

Abstract Submitted  
for the OSS14 Meeting of  
The American Physical Society

**Superhigh resolution microscopy using microlenses CHUANHONG**

ZHOU, Department of Physics and Astronomy, Youngstown State University, P.  
KOHLI, Department of Chemistry and Biochemistry, Southern Illinois University  
— We report a new super-resolution microscope for optical imaging which attains an  
upmost resolution  $<100\text{nm}$  with a broad-band white light source. The noninvasive  
microscope uses liquid plano-convex microlens (ML) to collect diffractive light from  
specimen. The deliquescent salt added in the liquid maintains the atomic smooth  
surface and the high refractive index of microlens. The microlens works in the  
near proximate to the objects and picks up both propagation and evanescent light  
diffracted from the objects. The produced super-resolution and enlarged images  
are then magnified by the conventional microscope. We also demonstrate that the  
microscope provides superior for fluorescence imaging where a resolution of  $\sim 90\text{ nm}$   
and  $\sim 4$  enhanced emission intensity was obtained. This microlens based microscope  
is easy to fabricate and use, inexpensive and no special requirement to illumination.  
It has potential applications in diverse fields of life-, bio-, and nano- sciences.

Michael Crescimanno  
Department of Physics and Astronomy, Youngstown State University

Date submitted: 14 Mar 2014

Electronic form version 1.4