

“There is this ability to dream together. You can talk to your colleagues about some crazy idea, and they will say, ‘Oh yeah, that’s an interesting idea. Let me put my spin on it.’”

— Long Cai
Professor of Biology and
Biological Engineering



Tell us about the contributions of someone who is part of the Chen Institute whose work you find inspiring.

“I find [Assistant Professor of Biology and Biological Engineering] Joe Parker’s work really inspiring. He’s going in this completely new direction, trying to understand how the brain evolves and symbiosis evolves. I don’t know what it’s going to reveal, but I feel like it’s such an exciting new direction. Not just studying the brain as this static organ but this thing that’s changing over these evolutionary timescales and really understanding what are the precise changes in the circuits that enable these incredible symbiotic relationships. So I think that’s so pioneering, and I’m really excited to see what comes with that.”

— Doris Tsao (BS '96), Professor of Biology and T&C Chen Center for Systems Neuroscience Leadership Chair and Director

How to Build a Better Fly Feeder

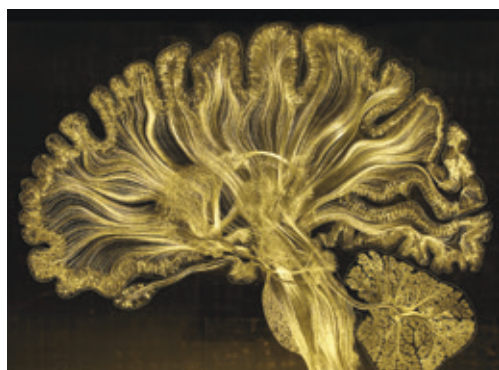
Research Professor Daniel Wagenaar is a neuroscientist and a problem solver. He also runs the Kevin Xu Neurotechnology Lab, where he helps his fellow scientists find novel solutions to a wide array of research equipment challenges. His move to a larger space in the Chen Building means he can say yes to more projects than ever.

“One of my favorite ever projects was a fly food mover for Betty Hong’s [BS '02] lab. Betty and I invented this chamber where the flies would just sit in their usual cylinder, but a dish underneath could be moved back and forth at a very slow pace allowing us to surreptitiously change food sources to control what food was available at what time.



“With our new space in the Chen Building, many of the labs we work with will be much closer. It’s surprising how much difference that makes, for people to just be able to walk along the hallway or take an elevator down. It really helps accessibility. And ultimately that’s what this whole thing is about.”

— Daniel Wagenaar, Director of the Kevin Xu Neurotechnology Laboratory



A Universe of Complexity

In the lobby of the Chen Neuroscience Research Building sits a triptych depicting the human brain. It is the work of Greg Dunn, who earned a doctorate in neuroscience before embarking on his artistic career. The large centerpiece, titled *Self Reflected*, is a National Science Foundation-funded project created by Dunn, his applied physicist collaborator Brian Edwards, and a team of scientists over a two-year period. It is an animated and extraordinarily detailed representation of human brain activity, designed to mirror the functioning of the viewer’s own mind.

“I hope this artwork serves as a daily reminder of the audaciousness of our attempts to tackle some of the most difficult and compelling scientific questions of our time,” says Dunn.

“We will find things that we could never imagine.”

— Viviana Gradinaru (BS '05)
Professor of Neuroscience and
Biological Engineering

Many Pathways into the Brain

The Chen Institute for Neuroscience at Caltech has been supporting graduate student research since it was inaugurated in 2016. Among them are: **Annie Erickson**, Chen Graduate Fellow, who aims to understand and map the pathways in the fruit fly brain when in flight; **Jonathan D. Kenny**, who studies the neural circuit dynamics of general anesthesia; **Guruprasad Raghavan**, who is growing neurons on a dish to fabricate “cortical computers” with graduate student **Varun Wadia**; **Sanghyun Yi**, a Chen Graduate Fellow, who studies how the human brain solves problems to improve machine learning algorithms; and **Jennifer Sun**, who is training machine learning models to recognize mouse behavior, allowing researchers to process larger volumes of data.

In Memoriam

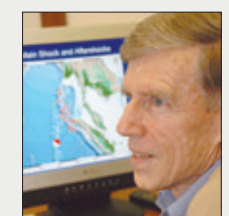
Read more about their lives at magazine.caltech.edu/post/in-memoriam



Bill May 1942–2020

William “Bill” H. May, chairman of the board of directors of the Arnold and Mabel Beckman Foundation and former member of the advisory committee for Caltech’s Division of Chemistry and Chemical Engineering, died on October 10. He was 77. May was senior vice president, general counsel, and secretary for Beckman Instruments, the company founded by Arnold O. Beckman (PhD '28). After his retirement, May served as chair of the board of directors of the Arnold and Mabel Beckman Foundation.

Bill Iwan (BS '57, MS '58, PhD '61) 1935–2020



Wilfred D. (Bill) Iwan, professor of civil engineering, emeritus, passed away on October 29. He was 85 years old. He joined the Caltech faculty in 1964 and remained at the Institute for the rest of his career. Iwan’s research focused on fundamental areas of mechanics, including work to understand and characterize

strong earthquake ground motion and the analysis and monitoring of the response of structural systems subjected to extreme events.



Vince McKoy 1938–2020

Basil Vincent “Vince” McKoy, emeritus professor of theoretical chemistry, died on November 2. He was 82. Work he conducted in the 1960s led McKoy to focus on quantum scattering theory, a field

of study that seeks to understand how waves and particles scatter after a collision. For the rest of his career, he continued to study collisions between particles, later focusing on how electrons affect large biomolecules like DNA when they collide with them.

Kim C. Border (BS '74) 1952–2020



Kim C. Border, a longtime professor of economics at Caltech, died on November 19. He was 68 years old. Border specialized in decision theory and sought to better understand

how and when people behave rationally when presented with risks. He applied insights from mathematical areas to design incentives to solve resource allocation problems; for example, his research helped in the design of auctions, such as those for greenhouse gas permits or online advertising.



Jean-Paul Revel 1930–2020

Jean-Paul Revel, the Albert Billings Ruddock Professor of Biology, Emeritus, died on December 4 at the age of 89. Revel served as dean of students at Caltech from 1996 to 2005. In his research in cell biology, Revel studied cell-to-cell communication, electron microscopy,

and scanning probe microscopy. He was the first to identify and characterize gap junctions, a means whereby cells can communicate to exchange small molecules and ions.

Ward Whaling 1923–2020



Ward Whaling, professor of physics, emeritus, at Caltech, died on December 15. He was 97 years old. Whaling was an experimental nuclear physicist who taught for many years at Caltech and served as the secretary of the faculty for 16 years. Late in his scientific career, Whaling used

spectrometers, including the one at Kitt Peak National Observatory in Arizona, to measure precise energy levels of atoms

Clarence Allen (MS '51, PhD '54) 1925–2021



Clarence Allen, professor of geology and geophysics, emeritus, and a prominent seismologist, died from COVID-19 on January 21. He was 96 years old. During his career, he was best known for his contributions to the evaluation of seismicity and fault movements in regions where earthquakes are common.

In addition to those individuals listed here, Caltech mourns the passing of staff members **Jose Mendez** and **Ramon Ramirez**. [Read more about them on page 11.](#)

Read the most recent issue of *Caltech Effect* at breakthrough.caltech.edu/magazine/the-caltech-effect-february-2021

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