Tweezers Trap Nanotubes by Color

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Singled-walled carbon nanotubes are graphene sheets wrapped into tubes, and are typically made up of various sizes and with different amounts of twist (also known as chiralities). Each type of nanotube has its own electronic and optical properties. Physicists at Osaka University in Japan used colored light to selectively manipulate different types of carbon nanotubes. They found that some of nanotubes displayed a tendency to cluster at the focal area of a focused laser beam.

Nanotubes are known for their strong color-dependant interactions with light. By using an optical tweezer, a device that traps microscopic or nanoscopic objects in laser beams, researchers were able to selectively pull only specific colors of nanotube into focus.

Their results are the first experimental evidence demonstrating that colored light drives the clustering of nanotubes in a laser tweezer. Moreover, this color dependence can be exploited to select one type of nanotube over another. The study is a significant step towards developing optical methods for sorting and purification of nanotubes, a process that remains a major challenge for the application of nanotubes to engineering.

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