Policies that single out certain groups can stifle scientific collaboration.

ILLUSTRATION: ROBERT NEUBECKER

LETTERS

Edited by **Jennifer Sills**

Racial profiling harms science

On behalf of the Society of Chinese Bioscientists in America (SCBA), the Chinese American Hematologist and Oncologist Network (CAHON), and the Chinese Biological Investigators Society (CBIS), we write to express our concerns about the recent political rhetoric and policies that single out students and scholars of Chinese descent working in the United States as threats to U.S. national interests [e.g., (*1*) and pp. 6–7 in (*2*)]. These developments have led to confusion, fear, and frustration among these highly dedicated professionals, who are in danger of being singled out for scapegoating, stereotyping, and racial profiling. U.S. policies must avoid targeting, as Representative Judy Chu (D–California) put it, "an entire ethnic group of people for suspicion that they're spies for China" (*3*).

Existing U.S. laws are in place to safeguard America's interests and to punish perpetrators for stealing trade secrets or engaging in illegal activities. We absolutely support the well-established policies regarding intellectual property, employment, and governance of conflicts of interest. Such policies have been further enhanced in recent years with more detailed and specific requirements from various federal and state agencies, including the National Institutes of Health (NIH) (*4*). The vast majority of scientists and students of Chinese descent are law-abiding citizens, residents, or visitors who have followed these rules.

Open data access and data sharing are important for accelerating research advancement and can be implemented without putting U.S. security at risk. NIH has espoused such policies for years (*5*). Most Chinese-American scientists believe that biomedical research benefits all mankind and that multinational collaborations accelerate scientific progress and discovery. However, some NIH recommendations could target collaborations if implemented with bias. For example, NIH recommends fostering "trusted relationships" [p. 12 in (*2*)] with foreign partners but does not specify whether the trust must be established through official channels. NIH also suggests more disclosure requirements for foreign collaborators than domestic colleagues (pp. 12–13 in (*2*)], which could hinder collaborations.

> ***"[We] hope that...increased security measures will not be used to tarnish law-abiding scientists..."***

In recent decades, there have been several high-profile cases in which Chinese-American scientists were wrongfully accused of spying [e.g., (*6–10*)]. Although all charges were eventually dropped and/or the individuals legally exonerated, the lawsuits have had not only devastating effects on the careers of these individuals but also a chilling and negative impact on the Chinese-American scientific community at large. It has also become increasingly difficult for Chinese students and scholars to obtain visas to enter the United States for scientific meetings, visits, and research opportunities (*3*).

It is our sincere hope that these actions, which we believe amount to racial profiling, will stop immediately and that increased security measures will not be used to tarnish law-abiding scientists and limit normal and productive scientific exchanges. We thus urge both federal and local governments to work with our academic and research institutions to create a respectful, transparent, and

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productive environment for everyone, regardless of their ethnic origin. We also hope that scientific collaborations and exchanges between the United States and foreign academic communities will be strengthened rather than suppressed. American scientific advances and technological innovations are the result of global efforts, and their future depends on the continuation of time-tested traditions of openness and cooperation on the global stage.

Shan Lu[1]*, Zhe Han[2]*, Mien-Chie Hung[3]*, Jianming Xu[4]*, Yong Xu[5]*, Pan Zheng[6]*, Zhi-Ming Zheng[7]*, Lee Zou[8]*†, Zihai Li[9]‡, Lei Zheng[10]‡, Yibin Kang[11]†, Yingzi Yang[12]†, Lin He[13]†, X. Charlene Liao[14]†, Hongtao Yu[15]†, Zhenyu Yue[16]† Shan-Lu Liu[17]*§, Hui Zheng[5]*§

[1]Worcester, MA 01655, USA. [2]Washington, DC 20010, USA. [3]Houston, TX 77096, USA. [4]Bellaire, TX 77401, USA. [5]Houston, TX 77030, USA. [6]Baltimore, MD 21201, USA. [7]Rockville, MD 20850, USA. [8]Boston, MA 02114, USA. [9]Charleston, SC 29425, USA. [10]Baltimore, MD 21287, USA. [11]Princeton, NJ 08540, USA. [12]Boston, MA 02115, USA. [13]Berkeley, CA 94720, USA. [14]Palo Alto, CA 94303, USA. [15]Dallas, TX 75390, USA. [16]New York, NY 10065, USA. [17]Columbus, OH 43210, USA.
*SCBA member. †CBIS member.
‡CAHON member. §Corresponding author.
Email: liushan1115@gmail.com; hz77030@gmail.com

The views expressed in this Letter are solely those of the authors and the three organizations, not the affiliated institutions of the authors.

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Response

The National Institutes of Health (NIH) appreciates the concerns expressed in the thoughtful letter from Lu *et al.* on behalf of the Society of Chinese Bioscientists in America, the Chinese American Hematologist and Oncologist Network, and the Chinese Biological Investigators Society. NIH greatly values scientists of Chinese descent as members of the American biomedical research enterprise. For decades, scientists of Chinese descent have contributed substantially to scientific innovations at research institutions across the United States. Collaborations with Chinese institutions have been critical to moving science forward. The vast majority of Chinese scientists working in America are honorable, conscientious, and dedicated to the cause of expanding knowledge for the betterment of humankind.

Unfortunately, instances have recently come to light where certain scientists, including some with links to foreign institutions and/or governments, have violated the honor-based systems and practices of the American research enterprise (*1*). Convened to address the issue, The NIH Advisory Committee to the Director working group (*2*) carefully considered how to ensure fairness of the grant process and intellectual property principles, while seeking to minimize jeopardy to innocent foreign nationals and important international collaborations. The working group recommendations apply to all foreign scientists, not just those of Chinese descent.

We are determined to maintain the integrity of the NIH research enterprise, but we are also deeply concerned about the issues raised by these three societies. NIH is committed to avoiding overreaction, stigmatization, harassment, and profiling. We will use our influence and bully pulpit as necessary to speak out against such prejudicial actions, for which there is no place in the biomedical research community.

Francis S. Collins,* Lawrence A. Tabak, Carrie D. Wolinetz, Michael S. Lauer, Michael M. Gottesman
National Institutes of Health, Bethesda, MD 20892, USA.
*Corresponding author. Email: collinsf@od.nih.gov

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TECHNICAL COMMENT ABSTRACTS

Comment on "Insulator-metal transition in dense fluid deuterium"

Michael P. Desjarlais, Marcus D. Knudson, Ronald Redmer

Celliers *et al.* (Reports, 17 August 2018, p. 677), in an attempt to reconcile differences in inferred metallization pressures, provide an alternative temperature analysis of the Knudson *et al.* experiments (Reports, 26 June 2015, p. 1455). We show that this reanalysis implies an anomalously low specific heat for the metallic fluid that is clearly inconsistent with first-principles calculations.

Full text: dx.doi.org/10.1126/science.aaw0969

Response to Comment on "Insulator-metal transition in dense fluid deuterium"

Peter M. Celliers, Marius Millot, Stephanie Brygoo, R. Stewart McWilliams, Dayne E. Fratanduono, J. Ryan Rygg, Alexander F. Goncharov, Paul Loubeyre, Jon H. Eggert, J. Luc Peterson, Nathan B. Meezan, Sebastien Le Pape, Gilbert W. Collins, Raymond Jeanloz, Russell J. Hemley

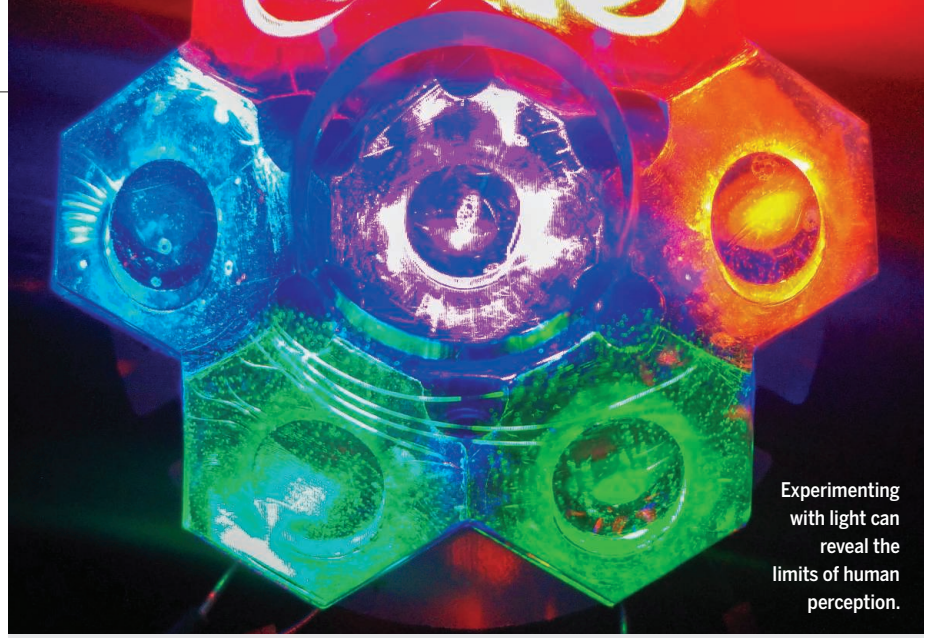
In their comment, Desjarlais *et al*. claim that a small temperature drop occurs after isentropic compression of fluid deuterium through the first-order insulator-metal transition. We show that their calculations do not correspond to the experimental thermodynamic path, and that thermodynamic integrations with parameters from first-principles calculations produce results in agreement with our original estimate of the temperature drop.

Full text: dx.doi.org/10.1126/science.aaw1970

ERRATA

Erratum for the Perspective "How fast are the oceans warming?" by L. Cheng *et al*., *Science* **363,** eaax1875 (2019). Published online 8 March 2019; 10.1126/science.aax1875

Erratum for the Research Article "Pan-tumor genomic biomarkers for PD-1 checkpoint blockade–based immunotherapy" by R. Cristescu *et al*., *Science* **363,** eaax1384 (2019). Published online 1 March 2019; 10.1126/science.aax1384



Experimenting with light can reveal the limits of human perception.

PHOTO: THOMAS SANCHEZ LENGELING

OUTSIDE THE TOWER

Empowering young innovators

We are surrounded by a group of high school and college students in Mérida, Mexico, in a classroom that is completely dark except for beams of colored light. We are using a black box full of LEDs to irradiate colored objects with a specific frequency of light. One student manipulates the dial on the box, and the beams gradually shift from a monochromatic deep red to bright blue to pure white. With this tool, called an iLuminator, we can explore the limitations of human vision. Students learn that light consists of a continuum of different wavelengths and that our perception of color is constrained by our three different types of color receptors. One student comments that some objects that she perceives as orange under ambient light brightly reflect both red and green spectral light, revealing their "true" color spectrum.

T.S.L.—a graduate student at the Massachusetts Institute of Technology (MIT)—and Martin Zumaya—a physics graduate student in Mexico—were paired to collaborate on this workshop by Science Clubs International (SCI) (*1*). For 4 months in 2016, we worked together to design our workshop. We successfully combined T.S.L.'s engineering background and experience abroad in the United States with Martin's physics expertise and knowledge about the resources available in Mexico.

After demonstrating the iLuminator, we show the students how to take pictures with a hyperspectral camera, which can identify spectral characteristics that are not visible to the naked eye, and then process the images with a python script. It is gratifying to see the students' expressions when they see a black-and-white representation of ultraviolet light reflected from a butterfly's wings for the first time. The students immediately begin to tweak their image analysis code, coming up with their own ways to dynamically display higher dimensional color data on their computer screens.

Over the years, we've taught similar workshops in Peru, Paraguay, Bolivia, Spain, and at MIT. We have seen the impact that the SCI program has on the lives of students, instructors, and local collaborators. Many alumni students have gone on to participate in summer research programs, and the program has sparked collaborations among instructors and fostered an international network of young scientists. By connecting talented youth in developing countries with mentors, SCI's workshops and collaborations have the potential to empower and nurture the next generation of scientists and innovators.

Thomas Sanchez Lengeling[1]* and Adrian Jinich[2]
[1]MIT Media Lab, Massachusetts Institute of Technology, Cambridge, MA 02139, USA. [2]Joan and Sanford I. Weill Medical College of Cornell University, New York, NY 10021, USA.
*Corresponding author. Email: thomassl@mit.edu

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