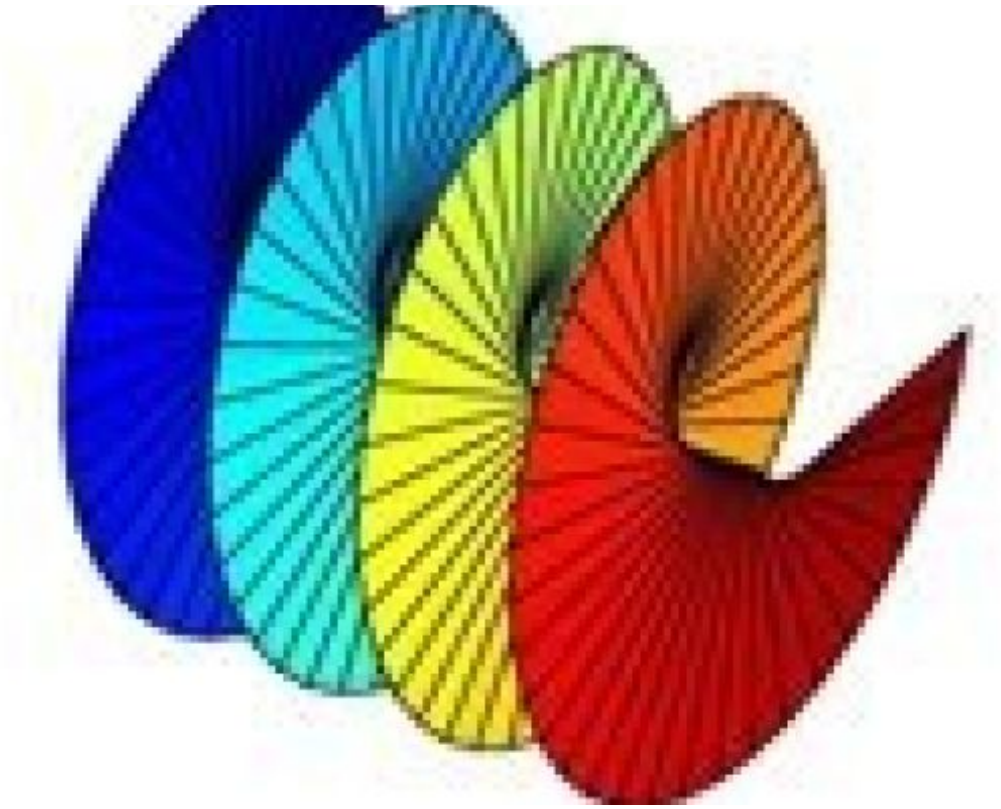

'Digital Spiral Imaging': a new concept in imaging and probing with light

A new optical technique put forward by ICFO researchers published in Optics Express and highlighted by Physics News Update

March 01, 2005

A radically new concept in optical imaging and probing of matter has been put forward by ICFO researchers Prof. Lluis Torner and Prof. Juan P. Torres in collaboration with Dr Silvia Carrasco, now at Boston University. The paper is featured by Physics News Update this week.

The paper was published this February in Optics Express. The concept put forward by the researchers relies on the unique properties of a property of light named orbital angular momentum (OAM). The technique might extract abundant information form matter providing a new and potentially wide-ranging optical tool. The concept might be useful for detecting biological and chemical agents, for probing biological specimens sensitive to OAM light, and might even aide recent proposals to increase the amount of data that can be imprinted on a compact disk using OAM.

ICFO

To get more info about the research please browse the links:

S. Ghotbi and M. Ebrahim-Zadeh

ract: We present studies of the optical properties of the new nonlinear mat
), for second harmonic generation from the visible to infrared. We
mined the phase-matching conditions and effective nonlinear coefficients i
principal optical planes, acceptance bandwidths, spatial and temporal wal
velocity dispersion and double phase-matching behaviour. We also repo
imental studies in this material, where efficient, high-average-power se
onic generation of femtosecond pulses into the blue is demonstrated. U
s fundamental pulses at 76 MHz, single-pass second harmonic average po
ads as 830 mW at greater than 50% conversion efficiency have been gene
e tunable range of 375–435 nm. Using cross-correlation measurements in a
-BaB_2O_4 crystal second harmonic pulse durations of 220 fs are obtained.
retical findings are verified by experimental data, where excellent agree