

| TEACHING & LEARNING

Academician James C. Liao Explores the Future of Technology and Humanity Through the Lens of Evolution

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Academician James C. Liao delivers his lecture, “Future Society: An Evolutionary Perspective on Technology and the Humanities,” exploring the impact of rapid technological change, the essential role of the humanities, and possible futures through the lens of evolution.

On March 6, 2026, National Taiwan University welcomed back distinguished alumnus Academician James C. Liao, a world-renowned pioneer in metabolic engineering and synthetic biology and former President of Academia Sinica (2016–2026), for a Royal Palm Lecture titled “*Future Society: An Evolutionary Perspective on Technology and the Humanities.*”

Drawing on the concept of evolution, Liao offered a compelling framework for understanding a world shaped by accelerating technological change.

The Limits of Prediction

Liao began with a simple observation: the future cannot be predicted with precision.



Academician James C. Liao, former President of Academia Sinica (2016–2026), is a distinguished NTU alumnus (B.S. in Chemical Engineering, Class of 1980).

Although societies often rely on historical experience or computational models to forecast what lies ahead, he explained that the principles of chaos theory remind us that even tiny initial differences can be amplified in complex systems, making long-term prediction inherently uncertain.

Rather than attempting to predict the future, Liao proposed understanding it through the lens of evolution.

Technological and social change, he argued, resembles biological evolution. New technologies enter existing systems much like invasive species, reshaping entire ecosystems. Organizations that fail to adapt to disruptive innovation risk becoming obsolete.

Information technology evolves especially rapidly because, unlike matter or energy, information is not constrained by conservation laws. As a result, its rate of evolution far exceeds that of biological systems.

Artificial Intelligence as Accelerated Evolution

Artificial intelligence, Liao said, represents perhaps the clearest example of this process.

Through reinforcement learning, AI systems undergo a form of accelerated evolution—continuously learning, adapting, and optimizing at extraordinary speed. As intelligent machines become increasingly autonomous, he argued, the humanities will become more—not less—essential.

He urged scholars to broaden the traditional scope of the humanities beyond the interactions between humans and nature. Future scholarship, he suggested, must also examine the relationships among humans, AI systems, the natural world, and the increasingly complex interactions that connect them.

Critical Thinking in an Age of Transformation

Concluding his lecture, Liao encouraged students and researchers to cultivate intellectual independence in an era of rapid change.

He urged the audience not to accept authority unquestioningly, but instead to challenge conventional wisdom, seek evidence, filter out misinformation, and pursue research that addresses problems of genuine societal importance.

His message underscored a broader truth: as technological change accelerates, society will increasingly depend not only on scientific innovation, but also on the critical thinking, ethical judgment, and human values that guide its application.



NTU President Wen-Chang Chen (left) presents the Royal Palm Lecture commemorative award to Academician James C. Liao (right).



Academician James C. Liao's thought-provoking and accessible lecture prompted lively discussion and active audience participation.