

Abstract Submitted  
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**Fourier phase contrast microscopy technique for real time imaging of phase and fluorescence features simultaneously**<sup>1</sup> CHANDRA YELLESWARAPU, ALEXEY VERAкса, BHARGAB DAS, DEVULAPALLI RAO<sup>2</sup>, University of Massachusetts Boston, DEPARTMENT OF PHYSICS TEAM, DEPARTMENT OF BIOLOGY COLLABORATION — Understanding of biological cell response is facilitated by microscopy techniques, but has been limited by our ability to image cell structure and function at the same time. Current procedure is to obtain separate images, such as phase and fluorescence features, using different imaging techniques one after the other and digitally register the resulting images together. Mostly this procedure requires switching between the light sources and the associated optical paths, making it difficult to image biological events at short time scales. Recently we developed a novel optical Fourier phase contrast microscopy technique for real time display of phase and fluorescence features of biological specimens at the same time. We were able to image the brightfield+fluorescence, phase+fluorescence, and edge enhanced+fluorescence features of the *Drosophila* embryo at once without the need for digital image registration and fusion. This comprehensive microscope has the capability of simultaneously providing both structural and functional information.

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