# John Belcher receives prestigious Oersted Medal

MIT professor of physics honored with the highest teaching award in the American physics community.

By Department of Physics

John W. Belcher, the Class of 1922 Professor of Physics and a member of the MIT Kavli Institute for Astrophysics and Space Research, has been awarded the 2016 Hans Christian Oersted Medal of the American Association of Physics Teachers. The award was given in recognition of Belcher's "tireless work with TEAL (Technology Enabled Active Learning) and Massive Open Online Courses (MOOCs)."

*Professor John W. Belcher*

Justin Knight Photography

**TECHNOLOGY-ENABLED ACTIVE LEARNING** is a teaching format that merges lectures, simulations, and hands-on desktop experiments to create a rich collaborative learning experience. As a result of the TEAL project, MIT has replaced its entire two-semester freshman physics sequence—the largest lecture subjects at MIT—with studio-mode classes, where students work collaboratively on laboratory work in a computer-rich environment. The TEAL group has also developed an extensive suite of simulation and visualization software for electromagnetism, which is being distributed across the world through MIT OpenCourseWare.

Belcher's research interests are within the areas of space plasma physics, in particular the interaction of the heliosphere with the local interstellar medium. He was the principal investigator on the Voyager Plasma Science Experiment during the Voyager Neptune encounter—the end of the Planetary Grand Tour, which sent Voyager probes to planets in the outer solar system. Belcher

***Professor of Physics John W. Belcher*** *(second from left) surveys an experiment in the interactive TEAL classroom being done by (left to right) students Bernardo Zacka, Matthew Socks, and John Gonzalez. (Photo: Donna Coveney)*

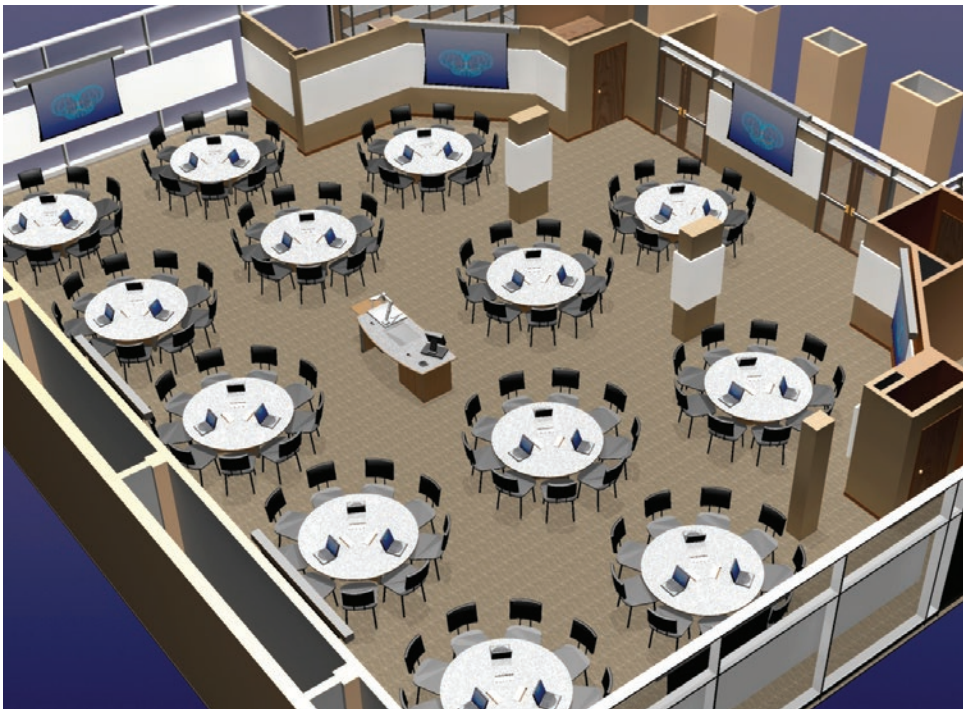
is now a co-investigator on the Plasma Science Experiment on the Voyager Interstellar Mission. The Voyager spacecraft are still returning data, 37 years after launch, with a predicted demise in 2031.

Belcher is a two-time winner of NASA's Exceptional Scientific Achievement Medal. In 2004, MIT awarded Belcher with the Class of '22 Professorship, given to recognize a "tenured faculty member with a record of excellence in education." He has been a MacVicar Faculty Fellow, and in 1994 was given the Department's Buechner Faculty Award for Teaching.

The Oersted Medal recognizes those who have had an outstanding, broad, and lasting impact on the teaching of physics. It is awarded annually by the American Association of Physics Teachers, a nonprofit organization founded in 1930 to "enhance the understanding and appreciation of physics through teaching."

Department of Physics Head Peter Fisher notes, "The Department has been the source of innovation in physics education for decades. Eight members of our Department have won the Oersted Medal, the most prestigious award of the American Association of Physics Teachers."

Other MIT Physics Department recipients of the Oersted Medal include Mildred S. Dresselhaus (2008), alumnus and Nobel Laureate Carl Wieman (2007), John G. King (2000), Daniel Kleppner (1997), Anthony French (1989), Victor Weisskopf (1976), Francis Friedman (1963), and Jerrold Zacharias (1961).



***A 3D rendering of the TEAL/ studio physics classroom*** *by TEAL 3D animator/illustrator Mark Bessette.*

For more information on TEAL and Prof. Belcher's research, please visit the following:

Technology Enabled Active Learning (TEAL) on MIT's *iCampus*:
*icampus.mit.edu/projects/project/?pname=TEAL*.

John W. Belcher, Class of 1922 Professor of Physics:
*web.mit.edu/physics/people/faculty/belcher_john.html*.

*This article authored by the Deparment of Physics was originally published online at* newsoffice.mit.edu*, on August 4, 2015.*