

Janus Waves



We demonstrate that the formation of symmetric twin images can be observed not only in holograms but also for a broad class of waves that we call Janus Waves (JWs). Like the god Janus from the Roman mythology, who was depicted with two faces looking in opposite directions JWs can be decomposed to the propagation of two waves, which are conjugate to each other under inversion of the propagation direction. Such waves include beams like the accelerating Airy and ring-Airy beams and higher order accelerating beams. When JWs are focused, they form a pair of opposite facing focal distributions coming from the converging and the diverging part of the beam respectively.

Janus waves are expected to find exciting applications both in linear and nonlinear optics. The possibility to engineer symmetric foci distributions can for instance impact optical trapping applications, or the controlled deposition of high laser powers at remote locations.

More information can be found in:

D. G. Papazoglou, V. Y. Fedorov, and S. Tzortzakis, "Janus waves,"
[Opt. Lett. 41, 4656-4659 \(2016\)](#)