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*Note: Images available at: <https://nyutandon.photoshelter.com/galleries/C0000d38y2d7dzak/G0000dtQKaUFDn5Y/Christopher-Musco>*

**Immediate Release**

## **Professor Christopher Musco receives NSF award for promising young researchers**

BROOKLYN, New York, Monday, March 22, 2021 — The National Science Foundation (NSF) selected an [NYU Tandon School of Engineering](#) professor who is spearheading a project to democratize big data modeling with novel algorithms to receive one of its most prestigious awards for promising young academics.

[Christopher Musco](#), an assistant professor in the Department of Computer Science and Engineering, received a 2021 NSF Faculty Early Career Development Award, more widely known as a CAREER Award, which supports early-stage faculty who have the potential to serve as academic role models in research and education. Musco, with fellow 2021 awardee [Anna Choromanska](#), joins the over 50% of NYU Tandon's junior faculty members who hold CAREER Awards or similar young-investigator honors.

A five-year, \$562,224 [grant](#) will support a project that focuses on new ways of processing and analyzing massive data sets — from such sources as scientific simulations, urban data, and web content. Typically, data-driven discovery and decision making for science, engineering, and industry requires enormous computational effort, making the process both costly and time consuming.

The goal of Musco's work is to democratize big-data processing by developing new algorithms capable of efficiently processing the world's largest datasets without the need for the world's largest supercomputers. To achieve this, Musco and his team will employ a powerful algorithmic technique known as "matrix sketching," the purpose of which is to quickly compress a large dataset (represented as a matrix of numbers) down to its most essential information by eliminating redundancy and noise.

"The beauty of matrix sketching is that it does not require you to redesign whatever downstream algorithms you are using for machine learning or statistical inference," explained Musco. "You simply

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pass your compressed dataset into those methods, which will require less computational resources if the compression is compact. We hope to advance the state-of-the-art through an interdisciplinary approach rooted in theory – our work combines tools from theoretical computer science with methods from computational and applied mathematics.”

Musco added that the project also involves a major educational component, aimed at improving U.S. mathematics education through closer ties with applications in STEM fields. For several years he has been involved as a problem writer and judge for SIAM’s “MathWorks Math Modeling Challenge,” an international high-school applied-mathematics competition.

“Through that program I have had the opportunity to develop curricular material and workshops for high-school educators, with the goal of getting students exposed to applied math and computing as early as possible,” he said. “That’s something I am very excited to continue working on.”

The project will also support course development at NYU with the goal of better preparing university students for careers in specialized areas like machine learning, data science, and algorithm research and development that are going to be in high demand for years to come.

Musco, received his Ph.D. in computer science from the Massachusetts Institute of Technology and B.S. degrees in applied mathematics and computer science from Yale University. He has authored several papers with his twin brother, Cameron, a professor at the University of Massachusetts, Amherst, who also received an NSF CAREER award this year.

“I’m thrilled that Christopher Musco has received the CAREER Award, an honor that is not merely an accolade or a mark of prestige, but a vote of confidence by the scientific community, and a bellwether for the future achievements of a young, talented member of our faculty,” said Jelena Kovačević, Dean of NYU Tandon. “I’m also proud that he’s our second CAREER honoree so far this year, which speaks to the strength of our researchers’ singular focus on engineering for a better society.”

This award reflects the NSF's statutory mission and has been deemed worthy of support through evaluation using the Foundation's intellectual merit and broader impacts review criteria.

### ***About the New York University Tandon School of Engineering***

*The NYU Tandon School of Engineering dates to 1854, the founding date for both the New York University School of Civil Engineering and Architecture and the Brooklyn Collegiate and Polytechnic Institute. A January 2014 merger created a comprehensive school of education and research in engineering and applied sciences as part of a global university, with close connections to engineering programs at NYU Abu Dhabi and NYU Shanghai. NYU Tandon is rooted in a vibrant tradition of entrepreneurship, intellectual curiosity, and innovative solutions to humanity’s most pressing global challenges. Research at Tandon focuses on vital intersections between communications/IT, cybersecurity, and data science/AI/robotics systems and tools and critical areas of society that they influence, including emerging media, health, sustainability, and urban living. We believe diversity is integral to excellence, and are creating a vibrant, inclusive, and equitable environment for all of our students, faculty and staff. For more information, visit [engineering.nyu.edu](http://engineering.nyu.edu).*

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