UC San Diego
UC San Diego News Center

April 28, 2020 | By Robert Monroe, Cynthia Dillon, Mario Aguilera, and Scott LaFee

Five UC San Diego Professors Elected to National Academy of Sciences

Leaders in medicine, biology, chemistry, physics honored

The National Academy of Sciences elected five professors affiliated with the University of California San Diego to membership in the prestigious National Academy of Sciences, one of the highest honors bestowed on U.S. scientists and engineers.

Clockwise from top left, Dmitri Basov, Lawrence Goldstein, Terence Hwa, Clifford Kubiak, Kimberly Prather

UC San Diego faculty members Dmitri Basov, Lawrence Goldstein, Terence Hwa, Clifford Kubiak, and Kimberly Prather – whose work spans fields ranging from medicine and biological sciences to atmospheric chemistry and physics – were recognized Monday "in recognition of their distinguished and continuing achievements in original research," according to the Academy. They were among 120 American scientists and 26 international members named this year.

"For a young institution such as ours, having five professors inducted into the National Academy of Sciences speaks volumes of the innovative and visionary nature of this university and our well-respected and accomplished faculty," said UC San Diego Chancellor Pradeep K. Khosla. "I am proud to see the career accomplishments of these five professors recognized on such a distinguished national platform, alongside the country's other leading researchers."

This brings the total number of National Academy of Sciences members from UC San Diego to 86.

Dmitri Basov is an affiliated UC San Diego professor in the Department of Physics, where he served as chair between 2010 and 2015. He is also a Higgins professor in the Department of Physics at Columbia University, where he is the principal investigator of the Basov Infrared Laboratory, the director of the DOE Energy Frontiers Research Center on Programmable

Quantum Materials and co-director of the Max Planck Society – New York Center for Nonequilibrium Quantum Phenomena. His research interests include physics of quantum materials, superconductivity, two-dimensional materials and infrared nano-optics. Basov has received numerous prizes and awards including a Sloan Fellowship (1999), the Genzel Prize (2014), a Humboldt research award (2009), the Frank Isakson Prize, American Physical Society (2012), Moore Investigator (2014), the K.J. Button Prize (2019) and the Vannevar Bush Faculty Fellowship (U.S. Department of Defense, 2019).

Basov earned his PhD at the Lebedev Physical Institute of the Russian Academy of Sciences (1991). He served as postdoctoral research associate at McMaster University (1992-96) and as an assistant physicist at Brookhaven National Laboratory (1996) before joining UC San Diego.

Lawrence Goldstein, PhD, is Distinguished Professor in the Department of Cellular and Molecular Medicine and Department of Neurosciences in the UC San Diego School of Medicine. He founded and directed the UC San Diego Stem Cell Program and the Sanford Stem Cell Clinical Center at UC San Diego Health and is founding scientific director of the Sanford Consortium for Regenerative Medicine. He was instrumental in the development and passage of Proposition 71 in 2004, which created an unprecedented $3 billion fund and infrastructure for stem cell medical research in California.

For more than 25 years, Goldstein's research focus has been to unravel how molecular motors interact with and control the behavior of axonal vesicles in neurons, and how defects in these processes underlie neurological conditions, such as Alzheimer's disease (AD). In 2012, his lab was the first to create stem cell-derived in vitro neurons of sporadic and hereditary AD, giving researchers a much-needed method for studying the disease's causes and pathologies and a new tool for developing and testing drugs to treat a disorder that afflicts 5.4 million Americans.

More recently, this work has led to the identification of new cellular targets in AD drug development and a deeper understanding of AD genetics and disease progression. He is among the nation's leading scientific figures in promoting AD research and evidence-based treatments.

Terence Hwa is the Presidential Chair and Distinguished Professor in the Department of Physics with a joint appointment in the Division of Biological Sciences. Trained in theoretical physics, Hwa launched a biology wet-lab 15 years ago and developed a unique quantitative approach to studying bacterial physiology. During this time, the Hwa Research Group established a number of bacterial growth laws and formulated a principle of proteomic resource allocation. This line of study culminated in a theory of bacterial growth control,

accurately predicting bacterial behaviors and gene expression for a variety of environmental and genetic perturbations, and resolving a number of long-standing mysteries in microbiology. Hwa's research team continues to extend its quantitative approaches to characterize bacterial species singly and in consortium, to uncover underlying principles governing the spatiotemporal dynamics of microbial communities.

Hwa is a champion of interdisciplinary research. In 2001, he launched an extended program at the Kavli Institute of Theoretical Physics in Santa Barbara, which has been regarded as a watershed event in bringing physicists to post-genome biology. He is also the founder and co-director of the Quantitative Biology specialization program at UC San Diego. Hwa received fellowships and awards from the Sloan, Beckman, Guggenheim and Burroughs-Wellcome Foundations, and is a Fellow of the American Physical Society and the American Academy of Microbiology. Hwa received his PhD in physics from MIT. After postdoctoral research at Harvard University in condensed-matter physics, he joined UC San Diego's physics faculty in 1995.

Clifford Kubiak is a Distinguished Professor and former chair of the Department of Chemistry and Biochemistry, who holds the Harold C. Urey Chair in Chemistry. His Kubiak Research Group at UC San Diego is especially known for its work on developing catalysts for the electrochemical reduction of carbon dioxide. Kubiak is also a fellow of the American Academy of Arts and Sciences and the American Chemical Society (ACS). He has received several awards including the prestigious ACS Award in Organometallic Chemistry (2018), the Tolman Medal (2018), the Basolo Medal for Outstanding Research in Inorganic Chemistry (2015), the Inter-American Photochemical Society, Award in Photochemistry (2013) and the ACS Award in Inorganic Chemistry (2012). Kubiak has held visiting appointments at Tohoku University, University of Chicago and University of Erlangen, and he was a visiting associate in chemistry at the Joint Center for Artificial Photosynthesis at Caltech. He has served on the Editorial Advisory Boards of Accounts of Chemical Research, Inorganic Chemistry and Materials Science in Semiconductor Processing. He is the author of more than 290 scientific articles.

Before joining UC San Diego in 1998, Kubiak was a faculty member at Purdue University (1982-98). Before that he was a postdoctoral associate with Mark S. Wrighton at MIT (1980-81). He received his PhD in chemistry from the University of Rochester (1980), where he worked with Richard Eisenberg.

Kimberly Prather is a Distinguished Professor who holds a joint appointment between UC San Diego's Scripps Institution of Oceanography and the Department of Chemistry and Biochemistry. Prather's research focuses on understanding the influence of atmospheric aerosols on clouds, human health, and climate. Early in her career, she developed a technique

known as aerosol time-of-flight mass spectrometry that is widely used in atmospheric field studies around the world to determine the origin and chemistry of aerosols. She is the founding director of the National Science Foundation Center for Aerosol Impacts on Chemistry of the Environment (CAICE), the largest federally funded center in the history of UC San Diego. CAICE researchers replicate ocean/atmosphere interactions in a laboratory setting to study the influence of ocean biology on atmospheric chemistry, clouds, and climate.

Prather joined UC San Diego in 2001. She was elected as a member of the American Academy of Arts and Sciences and a fellow of the American Geophysical Union in 2010. In 2019, she became the first woman at UC San Diego to be elected as a member of the National Academy of Engineering. Previously this year, she won the 2020 Frank H. Field and Joe L. Franklin Award for Outstanding Achievement in Mass Spectrometry from the American Chemical Society. She received her PhD in chemistry from the University of California, Davis.

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