Centre for Excellence in Basic Sciences

Tuesday Colloquium

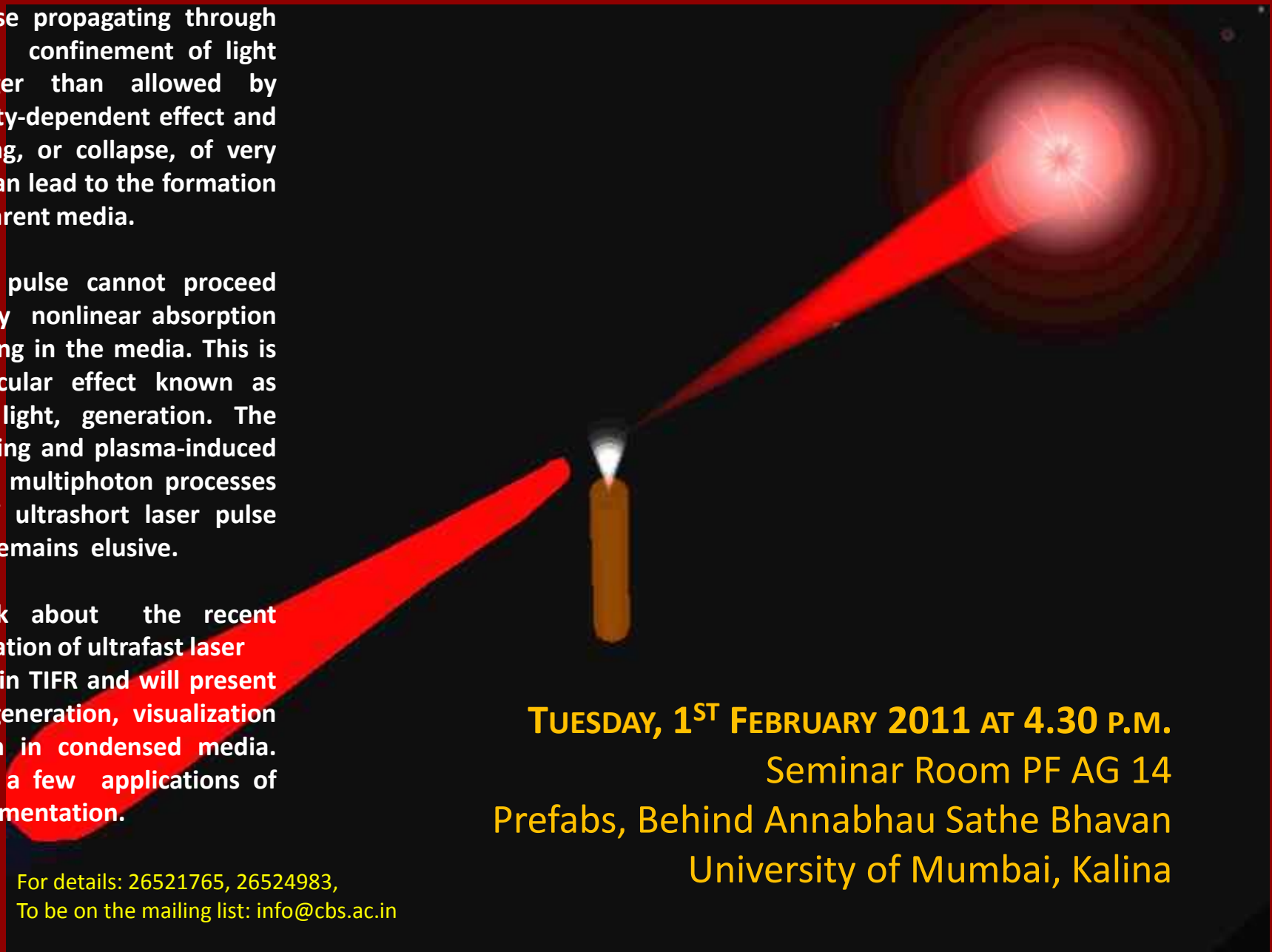
Exploring the propagation of ultrashort laser pulses in matter

By Dr. Aditya Dharmadhikari, TIFR, Mumbai

Intense, ultrashort laser pulse propagating through transparent media results in confinement of light beam over distances larger than allowed by diffraction. This is an intensity-dependent effect and is caused by the self-focusing, or collapse, of very intense light. Such collapse can lead to the formation of light filaments in all transparent media.

The collapse of the light pulse cannot proceed indefinitely and is arrested by nonlinear absorption and plasma induced defocusing in the media. This is accompanied by a spectacular effect known as supercontinuum, or white light, generation. The interplay between self-focusing and plasma-induced defocusing brought about by multiphoton processes determines the dynamics of ultrashort laser pulse propagation. But the physics remains elusive.

Dr. Dharmadhikari will talk about the recent experimental work on propagation of ultrafast laser pulses in transparent media in TIFR and will present results related to white light generation, visualization and control of filamentation in condensed media. Further, he will also discuss a few applications of white light generation and filamentation.



Tuesday, 1st February 2011 at 4.30 p.m.

Seminar Room PF AG 14

Prefabs, Behind Annabhau Sathe Bhavan

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