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Note: Image available at

https://nyutandon.photoshelter.com/galleries/C0000bm3nk9_B024/G00002qW5O3URqxQ/Marzetta-NAE

Immediate Release

Wireless technology innovator Thomas Marzetta elected to the National Academy of Engineering

NYU Tandon distinguished industry professor and director of NYU WIRELESS honored for pioneering the Massive MIMO antenna arrays that underpin 5G wireless communication

BROOKLYN, New York, Weekday, Friday, February 7, 2020 – [Thomas L. Marzetta](#), a distinguished industry professor of electrical and computer engineering at the [NYU Tandon School of Engineering](#) and the director of the research center [NYU WIRELESS](#), was elected to the [National Academy of Engineering](#) (NAE).

Election to the NAE – part of the 157-year-old National Academies of Science, Engineering, and Medicine – is among the highest professional distinctions accorded to an engineer. Academy membership honors those who have made outstanding contributions to “engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature” and to “the pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education.”

The NAE specifically cited Marzetta’s contributions to massive multiple-input multiple-output (MIMO) antenna arrays in wireless communications. Massive MIMO – considered a key enabler for the fifth generation of wireless technology, or 5G – utilizes numerous small, individually controlled, low-power antennas to direct streams of information, selectively and simultaneously, to many users. This confers spectral efficiency orders of magnitude greater than that experienced in 4G service, along with high-quality service throughout the cell, simplicity and scalability, and outstanding energy efficiency.

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Marzetta developed the concept of Massive MIMO during his 22 years at Bell Labs, where he directed the Communications and Statistical Sciences Department within the former Mathematical Sciences Research Center. His seminal paper, "[Noncooperative cellular wireless with unlimited numbers of base station antennas](#)," published in 2010 in *IEEE Transactions on Wireless Communications*, has been cited well over 4,000 times. He is the author or co-author of more than 220 published papers and is the lead author of the book [Fundamentals of Massive MIMO](#), published in 2016.

Under his leadership, NYU WIRELESS researchers are exploring the next frontiers of communications where users will demand factor-of-ten or greater throughputs, and corresponding reductions in latency, compared with 5G. Lines of research include experiments in terahertz propagation, with promise of vast amounts of new spectrum, novel forms of relaying, and new types of Massive MIMO. Examples of the latter are Large Intelligent Surfaces, which would surround the user with ultra-low power antenna arrays, and Holographic MIMO, which ultimately could replace arrays of discrete antennas with continuous transmitting/receiving surfaces.

"I am deeply honored to be in the company of such a transformative and talented group of engineers," Marzetta said. "While it is gratifying to receive this award for Massive MIMO, one of the foundations of 5G, we must now look to the future, where even 5G won't be able to meet the communication requirements of augmented reality and holographic video. Our utmost research efforts are needed to create the technology that, eight or ten years from now, will enable 6G."

In addition to his election to the NAE, recognition for Marzetta's contributions to wireless communications include the 2019 Armstrong Medal from Radio Club of America, the 2017 IEEE Communications Society Industrial Innovation Award, the 2015 IEEE Stephen O. Rice Prize, and the 2015 IEEE W. R. G. Baker Award. He was elected a Fellow of the IEEE in 2003 and a Bell Labs Fellow in 2014.

"Tom Marzetta's groundbreaking research on Massive MIMO has enabled the spread of 5G; Tom's election to the National Academies of Engineering is a well-deserved honor," said NYU Tandon Dean Jelena Kovačević. "I am exceptionally proud to be able to call him my colleague at NYU Tandon and look forward to NYU WIRELESS contributions to 6G under Tom's leadership."

Marzetta, along with 86 other new members and 18 international members, will be inducted during a ceremony at the NAE's annual meeting in Washington, D.C., on October 4, 2020.

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 (widely known as Brooklyn Poly). A January 2014 merger created a comprehensive school of education and research in engineering and applied sciences, rooted in a tradition of invention and entrepreneurship and dedicated to furthering technology in service to society. In addition to its main location in Brooklyn, NYU Tandon collaborates with other schools within NYU, one of the country's foremost private research universities, and is closely connected to engineering programs at NYU Abu Dhabi and NYU Shanghai. It operates Future Labs focused on start-up businesses in Brooklyn and an award-winning online graduate program. For more information, visit engineering.nyu.edu.

About NYU WIRELESS

NYU WIRELESS is a vibrant academic research center that is pushing the boundaries of wireless communications, sensing, networking, and devices. Centered at NYU Tandon and involving leaders from industry, faculty, and students throughout the entire NYU community, NYU WIRELESS offers its industrial affiliates, students, and faculty members a world-class research environment that is creating fundamental knowledge, theories, and techniques for future mass-deployable wireless devices across a wide range of applications and markets. Every April, NYU WIRELESS hosts a major invitation-only wireless summit, in cooperation with Nokia Bell Laboratories, for the center's industrial affiliates and thought leaders throughout the global telecommunications industry. For more information, visit wireless.engineering.nyu.edu.

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