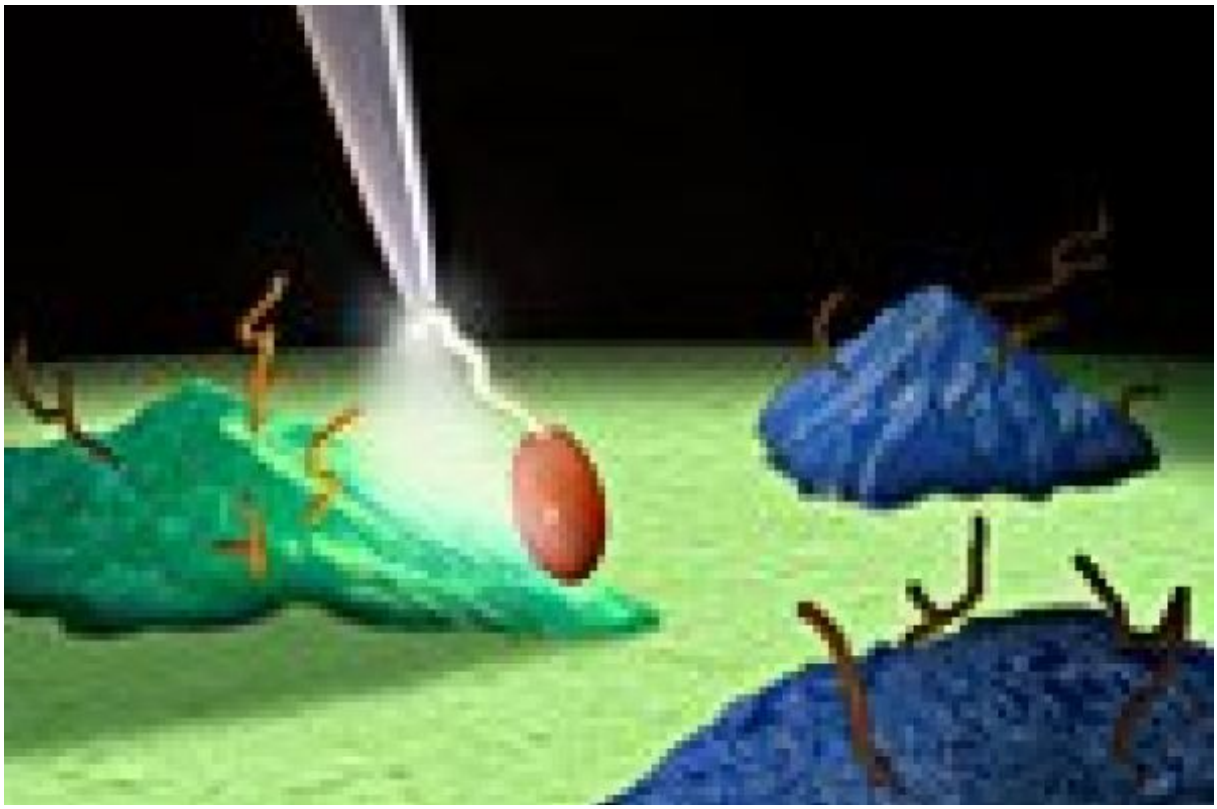


Fewer Photons are Enough

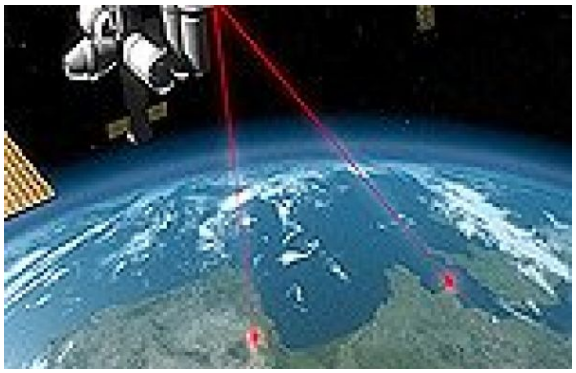
Prof. Juan P. Torres comments in Science on a paper about an approach that greatly reduces the number of photons needed to detect an object.

October 08, 2008

Using entanglement to reduce the number of photons needed to detect the presence of an object. This strategy has been proposed in a paper by Prof. Seth Lloyd (MIT) published in Science. According to ICFO group leader, Prof. Juan P. Torres, who has been asked by the magazine to express an opinion on this research, the implementation of this proposal is not impossible.

In order to detect an object, one can shine a search beam onto the object and wait for reflection. However, an object may reflect only a tiny fraction of light in the direction from which it came, and the surrounding environment itself can generate photons. So enough photons have to be sent out to determine if the number coming from a particular direction

exceeds the number expected from the environment alone. According to the paper, entanglement can reduce the number of photons needed. This system could be used for imaging laboratory samples with faint light or for spotting satellites with lesser bright beams. However, the role of entanglement in the proposed scheme needs further thinking. It could be that weaker correlations, and not entanglement, are enough to give the advantage, argues Prof. P. Torres.



Entangled photons