

Abstract Submitted  
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**Bright-field and dark-field sub-wavelength resolution microscopy using Ultra-thin Condensers**<sup>1</sup> DARSHAN DESAI, DANIEL DOMINGUEZ, AYRTON BERNUSSI, LUIS GRAVE-DE-PERALTA, Texas Tech University — Condensers are the one of the most commonly found components in optical imaging systems. Condensers illuminate the object under observation at inclined angles, which enhances the resolution of optical imaging system. However, as the resolution depends on the Numerical Aperture (NA) of the Condenser, the maximum resolution that can be obtained from conventionally used Condensers is limited, for example, by refractive index of the lenses used in the Condensers. Also, as several optical parts are required for concentrating the light into a cone and reducing aberrations, the conventionally used Condensers have been very bulky. To overcome these limitations, we have demonstrated Ultra-thin Condensers (UTCs) that are based on illuminating the object under observation by evanescent surface waves (highly inclined illumination). Also, NA of UTCs can be tuned by changing the refractive index above the object under observation - which also suggests a possibility to obtain extremely high resolution. Interesting theoretical discussion on working of UTCs, and on real plane and Fourier plane images that were experimentally obtained using UTCs in bright-field and dark-field microscopy arrangement will be provided.

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