Presentation & Panel Abstracts for November 2025 APS Meeting

Responding to New Realities for US Universities and for Science
Robert W. Conn

The US science and technology research ecosystem is undergoing revolutionary change: How should universities respond? The federal government has for its own reasons gone to war with our universities, an unprecedented event in US history, and is attacking on many fronts. Universities are struggling to respond. The implications for our science and discovery enterprise will be profound, and negative. If we hope to keep the country on a productive discovery and innovation pathway, there are four core principles upon which to forge a truce. The core principles must be ones that universities live by and the federal government respects. Only then will the formidable history of U.S. progress and leadership continue.

Reflections on Higher Education Today and Into the Future
Michael Crow, Alan Garber, Gabrielle Starr

This panel featuring Michael Crow, Alan Garber, and Gabrielle Starr reflect on their leadership experiences, their ideas about the future of higher education, and their views on the role of colleges and universities today and in the future.

Uncertainty: The Kryptonite of Nondeterministic A.I.
Missy Cummings

With the rise of large language models, agentic AI appears to disrupt jobs in many sectors. Such systems that embed neural networks to "reason" have seen mixed results in deployments, with little discussion of their need for significant human supervision. This talk with discuss how the degree of non-determinism and uncertainty inherent in neural network systems only exacerbates problems with AI reliability and safety, which is further complicated by a rush to market.

Playlist for the Apocalypse: Poems for Our Times
Rita F. Dove

A poetry reading featuring selections from my 2021 book, *Playlist for the Apocalypse*.

What Still Needs to be Done to Conquer Cancer

Tony Hunter

Amazing progress has been made in our understanding of the cellular and molecular underpinnings of cancer since 1971. We now know that the human genome encodes ~20,000 proteins and that genetic changes in any one of several hundred of these genes can be causal in cancer. The functional characterization of the oncoproteins made by these cancer genes has led to the development of many classes of targeted cancer drugs that work against individual oncoproteins, including kinase inhibitors, such as Gleevec for myeloid leukemia. Most recently, new drugs against the once thought undruggable KRAS oncoprotein have been developed and approved. The advent of cancer immunotherapies now offers another new approach to eliminating cancer cells. Nonetheless, most cancers are not susceptible to immunotherapy and drug resistance to targeted therapies commonly arises allowing the cancer to progress. Going forward, improved early detection methods, more effective combination therapies, and a better understanding of the tumor as a tissue, where tumor cells interact with normal cells, such as fibroblasts and immune cells, will all be needed to increase cancer cure rates.

Navigating the AI Horizon: Promises, Perils, and the Power of Collaboration

Semiha Ece Kamar Eden

We stand at the dawn of the AI era, a technological revolution poised to be the most consequential of our generation, presenting both unprecedented opportunities and profound challenges. But this promise is shadowed by significant challenges. To build a future we want, we must move beyond the hype and the headlines to confront the most pressing open problems—technical, sociotechnical, and multidisciplinary. This talk will review the rapid progress, dissect challenges ahead, and argue that our greatest task isn't simply building smarter machines, but fostering the human wisdom to guide them towards a future that is not only intelligent but also equitable, safe, and profoundly human.

Unique Potential for Learning Offered by Creative Listening in the 21st Century

Lei Liang

Chinese-American composer Lei Liang was a finalist for the Pulitzer Prize in Music, and the winner of the Grawemeyer Award – the highest international honor for classical composition. He launched “Lei Lab” where he works with oceanographers, geologists, engineers, and software developers, to explore what

he calls “the unique potential for learning offered by creative listening” in the 21st century.

Deliberative Pathways in Judicial Decision-Making

Goodwin Liu

The Supreme Court and other multimember appellate courts produce judicial decisions reflecting the votes of its individual members. Although it is common to dissect the methodological or substantive views of judges as individuals, less attention is paid to how the structure of deliberative processes may affect judicial opinions as the product of a collective body. I will discuss some differences between the decisional processes of the U.S. Supreme Court and California Supreme Court, and how those differences might affect collegiality, compromise, polarization, and opinion-writing. These ideas may have implications for deliberative processes more generally.

Neural Codes of Space

Edvard I. Moser

The ability to keep track of our position in space depends on neural circuits in the hippocampus and entorhinal cortex. These circuits contain specialized cell types, including hippocampal place cells and entorhinal grid cells, that together form the brain’s spatial mapping system. Recent advances in large-scale recording technologies now make it possible to monitor the activity of thousands of these neurons simultaneously during behavior. Using these approaches, we show how the collective dynamics of grid cells arise across large populations. Their activity is organized on a torus-shaped manifold, indicating that the brain’s internal representation of space is inherently periodic. This periodic code is transformed in the hippocampus into countless distinct place-cell maps, providing a basis for episodic memory. Remarkably, the toroidal structure emerges early in postnatal development, before significant experience, suggesting that the neural architecture for mapping space is intrinsic and largely pre-wired.

The Room Where – and When – It Happened: What Virtual Reality and the Great Experiment Reveal About American Democracy

Mohammad F. Obeid and Warren R. Hofstra

Borrowing from George Washington’s famous letter to English historian Catharine Sawbridge Macaulay Graham in 1790 observing that the “establishment of our new Government seemed to be the last great experiment, for promoting human happiness,” The Great Experiment is our experiment in

exploring this constitutional moment of great creativity and consequence within a virtual reality experience.

Set in a meticulous, historically accurate, digital reconstruction of the Assembly Room at the Pennsylvania State House (Independence Hall) as it stood during the 1787 Constitutional Convention, The Great Experiment invites users to encounter and participate in the original debate over how a republic should choose its chief executive. The experience progresses through staged levels: observing richly documented exchanges among delegates, studying their principles and life histories, embodying delegates in arguing from scripted positions, speaking in one's own words, and concluding with a free debate on a related contemporary question.

This talk examines what immersive learning environments reveal about history scholarship, pedagogical potential, and civic reasoning—how the phenomenon of presence illuminates the spatial and multi-sensory nature of evidence and elucidates rational discourse as a means of deliberative practice within a bespoke and curated environment.

Building a New Model for Nonprofit Research

Peter Schultz

Despite the remarkable advances in our understanding of human biology, the development of new medicines for many diseases lags far behind. At Scripps we are building an institutional model that seamlessly bridges new scientific discoveries with their translation to innovative medicines that directly impact patients. These include regenerative medicines that reverse heart, lung and intestinal disease, new treatments for infectious, metabolic and fibrotic disease, and novel cancer therapies. The impact is twofold- improving global human health and in doing so, creating a self-renewing source of unrestricted revenues that are reinvested in the research enterprise to augment dwindling federal dollars.

Stranger in the Shogun's City: From the Archive to the Page

Amy Stanley

In the early nineteenth century, an irrepressible woman named Tsuneno ran away from her home in the Japanese snow country. After three marriages and three divorces, she was determined to find a new life in the great city of Edo (now Tokyo), even if it meant pawning her clothes and working as a servant. When I encountered fragments of Tsuneno's life in the archive, I realized that her story had enormous potential to show us many facets of women's lives in early modern

Japan, but it was also a struggle to form her scattered record into a narrative.

This talk draws from my experience wrestling with Tsuneno's archive to consider problems of narration, methodology, and silence: Where do you turn when you don't know exactly what happened? How do you write a compelling narrative when you're faced with frustrating gaps? What can you draw from your own experience of the world, and where should you leave room for difference? And worst of all, how do you know what your sources aren't telling you, and make peace with what you don't know?

Super Agers: An Evidence-Based Approach to Longevity

Eric Topol

With all the advances in both the science of aging and artificial intelligence (AI), we are in a propitious position to accurately and precisely determine who is at high risk for the major age-related diseases years before any clinical signs manifest. It takes at least 20 years for most cancers, Alzheimer's disease, or cardiovascular disease to develop within our bodies. This provides a long window of opportunity to get ahead of the pathobiological process, both for prediction and prevention. The template for how we can achieve prevention of age-related disease will be reviewed.