

Chemical and Biological Engineering

FROM THE CHAIR / Fall 2024

Dear colleagues and friends,

The Department of Chemical and Biological Engineering has much to celebrate this fall. I hope that in addition to reading this newsletter, I will be able to share the good news with you in person this Sunday at the American Institute of Chemical Engineers (AIChE) reception in the San Diego. The next day, Professor **Linda Broadbelt** will deliver the P.V. Danckwerts Lecture, one of the highest honors given by the Institute.

Over the past year, we welcomed new assistant professors **Krishna Shrinivas** and **Lisa Volpatti**, both of whom opened their labs in winter 2024 but just started teaching this past month. The department also promoted **Ashty Karim**, who is moving into a tenure-track assistant professor position starting January 1. Please help me welcome these new professors, who will help the department continue its excellence in biological engineering. They are working on topics such as cell-free synthetic biology, modeling biomolecular condensates, and advancing immunotherapy. Their work is sure to have impacts in sustainable chemicals production, advancing human health, and uncovering the fundamental physics of non-equilibrium materials. You can read in this issue how Ashty is already hard at work, as he and Professor **Julius Lucks** recently published a common framework for the field of synthetic biology, which is sure to transform the teaching of this new field.

We have also put into place our first collective bargaining agreement with the graduate student workers in the department. In addition to the pay bump, I'm confident this will usher in healthy new approaches to cooperation and conflict resolution between students and faculty.

Speaking of students, it is my special honor to congratulate **Maggie O'Connell**, who won the Presidential Fellowship – the highest award for PhD students at Northwestern, and one of only seven this year. Maggie works with Professor **Jennifer Dunn** on holistic architectures for techno-economic assessments, and she continues a rich tradition of winners of the highest recognitions on campus.

In this issue of the newsletter, you will read about some of the amazing research by Professor Lucks and Professor **Josh Leonard**, as they make major new advances in drug delivery and work to deploy ultra-low-cost diagnostics to help farmers in resource poor regions. You can also read about Professor **Linsey Seitz's** work to unravel the mechanisms of (and potentially lower the cost of) the iridium oxide electrodes that will be critical to the deployment of green hydrogen.

Two other stories touch on the new US Department of Energy Midwest Nuclear Direct Air Capture Hub (MINDAC) led by Professor Dunn, and the launch of a large new National Science Foundation center on assessing and predicting technology outcomes to help bring technology advances to market more effectively.

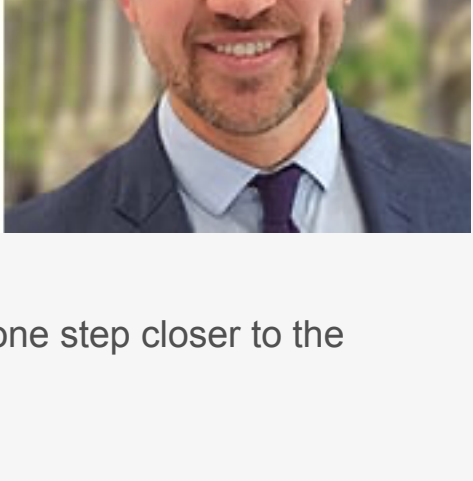
The department continues to excel in education, and Professor **Jennifer Cole** was recognized for her Service to Chemical Engineering Education by AIChE. This past September, she was also recognized by Northwestern Engineering with the Cole-Higgins Award (no relation!) for Excellence in Advising.

Finally, please check out the brief biography of **David Hinton** ('95), which discusses how the analytical and systems thinking skills he developed as an undergraduate chemical engineer were parlayed into success as an equity analyst.



Justin Notestein
Professor and Chair
Department of Chemical and Biological Engineering
McCormick School of Engineering

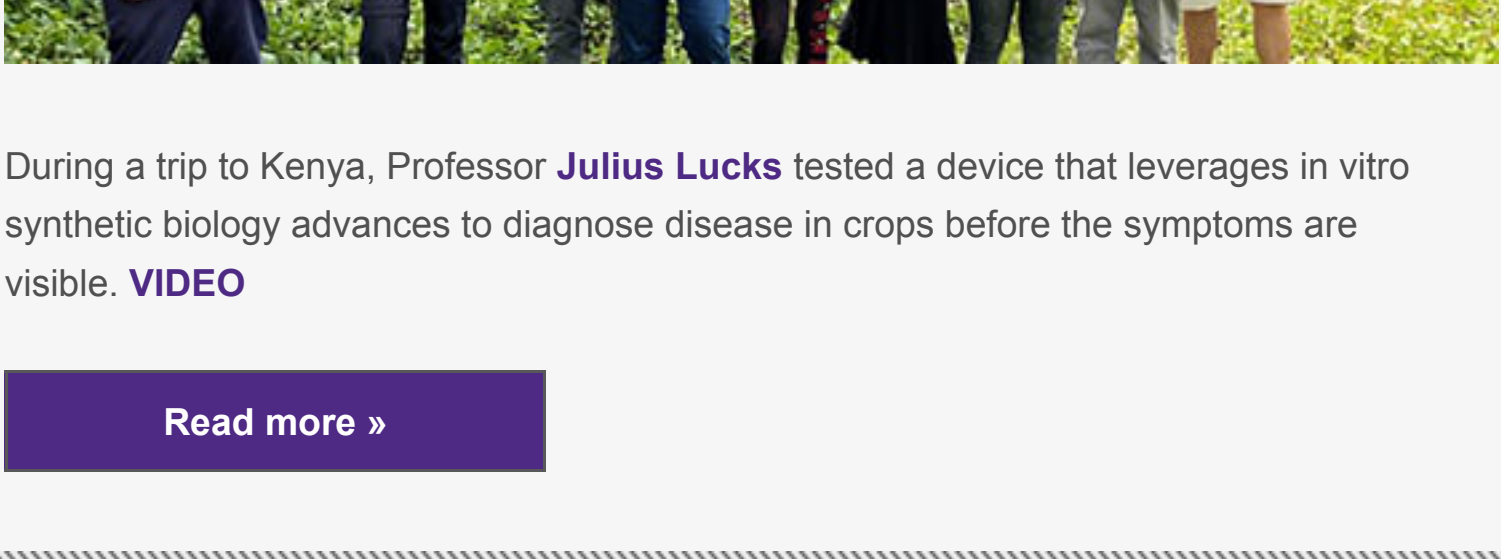
Transporting Precious Cargo Using the Body's Own Delivery System



The advances produced by Professor **Josh Leonard** “get us one step closer to the ultimate goal of targeted biological drug delivery.”

[Read more »](#)

Synthetic Biology Empowers Farmers with Cutting-Edge Crop Diagnostics



During a trip to Kenya, Professor **Julius Lucks** tested a device that leverages in vitro synthetic biology advances to diagnose disease in crops before the symptoms are visible. **VIDEO**

[Read more »](#)

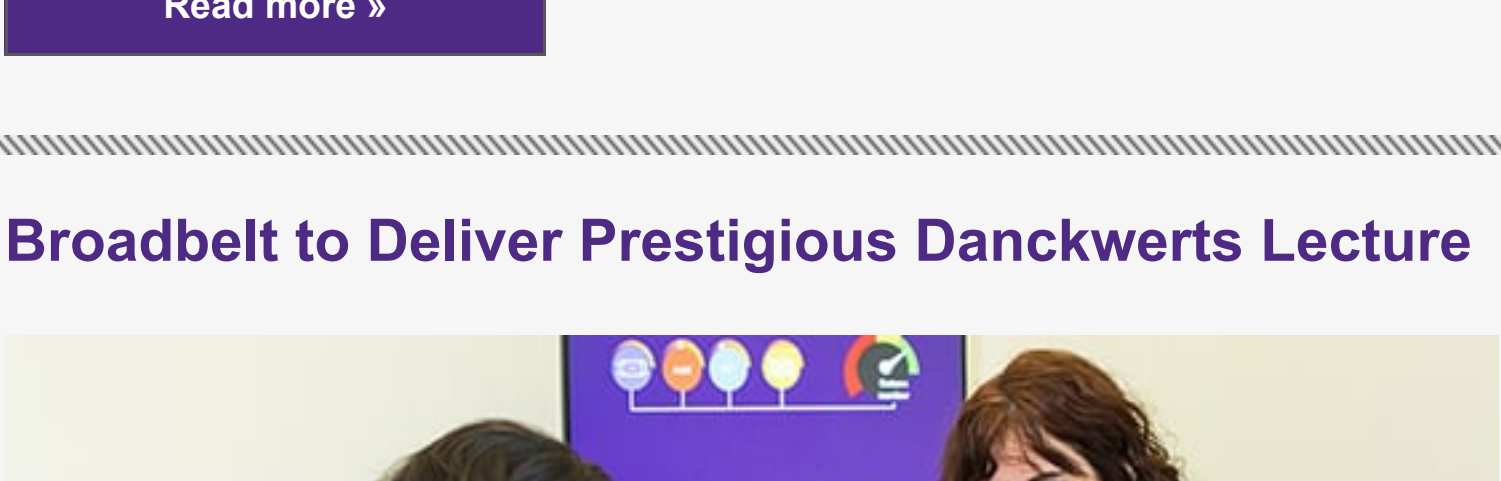
Researchers Move Closer to Green Hydrogen via Water Electrolysis



A study by Professor **Linsey Seitz** reveals a new understanding of iridium's surface using novel microscopy methods.

[Read more »](#)

A Process of Discovery



David Hinton ('95) turned his chemical engineering studies into a 22-year investment career.

[Read more »](#)

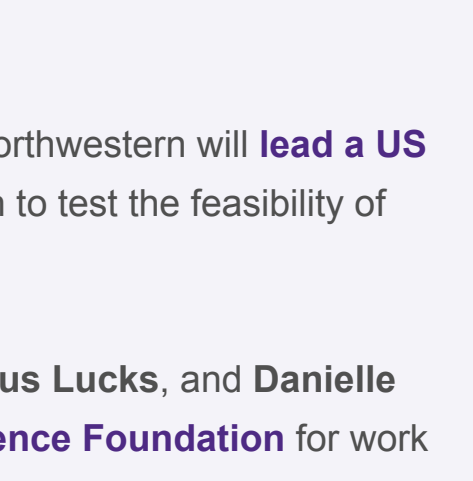
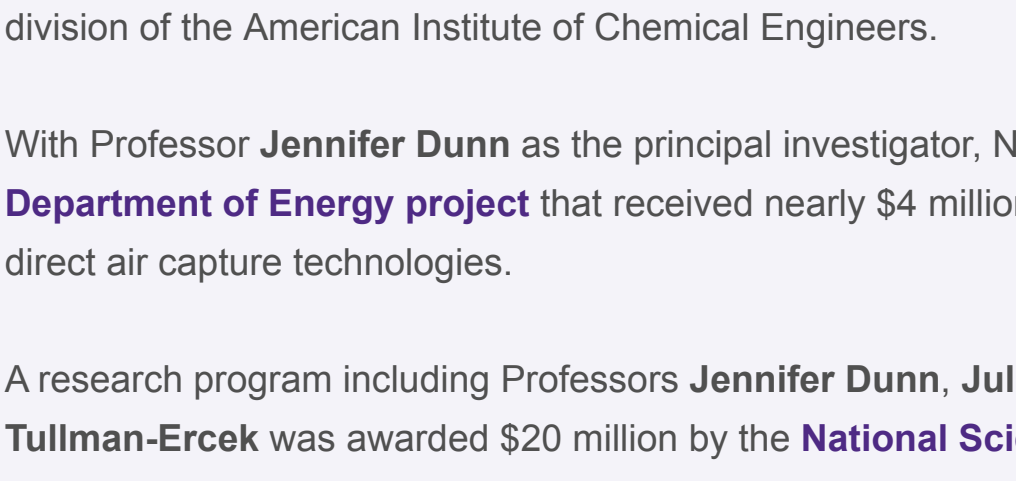
Broadbelt to Deliver Prestigious Danckwerts Lecture



Professor **Linda Broadbelt** will speak on October 28 at the 2024 American Institute of Chemical Engineers annual meeting on the topic of kinetic modeling and data science.

[Read more »](#)

Northwestern Researchers Propose a New, Holistic Way to Teach Synthetic Biology



The approach presented by Professors **Julius Lucks** and **Ashty Karim** promises to bridge scientists across disciplines to solve society's biggest challenges.

[Read more »](#)

DEPARTMENT NEWS

Associate Professor of Instruction **Jennifer Cole** was selected as the 2024 recipient of the **Award for Service to Chemical Engineering Education**, presented by the education division of the American Institute of Chemical Engineers.

With Professor **Jennifer Dunn** as the principal investigator, Northwestern will **lead a US Department of Energy project** that received nearly \$4 million to test the feasibility of direct air capture technologies.

A research program including Professors **Jennifer Dunn**, **Julius Lucks**, and **Danielle Tullman-Ercek** was awarded \$20 million by the **National Science Foundation** for work on measuring, understanding, predicting, and accelerating technology innovations.

Professor **Chad Mirkin** was awarded the **2024 Kavli Prize in Nanoscience** by the Norwegian Academy of Science and Letters, becoming the first Northwestern scientist to receive the prestigious award.

Professor **Julio M. Ottino** was elected to the **American Institute for Medical and Biological Engineering's College of Fellows**.

FACTS & FIGURES

4 Charles Deering McCormick Professors of Teaching Excellence	5 Members of the National Academy of Engineering	100+ PhD graduates and postdocs who took academic positions in past 20 years
---	---	--

[Make a Gift](#) [Update Contact Info](#)