

Interview: NSB vice chair Patricia Galloway

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Earlier this month, FTW talked with **National Science Board** vice chair Dr. Patricia Galloway about her views on science and engineering. Below is an edited version of the interview. Patricia Galloway has been a member of the NSB since 2006 and was elected its vice chair in 2008. A licensed professional engineer in 14 US states, Canada and Australia, and a certified forensic claims consultant, she is an internationally recognized leader in civil engineering and construction with over 30 years experience. A past president of the American Society of Civil Engineers (ASCE), Galloway is CEO of Pegasus Global Holdings Inc., an international management consulting firm. She has a bachelor's from Purdue Univ., MBA from New York Institute of Technology, and PhD from Kochi Univ. of Technology in Japan.

FTW: At times there have been calls for the National Science Foundation (NSF) to be renamed the National Science and Engineering Foundation to better reflect its responsibilities. That change has not happened, perhaps because science and engineering (s&e) can coexist happily under the foundation's existing name. But President Obama has talked recently about a proposed economic stimulus package that would include lots of exciting things related to building and upgrading the nation's infrastructure - from highways and bridges to power networks - using the latest smart technologies. Do you think these plans would enhance s&e disciplines and help attract new talent to both fields?

PG: Absolutely. I think that this has been a movement, slow in the making, but which has grown since the National Academies' Rising Above the Gathering Storm report was issued. That study highlighted the critical need to look at our nation's crumbling infrastructure and its consequences for us as a competitive nation. The American Society of Civil Engineers (ASCE), which has been grading the nation's infrastructure for 20 years, found that it's getting worse. Just the cost of repairing our infrastructure is now well over \$1.3-trillion. I think we're in a position of great opportunity to use scientific and engineering skills in this task. I'm not in favor of changing names because there's value in name recognition and both the NSB and the NSF are well-known and widely respected. However, I see activities where it's a blend of the scientific and the engineering communities, and I personally believe they are two separate communities. We also know, from NSF's Extraordinary Women's Project that I led three years ago, that girls aged 14 to 17 who we interviewed across the country clearly had a different idea what science was versus engineering. In its S&E Indicators, the NSB has now separated out people enrolling in science and engineering to track this very issue. We're seeing a decline in people wanting to go into engineering and an even larger decline in people wanting to go into construction. In the Job Rated Almanac, construction was ranked 244 out of 250 jobs that people might want to do! I think we've got quite a ways to go. NSB and NSF, in particular, have a great opportunity to work with the Obama administration to change people's behavior relative to how they think about science and engineering in future. We've a chance to bring together all the NSF directorates to a common goal of rising above this gathering storm and being able to put our nation on a better competitive and productive platform.

FTW: You've been a very active participant in professional societies. Such bodies seem to offer a good route for the NSB to look beyond the more traditional scientific community and get feedback from civil engineers, project managers and others who are likely going to be using lots of future s&e graduates and will have a major influence not just on employment needs, but the smart technologies used in future infrastructure projects.

PG: This has been a theme of mine even before I became a NSB member and served on the NSF engineering directorate's advisory committee prior to that. I've always felt that the engineering and scientific communities seldom came together with one voice. The engineering community has traditionally been much more splintered than even the scientific community. I wrote a recent weekly blog on 'Why Construction Must Change,' in which I described what happened when Teddy Roosevelt was president. How he looked upon challenges as opportunities and used them to get everyone to work together on things they thought were impossible at the time: from the Panama Canal to the Brooklyn Bridge. I think we've now a national opportunity, with a new president who is interested in pushing forward these types of changes and working together, to help him effectuate those changes more efficiently and effectively and probably sooner.

FTW: NSB has been a very strong advocate of international s&e, and the current global economic crisis would seem a good time to encourage more international s&e partnerships to leverage funding and share research facilities.

PG: That's correct. I've been fortunate to travel to over 100 countries in my life and I've worked in at least 60 countries including ones in the Middle East, Asia, Europe and Latin America. What's been interesting is that I realize we all have similar goals. The World Federation of Engineering Organizations (WFEO), which brings together representatives from engineering and science organizations and their governments, held its 2008 Congress in Brazilia in November 2008 and NSF director Arden Bement attended. I was there, too. Frankly, we have a lot of what I call world problems and issues that a single nation can't solve. For example, climate change issues don't affect only one nation. We need to be able to better [predict] the probability of natural disasters, such as tsunamis, floods, hurricanes, and their impact, and undertake emergency planning. These are areas where I believe it's critical to form international partnerships and have cooperative efforts, so we not only avoid duplicating but we do it for the goal of improving the quality of life and protecting mankind. The new administration has pulled together a cabinet with a lot of international experience, and I believe the NSB would have a lot to offer.

FTW: One of your NSB roles is to chair the task force to plan the NSF/NSB 60th anniversary celebration in 2010. Could you say a little about it?

PG: Yes. We laid out our plan at the December NSB meeting, and it was approved. We want to identify individuals who have done something amazing with funding provided by NSF in the last ten years. The NSF directorates should be working on this right now. We want these 'voices of the future' to share with us their vision, and we're going to bring them together for a public workshop in conjunction with our May 2010 board meeting. We hope to accomplish several things including intellectual exchanges at the workshop and using the Internet and media to reach out to the K-12 schools and universities to educate and enlighten everyone about the excitement, fun and new challenges we can take on that's all due to s&e initiatives. We also will be seeking what we're calling the

greatest achievements in s&e over the last 60 years. We will be asking the public to offer input, vote on, and feed us ideas. We're also hoping to work in collaboration with companies such as Hewlett-Packard, Intel and IBM, which have young scientist contests, and perhaps select a person who could be the keynote speaker at the December 2010 dinner that will be the actual 60th anniversary of NSF and NSB. We've got a lot on our plate and some pretty lofty goals, but with NSF's skills I know we can accomplish them.