

sci.astro.amateur: Re: How long until....

## Re: How long until....

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**From:** Chris L Peterson (*clp\_at\_alumni.caltech.edu*)

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Date: Sat, 13 Nov 2004 14:48:42 GMT

On Sat, 13 Nov 2004 01:56:15 -0500, RichA <none@none.com> wrote:

*>I think they meant better than 1/4 wave which I believe is a general  
>term for diffraction limited.*

No lens can perform better than the limits imposed by diffraction. That was why your claim that these lenses have been "shown to be better than diffraction limited" caught my eye. But reading the reference, it is clear that this isn't the case. The lens in question simply has an accurate enough figure that its wavefront aberration isn't what is limiting resolution. There is no lower limit to wavefront aberration— it can be zero. The lens itself, however, is still diffraction limited at best.

(And they seriously glossed over the issue of chromatic aberration. Saying that you can add something to the liquid that changes the dispersion is a bit of a stretch. After all, you can do the same for glass lenses. So far, nobody has had any luck finding very low dispersion materials suitable for practical optics. Liquid lenses in critical applications will probably have to work the same way glass ones do— with multiple liquids creating achromatic or apochromatic systems. And I wonder how difficult it would be to control the curvatures in a system like that? This system doesn't seem to have any feedback except the final focus. That's easy— but how do you control two surfaces for minimum chromatic aberration using just the information at the focal plane?)

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