowships — is a testament to the sustained charitable support from our benefactors, and the trust we have earned from state leaders.

CCST's motto is “**making California's policies stronger with science**” — and this strength comes from harnessing the expertise needed to address whatever emerging topics deemed to be priorities by state executives and lawmakers. From our own **CCST Council Members** to the wealth of leading academics across our **CCST Sustaining Institutions** and **CCST Federal Laboratory Affiliates**, our pool of expertise grows deeper with time, adapting to the shifting currents of new discoveries and societal needs.

As CCST looks back on three decades of service advising California's state leaders, our sense of pride is undeniable. **We are grateful for this responsibility to advise our great state — and we stand ready to serve in the decades to come.**

CHARLES KENNEL PHD
CCST BOARD CHAIR
FORMER ASSOCIATE ADMINISTRATOR, NASA
FORMER DIRECTOR, SCRIPPS INSTITUTION OF OCEANOGRAPHY

SUSAN HACKWOOD PHD
CCST EXECUTIVE DIRECTOR
FOUNDING DEAN, UC RIVERSIDE
BOURNS COLLEGE OF ENGINEERING



LETTER FROM THE CCST COUNCIL CHAIR

What's in a name? For the **California Council on Science and Technology**, “Council” is the operative word.

In **Assembly Concurrent Resolution 162**, which chartered CCST in 1988, it was resolved that the membership of the Council “be comprised of distinguished scholars and experts, including scientists and engineers from California’s academic and industrial community” — and that the Council shall “respond appropriately to the Governor, the Legislature, and other relevant entities on public policy issues significantly related to science and technology.”

All of which places weighty responsibility on the title of “Council Chair” and its bearer.

As I conclude my appointment as **CCST Council Chair** and reflect on my three years in this role, I am reminded of the honor and privilege I have had in steering this body of illustrious scientific minds and ingenious innovators in our collective service to the great state of California.

In my career, I have found success as an academic researcher and educator at Stanford and UC Berkeley, and as an entrepreneur and business leader, building biotechnology companies to help solve unmet medical needs. But it was my position on the CCST Council that solidified my appreciation for the importance of science in service to governance and public policy.

The State of California is inventive, daring, and savvy with foresight because our leaders consider and incorporate scientific input when making critical policy decisions. To do so, our leaders need clearly translated, policy-relevant information and insights distilled from the top subject-area researchers and practitioners in the state. And this translation facilitation is the crucial role that CCST provides.

In my time as Council Chair, I have witnessed the intricate balance required to bridge scientists and policymakers. Whenever CCST receives a request from state leaders, our Council Members rise to the challenge, lending their specific expertise or recommending other leading scientists who can best address the question. Then, working together with the capable, talented associates on staff at CCST, we deliver our analysis and findings in formats that meet the needs of Capitol decision makers — be it a detailed report, a concise one-pager, an expert panel, or an in-person briefing.

Providing impartial data and well-communicated recommendations so that a leader can make their best decision? That is a service any executive in business, academia, and government should appreciate.

CCST, its Council, and its staff have much to be proud of in the 30 years since its founding. The decades ahead will undoubtedly reveal new frontiers and herculean tasks for both scientists and policymakers in our great state. But I am comforted in knowing that CCST will always be there to answer the call — to help make California’s policies stronger with science.

COREY GOODMAN PHD
OUTGOING CCST COUNCIL CHAIR
MANAGING PARTNER, VENBIO PARTNERS, LLC





CCST GOVERNANCE AND CAPACITY

THE BOARD AND COUNCIL: SAME MISSION, TWO FUNCTIONS

California Assembly Concurrent Resolution 162 (1988) called for the creation of the California Council on Science and Technology to “respond appropriately to the Governor, the Legislature, and other relevant entities on public policy issues significantly related to science and technology.” It was resolved that the membership of the Council “be comprised of distinguished scholars and experts, including scientists and engineers from California’s academic and industrial community.”

As a result, two major bodies work together to implement the mission and programming of CCST: **the Board, and the eponymous Council.**

THE BOARD PROVIDES GOVERNANCE

As a registered 501(c)(3) not-for-profit corporation, CCST is governed by a Board of Directors.

The **Board** provides strategic vision and direction and has fiduciary responsibility for CCST. Distinguished leaders from academia and industry — including those representing our **Sustaining Institutions** and **Federal Laboratory Affiliates** — form the 16 members of the Board.

See Page 33 for our Board of Directors roster.

THE COUNCIL PROVIDES CAPACITY

The **Council** itself is comprised of up to 30 California-based scientists, industry leaders, and scholars of the highest distinction. The expertise makeup of the Council tend to reflect the diversity of priority issue areas facing the State of California at any point in time.

The Council does not govern the direction of CCST; instead, it serves as the principal operational body of CCST, guiding its work and fulfilling its charter to respond to the Governor, the Legislature, and other entities. It performs two primary functions:

Convening Experts: When CCST receives a request for science and technology advice from state leaders, our staff relays this call for assistance to CCST Council Members, who then respond with suggestions for relevant experts from their field or sector of expertise.

Leading Commissioned Projects and Reports: When the Governor, the Legislature, or other state entities request that CCST conduct an independent assessment, CCST Council Members are called upon to serve on the project’s Steering Committee, and recruit other leading experts as report authors.

See Page 34 for our Council Members roster.

See Page 14 for the Commissioned Reports process.

A LIFETIME HONOR: THE CCST SENIOR FELLOWS

Created in 1997, the CCST Senior Fellows are an invited roster of distinguished California scientists, practitioners, and innovators with a lifetime of deep experience in a field of science and technology. The CCST Senior Fellows program was created to parallel that of the “Members of the National Academy of Sciences” with the National Academies of Science, Engineering, and Medicine, providing the State of California with a similar body of lauded scientific leaders.

Their titles are for life — for many, it is the latest of many national and global commendations, from the Nobel Prize to MacArthur “Genius” Grants, from Presidential Cabinet appointments to university chancellorships. But collectively, their real-world experience and intellectual depths do much to serve California, giving our state and CCST not only a source of pride, but a ready pool of expertise to draw from in times of advice and need. They are the best in science and technology that our great state has to offer.

See Page 39 for our Senior Fellows roster.

CCST ACTIVITIES IN SERVICE TO THE STATE OF CALIFORNIA

In the 30 years since its creation, CCST has actively engaged the Capitol policy community to tailor its services for convening impartial advice and expertise. Leveraging its network of experts across the University of California, California State University, California Community Colleges, Stanford, Caltech, and NASA and DOE campuses, CCST can respond to Capitol offices on a number of requests. In order of response time, from brief to extended:

Chat with an Expert: CCST can search for and connect state offices with relevant experts via email or phone to glean background information on the science or technology topic at hand.

Expert Testimony: CCST can search for and connect state offices with relevant researchers and practitioners to provide expert testimony at a hearing on the science or technology topic at hand.

In-Office Meeting with Experts: CCST will search for relevant experts and facilitate meetings for your office to be briefed on a science or technology topic of your choosing.

CCST Expert Briefings: CCST will organize a panel briefing in the Capitol around a science or technology topic of your choosing, selecting and convening relevant experts from California and beyond, accompanied by a clearly written CCST One Pager handout.

CCST Emerging Topic Report: CCST staff, with input from our network of experts, will produce a short report that reviews a science or technology topic of your choosing. This series is best for new and rapidly evolving issues areas, serving as a high-level overview of current knowledge, rather than a definitive, in-depth analysis.

Expert Workshop: CCST will convene experts to provide their expert opinion and discuss in detail your science-technology-related questions. CCST will produce summary notes from the workshop.

Commissioned Projects and Reports: As directed by the Governor, the Legislature, or other state entities, CCST will convene a balanced committee of experts to produce a full-length report that will be vetted through a rigorous peer-review process. Executive, Legislative, and public briefings will be included in the report roll-out. Commissioned reports require dedicated funding through state authorization.

Make a Request with CCST:

Contact Amber Mace at ambermace@ccst.us

2017 UPDATE ON CCST RESPONSES TO STATE REQUESTS

In addition to routine requests received from the Executive Branch, the Legislature, and other state entities via email, telephone, and in-person meetings, CCST devoted time and effort towards the following responses and projects during 2017:

Rapid Response

- Expert Briefing: Hepatitis A
- Emerging Topic Report: K-12 Makerspace

Commissioned Projects and Reports

- Underground Natural Gas Storage in California
- Assessing Biomethane Delivery in California
- Organizing California's Water Information Systems
- Community Colleges and the Maker Movement
- Water in Oil and Gas

RAPID RESPONSE

The world of the California State Capitol is fast-paced and in constant need for updated, accurate information summarized in policy-relevant terms, often on deadline.

This tightly wound process can leave one lost if the topic at hand is technically complex — especially when it comes to areas of science and technology. Who are the best experts on the landscape to reach out to? Can they be trusted to offer reliable, impartial information and insights? Are they prepared to deliver briefings in a clear, concise manner, translating in-depth knowledge into policy implications that can directly inform critical decisions?

Comprised of policy professionals with legislative, agency, and journalism experience, the associates on staff at CCST understand the rhythm and needs of Capitol decision makers. To satisfy the “rapid response” nature of such requests for science and technology advice, CCST pays attention not simply to the available experts in its statewide network, but in particular those who can communicate science clearly for a policymaking audience.

For these rapid response services, the CCST charge to “respond appropriately” to state leaders is interpreted as being timely, pithy, and helpful. As CCST continues to grow its corps of policy-savvy staff, our ability to quickly deliver CCST Expert Briefings and One Pagers and convene other conversations and meetings also will grow.

CCST One Pagers succinctly summarize the background information and policy-relevant discussions necessary for a reader to be briefed on a science or technology topic.



RESPONDING QUICKLY TO LEGISLATIVE REQUESTS IS KEY TO CCST'S SUCCESS. OUR RAPID RESPONSE FUND IS A UNIQUE RESOURCE DONORS AND PARTNERS PROVIDE.

CCST EXPERT BRIEFING: HEPATITIS A

In 2017, San Diego County began to experience an outbreak of hepatitis A, alarming public health officials and government leaders at the state and county level. Health practitioners, agency officials, and medical scientists around California rallied forces to understand and address the trend.

Sacramento lawmakers increasingly sought background information and case study insights on the outbreak. In response to this demand, CCST launched its “Expert Briefing” series with hepatitis A as the focal topic.

With consultation from CCST Council Members and assistance from the Health Officers Association of California, five experts were invited to Sacramento in December 2017 to deliver the briefing, including two from CCST Sustaining Institutions:

Bob Kim-Farley MD MPH, Director of Communicable Disease Control and Prevention, L.A. County Dept. of Public Health

Paul Kwo MD, Professor of Medicine and Director of Hepatology, Stanford University Medical Center

Jeffrey Norris MD, Medical Director of Father Joe’s Villages—Village Family Health Center in San Diego

Francesca Torriani MD, Professor of Clinical Medicine, UC San Diego School of Medicine

James Watt MD MPH, Division Chief, Communicable Disease Control, California Department of Public Health

An audience of some 60 legislative staff and Capitol community members attended the briefing, which was officially hosted in partnership with the California State Senate Health Committee and Senator Dr. Ed Hernandez, Chair; Senator Ben Hueso; Assemblymember Todd Gloria; Assemblymember Brian Maienschein; and Assemblymember Jim Wood.

During the hour-long briefing and Q&A, panelists explained the biology and epidemiology of the hepatitis A virus, as well as the management, vaccination, and treatment of at-risk populations. Options for local- and state-level actions to address and prevent outbreaks were discussed, and all attendees received a succinct CCST One Pager clearly summarizing key takeaways from the briefing.

DOWNLOAD THE CCST ONE PAGER:
ccst.us/publications/2017/2017HepA.pdf

The debut of the CCST Expert Briefing series and the CCST One Pager focused on the science of the hepatitis A outbreak in California.



A San Diego County public health nurse gives a hepatitis A vaccination to a homeless man. Courtesy County News Center



EMERGING TOPIC REPORT: K-12 MAKERSPACE

With rapid progress and early success of the **California Community Colleges “CCC Maker”** program (see page 18), conversations on the impact of makerspaces in California naturally turn to those on K-12 classrooms. Many are finding potential for educators to incorporate the “maker mentality” into existing K-12 curricula and individual lesson plans, but what challenges remain if makerspaces are to be adopted across the state?

To complement ongoing discussions and burgeoning efforts already underway around the state, CCST produced **“The Maker Movement and K-12 Education: Current Status and Opportunities for Engagement in California”** — the pilot offering of the “Emerging Topic Report” series.

Authored by CCST Senior Program Associate Brie Lindsey PhD and CCST Senior Research Associate M. Daniel DeCillis PhD, the new report provides an overview of what makerspaces look like in K-12 environments, and what maker-centered instruction and assessment of learning looks like at that level. In particular, the report sought to identify opportunities to build on existing engagements between K-12 institutions and higher education initiatives, such as CCC Maker.

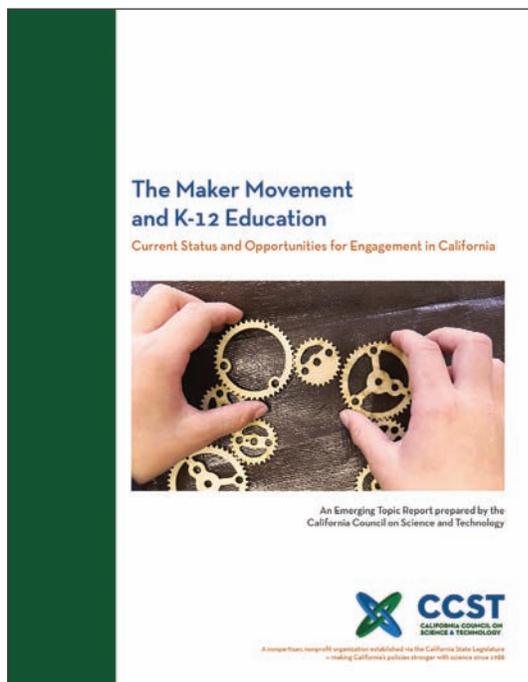
The new K-12 report found that there is significant interest in the maker movement among K-12 educators in California, though actual implementation of maker education varies. As the equipment and environment used in many makerspaces are not always practical for K-12 schools due to resource constraints and the younger age of students, K-12 educators often only adopt certain aspects of maker education.

Also, learning outcomes from the types of open-ended educational activities inherent to makerspaces cannot be readily measured by traditional education metrics, which poses a challenge for those seeking to integrate makerspaces into K-12 curricula. Cultural considerations must also be addressed: who will be able to learn well in a makerspace, and how can that access be expanded or adapted?

The report was completed with input from leading maker education practitioners, including Kylie Peppler PhD of Indiana State University and Jessica Parker PhD of Maker Ed.

[DOWNLOAD THIS EMERGING TOPIC REPORT:
ccst.us/publications/2017/2017K-12makers.php](http://ccst.us/publications/2017/2017K-12makers.php)

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“EXPLORING OPPORTUNITIES FOR THE MAKER MOVEMENT IN CALIFORNIA’S K-12 ENVIRONMENT IS A NATURAL EXTENSION OF THE WORK WE UNDERTOOK FOR THE CALIFORNIA COMMUNITY COLLEGES. EDUCATION ORGANIZATIONS AND LEADERS AROUND THE COUNTRY ARE ALREADY ACTIVELY GROWING THIS MOVEMENT, AND WE HOPE THIS REPORT ADDS TO THAT CONVERSATION AND SERVES AS A HELPFUL READER FOR ANYONE INTERESTED IN STEM EDUCATION INNOVATION.”
— Susan Hackwood, CCST Executive Director

COMMISSIONED PROJECTS AND REPORTS

When faced with policy questions requiring in-depth assessment of science, technology, and innovation issues, California state leaders have been calling on CCST to produce **Commissioned Reports** since its founding in 1988.

Commissioned reports are the highest level of research and deliberation process conducted by CCST to provide sound science. As directed by the Governor, the Legislature, or other state entities, CCST convenes a balanced committee of experts to produce full-length reports that are vetted through a rigorous peer-review process. Because such reports are necessarily dense and thorough, care is taken to translate the findings and recommendations into digestible briefings and summaries for Executive, Legislative, and other stakeholders.

TRANSPARENCY, BALANCE, AND RELEVANCE

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For any given report topic requested, CCST draws from the most qualified scientists, engineers, and practitioners across our networks of **Sustaining Institutions** and **Federal Laboratory Affiliates** and beyond. When CCST recruits and assembles these teams of experts, we seek a balance of professional perspectives and technical expertise. We convene a breadth of experts who can translate scientific data into nuanced, real-world assessments that inform policy — not just give one-dimensional answers to a multifaceted question.

REVIEW AND RIGOR

CCST reports are subject to the same rigorous process of peer review as publications in scientific journals — in fact, even more so. In addition to the balanced set of experts and expertise for each study that CCST convenes as **Report Authors**, each study is assigned an independent “**Report Monitor**” to ensure that peer review comments are sufficiently addressed in the final report. These steps are guided by a **Steering Committee**. **The entire process, including conflict-of-interest declarations, are further reviewed by an Oversight Committee.**

EXPANSIVE AND IN-DEPTH

CCST reports have been requested on some of California’s most complex questions and challenges. They have brought impartial reviews to topics such as **well-stimulation technology (requested via SB 4, Pavley, 2013)**; they have brought clarity in public debates over new technology, such as **assessing the health impacts of smart meters (requested by Assemblymembers Jared Huffman and Bill Monning)**; and they have mustered comprehensive overviews of statewide trends such as **California’s energy future (driven by Executive Order S-3-05, Schwarzenegger)**.

These reports provide California state leaders with the impartial information and expert analysis they need to make critical decisions — truly making California’s policies stronger with science.

COMMISSIONED PROJECTS
AND REPORTS ARE
SUPPORTED THROUGH
DEDICATED FUNDING
VIA STATE AUTHORIZED
CONTRACTS OR
FOUNDATION GRANTS.

UNDERGROUND NATURAL GAS STORAGE IN CALIFORNIA

In response to **Governor Brown's** January 2016 state of emergency proclamation regarding the **Aliso Canyon** gas leak, **SB 826 (Leno, 2016)** requested that CCST provide the state with up-to-date information on all currently operating underground natural gas storage fields in California.

The **California Public Utilities Commission** — in consultation with the **California Energy Commission**, the **California Air Resources Board**, and the **Division of Oil, Gas, and Geothermal Resources** within the **Department of Conservation** — instructed CCST to provide an independent technical assessment answering three key questions about:

1. The risks California's underground gas storage facilities pose to health, safety, environment, and infrastructure;
2. Whether California needs underground gas storage to provide for energy reliability through 2020; and
3. How implementation of California's climate policies changes the future need for underground gas storage.

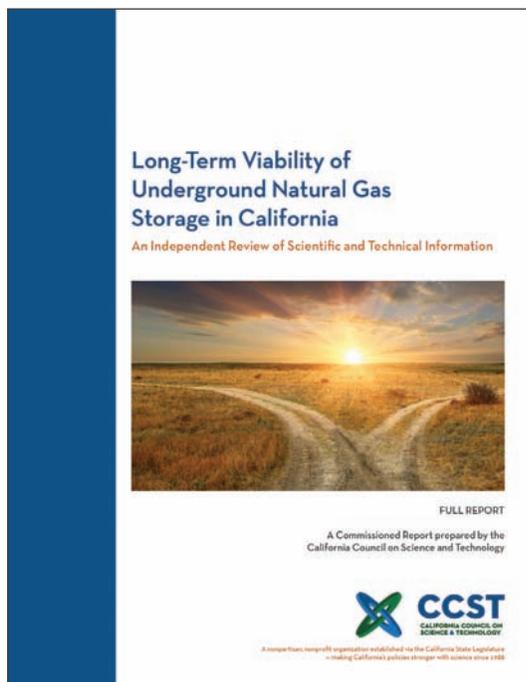
From a statewide field of leading energy researchers, CCST selected **Jens T. Birkholzer** of the **Lawrence Berkeley National Laboratory**, and independent scientific consultant and CCST Council Member **Jane C.S. Long** to serve as co-chairs of the 12-member CCST Report Steering Committee — which supervised 21 Report Authors with expertise spanning hydrogeology and reservoir engineering, risk assessment, public and occupational health, greenhouse gas (GHG) emissions, and energy analysis and economics.

The Steering Committee drafted the conclusions and recommendations, which are based on a review of published literature and official and voluntary databases, which the Report Authors compiled between January through September 2017. The entire report was subject to a peer review process by independent experts, while another independent expert served as Report Monitor to oversee the process, ensuring that peer review comments were sufficiently addressed in the final report. An additional Oversight Committee reviewed the entire process, including conflict-of-interest declarations.

The completed report will be delivered on time to the California Public Utilities Commission in January 2018, with associated briefings scheduled with Capitol offices and other stakeholders.

ONLINE:
www.ccst.us/projects/natural_gas_storage

PROJECT MANAGER:
Sarah Brady PhD, sarah.brady@ccst.us



THE FULL REPORT, A SUMMARY REPORT, AND EXECUTIVE SUMMARY FOR THE UNDERGROUND NATURAL GAS STUDY WILL BE DELIVERED IN JANUARY 2018.

ASSESSING BIOMETHANE DELIVERY IN CALIFORNIA

SB 840 (2016), a Senate Budget and Fiscal Review Committee trailer bill, requested that CCST complete a study analyzing the minimum heating value and maximum siloxane specifications for the delivery of biomethane to the public gas pipelines, and their impacts to cost, volume of biomethane sold, equipment operation, and safety.

This is important as it will affect biomethane producers, public utilities, and consumers. The study must consider and evaluate other states' standards, the source of biomethane, the dilution of biomethane after it is injected into the pipeline, and the equipment and technology upgrades required to meet the specifications.

Incoming CCST Council Chair and Stanford University Professor **Jim Sweeney** was chosen to serve as Steering Committee Chair for this report, and Stanford University Professor **Adam Brandt** will serve as the lead researcher. Delivery of the report is expected in June 2018.

CCST will write a report with an executive summary, introduction, and five chapters:

Chapter 1: Heating Value Specification for Pipeline Injection Biomethane

Chapter 2: Siloxane Specifications for Pipeline Injection of Biomethane

Chapter 3: Options for Dilution of Biomethane after Pipeline Injection

Chapter 4: Case Studies of Region-Specific and Utility-Specific Considerations

Chapter 5: Summary and Future Directions

ONLINE:

www.ccst.us/projects/biomethane

PROJECT MANAGER:

Sarah Brady PhD, sarah.brady@ccst.us

WATER IN OIL AND GAS ACTIVITIES

CCST's 2013 report to satisfy the requirements of **SB 4 (Pavley, 2013)** recommended that the State collect data on water used, produced and treated in all petroleum industry activities, not limited to hydraulic fracturing.

SB 1281 (Pavley, 2014) now requires data reporting on water use, production, storage, treatment, and disposal in the oil and gas industry. CCST will conduct a two-phase early assessment of the required data collection, to enable the state to implement the important provisions of SB 1281 in the most illuminating and efficient manner possible.

During Phase I of the study, CCST will collaborate with the **Division of Oil, Gas, and Geothermal Resources** within the **Department of Conservation**; the **State Water Resources Control Board**; and other relevant state agencies and entities to produce a short report. This project phase will identify important questions for State decision makers about the water life cycle in California's oil and gas production, provide a description of the data required to answer these questions, and clarify how this information may be used to inform decision making.

Phase II of the study will carry out an early and preliminary assessment of the SB 1281 data set, along with other available relevant data, to determine whether the type of information reported is accurate, necessary, and sufficient to answer the questions identified in Phase I. This project phase will make recommendations on data collection improvements and streamlining, and identify new questions that may arise through the preliminary data assessment.

CCST held preliminary meetings with DOGGR and the Water Board to discuss the merits of the study, and begin assessing important questions and their relevance to different agencies. The project proposal has been submitted, and project planning and steering committee recruitment is underway.

PROJECT MANAGER:

Brie Lindsey PhD, brie.lindsey@ccst.us

ORGANIZING CALIFORNIA'S WATER INFORMATION SYSTEMS

Following on the heels of CCST's 2014 report **Achieving a Sustainable California Water Future Through Innovations in Science and Technology**, water remains a highly visible policy area. Concerns remain on how to manage water usage, protect critical infrastructure, and put plans into place to be better prepared for the next drought.

Among CCST's continued involvement in California water management issues is the area of water data management. In response to a request by the **California Department of Water Resources (DWR)**, CCST supported efforts by **UC Riverside** doctoral students Holly Mayton and Drew Story to explore how water data across various agencies, institutions, and repositories in California can best be managed and integrated.

These researchers presented their work at the **Turbulent Futures** conference in May at UC Riverside, as part of its Water SENSE NSF-IGERT program. Former CCST Science Fellow Newsha Ajami, currently Director of Urban Water Policy at the Stanford Water in the West program and a Senior Research Associate with the Stanford Woods Institute for the Environment, gave the keynote address.

In May 2017, CCST, DWR, and **UC Water** hosted the workshop **"Data for Water Decision Making in California"** — an invitation-only workshop discussing the creation of a comprehensive water data management system in California. This was followed by the November 2017 capstone workshop **"Open and Transparent Water Data in California"** held at **UC Berkeley** and led by Susan Hubbard, an Associate Director of the Lawrence Berkeley National Laboratory and a CCST Council Member.

These workshops are a product of **AB 1755 (Dodd, 2016)**. Named the **The Open and Transparent Water Data Act**, the bill sought to create, operate, and maintain a statewide integrated water data platform that "would integrate existing water and ecological data information from multiple databases and provide data on completed water transfers and exchanges."

A report reviewing the discussions resulting from the Open and Transparent Act — **"Water for Decision Making"** — will be published by UC Berkeley Law and UC Water in January 2018.

CCST WATER ISSUE AREA CONTACTS:
Amber Mace PhD, ambermace@ccst.us
Brie Lindsey PhD, brie.lindsey@ccst.us

CCST Council Members Amber Mace and Susan Hubbard at the November 2017 Open and Transparent Water Data workshop.



COMMUNITY COLLEGES AND THE MAKER MOVEMENT

The **makerspace** — where communities join together to tinker, explore, and create — has emerged as an area rich not only in exciting possibilities for innovation and collaboration, but also in significant shifts in the formal learning environment. “Making” offers complementary modes of learning to the traditional classroom, helping participants develop skills that differ from those learned while completing traditional coursework. In this context, makerspaces can be considered interdisciplinary, participatory, peer-supported learning environments.

The California Community Colleges have recognized the potential of the broadly accessible Maker Movement to transform their ability to educate students and train an emerging creative workforce. Much progress has been made since 2016, when CCST presented its report — “**Promoting Engagement of the California Community Colleges with the Maker Space Movement**” to the **California Community Colleges Chancellor’s Office (CCCCO)** — a report which envisioned a network of makerspaces across the California Community College system.

Within months, over 60 colleges—more than half of all campuses in the state—participated in regional symposia CCST presented at **UC Berkeley**, **UC San Diego**, and **CSU Bakersfield**. These events, dubbed the **InnovationMaker3 Symposium Series**, were designed

to bring together interested community college faculty with experts from the Maker community. Following this outreach and education campaign, the CCCCCO launched the **California Community Colleges Maker Initiative (CCC Maker)** to distribute \$17 million in funding to eligible colleges to create or enhance makerspaces on their campuses — foundations for the community college makerspace network envisioned for California.

CCST has served in an advisory role since the start of CCC Maker, through contact with the CCC Maker leadership team and regular participation on the CCC Maker Advisory Committee. Working with the two campuses designated as program leads (**Sierra College and Pasadena City College**) CCST has worked to bring research and information to the awarded colleges — providing direct feedback and research support to applicants during the planning process, and serving as an application evaluator during the selection process.

In January 2017, 38 colleges were awarded seed grants to imagine and design their programs — considering integrated curricula, inviting spaces, appropriate assessments, and connections to their regional networks. In May, 28 of these colleges submitted applications — with 24 selected in July to receive funds to implement the very plans they imagined and designed.

CATAPULTING CALIFORNIA THROUGH STEM INNOVATION

In the past 30 years, State leaders have asked CCST to report on the intersection of technology, education, and workforce training. Notable projects include those exploring Digitally Enhanced Education (2011-2014), Creating a Well-Prepared STEM Workforce (2009), and Critical Path Analysis of California’s Science and Technology Education System (2001-2002).





CCST Board Member and Vice Chancellor of Community Colleges Van Ton-Quinlivan welcomes participants to the CCC Maker kick off symposium.

To celebrate the accomplishments of the colleges chosen to receive funding, and to inspire grant winners to achieve their makerspace goals, CCST presented the **CCC Maker Kickoff Symposium** on August 18, 2017 at UC Berkeley's **Jacobs Institute for Design Innovation**. Nearly 100 attendees participated: teams from all 24 colleges, along with leaders from industry and community colleges, were treated to talks from innovators in makerspace education research. The symposium incorporated hands-on activities and discussions on creating the optimal culture for engaging students in STEM learning and workforce skills development. The meeting was a high-energy event that sought to inform and further connect the growing community college makerspace network now available to California's citizens.

CCST continues to deliver information and guidance to the CCC Maker Initiative, including a pair of symposia that will be held during the spring of 2018, when CCC Makers will come together to learn about best practices in work-based learning programs and curriculum

development to integrate making. In addition to presenting these upcoming symposia, CCST will build on its series of webinars highlighting current trends in academic makerspaces as learned from participation in the annual **International Symposium on Academic Makerspaces (ISAM)**. CCST will also provide significant guidance to a selection of exemplary CCC Maker teams to present academic papers at this year's ISAM in August 2018 at Stanford University.

The exciting journey for community college makerspaces has just begun. CCST will continue to serve in its role as an advisor of the CCC Maker program, and we look forward to our ongoing participation in the Advisory committee — and opportunities to connect the community colleges to decision makers in Sacramento.

ONLINE:

www.ccst.us/projects/makerspace

PROJECT MANAGER:

Brie Lindsey PhD, brie.lindsey@ccst.us

The August 18th symposium at the Jacobs Institute inspired participating colleges to take a hands-on approach to the maker mentality.



Brie Lindsey connects maker educators from around the globe at the symposium.



CCST CORE PROGRAM UPDATES

CCST establishes and implements key programs when it identifies unmet needs at the intersection of science and policy in the State of California. Currently, CCST programs include:

FEDERAL RESEARCH IN CALIFORNIA

CCST serves as a guide for state policymakers, helping them understand how to access and leverage California's rich portfolio of federal research for the benefit of State governance and for constituents. Representing our **Federal Laboratory Affiliates**, CCST helps State leaders identify and solicit expertise from federal research institutions to inform their policy priorities. Likewise, CCST works with California's federal laboratories to help them understand the policy priorities of State leaders.

CCST SCIENCE AND TECHNOLOGY POLICY FELLOWS

Each year, CCST recruits and trains 10 PhD scientists and engineers in the policymaking process — then places them as legislative staff in California State Assembly and State Senate offices. These PhD-level experts experience a year of public service and government leadership training, and get the chance to explore a career in California's policy arena. At the same time, legislators benefit from access to highly skilled, science-savvy staff to support them on legislative issues and priorities.

SCIENCE AND STATE POLICY BEYOND CALIFORNIA

CCST cultivates a network of like-organizations providing independent scientific advice in other states. CCST shares materials and resources with these partners to encourage science policy engagement at the state government level — as well as interfacing with relevant national organizations such as the National Conference of State Legislatures.

CALIFORNIA TEACHERS ADVISORY COUNCIL (CALTAC)

CCST created a group of 12 outstanding K-14 science and math classroom teachers from throughout California to form CalTAC. This body is strengthening the voice of STEM educators by providing them a forum to discuss trends and policies facing science, technology, engineering, and math education in California — and offering them training and development in the art of interfacing with the state policymaking community.

The CCST Science Fellows program trains PhD scientists to be policy-savvy, while giving lawmakers access to science-savvy staff to advise them on critical decisions.



FEDERAL LABORATORY AFFILIATES

In 2005, there was growing interest by state leaders to improve access to expertise found at federal laboratories and science centers across California, and engage them on issues affecting the Golden State.

The call for advice coincided with conversations and coordination already ongoing between CCST and several federal research institutions in California, and the **CCST Federal Laboratory Affiliates** program was created as a result. Of the six founding member institutions, four came from the U.S. Department of Energy: the Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, and SLAC National Accelerator Laboratory; and two came from NASA: the Jet Propulsion Laboratory and the Ames Research Center.

As the convener for this California research network, CCST helps facilitate links across the capabilities and talents of these labs and centers. In turn, these ongoing relationships and dialog improve CCST's ability to fulfill its mission to the State of California.

Notable updates on CCST's activities in support of and in collaboration with our Federal Laboratory Affiliates include:

An Audience with the Administration: Federal labs directors and CCST leadership met with Governor Brown and his top advisors. The two-hour meeting was packed with discussion of the high priority scientific issues in California — including climate and air quality, biofuels, drought, and cybersecurity — and how California's federal labs are addressing these issues.

Prioritizing Budgets: The Assembly Budget Subcommittee on Resources and Transportation held an informational hearing on climate and environmental research in California. CCST Senior Program Associate Shannon Muir testified on behalf of the Federal Laboratory Affiliates, highlighting the research that each facility performs in this space and the key partnerships that federal labs and research centers have with state agencies.

Science & Policy Discussions: The CCST Board, Council, and Federal Laboratory Affiliates representatives convened its meetings at the NASA Jet Propulsion Laboratory. The group enjoyed a tour of JPL facilities, learning about the research that JPL performs in space exploration and the earth sciences.

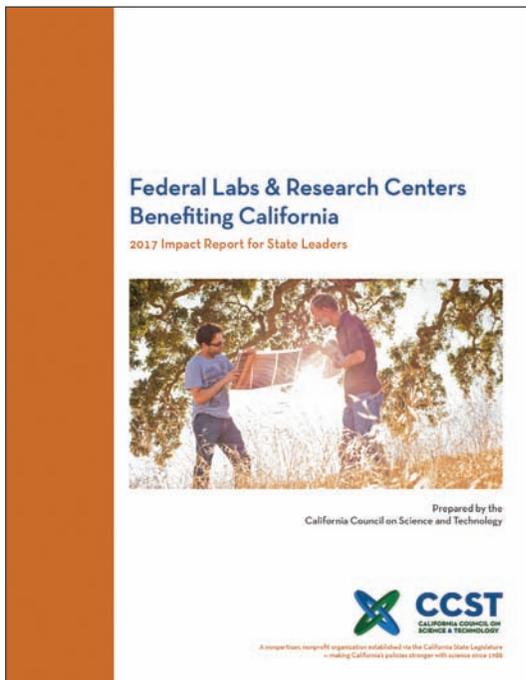
Meeting the Fellows: The 2017 Class of CCST Science Fellows toured the Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, and Sandia California as a part of their professional development opportunities.

Milestones Expected in 2018: CCST is welcoming an out-of-state member to the CCST Federal Laboratory Affiliates program for the first time — the National Renewable Energy Laboratory in Golden, Colorado.

CCST is also looking forward to its February 2018 release of “**Federal Labs & Research Centers Benefiting California**” — an impact report for state leaders showcasing the policy-relevant capabilities of California's federal labs, and a handbook on ways to tap into their timely expertise.

ONLINE: www.ccst.us/federal

PROGRAM CONTACT:
Christine Casey PhD, christine.casey@ccst.us



CCST SCIENCE & TECHNOLOGY POLICY FELLOWSHIP

Our **CCST Science Fellows** program continues to be a win-win for California.

Each year, CCST recruits a corps of PhD scientists and engineers to spend one year in Sacramento serving the California State Legislature. Working as legislative staff in the State Senate or State Assembly, these scientific minds get a front-row seat learning about the craft and process of lawmaking in the State of California. Talented scientists and engineers gain valuable career training in public policy, and lawmakers gain access to science-savvy staff to help them craft fact-based policies for California's future.

The CCST Science Fellows program ensures that there are science-savvy staff close to the first steps of policy formation. Their experience evaluating complex scientific issues and interpreting data provides a timely and valuable resource to policymakers. By applying the lens of scientific thinking, **CCST Science Fellows** bring unique rigor to legislative analysis in any area of public policy, not just science. Their inclusive approach and strong team values enable them to become trusted staff, ready to work with each legislative office or committee, to staff hearings, review documents, staff bills, and interface with constituents and other legislative members.

CCST is grateful for the Gordon and Betty Moore Foundation, WHH Foundation, TOSA Foundation, Heising-Simons Foundation, and many other philanthropic foundations and individuals who generously underwrite this nonpartisan, nonprofit program — which receives no government funding and is entirely donor-supported.

THE 2017 CCST SCIENCE FELLOWS

The **2017 Class** of our **CCST Science & Technology Policy Fellowship** comprised of nine talented PhD scientists and engineers hailing from institutions around the United States. As is tradition, they undertook a month of “policy boot camp” at CCST headquarters prior to their legislative office interviews and placements — spending busy weeks learning the history and nuances of California policy and politics, while honing their communications, networking, and other professional skills to prepare these scientists in their transition from the lab bench and in State Capitol Building.

2017 CLASS OF FELLOWS

Bao-Ngoc Nguyen

Senate Health Committee

PhD, Bioengineering, University of Maryland

Anna Reade

Senate Environmental Quality Committee

PhD, Developmental Biology, UC San Francisco

Mikel Shybut

Senate Transportation and Housing Committee

PhD, Plant Biology, UC Berkeley

Julianne McCall

Senate Office of Research

PhD, Cellular & Molecular Biology, Heidelberg University

Mike Peterson

Senate Natural Resources and Water Committee

PhD, Environmental Science, Policy & Management, UC Berkeley

Biswajit “Bish” Paul

Assembly Elections and Redistricting Committee

PhD, Cell Molecular Biology, University of Washington

Kristin Warren

California Legislative Black Caucus

PhD, Mechanical Engineering, Carnegie Mellon University

Laura McWilliams

Assembly Utilities and Energy Committee

PhD, Chemistry, University of Oregon

Jennifer Chase

Assembly Privacy and Consumer Protection Committee

PhD, Cellular & Molecular Biology, University of Michigan

LASTING LEGACY

Of the nine 2017 CCST Science Fellows, five have been hired into California State Legislature offices upon the conclusion of their fellowship, with others taking policy positions with federal agencies, nongovernment organizations, and trade organizations.

The career trajectories of our CCST Science Fellows are significant. That more than 50 percent of CCST Science Fellows find employment in the Legislature or state agencies means that California retains these bright scientific minds in critical state policy roles — and they remain in Sacramento to serve as ready mentors for each incoming class of CCST Science Fellows. In fact, over the years, fellowship alumni have increasingly played a hand in designing and improving the “policy boot camp” for subsequent fellowship classes, taking the time to sit on training panels and discussions with new fellows each November.

Indeed, thanks to philanthropic support, the **CCST Science Fellows Alumni Network** has blossomed into a vibrant resource for career advice and mentorship. The now nearly 80-strong alumni corp are spread throughout the United States and beyond, from Washington DC to Australia and France. Their career successes — be they in policy, academia, industry, or nonprofit sectors — are ample evidence that the fellowship program is an invaluable asset, one worthy of continued investment by CCST, our Capitol champions, and our charitable supporters.

ONLINE: fellows.ccst.us/blog
facebook.com/ccstfellows, twitter.com/ccstfellows

PROGRAM CONTACT:
Annie Morgan, annie@ccst.us

**“THE BUILDING IS A
DYNAMIC, HURRIED PLACE,
FULL OF OPPORTUNITY —
AND I LOVE IT.”**

— Laura McWilliams
2017 CCST Science Fellow

Back Row, Left to Right: Julianne McCall, Mikel Shybut, Mike Peterson, Jen Chase
Front Row, Left to Right: Bao Nguyen, Anna Reade, Bish Paul, Laura McWilliams, Kristin Warren



SCIENCE AND STATE POLICY BEYOND CALIFORNIA

Building on its 30 years of experience as state policy advisors, CCST is now cultivating a network of like-minded organizations around the country also dedicated to providing independent scientific advice in their respective states. CCST shares materials and resources with these partners to encourage science policy engagement at the state government level — as well as interfacing with relevant national organizations, such as the National Conference of State Legislatures (NCSL) and the American Association for the Advancement of Science (AAAS).

ONLINE: www.ccst.us/beyondca

CCST AT NCSL 2017 LEGISLATIVE SUMMIT

CCST participated in the **National Conference of State Legislatures (NCSL) Legislative Summit**, held in Boston in August. CCST Deputy Director Amber Mace PhD, and CCST Program Advisor Doug Brown hosted “Science Advice for State Legislators” — an ancillary meeting for state legislators and staff interested in the concept of recruiting PhD scientists as legislative policy advisors.

The informational session provided an overview of the **CCST Science & Technology Policy Fellowship**, as well as the state-based efforts underway via the **CCST State Fellowships Planning Grant** (see next page). Invited speakers at the CCST session included **California State Senator Anthony Portantino (D-La Cañada Flintridge)**, and **Boston University Professor Nathan Phillips PhD**, who is the lead on the Massachusetts state fellowship planning grant and a 2014 CCST Science Fellow. Interested staff and legislators in attendance included those from Ohio, Pennsylvania, Nevada, Massachusetts, and Michigan.

Amber Mace, Doug Brown, and Nathan Phillips in Boston for the NCSL Legislative Summit.



California State Senator Anthony Portantino and “Junior Science Fellow” Julian Phillips, son of Nathan Phillips, promoting the CCST event at the NCSL exhibit hall.



STATE FELLOWSHIPS PLANNING GRANT

In 2016, CCST received a gift from the **Gordon and Betty Moore Foundation** and the **Simons Foundation** to help other states replicate the success of our CCST Science & Technology Policy Fellowship. These State Fellowships Planning Grants would provide up to \$25,000 for teams in other U.S. states to conduct landscape analyses, strategic plans, and other program development tasks. Full proposals were received from 11 teams, and in early 2017, teams from nine states were awarded the planning grants:

Alaska (Team Lead: University of Alaska System; University of Alaska Fairbanks; Alaska Center for Energy and Power)

Colorado (Team Lead: Boulder Center for Science and Technology Policy Research, University of Colorado)

Connecticut (Team Lead: Connecticut Academy of Science and Engineering)

Idaho (Team Lead: Boise State University)

Massachusetts (Team Lead: Boston University)

Michigan (Team Lead: Michigan State University)

New Jersey (Team Lead: Rutgers University Eagleton Institute of Politics)

North Carolina (Team Lead: Duke University Science and Society Initiative, Sanford School of Public Policy, NC State and Duke Government Relations; North Carolina Sea Grant)

Washington (Team Lead: Washington State Academy of Sciences; Washington State University William D. Ruckelshaus Center; Washington State Institute for Public Policy)

To provide the teams with a forum to share best practices and strategies, CCST led a workshop at the 2017 AAAS Annual Meeting in Boston, in partnership with the Moore Foundation and the AAAS Science and Technology Policy Fellowships program. More than 50 participants attended from the nine awardee states, along with representatives from five other states and two countries.

Administering the State Fellowships Planning Grant has given CCST the chance to create a new community of like-minded partners eager to discuss the role of science informing policy. The Boston workshop was a fantastic opportunity for the awardee teams to meet one another in person — building the foundation for a wide network of state-level science policy fellowship programs — and growing CCST’s national visibility as a respected resource for decades to come.

“THIS GRANT GIVES SCIENTISTS A NEW AND POWERFUL WAY TO GIVE BACK TO THE COMMONWEALTH BY DIRECTLY HELPING LEGISLATORS CRAFT POLICY.”

— Professor Nathan Phillips
Boston University, State Fellowships
Planning Grant Recipient

**“SCIENCE AND POLICY
— IN AN IDEAL WORLD —
ARE JOINED AT THE HIP.”**

— Gwen Holdmann
Alaska Center for Energy and Power,
University of Alaska Fairbanks, State
Fellowships Planning Grant Recipient

Attendees of the CCST workshop hope to pave way for a national network of partners.



CALIFORNIA TEACHER ADVISORY COUNCIL (CALTAC)

In 2005, CCST created the California Teacher Advisory Council (CalTAC) to give leading California science, technology, engineering, and mathematics (STEM) teachers a forum to discuss and advise on policy issues involving STEM education. Modeled after the National Teacher Advisory Council (NTAC) of the National Academies of Science, Engineering, and Medicine, CalTAC recruits highly acclaimed and nationally recognized, award-winning teachers from the K-14 system in California as members, including National Board Certified teachers and those with membership on state and national committees.

STEM education will always play a central role in buoying California's innovation economy and preparing our future workforce. Acknowledging this certainty, CCST will continue to assess how the collective resources of CalTAC, our Sustaining Institutions, and our Federal Laboratory Affiliates can be leveraged to benefit all who seek to encourage STEM education in our great state.

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ONLINE: www.ccst.us/caltac

STEM teachers from Texas to California attended the CCST policy workshop.



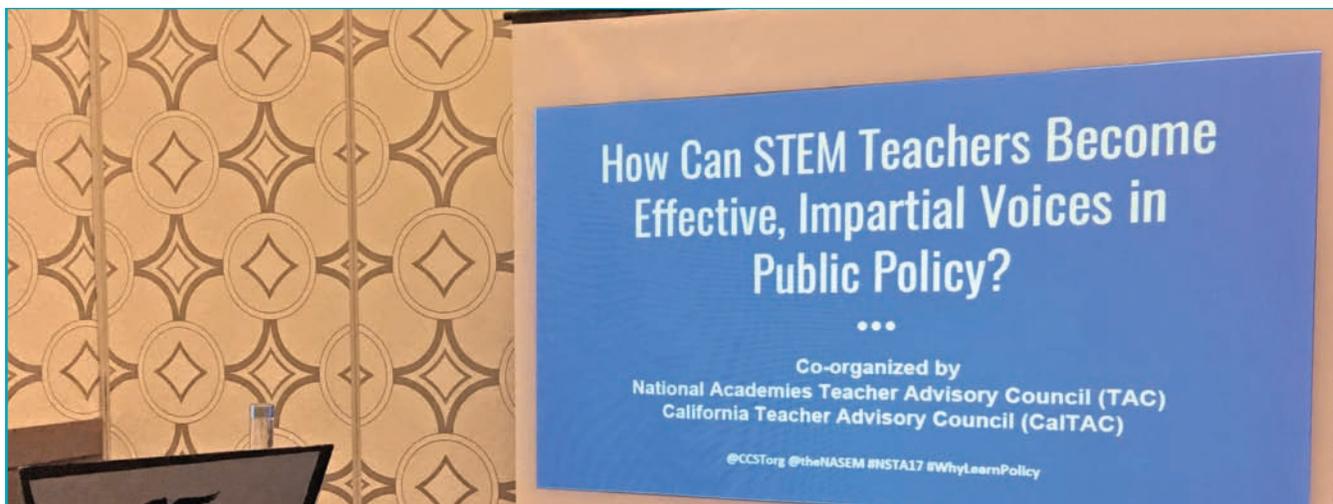
CALTAC LEADERSHIP AT THE 2017 NSTA NATIONAL CONFERENCE

Can STEM educators benefit from having a foundational understanding of the policymaking process? Should STEM leaders learn to identify avenues to provide policy advice at state and national levels? Can teaching teachers how to communicate their experience and insights to policymakers — with awareness of the nuances between advice versus advocacy — strengthen their voices as leaders within their profession?

In 2017, CCST took strides to explore the idea of providing STEM educators with professional development in public policy training. Teaming with Jay Labov PhD, Director of the National Teacher Advisory Council, and Herb Brunkhorst PhD, former Co-Chair of the California STEM Task Force, CCST led the workshop “How Can STEM Teachers Become Effective, Impartial Voices in Public Policy?” at the 2017 National Conference of the National Association of Science Teachers (NSTA), held in Los Angeles.

CCST Executive Director Susan Hackwood PhD, and CalTAC Chair Andy Kotko of the Folsom Cordova Unified School District, introduced the session, which aimed to provide participants with a high-level overview of how educators can engage in the state or federal policy process. Dr. Labov reviewed the federal landscape of STEM education funding and priorities, while CCST Senior Program Associate Sarah Brady PhD, reviewed opportunities for STEM educators to weigh in on legislation at the state level.

To close, Dr. Brunkhorst led the more than 40 educators and administrators in attendance from Texas to California in a brainstorming session. Having been exposed to the gamut of policy engagement options, are they now enticed to pursue further professional development in policy training? The workshop left participants abuzz with curiosity — and stirred the possibilities for the National Academies and CCST to develop such trainings.



CALTAC POLICY WEBINARS: A PROOF OF CONCEPT

Fresh off the excitement of the NSTA workshop, CCST associates Doug Brown, Sarah Brady, and Ben Young Landis worked with CaTAC Chair Andy Kotko to create a pilot suite of “policy webinars” for current CaTAC members. Leveraging CCST’s existing curriculum for training the CCST Science and Technology Policy Fellows, four webinars were developed and hosted for CaTAC members in late 2017:

These pilot webinars were positively received and seeded tantalizing possibilities for the changing mission of CaTAC. For a body such as CaTAC to serve as effective advisors to California state policymakers, it should be afforded every training in the art of providing advice. The road ahead for CCST in supporting STEM educators has been made even more exciting by the lessons learned this year.

How a Bill Becomes a Law in California

Presented by CCST Science Fellow alum Sarah Brady PhD

The Legislative Meeting: Advice vs Advocacy

Presented by CCST Science Fellow alum Sarah Brady PhD

The State Executive Branch

Presented by CCST Science Fellow alum Gabby Nepomuceno PhD

Experiences of a Former Teacher in the California Policymaking World

Presented by former Assemblywoman Susan Bonilla



MASTER TEACHERS

Since its creation, nearly 40 leading STEM teachers from California K-12 schools have served as CaTAC members, including 10 recipients of the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) from The White House.



FINANCIAL ACTIVITIES

CCST is a 501(c)(3), not-for-profit organization. Full financial statements, which are audited annually by Teaman, Ramirez and Smith, Inc., are available upon request.

Below are highlights from CCST's financial statements from January 2016 through December 2016, showing the sources and uses of funds.

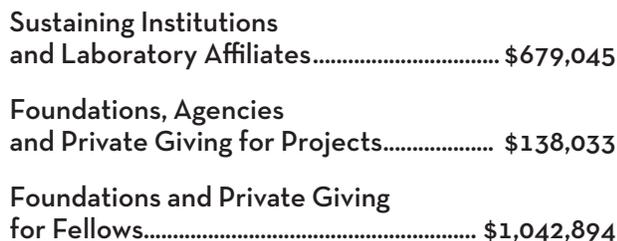
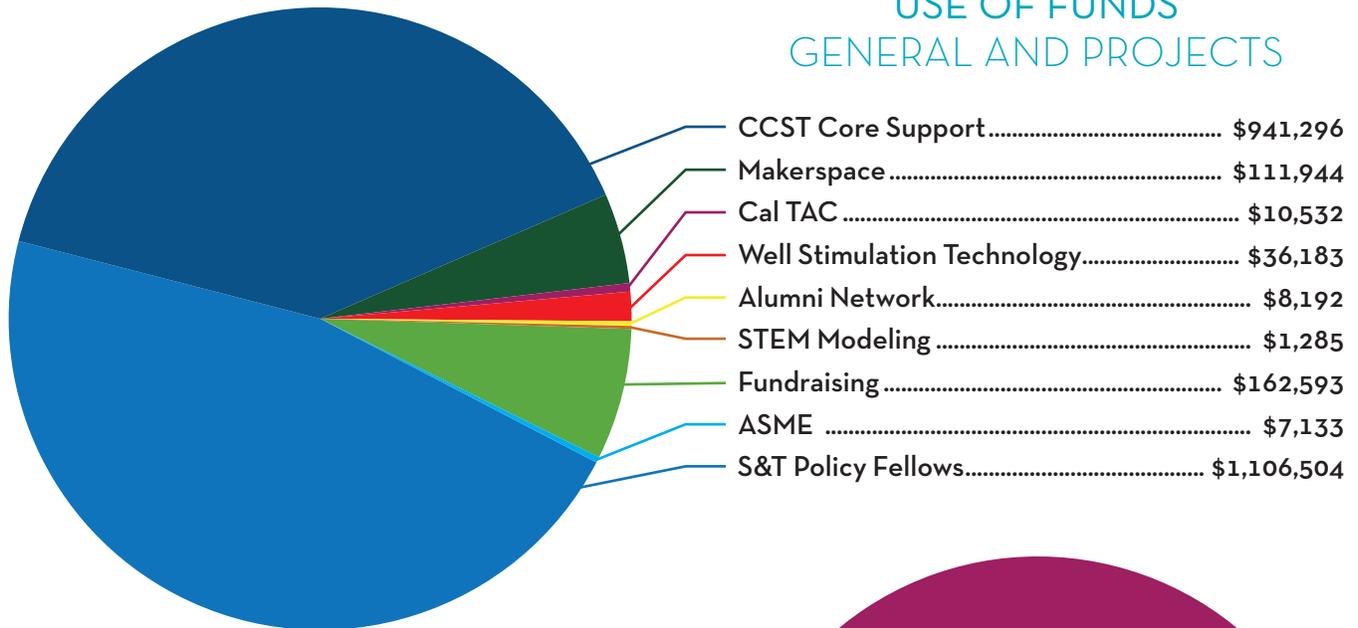
Operating costs are covered through core support funding received from CCST Sustaining Institutions and Federal Laboratory Affiliates.

Project costs are covered primarily through project funds received from the authorizing government entity, with additional support from foundations and private giving.

Costs for operating the CCST Science Fellows program are entirely funded by foundations and private giving, and receive no contributions from the State of California.

OPERATIONS AND FINANCE CONTACT:
Donna King, donna@ccst.us

USE OF FUNDS GENERAL AND PROJECTS



SOURCES OF FUNDS GENERAL AND PROJECTS

PHILANTHROPY 2017

CCST increased its **Major and Annual Gift** effort in 2017, reaching out to individuals, family foundations, and institutional foundations, from San Diego to San Francisco. We thank the generous hosts of our in-home “**Science and Policy**” discussions, and those who responded to our call for support.

Your investment makes you a partner in our mission to make California’s policies stronger with science. THANK YOU for investing in CCST!

DONOR PROFILE: BERNADETTE GLENN



WHH Foundation is a Los Angeles-based family foundation. Bill Hurt and his family have spent decades investing in what they call “human capital”, building the capacity and character of people they believe in. Their first grant to CCST was designed to strengthen the network of Science Fellows alumni; keeping the Science Fellows connected after they finish their Fellowship is key to the program’s lasting impact. Their dynamic President, Bernadette Glenn, has joined our Science Fellows Advisory Council bringing her leadership and vision directly to the program. Thanks to Bernadette we partnered with Southern California Grantmakers on their inaugural Policy Conference in April. A month later we added a day focused on Science & Policy discussion, touring Jet Propulsion Labs and having a **Science & Policy Dinner** at **Caltech** with CCST, JPL, Caltech and our new partner Southern California Grantmakers.

What started as a small family foundation grant has grown to a significant funding relationship and building, together, a region-wide partnership reaching across Los Angeles. CCST is now poised to speak to other granting agencies, around the state, interested in partnering on policy. Bernadette shared why the CCST Science Fellows are a great investment: “We look for great people doing brilliant work and invest in both. I’m so impressed by the dedication of these CCST Science Fellows. They work, tirelessly, day-in and day-out with legislators to make policy on MANY topics, not just science, to build a stronger California”.

DONOR PROFILE: BUZZ WOOLLEY



Buzz Woolley is a 60-year San Diego resident, a retired venture capitalist and entrepreneur, and Chairman of the Board of *Voice of San Diego*. He is President of the Girard Foundation, which has provided significant funding for K-12 education in San Diego. Buzz is interested in scientists and engineers getting involved in all aspects of our society, as shown by his establishing the R.B. Woolley Graduate Leadership Award at UCSD Jacobs School of Engineering — **and now by his support of the CCST Science & Technology Policy Fellowship program**. Buzz told us why he supports CCST and our Science Fellows: “Our society will be increasingly affected by decisions that politicians make. Those decisions are best done with an understanding of science and technology.”

Thank you, Buzz, for investing in our fellowship program — training new generations of scientists and engineers serving public policy and society — and helping make California’s policies stronger with science.

Thank you for your support

THANK YOU TO OUR MULTI-YEAR PARTNERS GIFTS OF \$250,000 AND ABOVE

Gordon and Betty Moore
Foundation
Heising-Simons Foundation
TOSA Family Foundation

GIFTS OF \$100,000 AND ABOVE

William Hurt Philanthropy Fund
The Rutter Foundation

GIFTS OF \$25,000 AND ABOVE

Bruce Alberts
Irwin and Joan Jacobs
Charles Kennel/Alan G. Lehman
and Jane A. Lehman Foundation
Buzz Woolley

GIFTS OF \$5,000 AND ABOVE

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Paul Jennings
C. Judson King
Amber Mace
David Martin
Carol Papay
Maxine Savitz
Marianne Walck
Burroughs Wellcome Fund

GIFTS OF \$500 AND ABOVE

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Quoc Bao Ha
Susan Hubbard
Michael Kavanaugh
William McLean
Karl Pister
Stephen Rockwood
Soroosh Sorooshian
Dan Sperling
Carl Weinberg
Loring Wyllie
James Zheng

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Julie Meier Wright
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Suzanne Nakashima
Randy Pestor
Tepring Piquado
Renita Polk
James Pooley
Michael Rodemeyer
Robert Shelton
Mikel Shybut
Laura Smith
John Thompson
Yulun Wang
Robert Wertheim

CCST donor and former California State Senator Becky Morgan speaks with the 2017 CCST Science Fellows.



Science & Policy Dinner hosts Bill Rutter and Bruce Alberts with CCST Science Fellows and Leadership.



Fellows alumni co-chair Sarah Brady with Bernadette Glenn, Executive Director of the WHH Foundation.



Amber Mace, CCST Council Chair Corey Goodman, with Thomas Rosenbaum, President of Caltech.



Amber Mace and Bernadette Glenn with Christine Essel, President of Southern California Grantmakers.



Former CCST Council Vice Chair Peter Cowhey hosts friends and champions.



DIRECTORY

CCST BOARD OF DIRECTORS

The Board provides strategic vision and direction for CCST, and has governing and fiduciary responsibility for the organization.

Charles F. Kennel
(Board Chair)
Scripps Institution of Oceanography
UC San Diego

Bruce Alberts
UC San Francisco

Jeffrey Armstrong
California Polytechnic
State University SLO

Ann Arvin
Stanford University

Bruce B. Darling
National Academy of Sciences
National Research Council

Dori Ellis
Sandia California

Richard C. Flagan
California Institute of Technology

Corey Goodman
(Council Chair)
venBio Partners, LLC

Susan Hackwood
(Executive Director)
CCST

Charles E. Harper
Jarriet Technologies

John C. Hemminger
UC Irvine

Lisa Rossbacher
Humboldt State University

Judith Swain (Council Vice Chair)
National University of Singapore

Van Ton-Quinlivan
California Community Colleges

Samuel Traina
UC Merced

Eugene Tu
NASA Ames Research Center

CCST STAFF

The staff implements CCST programs as directed by the Board, providing policy analysis and project management, and serving as direct liaisons between state leaders and the Council.

Susan Hackwood
Executive Director

Amber Mace
Deputy Director

Puneet Bhullar
Program Assistant

Sarah Brady
Senior Program Associate

Doug Brown
Program Advisor, CCST Science &
Technology Policy Fellowship and
CalTAC

Pat Callahan
Director of Philanthropy

Christine Casey
Senior Program Associate

M. Daniel DeCillis
Senior Research Associate and
Director of Web Operations

Donna King
Operations and Finance Director

Ben Landis
Communications Advisor

Brie Lindsey
Senior Program Associate

Annie Morgan
Program Manager, CCST Science
& Technology Policy Fellowship

Shannon Muir
Senior Program Associate

Christy Shay
Executive Assistant

THE CCST COUNCIL MEMBERS

The Council is the the principle advisory body to the Governor, the Legislature, and other state entities. Council Members serve three-year terms, with the possibility of renewal.

Corey Goodman (Council Chair)
venBio Partners, LLC

Michael Kavanaugh
Geosyntec Consultants, Inc.

Steven Schroeder
UC San Francisco

Judith Swain (Council Vice Chair)
National University of Singapore

Regis Kelly
QB3 Institute

Linda Dairiki Shortliffe
Stanford University

Lori Bettison-Varga
Natural History Museum

Charles Kolstad
Stanford University

Soroosh Sorooshian
UC Irvine

Peter Cowhey
UC San Diego

Patrick Lee
Sempra Energy

Dan Sperling
UC Davis

Dona Crawford
Lawrence Livermore National
Laboratory

Henry Lester
California Institute of Technology

James L. Sweeney
Stanford University

Jeff Dozier
UC Santa Barbara

Terry Lewis
Independent Contractor and
Consultant

Joseph Walkush
Science Applications International
Corporation

Ziyad "Zee" Duron
Harvey Mudd College

Jane Long
Climate Strategist

Yulun Wang
InTouch Health

Susan Hackwood
CCST (Executive Director)
UC Riverside

Amber Mace
CCST (Deputy Director)
UC Davis

Bryan Hannegan
Holy Cross Energy

Michael Norman
San Diego Supercomputer Center

Susan Hubbard
Lawrence Berkeley National
Laboratory

Prasad Ram
Gooru

REPRESENTATIVES OF THE CCST FEDERAL LABORATORY AFFILIATES

The lab representatives provide guidance on collaborative strategies for state policy engagement and expertise sharing.

Sheryl Hingorani (Chair)
Senior Manager, Systems Analysis
and Engineering
Sandia National Laboratories

Mark Hartney
Chief Technology Officer and
Applied Energy Division Director
SLAC National Accelerator
Laboratory

Jim Hawley
Manager, State and External
Relations
Lawrence Berkeley National
Laboratory

Buck Koonce
Senior Advisor to the Laboratory
Director
Lawrence Livermore National
Laboratory

Robin Newmark
Executive Director for Strategic
Initiatives
National Renewable Energy
Laboratory

Patty Rhee
Government and Legislative Affairs
NASA Jet Propulsion Laboratory

Steven F. Zornetzer
Associate Center Director,
Research and Technology
NASA Ames Research Center

CCST SCIENCE & TECHNOLOGY POLICY FELLOWSHIP — 2017 CLASS

The prestigious fellowship is awarded to 10 PhD scientists each year, who undergo a year of public service and government leadership training working as staff in the California State Legislature.

Jen Chase
PhD, Cellular and Molecular
Biology
University of Michigan
Placement: Assembly Privacy and
Consumer Protection Committee

Julianne McCall
PhD, Neuroscience
Heidelberg University
Placement: Senate Office of
Research

Laura McWilliams
PhD, Chemistry
University of Oregon
Placement: Assembly Utilities and
Energy Committee

Bao-Ngoc Nguyen
PhD, Bioengineering
University of Maryland, College
Park
Placement: Senate Health
Committee

Biswajit “Bish” Paul
PhD, Cell and Molecular Biology
University of Washington
Placement: Assembly Elections and
Redistricting Committee

Mike Peterson
PhD, Environmental Science,
Policy, and Management
UC Berkeley
Placement: Senate Natural
Resources and Water Committee

Anna Reade
PhD, Developmental Biology
UC San Francisco
Placement: Senate Environmental
Quality Committee

Mikel Shybut
PhD, Plant Biology
UC Berkeley
Placement: Senate Transportation
and Housing Committee

Kristin Warren
PhD, Mechanical Engineering
Carnegie Mellon University
Placement: California Legislative
Black Caucus

CCST SCIENCE & TECHNOLOGY POLICY FELLOWSHIP – FELLOWSHIP ADVISORY COMMITTEE MEMBERS

The Advisory Committee comprises philanthropic, policy, and science leaders and provides oversight on the direction and quality of the fellowship program.

Bruce Alberts
UC San Francisco

Sam Blakeslee
Former California State
Assemblymember and Founding
Director, Institute for Advanced
Technology and Public Policy

Diane Cummins
Fiscal Policy Staff
California State Senate (Retired)

Robert Dynes
President Emeritus
University of California

Bernadette Glenn
Executive Director
WHH Foundation

Paul Gray
Professor Emeritus and Executive
Vice Chancellor and Provost
Emeritus
UC Berkeley

Mary Maxon
Associate Laboratory Director for
Biosciences
Lawrence Berkeley National
Laboratory

Dharia McGrew (CCST Science
Fellow '14)
Policy Analyst
California Dental Association

Julie Meier Wright
President and CEO
San Diego REDC (Retired)

Timothy Portwood
Senior Consultant and Principal
Marts and Lundy

Mike Rodemeyer
Independent Consultant

Maxine Savitz
Vice President
National Academy of Engineering
Presidents' Council of Advisors on
Science and Technology (PCAST)

Al Teich
Director of Science and Policy
Programs
AAAS (Retired)

Ex Officio Members:

Senator Kevin de León
Ex Officio Member Representative
President pro Tempore
California State Senate
(Representative: Annette Porini /
Leonor Ehling)

Assemblymember Anthony Rendon
Speaker of the Assembly
California State Assembly
(Representative: Gabrielle Zeps)

CALIFORNIA TEACHERS ADVISORY COUNCIL (CALTAC) – 2017 MEMBERS

CCST selects and invites leading STEM educators in California to serve on CalTAC. Members serve three year terms.

Andrew Kotko (Chair)
First-Grade Teacher
Mather Heights Elementary

Marilyn Garza
Physical Science Teacher
Santa Barbara Junior High School

Zovig Minassian
Biology Teacher
Glendale High School

Darrel James (Vice Chair)
Biology Teacher
Fred C. Beyer High School

Susan Kunze
Second-Grade Teacher
Elm Street Elementary School

Octavio Rodriguez
Science Teacher
Sequoia High School

Jeff Bradbury
Chemistry Professor
Cerritos Community College

Arthur Lopez
Computer Science Teacher
Sweetwater High School

Kim Castagna
Math/Science/Computer Teacher
Carpinteria Middle School

Dena Lordi
Mathematics and Theory of
Knowledge Teacher
Diamond Bar High School

Megan Cook
Chemistry Teacher
Cordova High School

CCST SENIOR FELLOWS

The title of “Senior Fellow” is the highest career honor that CCST bestows on California science and technology leaders in academia, industry, and professional practice. The title is for life.

Bruce N. Ames
UC Berkeley

Richard C. Atkinson
University of California

Sheldon Axler
San Francisco State University

Francisco J. Ayala
UC Irvine

Dorothy F. Bainton
UC San Francisco

Warren Baker
California Polytechnic State
University San Luis Obispo

David Baltimore
California Institute of Technology

C. Gordon Bell
Microsoft Bay Area Research
Group

Alan B. Bennett
UC Davis

Francine Berman
Rensselaer Polytechnic Institute

Arthur Bienenstock
Stanford University

Jens Birkholzer
Lawrence Berkeley National
Laboratory

Joel S. Birnbaum
Hewlett-Packard Company;
QLogic

J. Michael Bishop
UC San Francisco

George Blumenthal
UC Santa Cruz

Robert L. Byer
Stanford University

Alfonso F. Cárdenas
UC Los Angeles

Jerry Caulder
Kapyon Ventures, LLC

Arthur N. Chester
HRL Laboratories, LLC

Steven Chu
Stanford University

Michael T. Clegg
UC Irvine

Linda Cohen
UC Irvine

Lawrence B. Coleman
University of California

Lynn R. Cominsky
Sonoma State University

Harry M. Conger
Homestake Mining Company

Molly Joel Coye
AVIA

Michael R. Darby
UC Los Angeles

Thomas B. Day
San Diego State University

Octavia Diener
Densmore Engines

Steven D. Dorfman
Hughes Electronics Corporation

Michael V. Drake
The Ohio State University

Robert C. Dynes
UC San Diego

Richard S. Elster
Naval Postgraduate School

Thomas E. Everhart
California Institute of Technology

Sandra M. Faber
UC Santa Cruz

John S. Foster, Jr.
Northrop Grumman Space
Technologies

T. Kenneth Fowler
UC Berkeley

Jean-Louis Gassée
Allegis Capital

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Stanford University

Sidney H. Golub
UC Irvine

David L. Goodstein
California Institute of Technology

Susan L. Graham
UC Berkeley

Harry B. Gray
California Institute of Technology

Jeffery Greenblatt
Lawrence Berkeley National
Laboratory

Robert D. Grey
University of California

Mirat D. Gurof
San Diego State University

Carlos Gutiérrez
California State University
Los Angeles

Charles E. Harper
Jarriet Tech

CCST SENIOR FELLOWS CONTINUED

John L. Hennessy
Stanford University

Stephen L.M. Hockaday
California Polytechnic State
University, San Luis Obispo

David A. Hodges
UC Berkeley

Alice S. Huang
California Institute of Technology

G. Scott Hubbard
Stanford University

Theodore L. Hullar
UC Davis
UC Riverside

Irwin M. Jacobs
QUALCOMM Incorporated

Paul C. Jennings
California Institute of Technology

Miriam John
Sandia National Laboratories/
California

Robert P. Kennedy
RPK Structural Mechanics
Consulting, Inc.

Charles F. Kennel
UC San Diego

C. Judson King
Provost and Senior VP of Academic
Affairs Emeritus, University of
California System
Professor Emeritus, UC Berkeley

Steven E. Koonin
Center for Urban Science and
Progress, New York University

William C.Y. Lee
Peking University

James U. Lemke
Achates Power, LLC

Mark D. Levine
Lawrence Berkeley National
Laboratory

Alexis C. Livanos
California Institute of Technology

Jane C.S. Long
Climate Strategist

Karl Longley
California State University, Fresno

Emir José Macari
University of New Orleans

Johnetta MacCalla
Zyrobotics

David W. Martin, Jr.
AvidBiotics Corp.

Perry L. McCarty
Stanford University

James L. McGaugh
UC Irvine

William J. McLean
Sandia National Laboratories

Burton J. McMurtry
Venture Capitalist

Julie Meier Wright
San Diego REDC (Retired)

Jarold A. Meyer
J.A. Meyer Associates

Meyya Meyyappan
NASA Ames Research Center

William F. Miller
Stanford University

Mark Moline
California Polytechnic University,
San Luis Obispo

Edward I. Moses
Longview Consulting, Inc.

Cherry Murray
Harvard University

Michael Nacht
UC Berkeley

Venkatesh Narayanamurti
Harvard University

J. Fernando Niebla
International Training Partners

C.L. "Max" Nikias
University of Southern California

Roger G. Noll
Stanford University

Tina S. Nova
Molecular Stethoscope

Elisabeth Paté-Cornell
Stanford University

C. Kumar N. Patel
UC Los Angeles

Roy Pea
Stanford University

Edward E. Penhoet
UC Berkeley

Karl Pister
UC Santa Cruz

James Pooley
Orrick Herrington and Sutcliffe

Mohammad H. Qayoumi
Government of Afghanistan

Ramesh Rao
UC San Diego

Rollin C. Richmond
Humboldt State University

Burton Richter
SLAC National Accelerator
Laboratory

CCST SENIOR FELLOWS CONTINUED

Stephen D. Rockwood
Science Applications International
Corporation (SAIC)

James M. Rosser
California State University, Los
Angeles

Jeffrey N. Rudolph
California Science Center

William J. Rutter
UC San Francisco

Maxine L. Savitz
National Academy of Engineering

Robert F. Sawyer
UC Berkeley

George M. Scalise
Semiconductor Industry
Association (SIA)

John H. Seinfeld
California Institute of Technology

Charles V. Shank
UC Berkeley

Lucy Shapiro
Stanford University
School of Medicine

Robert N. Shelton
Giant Magellan Telescope
Organization (GMTO)

John B. Slaughter
University of Southern California

Edward C. Stone
California Institute of Technology

Robert S. Sullivan
UC San Diego

Cornelius (Neal) W. Sullivan
University of Southern California

Bob H. Suzuki
California Polytechnic State
University, Pomona

James L. Sweeney
Stanford University

R. Michael Tanner
Association of Public and Land-
grant Universities

C. Bruce Tarter
Lawrence Livermore National
Laboratory

Larry Toy
Foundation for California
Community Colleges

Hal R. Varian
Google

John R. Weeks
San Diego State University

Carl J. Weinberg
Weinberg and Associates

Robert H. Wertheim
Lockheed Corporation (Retired)

Robert Wilkinson
Bren School of Environmental
Science and Management, UC
Santa Barbara

John Oliver Wilson
Calpine, The Ryland Group
Incorporated, and SDR Capital
Management

Loring A. Wyllie, Jr.
Degenkolb Engineers

Henry T. Yang
UC Santa Barbara

Richard N. Zare
The National Academies

Abe M. Zarem
Frontier Associates

David Zoldoske
California State University, Fresno

CCST CELEBRATIONS

AND **OPPORTUNITIES** IN THE COMING DECADES

With **30 years of service** to the State of California in the books, 2018 will mark a year of reflection and new momentum for CCST.

Major studies on underground natural gas storage and biomethane will be completed and delivered to state leaders. A new CCST guide to the dazzling research and policy-relevant resources of California's NASA and DOE labs will be issued for the first time since 2006. And perhaps our proudest program, the **CCST Science & Technology Policy Fellowship**, will be welcoming its **10th anniversary class** come November.

California's policies are stronger with science – and this strength comes from the academic might of the **University of California, California State University, California Community Colleges, Stanford, and Caltech** campuses, combined with the technological arsenal of California's federal labs and research centers. Joining with these Sustaining Institutions and Federal Laboratory Affiliates, CCST will seek to elevate our engagement and service for the Capitol community for the next 30 years.

We will launch our anniversary year with the revival of **CCST Science & Technology Week** – a celebration of science in service to California state policy featuring a slate of State Capitol events in February 2018. Continuing through to the commemoration of CCST's date of charter in September, our Board, Council, and staff will be reaching out to our partners and champions in government, academia, and philanthropy with renewed vigor. We hope to start new conversations and listen for new ideas on ways to ensure that California's state leaders have ready access to impartial science advice – facilitating, translating, and delivering the most timely and relevant information and expert insights from California's best research institutions.

Whether you have worked with a CCST Science Fellow in the Legislature, have commissioned a CCST report, or have found a CCST briefing to be time well-spent, we want to hear how CCST can be of help to your needs as California state leaders and staff. **Science is at your service – and CCST is here to be your guide.**



CCST
CALIFORNIA COUNCIL ON
SCIENCE & TECHNOLOGY



CCST
SCIENCE & TECHNOLOGY
POLICY FELLOWS



2017

FEBRUARY 16, 2017

CCST Awards Grants to Nine States to Explore Potential for Science Policy Fellowships; funding for the grants provided by the Gordon and Betty Moore Foundation and the Simons Foundation beyond CA.

2016

JUNE 27, 2016

SB 826 (Budget Act of 2016) is signed by the Governor, directing the Public Utilities Commission, in consultation with the Energy Commission, Air Resources Board, and the Division of Oil, Gas, and Geothermal Resources within the Department of Conservation to request CCST to undertake a study on the long-term viability of natural gas storage facilities in California.

2014

FEBRUARY 2014

CCST's first Science Fellow placed in the executive branch (Governor's Office of Emergency Services) as part of a pilot project in partnership with the American Society of Mechanical Engineers.

2013

SEPTEMBER 20, 2013

SB 4 (Pavley) is signed by the Governor, directing the Natural Resources Agency to conduct an independent scientific study on well stimulation treatments.

2007

OCTOBER 2007

Partnered with the National Academies to hold the first national convocation on state-level science and technology policy.

2018

JANUARY 2018

CCST completes report for the Public Utilities Commission on Underground Natural Gas Storage in California.

2015

JANUARY 1, 2015

CCST delivers final report to Natural Resources Agency on an Independent Scientific Assessment of Well Stimulation.

2013

SEPTEMBER 30, 2013

CCST celebrates its 25th Anniversary with a Board and Council meeting at the California Science Center, featuring dinner under the wings of the Endeavour Space Shuttle Board and Council meeting agenda.

2013

SEPTEMBER 27, 2013

CCST's 25th Anniversary recognized through Assembly Concurrent Resolution 75 (Bonilla).

2009

NOVEMBER 2, 2009

The first class of CCST Science Fellows begins their policy training in Sacramento; funders include the Gordon and Betty Moore Foundation; Stephen Bechtel Fund/S.D. Bechtel Jr. Foundation; Kingfisher Foundation; The Heising-Simons Foundation; TOSA Foundation, and the Gen-Probe Fund.



CCST

CCST is a nonpartisan, nonprofit organization established via the California State Legislature – making California’s policies stronger with science since 1988. We engage leading experts in science and technology to advise State policymakers – ensuring that California policy is strengthened and informed by scientific knowledge, research, and innovation.

CCST operates in partnership with, as well as receives financial and mission support from, a network of public and private higher-education institutions and federally funded laboratories and science centers:

The University of California System
The California State University System
California Community Colleges
Stanford University
California Institute of Technology
NASA Ames Research Center
NASA Jet Propulsion Laboratory
Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Sandia National Laboratories-California
SLAC National Accelerator Laboratory
National Renewable Energy Laboratory

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