Letters

The hypochromatic refractor revisited

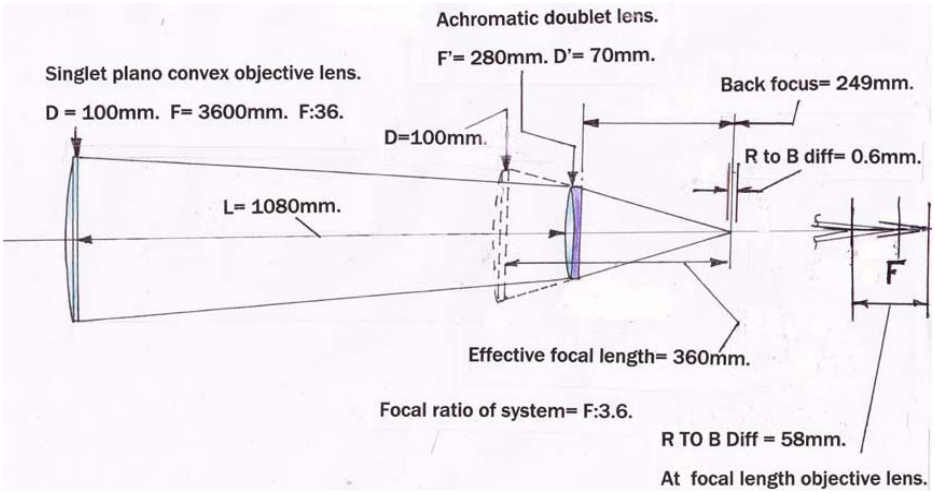
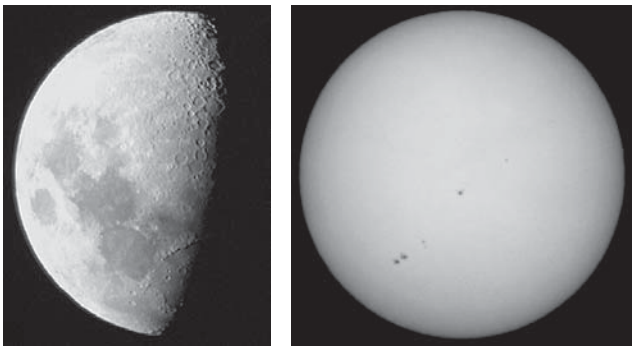


Diagram of the hypochromatic refractor.

From Mr John Wall

Since the invention of the hypochromatic refractor by the author some three years ago, and announced in the letters column of the Journal at that time,[1] the system has undergone considerable development. A seminal short paper on the telescope was published in the articles section of the 'Cloudy Nights Review, ATM Optics and DIY' Forum. The website is global and the Hypo has attracted considerable attention.



Lunar and solar images taken with the hypochromatic refractor, as described in the text.

Development has been toward the instrument being used as a high power solar imager, for which it is eminently suited, and the author has travelled down this path with considerable success. Suppression of chromatic aberration from tens of millimetres to 0.6mm in some cases has placed the instrument in a unique niche. However, the disadvantage of the system is the residual lateral chromatic aberration, which gives slight colour fringes to the edges of bright objects, yet it still yields clear, very bright, needle sharp images in spite of this defect. The LCA is partially corrected by making the simple plano-convex objective lens at least f/40, however as the secondary achromatic reduction lens is placed at only one third of the focal length from the OG, the tube lengths are similar to that of standard refractors.

The direction of research changed recently towards solar imaging, and images of the Sun were taken with a 150mm

The Nikon 'Coolpix' compact camera mounted at the afocal position.

aperture Hypo fitted with a 'Thousand Oaks' trimetal front-end filter 127mm diameter, a 'Ruby' coated optics 50mm Plossl eyepiece, which suppresses the red fringe generated by the LCA, and a Nikon 'Coolpix' camera at the afocal position. This cheap and cheerful setup is in keeping with the philosophy of the Hypochromat. The images were expanded using the zoom capacity on the camera, instead of using a high power ocular, and the raw images being bright green were then processed on the computer using Adobe Photoshop, the final images being converted to greyscale.

The Hypochromat serves well the need for school science projects, where a low cost reasonably large aperture refractor can be constructed from cheap available recycled components, such as damaged binoculars where the OG can be rescued and used for the reduction lens. The simple plano-convex lens can easily be made from a piece of green float glass where it is only necessary to grind a very shallow front curve and a rear surface reasonably flat; the lens does not have to be test plated or figured as a good polish and careful grinding is all that is necessary. The system is very forgiving and tolerances are loose, a feature that will not be found on ordinary refractor OGs. The images of the Moon and Sun shown here were taken with this setup.

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1 Wall J., *J. Brit. Astron. Assoc.*, **119**(3), 163 (2009)

The 'Hyperstar' optical corrector

From Mr Peter Howard

At the 2011 Deep Sky Section meeting reported in the 2011 August *Journal* [vol. **121**(4), p.245] Dr David Arditti described his problems using the Starizona Hyperstar optical corrector, which enables an f/10 Schmidt–Cassegrain telescope to be used at f/1.7. He found that setting up his telescope with Hyperstar in the dark was 'fiddly', and in one attempt he even dropped his secondary mirror. He also had difficulty with collimation changing at each re-pointing.

I am surprised that he had so many problems, as I have made many images with Hyperstar on my 11-inch [28cm] Celestron telescope for several years (see attached example), and have always found setting it up to be a simple task that takes a few minutes in the pitch darkness of the Arizona desert. I have written a short article for the January Deep Sky Section newsletter (available on the Section webpage) describing my trouble-free experiences.

A demonstration of the Hyperstar system can be found at **http://starizona.com/acb/videos/Hyperstar/HyperStarDemo.wmv**.

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Southern-hemisphere galaxy Centaurus A, imaged from southern Arizona by Peter Howard using his 28cm SCT and the Hyperstar system.