Re: Off−Axis (Zero Obstruction) Reflector Telescopes

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From: Guy Macon (*http://www.guymacon.com*)
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Dan Chaffee <dchaffee@blitz−it.net> says...

>The main the reason some large apertures give better images when
>stopped down is that the RMS wavefront contained in the masked area
>is far and away better than the whole surface. My first attempt at
>mirror making resulted in a 6"f 7.3 hyperboloid with a pathetic .5
>wave of overcorrection. Star testing it with a 2" mask showed a
>nearly perfect star test−−−certainly a high .90's strehl. My point
>is that a small section of a much larger mirror will almost always be
>DRASTICALLY better than the whole surface, unless a rolled edge
>or excessive roughness is included in the section.
>A champion wavefront on a large, fast mirror is not necessary for
>getting a very good idea of unobstructed performance from
>30−40% of the original aperture, provided the mirror's edge zone is
>not included in the mask and it's not too rough. A 16" f/4.5 with
>a reasonably smooth surface and overall strehl of .7−.8, if even that
>good, would easily do for a 6" unobstructed mask.

Good point. I could move the mask around and do tests so as
to find the best section.

A smaller hole in the mask not only gives me a better probability
of finding an excellent section, but also allows me to try more
places on the mirror. If the hole is as large as possible, I can
only rotate it, but if it's smaller, I can vary how far off−axis
I place it.

Given the low cost of a mask, I can see myself having a collection
of them with different−sizes holes, each marked with the best place
to put it on the mirror.

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