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Teaming up to keep water innovation flowing

Xylem Inc. and J-WAFS build a close alliance to improve technologies for the water sector.



The world is facing unprecedented water challenges brought on by climate change, population growth, urbanization and shrinking fresh water supplies. The need to meet these rapidly intensifying pressures is the focus of an unusually broad collaboration between the Abdul Latif Jameel Water and Food Systems Lab (J-WAFS) at MIT and Xylem, a water technology leader with 17,000 employees and nearly \$6 billion in annual revenue that serves utilities and commercial users of water around the world.

In 2016, Xylem became a founding member of J-WAFS' Research Affiliate Program. Since that time, J-WAFS and MIT have become a key part of Xylem's global innovation ecosystem, with Xylem funding directed research projects through a multi-faceted collaboration between Xylem Innovation Labs and the leading academic and research institute.

"We know that no technology provider alone can bring the innovation needed to mitigate against climate change and other urgent challenges like aging infrastructure," says Dave Flinton, Xylem's Chief Innovation, Technology and Product Officer. "That's why we are helping bring together the most creative minds to find break-through solutions."



Collaborating to improve water-security

Dave Ayers, who oversaw the relationship from 2016 to 2022 as Xylem's VP for Innovation Strategy and Partnerships and Senior Fellow, says that the most critical element in this collaboration is MIT's strengths in identifying groundbreaking new technologies and in early-stage examination of technical feasibility.

New technologies can address an extremely wide spectrum of needs for water utilities, everything from improvements in pumping efficiency, water quality sensing, leak detection and preventive maintenance, to predictive analytics and artificial intelligence that help optimize water networks, says Ayers.

Overcoming obstacles for water utilities often requires adopting multiple advances in technology at the same time. "To pull that all together into one solution for utilities is a real challenge, which is why Xylem partners with collaborators like MIT," Ayers says.

"Our relationship with MIT will help us stay close to what's possible."

--Dave Ayers

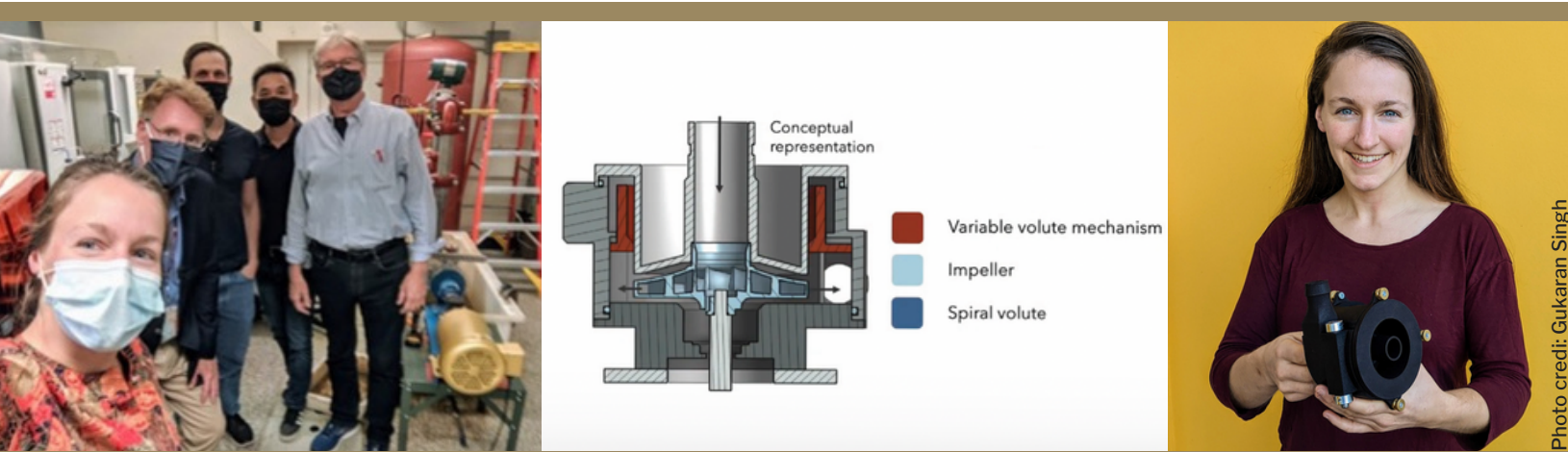
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Taking on tough issues

MIT is an especially attractive candidate for collaboration, given its global reputation for innovation and its dedicated focus on water through J-WAFS, Ayers says. From its early days, the Xylem/MIT relationship has produced a rich portfolio of more than 100 collaborations tackling tough problems for water resiliency, scarcity, and affordability.

One notable result has been in an "elegant solution," as Ayers describes it, to boost the energy efficiency of pumping water. Hilary Johnson, who completed her MIT PhD in mechanical engineering in 2022, invented an adaptive centrifugal pump that can adjust to changes in water flow, with Xylem's support. The advanced pump design results in financial and energy efficiency, cutting greenhouse gas emissions.

This sponsored research project is a good example of the joint collaboration between Xylem and MIT, Ayers says. Johnson and her MIT colleagues worked hand-in-hand with a Xylem team, starting with kicking around the concept and continuing through early lab testing. Xylem now is performing higher-scale testing of the pump design and readying it for commercialization.



From L to R: Xylem and MIT collaborators, schematic of the adaptive centrifugal pump, and Hilary Johnson holding a prototype of the pump

Making partnerships pay off

Xylem's engagement with J-WAFS enables their technical leads to gain access to MIT's view of emerging trends and technologies through conferences, webinars, and other avenues. The collaboration also provides opportunities to connect with MIT startups through direct introductions and exposure at MIT conferences.

Ayers says that Xylem will continue to expand its MIT collaborations, leveraging more and more around complete solutions that might include artificial intelligence or autonomous systems. "Our relationship with MIT will help us stay close to what's possible," he says. "We'll also be working together on efficient knowledge transfer, from the lab testing that MIT excels at to more scalable, full volume testing and productization that Xylem is skilled at. That way we can leverage more of the work we've been doing together at the research side into products and solutions." Ayers sums up, MIT is a key member of Xylem's ecosystem – a collaboration that fuels progress and a great deal of pride.