

# A Scientist in Service to Society: Announcing the New Sadoway Award

Ashley-Anne Bohnert



Donald R. Sadoway

The newest award to be offered by TMS honors a giant within the materials science community and member of the 2020 TMS Class of Fellows, Donald R. Sadoway.

**The Sadoway Materials Innovation and Advocacy Award** is aimed at fostering the participation of TMS members in public advocacy for sustainable materials solutions while celebrating Sadoway's own commitment to sustainable solutions in materials processing, and his legacy of teaching and advocacy in public fora.

It will recognize a mid-career member with impactful and broad materials science and engineering achievements and a unique ability to champion their work and the materials science and engineering field through education, public advocacy, or entrepreneurship, particularly in areas related to sustainability.

The award was endowed by Sadoway's students, friends, and colleagues through the TMS Foundation to honor his influence on them, the Massachusetts Institute

of Technology (MIT) Department of Materials Science and Engineering, and the global materials science community. The first recipient will be honored at the TMS-AIME Awards Ceremony held during the TMS 2022 Annual Meeting & Exhibition in Anaheim, California. All nominations must be received by **April 1, 2021**. Visit the TMS Honors and Awards website at [awards.tms.org](https://awards.tms.org) for further details.

Jim Yurko, an MIT alumnus and one of the two original proposers of the award, noted that, "Sadoway's enthusiasm for materials science and engineering, evident in both his ability to masterfully teach the subject as well as apply it to challenging societal problems, has influenced students and colleagues at MIT for more than 40 years. With the dawn of the internet age, Don's reach has expanded globally, giving him a platform to advocate for the use of materials chemistry and innovative solutions for a variety of sustainability challenges. This award comes at the perfect time to honor Don's legacy, but more importantly celebrate emerging people in our field who focus on impactful problems while harnessing his unique spirit."

"I was energized to work with Jim Yurko to create this award because it was an opportunity to provide recognition for mid-career individuals with passion and unique skills at championing their work and our field in broader public policy forums. To me, this award should recognize those who have been advocates for all of us working in materials science and engineering," noted 2017 TMS President, David DeYoung. "I have known Don Sadoway since my time as a graduate student at MIT and was delighted to help honor his legacy as a superb teacher and developer of sustainable materials processes."

Donald R. Sadoway is the John F. Elliott Professor of Materials Chemistry in the Department of Materials Science and

## About the Sadoway Materials Innovation and Advocacy Award

**Recognizes:** This award was established to honor and recognize the innovative achievements of Donald R. Sadoway in materials science, his commitment to sustainable solutions in materials processing, and his legacy of teaching and advocacy in public forums.

**Criteria:** Recipients must have an established record of innovative achievements in materials science or innovations that use and/or involve materials science as a core enabler. They must also have a record of outstanding communications, as evidenced by teaching, public advocacy, or entrepreneurship. Additionally, recipients must be current professional members of TMS and have been members for at least three consecutive years. Finally, they may not reach their 50th birthday by December 31 of the year in which the initial nomination is made.

**Award:** Award piece, \$3,500 cash prize.

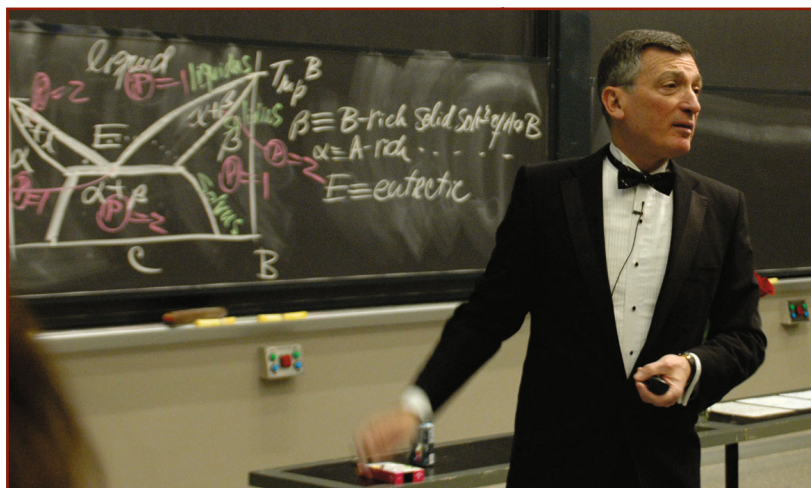
**Nominations:** Award nominations will be due April 1 of each year. Visit [awards.tms.org](https://awards.tms.org) for details and the nomination form. For questions or additional information, contact Deborah Hixon, TMS Awards Program Administrator, at [hixon@tms.org](mailto:hixon@tms.org).

Engineering at MIT and, over the course of his career, has authored over 170 scientific papers and has been listed as inventor on 32 U.S. patents. Much of his research is on environmentally sound metals extraction technologies and on batteries for grid-scale storage and electric vehicles.

Sadoway earned his B.A.Sc. in engineering as well as his M.A.Sc. and Ph.D. in chemical metallurgy from the University of Toronto. He won a NATO Postdoctoral Fellowship which took him to MIT where he worked under Julian Szekeley. Before the fellowship year was up, Sadoway was hired as an assistant professor and gave his first conference presentation as a new faculty member at the TMS 1979 Annual Meeting & Exhibition and found it to be, “a huge boost to meet so many people who work in the same field and engage in face-to-face conversations. The networking was so critical in a time before internet and smartphones.” He maintained his involvement with TMS and notes that, “over time I rose through the ranks of TMS here in Boston, while at the national level I was active in light metals and reactive metals. No question that my connection with TMS was beneficial to my career.”

By 1990, he had distinguished himself as a hands-on experimentalist who imported techniques to the study of the fundamental processes at the heart of electrolytic production of metals. By adopting a holistic approach to materials selection, he conceived of a complete set of anode material, electrolyte, and electrical operating envelope which then led to his conceptualization of molten oxide electrolysis which today is being commercially deployed by Boston Metal. To complement his inventions in high-temperature electrochemical processing, he turned his attention to the largely neglected medium of liquefied gases. This gave birth to cryoelectrodeposition and, eventually, his work on high-Tc superconducting materials.

In the early 1990s, Sadoway turned his attention to another branch of electrochemistry: batteries. Shortly after came the invention of a solid polymer electrolyte which not only obviated the safety risk of the volatile, flammable liquid electrolyte still used today, but also allowed

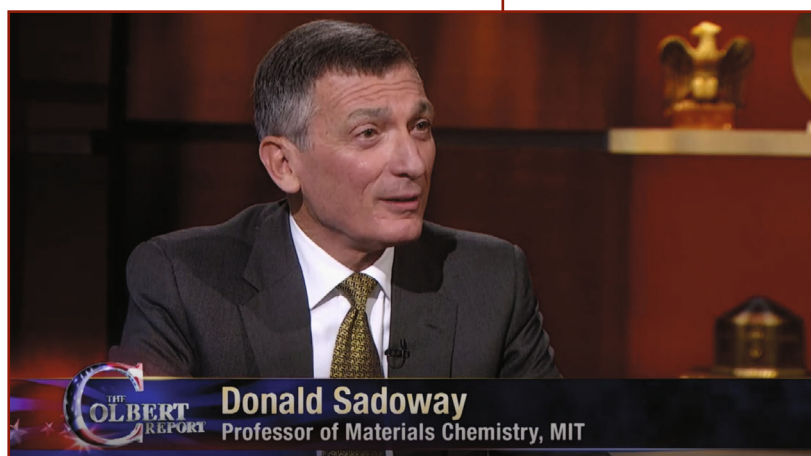


for the use of lithium metal as the negative electrode. This meant a safe battery with exceptionally high energy density. Then, in the 2000s came the jump to grid-scale storage and the invention of the liquid metal battery. The work of Sadoway and his team led to the creation of the company Ambri, which is working to bring liquid metal batteries to the market.

If these accomplishments were not enough, Sadoway also found the time to demonstrate to NASA that electrolysis of lunar regolith was a feasible solution to producing oxygen on the moon. The by-product of this process was molten metal, an outcome that led to an even more interesting application: greenhouse gas (GHG)-free steelmaking on Earth. Sadoway received funding from the U.S. Department of Energy to continue his work on GHG-free steel and, in 2011, his team at MIT discovered a practical inert anode that would make the process more

Sadoway delivers his last lecture for the Introduction to Solid State Chemistry class on December 7, 2010.

*“To me, this award should recognize those who have been advocates for all of us working in materials science and engineering.”*  
—David DeYoung



In October 2012, Sadoway appeared on *The Colbert Report* to discuss his team's work on liquid metal batteries.





Sadoway (front row, far right) is pictured with his liquid metal battery team of students and postdocs at MIT, “Group Sadoway,” in July 2011.

*“I’ve always tried to practice science in service to society.”*

—Donald Sadoway

feasible. This led to the founding of the company Boston Metal, which is working to commercialize the process.

Among the many accomplishments in his distinguished career, Sadoway takes the most pride in those that have had a wide impact: “I’ve always tried to practice science in service to society. When you fold that in with decarbonization of industry this is a rich area for our brand of engineers. I am proud of two inventions that resulted in the creation of companies: the liquid metal battery leading to Ambri and molten oxide electrolysis leading to Boston Metal.”

In many ways however, his widest



In 2012, Sadoway was named one of *TIME* magazine’s 100 Most Influential People in the World and delivered a TED talk that has since received over two million views.

impact is through the students and postdocs he mentored. Amidst all of his research, Sadoway remained preoccupied with teaching students to have a visceral understanding of the subject matter and developing a mastery of it. He notes that, “I’m also proud of my record of teaching and the web streaming of my lectures that extended my influence far beyond the walls of the lecture hall.” Over the years at MIT, he has taught graduate classes in kinetics and in electrochemistry and undergraduate subjects in general chemistry and chemical metallurgy. His series of general chemistry lectures was disseminated online by MIT OpenCourseWare and has accumulated more than two million total views to date. His 2012 TED talk also gathered an additional two million views and brought liquid metal batteries, and a greater focus on the process of mentorship, to an even wider audience—including Bill Gates, who became one of Sadoway’s most ardent admirers after watching his lectures.

When asked about the new Sadoway Materials Innovation and Advocacy Award, Sadoway’s answer is true to the focus on the greater good demonstrated throughout his career: “It is my hope that this award will inspire young people to steer their careers in such a way as to align scientific accomplishment with societal benefit—science in service to society.”



## Would You Like to Contribute?

Donations continue to build for this award fund. If you would like to join his students, colleagues, and friends in honoring Donald Sadoway, you can make a contribution by visiting [www.tms.org/SadowayAward](http://www.tms.org/SadowayAward) and clicking on the “Sadoway Materials Innovations and Advocacy Award Fund” link in the award description. This award is funded through the TMS Foundation.

