

NEWS & ANNOUNCEMENTS



Using microbes for sustainable agriculture

Chris Voigt will lead a team awarded a J-WAFS Grand Challenge grant to boost African agriculture with microbes

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Color changing sensors detect early drought stress in crops

Past J-WAFS researchers Michael Strano and Benedetto Marelli worked with collaborators on sensors that allow farmers to detect drought stress up to 48 hours before visible symptoms.

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J-WAFS fellow's system desalinates groundwater at low cost

Jon Bessette, along with past J-WAFS PI Amos Winter, designed a solar-powered system to make brackish groundwater drinkable in communities where seawater and grid power are limited.

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Hidden power of boiling could advance desalination

Matteo Bucci, an associate professor in the Department of Nuclear Science and Engineering, studies the physics of boiling to improve sustainable energy systems.

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MIT alum uses rum wastewater to produce biofuel

Legena Henry SM '10 is the CEO and cofounder of Rum & Sargassum, which uses distillery wastewater and sheep manure to convert seaweed into renewable natural gas in Barbados.

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J-WAFS awards projects that seek to help farmers

Karen Zheng and Sai Ravela received India Grants for their work promoting sustainable agricultural practices.

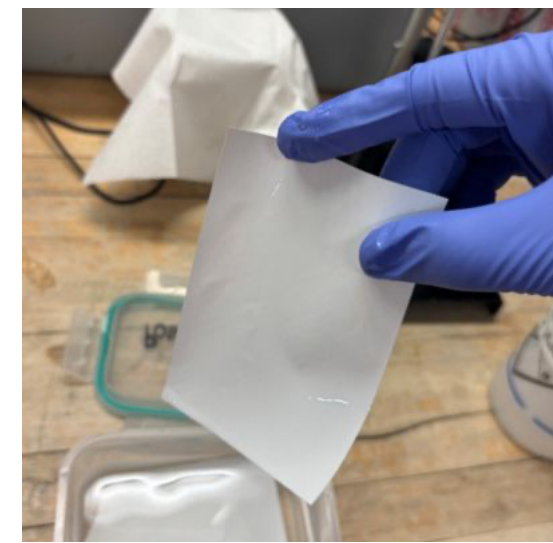
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IN-DEPTH LOOK

J-WAFS DIRECTOR LEADS RESEARCH ON FILTRATION OF ALUMINUM WASTEWATER

Use of nanofiltration helps capture and reuse waste aluminum during production

John H. Lienhard V, the director of J-WAFS and a professor in the Department of Mechanical Engineering, has been working with his research group on membrane filtration technologies for efficient aluminum production. Their work aims to recover wasted aluminum and improve the environmental quality of the wastewater generated during aluminum smelting.

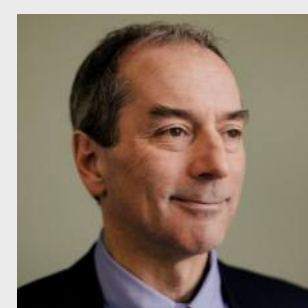


Bauxite ore is processed at an aluminum refinery to produce aluminum oxide in a powdery form called alumina. Much of this alumina is then shipped to aluminum smelters, where the powder is poured into electrolysis vats containing a molten mineral called cryolite. Cryolite electrolyte acts as a solvent, facilitating the separation of alumina. Over time, the cryolite accumulates impurities and its effectiveness in dissolving alumina is reduced. Fresh cryolite must then be used to maintain process efficiency. The spent cryolite, which contains residual aluminum ions and other impurities, becomes part of the waste stream.

Lienhard's research team developed a membrane process to filter cryolite waste and recover aluminum ions. They adapted nanofiltration membranes used in conventional water treatment plants by applying a thin, positively charged coating to cover the membrane. The coating's charge is just positive enough to strongly repel and retain aluminum while allowing less positively charged ions to flow through. The group observed that the membrane consistently captured 99.5 percent of aluminum ions. The hope is that the captured aluminum will be upcycled and added to the bulk of produced aluminum, thereby increasing yield while simultaneously curtailing hazardous waste that could potentially impact water sources.

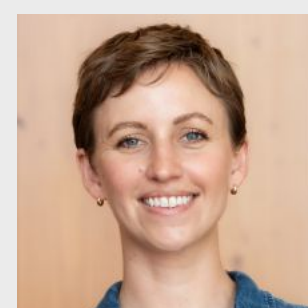
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AWARDS & RECOGNITIONS



J-WAFS director receives lifetime achievement award

John Lienhard was honored with the 2024 Lifetime Achievement Award of the International Desalination and Reuse Association. He was recognized for his many contributions to water reuse. He accepted the award virtually on December 11 during the IDRA World Congress, held in Abu Dhabi. [MORE INFO](#)



Sara Beery selected as a Schmidt Sciences AI2050 Fellow

The J-WAFS PI received the fellowship, which seeks to advance research on beneficial AI, for her project that focuses on using AI to develop an evaluation framework to improve data accessibility on ecosystem change and biodiversity loss. [MORE INFO](#)



MIT community members named to Forbes' "30 Under 30"

The list includes Yang Zhong SM '21, the creator of a seawater desalination system that uses heat energy from the sun to produce potable water. Graduate student Sanjana Paul was also recognized for Earth Hacks, an environmental hackathon that has engaged 5,000+ participants. [MORE INFO](#)



MIT welcomes Environmental Solutions Journalism Fellows

The MIT Climate Change Engagement Program awarded fellows who are covering topics from farmland and groundwater to emissions from dairy farms to food waste. Fellowships provide support to journalists in support of local reporting that opens conversations about climate change. [MORE INFO](#)

FUNDING

AND OTHER OPPORTUNITIES

J-WAFS Graduate Fellowships

Open to: MIT PhD students
Deadline: March 3, 2025

MIT faculty are invited to nominate outstanding PhD students who are pursuing research related to water and water supply for human need.

[MORE INFO](#)

Martin Family Society of Fellows for Sustainability

Open to: MIT PhD students
Deadline: February 5, 2025

MIT faculty are invited to nominate outstanding PhD students who are working in an area of environment and sustainability.

[MORE INFO](#)

MIT Sea Grant Core

Open to: Massachusetts researchers
Deadline: February 18, 2025

Proposals up to \$340K over a two-year period will be awarded to projects in areas such as sustainable aquaculture and seafood processing.

[MORE INFO](#)

UROP for MIT ESI

Open to: MIT undergrads
Deadline: January 28, 2025

J-WAFS researcher Scott Odell is looking for help on a project related to mining, desalination, and glaciers in Chile for the spring semester.

[MORE INFO](#)

IN CASE YOU MISSED IT



J-WAFS researchers unveil Jameel Index

Greg Sixt and Ken Strzepek discussed the Jameel Index for Food Trade and Vulnerability at the World Food Prize.

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Podcast sheds light on renewable energy projects

On a podcast with the MIT Energy Initiative, past J-WAFS PI Larry Susskind says renewable energy implementation must engage the people of the communities affected.

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J-WAFS funder Community Jameel recaps 2024 in video

Highlights include a J-WAFS celebration of 10 years of innovation in water, food, and sustainability, and the development of the Jameel Index for Food Trade and Vulnerability.

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New J-WAFS PI discusses ways to help farmers

On the VoxDev podcast Tavneet Suri explains ways to improve small-scale farmers' resilience to climate change.

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When you make a gift, you are making an investment in both the future of J-WAFS and our institute-wide work to improve the productivity, accessibility, and sustainability of the world's water and food systems.

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