

Science For All: Jim Gates Honored with 2021 Andrew Gemant Award

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Prize awarded to physics, physical sciences champion for "being a steadfast ambassador of science policy and the history of physics"

WASHINGTON, August 19, 2021 -- The American Institute of Physics announces theoretical physicist Sylvester James "Jim" Gates Jr. as the winner of the 2021 Andrew Gemant Award, presented to those who have made significant contributions to the cultural, artistic, or humanistic dimension of physics.

Gates was selected by the award selection committee "for instilling a deep and humanistic love of physics in generations of students, being a steadfast ambassador of science policy and the history of physics, and his persistent dedication to communicating the wonders of the field."

"I was stunned, surprised, shocked, and joyous when I heard I was chosen for the 2021 Gemant Award," Gates said. "Perhaps I have been able to accomplish something I have described as providing a doorway through which others can traverse to a brighter future. In a

sense the first step, in my now 50 consecutive years of university level instruction, occurred in my 12 straight summers (1972-1985) of teaching mathematics and physics in Project Interphase at the Massachusetts Institute of Technology."

"Jim Gates has spent his life and career expanding physics and the physical sciences not only through the advancement of scientific knowledge, but also through his passion and love of sharing the wonders of science with the world," said Michael Moloney, CEO of AIP. "Jim continues to be a leader and champion of physics in and outside the classroom, and we value his partnership with AIP over many years and as the current president of the American Physical Society, one of AIP's 10 Member Societies.

"He takes every opportunity to inspire and open up access to the next generation of scientists through programs like the APS Inclusion, Diversity, and Equity Alliance and AIP's Society of Physics Students. I am excited for him to be our latest Gemant Award winner and look forward to our continued efforts together to promote physics and the physical sciences."

After his time at MIT, Gates held faculty or visiting faculty positions at the University of Maryland, Howard University, Caltech, Gustavus Adolphus College, and Brown University, winning teaching awards from MIT, the American Association of Physics Teachers, Howard University, and Washington Academy. But Gates said he learned as much from his students during his time in the classroom as his students did from him.

"On many occasions, as I have taught across the decades, I have been struck by the fact that sometimes no matter how many occasions I have taught a lesson, some student will come up with a way of thinking about a problem that has never occurred previously to me," he said. "Generating a distinctive way of thinking is the key predicate to creative and powerful innovations. There is a cornucopia of such lessons, but this is the most important one for a research scientist."

Gates' influence on educating the public is not limited to the classroom. His contributions to documentaries, books, DVD series, network broadcasts, and many other forms of media have made the complex language of physics theories understandable to science students and nonscience minds alike.

"Most physicists are pretty smart, but far from all of them have wisdom, and very, very few have the wisdom of Jim Gates," said David Helfand, chair of the AIP board of directors. "Even fewer have Jim's ability to communicate the beauty and majesty of what physicists know about the world, along with the humility to appreciate how much we have still to learn.

"AIP is delighted to be able to recognize Jim's contributions to the education of generations of students, his unequalled ability to engage the public, and his leadership of our largest member society (American Physical Society) by bestowing on him the 2021 Gemant Award."

Beyond the classroom, Gates has taken his message of science-for-all to many groups, including Achieve, Inc. and the Boy Scouts of America STEM National Council. He was awarded the National Medal of Science, the highest award given to scientists in the U.S., by former President Barack Obama.

While attempting to connect with anyone interested in the physics of our world and the wider universe, Gates turned his attention to the African American presence in physics and astronomy in undergraduate programs.

He served on the AIP Task Force to Elevate African American Representation in Undergraduate Physics & Astronomy (TEAM-UP) Project to address diversity, equity, and inclusion for African Americans in physics and the physical sciences at the undergraduate level. While Gates believes there is hope for change -- "there must always be hope, otherwise the long-term prospects for our species are dim" -- the speed at which change is occurring needs to increase.

"As recent occurrences in the U.S. society demonstrate, progressive steps can be ephemeral. This has long been my opinion and has prompted me on a number of occasions to speak of the 'blazingly glacial speed' we, and our society, are making," Gates said. "However, my own career has illustrated change is possible. In 2013, 150 years after President Abraham Lincoln established the National Academy of Sciences, I was elected as its first theoretical physicist of the African diaspora.

"I am currently the second African American president of the APS following the 2016 election of Professor Homer Neal. So, something changed as these events give evidence of the drive and courage possessed by the community, but barriers remain."

Among all the activities for the expansion of science knowledge he champions, Gates said solving mathematical/theoretical physics problems gives him great satisfaction.

In 1995, he began work with "computational thinking" toward understanding the mathematics of supersymmetry. Staring nine years later, he and others were able to connect the work of computer science and genetics through network theory.

In 2020, he and two graduate students used his previous methods and mathematical algorithms to solve an 11D supergravity problem that involved 4,294,967,296 functions.

"Albert Einstein once said, 'Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there will be to know and understand.' In a similar manner, Alan Turing commented, 'Sometimes it is the people no one can imagine anything of, who do the things no one can imagine,'" Gates said.

"I am not in the business of 'chasing' impossibilities but am systematically implementing the observations inherent in the Einstein-Turing recipe for discovery. Buoyed by this result, I plan to continue to use adinkras (a class of geometric symbols) to reveal answers to hitherto unsolvable problems."

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About American Institute of Physics

The American Institute of Physics (AIP) is a 501(c)(3) membership corporation of scientific societies. AIP pursues its mission—to advance, promote, and serve the physical sciences for the benefit of humanity—with a unifying voice of strength from diversity. In its role as a federation, AIP advances the success of its Member Societies by providing the means to pool, coordinate, and leverage their diverse expertise and contributions in pursuit of a shared goal of advancing the physical sciences in the research enterprise, in the economy, in education, and in society. In its role as an institute, AIP operates as a center of excellence using policy analysis, social science, and historical research to promote future progress in the physical sciences.

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