

| TEACHING & LEARNING

# A Nobel Laureate Explores the Brain's "GPS"—and What It May Reveal About Alzheimer's

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On February 9, 2026, May-Britt Moser addressed her audience at National Taiwan University on a profoundly complex and deeply human concern: how we find our way. How we find our way, not just through cities or country landscapes, but through labyrinth of memory itself.

Moser, the Norwegian neuroscientist who shared the 2014 Nobel Prize in Physiology or Medicine, presented her keynote lecture on "The Brain's Navigation and Memory Systems and Their Relevance to Alzheimer's Disease." A professor at the Norwegian University of Science and Technology (NTNU) and the founding director of the globally renowned Kavli Institute for Systems Neuroscience, Moser is most well-known for discovering "grid cells." These are neurons which form an internal coordinate system in the brain, allowing humans and animals to navigate space. Often characterized as the brain's built-in GPS, these neural coordinate systems map location through a strikingly geometric pattern of activity, anchoring our sense of place and direction.



May-Britt Moser, recipient of the 2014 Nobel Prize in Physiology or Medicine and Professor at the Norwegian University of Science and Technology (NTNU).

In her lecture, Moser traced the implications of that discovery far beyond spatial navigation, focusing on the brain’s spatial system’s interconnection with memory—and how understanding its breakdown may offer early clues to one of the most devastating neurodegenerative diseases.

## Where Navigation Meets Memory

Grid cells reside in the entorhinal cortex, a region of the brain that serves as a gateway between sensory input and memory formation. It is also one of the first areas affected in Alzheimer’s disease.

This overlap, Moser explained, is not coincidental.

When the entorhinal cortex begins to deteriorate, the brain’s ability to construct spatial maps is compromised. The result is often subtle at first: occasional disorientation, a tendency to get lost, a fading sense of direction. These are among the earliest and most recognizable symptoms of Alzheimer’s—a disease typically associated with memory loss, but one that may in fact commence with the loss of spatial awareness.

Understanding how grid cells function, Moser suggested, may thus offer a pathway toward earlier diagnosis—and, eventually, more targeted and potentially efficacious treatments.

But, the implications go further still.

## The Brain’s Hidden Algorithm

In recent years, Moser’s research has expanded to investigate how the brain integrates not just place, but also time and experience—how it weaves together where we are, when events occur, and what they mean, into coherent memories.

At its core, she argues, the challenge is to understand the brain’s underlying “algorithm”: the rules by which neural activity becomes coordinated perception, memory, and thought.

Without that understanding, she cautioned, efforts to treat neurological disease risk remaining imprecise.

“Only when we truly understand how the brain works,” she has often emphasized, “can we design therapies that are both accurate and effective.”

## Beyond the Laboratory

Moser’s visit to NTU extended beyond the lecture hall.

At NTU’s Green Health Research Center, she met with researchers exploring how neuroscience might inform the design of physical environments. Their discussions focused on integrating insights from brain science into the HEALS Design framework, an emerging approach that harnesses architecture, health, and technology.

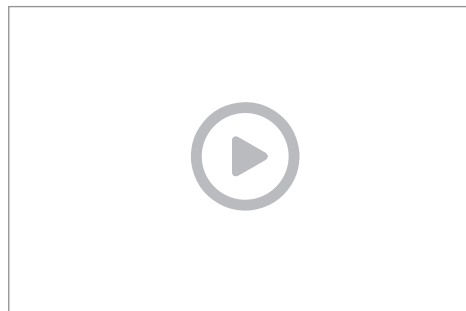
Among the possibilities: immersive environments using virtual reality and 360-degree simulation to create spaces that support cognitive function and well-being—particularly for aging populations.



Prof. Moser emphasizing the importance of fostering a psychologically safe and supportive research environment—one in which students feel free to question, explore, and learn without fear of failure in panel discussion.



NTU President Wen-Chang Chen (right) presenting the Raymond Soong Chair Professorship trophy to Prof. Moser (left).



Highlights from Prof. May-Britt Moser’s public lecture, “The Brain’s Navigation and Memory System and Its Relevance to Alzheimer’s Disease.”

The idea reflects a broader shift in scientific thinking: the boundaries between disciplines are becoming less rigid and more porous, and solutions to complex problems—from dementia to urban health—may emerge at their intersections.

For Moser, the journey from fundamental discovery to real-world application underscores a larger point.

The most transformative advances, she suggests, often begin with curiosity-driven targeted research—questions about how the brain maps space, how cells communicate, how memory is formed. Only later do their implications unfold and interconnect, reshaping how we understand disease, treatment and, ultimately, ourselves.

In that sense, the brain's internal GPS is more than a navigational tool.

It is a window into how we make sense of the world—and what happens when that sense begins to slip away.

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