



# Robert D. Maurer

## Distinguished Lecture Series

### 2023



Thursday, March 16th, 2023

6:30pm

GEAR 0026

# The Science and Art of Taming Light

Presented by:

**Dr. Lene Vestergaard Hau**

**The Mallinckrodt Professor of Physics and of Applied Physics at Harvard University**

Nothing goes faster than light... usually!

In our laboratory we have used ultra-cold atom clouds to slow light pulses to the speed of a bicycle, which is 50 million times lower than the normal light speed. In the process, a light pulse spatially compresses by the same large factor, from 1 mile to only 0.001 inches, and the pulse can then be completely stopped and later restarted. From here, we have taken matters further: Stopped and extinguished a light pulse in one part of space and revived it in a completely different location. In the process, the light pulse is converted to a perfect matter copy that can be stored—‘put on the shelf’—sculpted, and then turned back to light. The storage time can be tens of seconds, and during this time, light could—under normal circumstances—travel back and forth to the Moon many times over. Our observations represent the ultimate degree of control over light and matter with applications in quantum engineering.