Women and Science: an essay

Every year at this time we celebrate the new winners of the Nobel Prizes for science. I was thrilled to hear that two U.S. women – Andrea Ghez and Jennifer Doudna – won the Nobel prizes in physics and chemistry. Both women were among only a few in history to win Nobel prizes in the physical sciences.

I am frequently asked about overcoming challenges as a women leader, and taking risks. In a recent web meeting with students, this question came up: “How can the culture of US science be changed to have more women at the top leadership roles?”

Many organizations are wrestling with howto drive culture change to achieve gender equity. Here are a few thoughts from my own experience working with others across government, academia, and industry.

It is clear that numbers matter. Students recommend appointing more women in all areas of the university to assist each other and assist students, making them feel welcome and supported.

Students offer that when you see an example of bias (e.g. a women speaks and is passed over at a meeting), counter it by repeating her idea and giving her credit.

They recommend that the staff who mentor students for career placement should not be biased about what a student can do. For example, many women and minorities who have an interest in science are turned away from pursuing science courses because of bias about what a scientist “looks like.” The students’ advice: Take time to mentor the mentors.

Industry has studied the dearth of women in senior positions. A male executive at a prominent pharmaceutical company told me he was charged by management to look into this and recommend strategies to change the situation. He noticed that male employees formed support groups, helping to promote other males to leadership positions. He that women also formed groups within his organization, but these were principally for social contact and to share stories of home challenges. He recommended women organize to promote women for advancement and for significant awards. You can’t win a prize unless you are nominated. And prizes become “messages” to the wider community that women are significant contributors.

What helps to make change is collecting the data that demonstrate unequivocally that there is a problem. There are striking examples of where this has been effective, starting with a 1999 MIT study of the status of women in its School of Science. They found dramatic inequities in office space and salaries for women, compared to those of their male counterparts. The evidence clearly showed a bias against women faculty, and this was addressed swiftly by MIT’s administration. Similar studies followed, most recently, at Princeton where, again, gender bias was demonstrated by the data.

There is an old Chinese saying: women hold up half the sky.

I realized, early on in my career as a scientist and administrator that science has failed to hold up its share of the world because it is lacking vital participants: women and minorities. I had an opportunity to address this when in 2014 I was appointed by the President as the 14th Director of the National Science Foundation (NSF).

For decades, NSF has attempted to combat the exclusion of women in prominent positions in science through programs to encourage and support the upward mobility of women. Such programs require that senior leadership in an organization be actively involved and committed to change.

But there was another quite different problem in science that was looming, and the media brought it to public attention. Science was being harmed by the misconduct of a few-- scientists. Widespread stories of abuse of women scientists by peers and supervisors came as unsettling news. When you lose a young woman to science because of abuse, particularly from a person respected in science, you have lost the potential of science itself.

Imagine if any of our current female Nobel Prize winners had given up because of harassment from those in their own work place. Imagine the loss to discovery.

We realized at NSF that we needed to find new ways to fight what was a cultural and social issue through policy. But instituting new policy, we discovered, was harder than instituting new programs.

We revised and published codes of conduct for all of our field sites. We funded the National Academies of Science, Engineering and Medicine to study this issue and in 2018 they published a report called “Sexual Harassment of Women.” It uncovered systemic, widespread explicit and implicit bias against women in science. This became the most downloaded report in the Academies’ history; its revelations about gender harassment were eye-opening and disturbing.

Then we made a policy change. Through study and teamwork we devised a careful-worded policy change to the terms and conditions of our awards that would require universities to notify us of potential harassers on campus if there was any administrative action against them. The agency could then decide if the university’s NSF grant could be retained under different leadership, or not. It was a big change for the agency and took months to get through various hurdles, including responding to hundreds of queries. Yet already it is having an effect. In truth, it was a change in policy that moved toward changing culture.

Recently singer Helen Reddy died. In the early 1970s she wrote a song that became the anthem of a movement that energized my generation, “I am woman.” It is a half-century later. It is time for our voices to sing, “I am scientist. I am engineer. I am doctor. I am woman.”