

NATIONAL SCIENCE FOUNDATION: ADVANCING RESEARCH FOR THE FUTURE OF U.S. INNOVATION PART II

Testimony before

SUBCOMMITTEE ON RESEARCH AND TECHNOLOGY

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY

U.S. HOUSE OF REPRESENTATIVES

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**Dr. Roger M. Wakimoto
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Thank you, Chairwoman Stevens, Ranking Member Waltz, Chairwoman Johnson, Ranking Member Lucas, and members of the committee. I am Roger Wakimoto, Vice Chancellor for Research and Creative Activities at UCLA. UCLA has been named the number one public university for several years running and ranks among the world's top research universities, successfully competing for significant federal research funding, including from the National Science Foundation.

More broadly, the University of California campuses together garner more than half the total NSF funds that come to California. With this support, UC advances knowledge, builds technical expertise, drives innovation, helps create new businesses and trains tomorrow's research workforce. Thus, with the NSF's partnership, the University of California contributes to our nation's ability to solve pressing societal challenges and remain globally competitive.

It is an honor and a pleasure to join you today to discuss the NSF for the Future Act, and possibilities for how major research institutions can make headway in addressing challenges related to diversity and inclusion in research, and partnerships with smaller

research institutions to advance knowledge. I thank the committee for considering these issues and for inviting me as a witness here today.

As Congress has been contemplating a new authorization for the National Science Foundation over the past couple years, I too have been contemplating what a bright future for the Foundation would look like. To begin with, such legislation should abide by the Hippocratic Oath's dictum to "first, do no harm." NSF's support of curiosity-driven research across a wide variety of fields is a mainstay of U.S. scientific strength. That must remain the primary mission of the agency and its guiding light. That does not mean, however, that NSF cannot take on new responsibilities, consistent with its primary mission, to strengthen our nation.

Given the long-standing importance of basic research for the U.S. scientific enterprise, I appreciate that the NSF for the Future Act aims to maintain the core mission of the Foundation, while also creating a new directorate to support use-inspired research and translation and to drive and propel technological innovation in our country. I'm a believer that research in the public interest, research that can demonstrate a societal purpose, is a worthy pursuit and an appropriate use of public funds. The Solutions Directorate would take on many issues which NSF already addresses but with an even more interdisciplinary and goal-oriented approach. Ideally, the new Directorate would be a cross-cutting entity in order to maximize its success.

I appreciate that the NSF for the Future Act proposes that the head of the new Solutions Directorate be someone with the same stature as the leaders of NSF's other directorates. I also appreciate that the bill authorizes transfer of funds from the new directorate to NSF's traditional programs but not the other way around. These steps help ensure an appropriate balance between basic and applied research at NSF and that the new directorate is not considered a preeminent entity in the agency, with more sway than the other very important parts of the Foundation.

The NSF for the Future bill aims to poise the Foundation to deliberately tackle some significant societal concerns, and I applaud that. These challenges include climate change and environmental sustainability, which are topics close to my own scientific background and research expertise. I believe that climate change is one of the greatest technological challenges facing our world and I strongly support an explicit focus on this matter in the legislation, including research to improve understanding and predictability of the climate system and climate-change risk, resilience, and mitigation, and to training the next generation of climate researchers.

Another important and persistent challenge the bill seeks to address is the need to increase the diversity of those involved in research. This is necessary at all levels of the workforce – from established investigators to early career scientists to postdocs, to grad students to undergraduates curious about and participating in research. It is especially critical to encourage and develop a robustly diverse pipeline of scientists and researchers. The bill provides some helpful incentives to prod a rather complacent system out of its posture of benign neglect, but I believe it can do even more.

Codification of the INCLUDES program, the pilot to foster partnerships with emerging research institutions, and other provisions in the NSF for the Future Act to broaden

participation are welcome steps. Additionally, the bill could explicitly include MSIs and HBCUs among the emerging research institutions and include best practices learned from NSF-supported Centers such as the STCs and ERCs which partner with local universities and industries. UCLA supports additional criteria be adopted for multi-institutional awards with annual reporting.

The legislation encourages greater collaboration and coordination between institutions of higher education and industry to enhance the educational experience and improve alignment with workforce needs. These collaborations could also foster increased diversity in the STEM pipeline and further drive innovations in both research and commercialization. Given our country's changing demographics, additional efforts for broadening participation in STEM are necessary to build the next generation STEM workforce. The success of our research enterprise depends on it.

Given large societal challenges that need to be addressed at a national level, it is critical that we support graduate students and postdoctoral researchers in our institutions and provide them with professional development opportunities. Supporting training grants is a promising mechanism for this purpose, as the NSF for the Future Act indicates. Developing innovative approaches for training and career development for early career researchers, including the necessary administrative supplements would also help. Finally, given the new directorate has the potential to impact the next generation of researchers funded by NSF grants, it will be instrumental to clarify the role of early career researchers in the system and consider how the new directorate may influence their research focus and professional options.

In conclusion, thank you for proposing a solid, bipartisan NSF authorization bill and for sincerely eliciting input to help further strengthen the legislation. I look forward to the Q&A and discussion.



ROGER WAKIMOTO

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Roger Wakimoto began as the Vice Chancellor for Research at UCLA in July 2017. He is an accomplished atmospheric scientist specializing in research on mesoscale meteorology, particularly severe convective storms and radar meteorology. In 2017, he returned to UCLA's Department of Atmospheric and Oceanic Sciences faculty, having previously served as a member in 1983-2005 and as its chair in 1996-2000. After his initial tenure at UCLA, he served as the director of the National Center for Atmospheric Research (NCAR) Earth Observing Laboratory from 2005-2010 and subsequently as director of NCAR from 2010-2013. Vice Chancellor Wakimoto was also assistant director of the National Science Foundation Directorate for Geosciences from 2013-2017; where he led a division that supported the atmospheric, geospace, polar, earth, and ocean sciences with a \$1.3 billion annual budget, and president of the American Meteorological Society from 2017-2019.

Vice Chancellor Wakimoto received his B.S. with honors and great distinction in meteorology from San Jose State University and his Ph.D. in geophysical sciences from the University of Chicago. He previously held a professorship at both UCLA and the University of Colorado at Boulder. He has received many honors, including a scientific and technical achievement award from the Environmental Protection Agency for observations of air pollution as well as the Clarence Leroy Meisinger Award from the American Meteorological Society for his contributions to understanding of mesoscale phenomena