

National Nuclear Security Administration/Nevada Field Office
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**President Trump names NNSS mathematician as recipient of
'highest honor' for early-career scientists**

*Presidential Early Career Award for Scientists and Engineers announced
July 2*

NORTH LAS VEGAS, Nev. – President Donald J. Trump [announced](#) the recipients of the Presidential Early Career Award for Scientists and Engineers (PECASE) July 2; included on the prestigious list is the Nevada National Security Site's own Marylesa Howard.

“The PECASE is the highest honor bestowed by the United States Government to outstanding scientists and engineers who are beginning their independent research careers and who show exceptional promise for leadership in science and technology,” the White House’s announcement says.



“Marylesa’s technical contributions are vital to the security of our country,” said Mark Martinez, president of Mission Support and Test Services, the management and operating contractor for the NNSS. “Her work is integral to our mission, and I’m very proud to have her as part of the NNSS team.”

An NNSS supervisor, scientist and mathematician, Howard has established herself as an influential leader among scientists in Nevada, at the U.S. National Laboratories and at universities across the country. She is a highly published researcher, whose work has been highlighted by the Society of Industrial and Applied Mathematics and the American Institute of Physics; a champion for women in science, helping to direct the graduate research and guide the careers of women around the country; and an enthusiastic partner in scientific and educational outreach, working with the U.S. Department of Energy and the National Science Foundation to bring real-world scientific problems to students in universities across the country.

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“I see this as being much bigger than me,” Howard said. “This is also about the NNSS being recognized for the powerful research enabled here. I came to the NNSS for a job, but what I’ve found here is much more than a job. It is a mission I’m proud to serve, groundbreaking research to which I can contribute and a sense of belonging among the people with whom I work. This is an absolute honor, one of which I would have never dreamed.”

More about Howard’s career:

Howard has contributed to a wide range of scientific fields, but her most distinguished contribution is in the field of quantitative imaging science. She established herself as a creative researcher by developing novel methods to use satellite images to determine how ecologies evolve over time, which is important for understanding how to preserve marshlands and other disappearing landscapes.

Howard’s work then found applications in X-ray imaging, where she developed a new technique for computing the density of materials from X-ray images, with statistically justified measures of confidence. With her approach, it was no longer a matter of computing a single, uncertain answer, but rather computing a whole distribution of answers, which allows scientists to assess how confident they can be of their results. This was an outstanding contribution with applications to medicine and the physics of materials under extreme temperatures and pressures. When published, the Society of Industrial and Applied Mathematics, one of the largest professional societies of mathematicians, highlighted her work as one of its featured Nugget Bytes in applied mathematics in 2016.

Howard’s capstone accomplishment – to date – is a new approach to image segmentation, which means having an automated method to quantitatively determine which parts of an image correspond to different objects in a street scene or different materials in an X-ray image or different components of an item on an assembly line. Howard invented the first statistical method that allows a user to characterize parts of an image, but then automatically characterizes the rest of the image, even with the ability to correct any mistakes made by the user. Her novel technique has been incorporated into a software tool that has been copyrighted and licensed to Sandia National Laboratories, which is using the software in its thermal battery design department; Los Alamos National Laboratory, which is using the software in material studies; Livermore National Laboratory, which uses the approach to analyze explosives-driven experiments; and many universities, which are using Howard’s ideas in a wide range of sciences. In collaboration with MIT, this research was featured by the American Institute of Physics as one of its SciLight accomplishments of 2017.

Howard received her bachelor’s degree in mathematics with a minor in chemistry from George Fox University in 2007 and her master’s degree and Ph.D. in mathematics from

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The University of Montana in 2009 and 2013, respectively. Her thesis work focused on image classification methods for characterizing regional ecological landscapes from satellite imagery. She joined the NNSS' Signal Processing and Applied Mathematics team as a senior scientist immediately upon graduation and now supervises a team of 11 staff researchers and two graduate students, working on problems in national security. She is regularly invited to present her research at colleges and universities around the country, as well as professional conferences.

For more information on the PECASE, visit whitehouse.gov.

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The NNSS and its related facilities help ensure the security of the United States and its allies by: supporting the stewardship of the nation's nuclear deterrent; providing nuclear and radiological emergency response capabilities and training; contributing to key nonproliferation and arms control initiatives; executing national-level experiments in support of the National Laboratories; working with national security customers and other federal agencies on important national security activities; and providing long-term environmental stewardship of the NNSS's Cold War legacy.

The NNSS is managed and operated by Mission Support and Test Services LLC (MSTS). MSTS is a limited liability company consisting of Honeywell International Inc., Jacobs Engineering Group Inc., and HII Nuclear. The NNSS falls under the jurisdiction of the National Nuclear Security Administration (NNSA), an agency within the U.S. Department of Energy. The Site's operations are government-controlled and contractor-operated, and are overseen by NNSA's Nevada Field Office, headquartered in North Las Vegas.

For more information on the NNSS, visit www.nnss.gov.

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