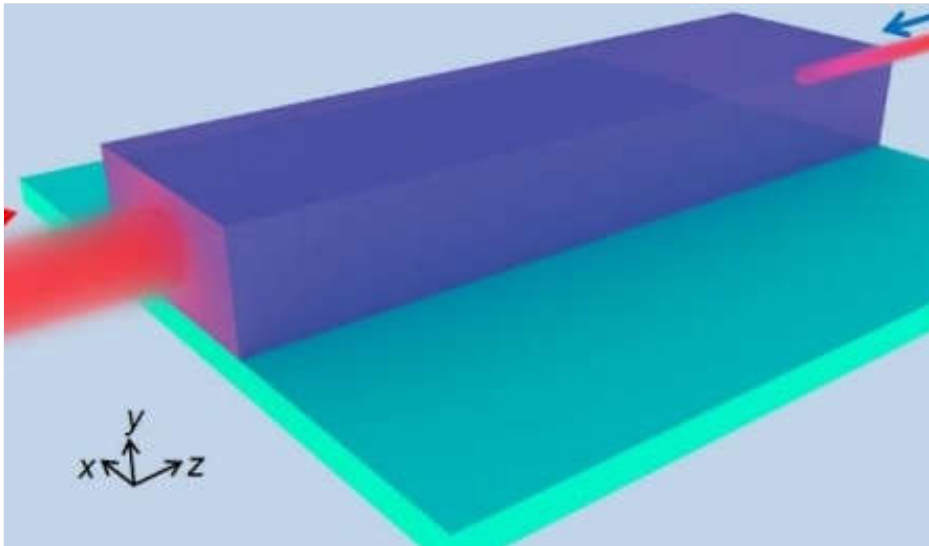


Weakness is good... when controlling light



The image above shows a weak control beam (narrow red line, far right) and a more intense laser signal (larger red line, far left) within an asymmetrical metawaveguide (purple box). Credit: University at Buffalo.

Study reports how new weak control laser beam could boost computer chips

By Cory Nealon

Release Date: October 31, 2016

BUFFALO, N.Y. — It's a paradox that has long vexed researchers in the field of optics.

To control a light source, another light source that uses as much energy — if not more — is often required. The setup works, but it's not efficient.

A new study reports that researchers have demonstrated a way to control light with light using one third — in some cases, even less — of the energy typically required. The advancement, coupled with other developments, could ultimately lead to more powerful, energy-efficient computer chips and other optics-based technologies.

"Typically, symmetry connotes harmony and beauty. But not in this case. We've developed technology — an asymmetric metawaveguide — that enables a weak control laser beam to manipulate a much more intense laser signal," says Liang Feng, PhD, assistant professor in the Department of Electrical Engineering at the University at Buffalo's School of Engineering and Applied Sciences, and the study's lead author.

The study — "Metawaveguide for Asymmetric Interferometric Light-Light Switching" — was published Oct. 31 in the journal *Physical Review Letters*. It was co-authored by researchers at California Institute of Technology and the City University of New York.

The study reports that the metawaveguide — a tiny rectangular box made of silicon, the semiconducting material for computer chips — creates asymmetric reflections of the two beams of light, which enables the weaker beam to control the other beam.

The research was supported by grants from the U.S. Army Research Office, the National Science Foundation and Boeing.

MEET OUR EXPERTS



David Castillo

Professor of Romance Languages and Literatures

Expertise: early modern culture, Baroque literature, horror and fantasy, new media and culture

Phone: 716-645-0869

Email: dc63@buffalo.edu

[ALL OUR EXPERTS](#)



Social Media / RSS

Read the latest in your favorite channels.



UB Mobile

Take UB With You. Wherever.

[Download UB Mobile App](#)

"Typically, symmetry connotes harmony and beauty. But not in this case."

Liang Feng, assistant professor
Department of Electrical Engineering

Media Contact Information

Cory Nealon

Director of News Content
Engineering, Computer Science
Tel: 716-645-4614
cmnealon@buffalo.edu
Twitter: @UBEngineering