

The *Physical Review* Journals Celebrate The International Year of Light



INTERNATIONAL
YEAR OF LIGHT
2015

2015 has been designated the International Year of Light and Light-based Technologies by UNESCO. This global initiative aims to highlight the importance of light in our everyday lives and how it has contributed to the development of society. To celebrate this yearlong event, the editors of the *Physical Review* journals have organized a collection of papers that represent important breakthroughs in the field of optics, from fundamental insights into how light behaves, to findings that were critical in the development of everyday technologies.

A [guest editorial](#) by John Dudley celebrates this occasion.

Storing Light

Quantum technologies require that information encoded in a photon be stored without damaging its quantum properties. Michael Fleischhauer and Mikhail Lukin predicted the controlled propagation of photons in a material with electromagnetic-induced transparency, showing that photons could be stopped, and stored, and their quantum state preserved. Lukin and colleagues then went on to demonstrate this in a hot rubidium vapor, where they decelerated a light pulse, trapped it for up to 200 microseconds, and then released it. In the last fifteen years, using these methods, the storage and retrieval of light has been achieved in a variety of systems ranging from gases to defects in solids. The longest storage time of a photon to date is greater than 39 minutes.

[Storage of Light in Atomic Vapor](#)

D. F. Phillips, A. Fleischhauer, A. Mair, R. L. Walsworth, and M. D. Lukin
[Phys. Rev. Lett.](#) **86**, 783 (2001)

[Dark-State Polaritons in Electromagnetically Induced Transparency](#)

M. Fleischhauer and M. D. Lukin
[Phys. Rev. Lett.](#) **84**, 5094 (2000)

[Quantum memory for photons: Dark-state polaritons](#)

M. Fleischhauer and M. D. Lukin
[Phys. Rev. A](#) **65**, 022314 (2002)