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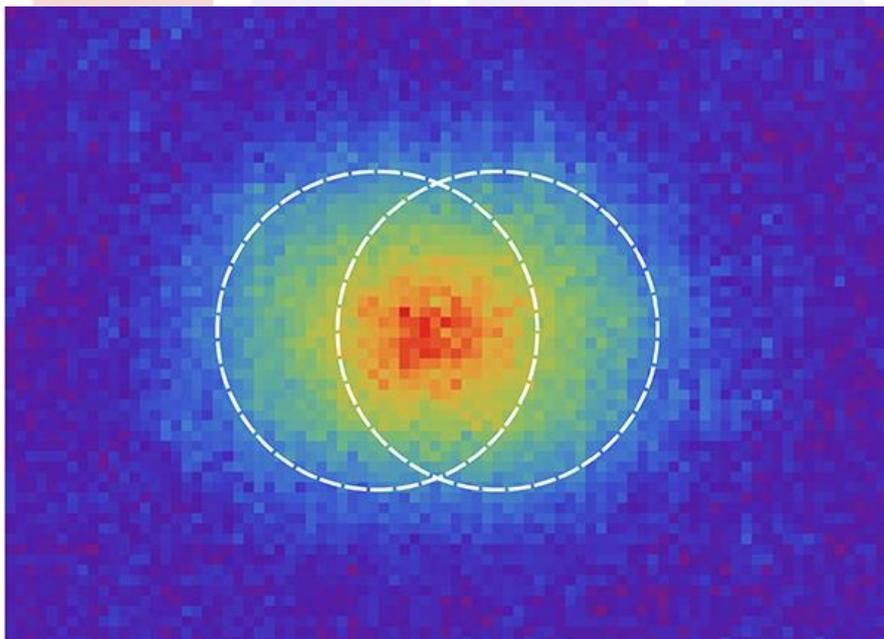
OFICINA DE TRANSFERENCIA DE RESULTADOS DE INVESTIGACIÓN

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A team of physicists dispels Rayleigh's curse



The resolution of an optical system (like a telescope or a camera) is limited by the so-called Rayleigh criterion. An international team, led by Complutense University of Madrid, has broken this limit, showing that it is not a fundamental curse. This opens the door to considerable improvement in resolution and could force the revision of Optics textbooks. This research is the culmination of a thrilling race between four groups of scientists around the world.



Optical resolution is the ability of an imaging system to distinguish between closely spaced objects. In the picture, we show two points separated by the Rayleigh's limit, as observed in the experiment. Picture by Martin Paúr – Palacký University.

An ideal optical system would resolve a point perfectly as a point. However, due to the wave nature of light, diffraction occurs, caused by the limiting edges of the system's apertures. The result is that the image of a point is a blur. This limits the resolution of any imaging system, including microscopes, telescopes, and cameras. The quantitative formulation of this phenomenon is the time-honored Rayleigh's limit.

Rayleigh's curse limits the minimum distance that can be distinguished with visible light: on the order of 0.1 micrometer (a bacterium, for example, has a size of 2 micrometers), "which is a great limitation to our ability to see finer details", says Luis Sánchez Soto, Professor at the Faculty of Physics at Complutense University of

