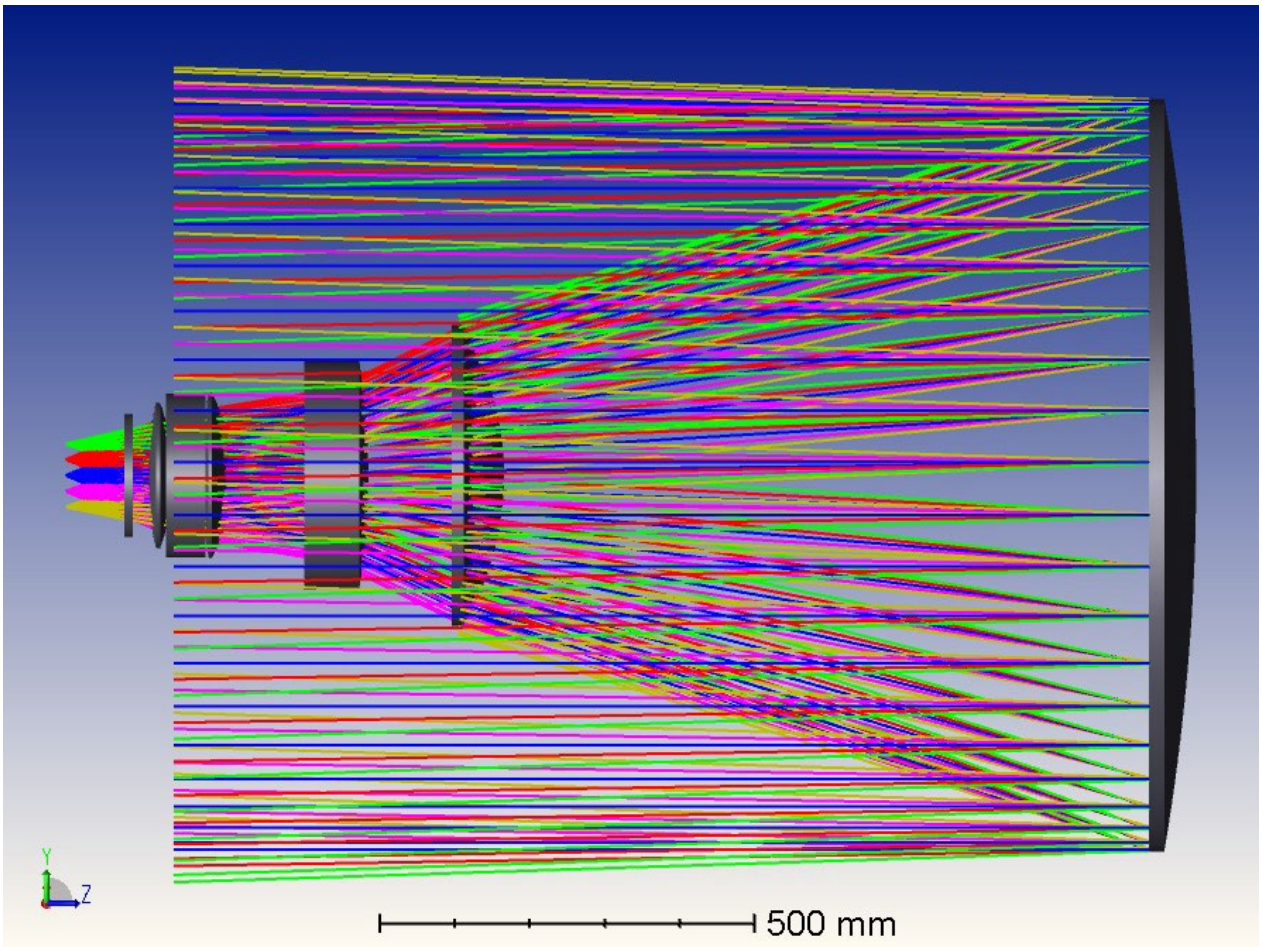
UWF 1000 f/1.3

Optical Layout

The UWF1000 uses a prime focus configuration. The main mirror is a high order asphere and in the prime focus we use a highly aspheric 5 Lens corrector to correct any field aberrations in a wavelength range from 400nm to 700nm. Only with these latest technological advances in optical design (aspherical surfaces, ED glasses), we could combine such a wide field with this short focal ratio.

It is definitely the best telescope if it comes to recording very faint objects with the minimal possible exposure time.

Figure 1 Optical Layout



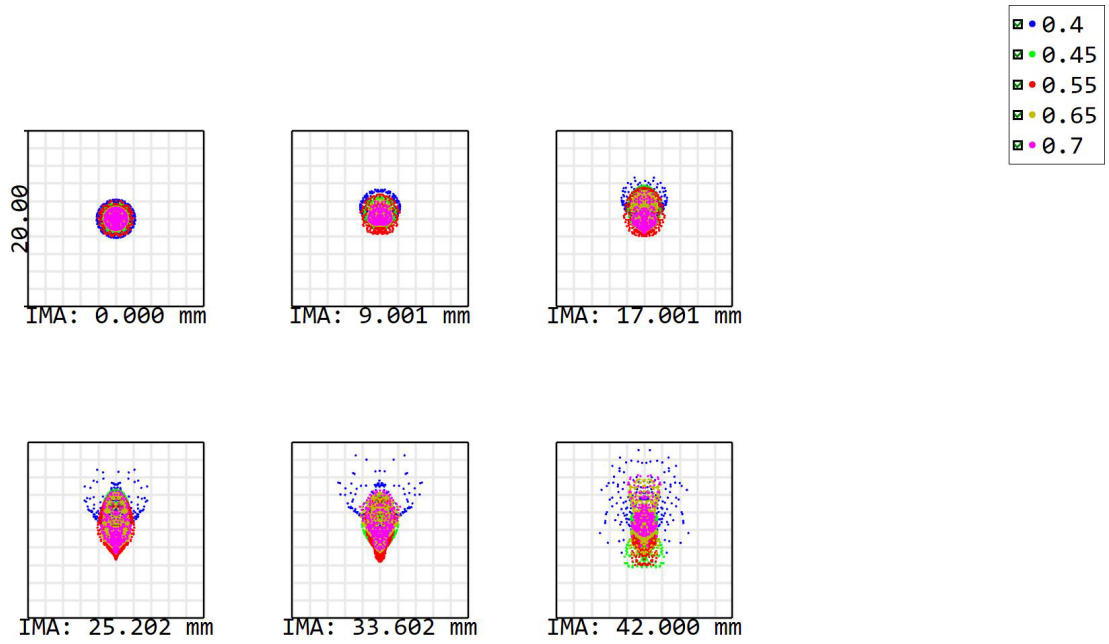
Optical Diameter:	1000mm
Field of view:	84mm[*1)]
Focal length:	1300mm
Focal Ratio:	f/1.3

As with all these ultrafast systems, the system has to be optimized and assembled for a certain filter thickness. While other manufacturers will not care about filter thickness, we do know, that in a f/1.3 light beam even a flat medium with a refractive index <>1 causes spherical aberration which has to be included in the optical design for perfect image quality.

The corrector is of course coated with a multi layer AR coating.

*1) The field of view is given as diameter for which the performance was optimized. Since there exist no circular sensors, we often recommend to use a CCD with larger diagonal, since this allows a better usage of the optimized field.

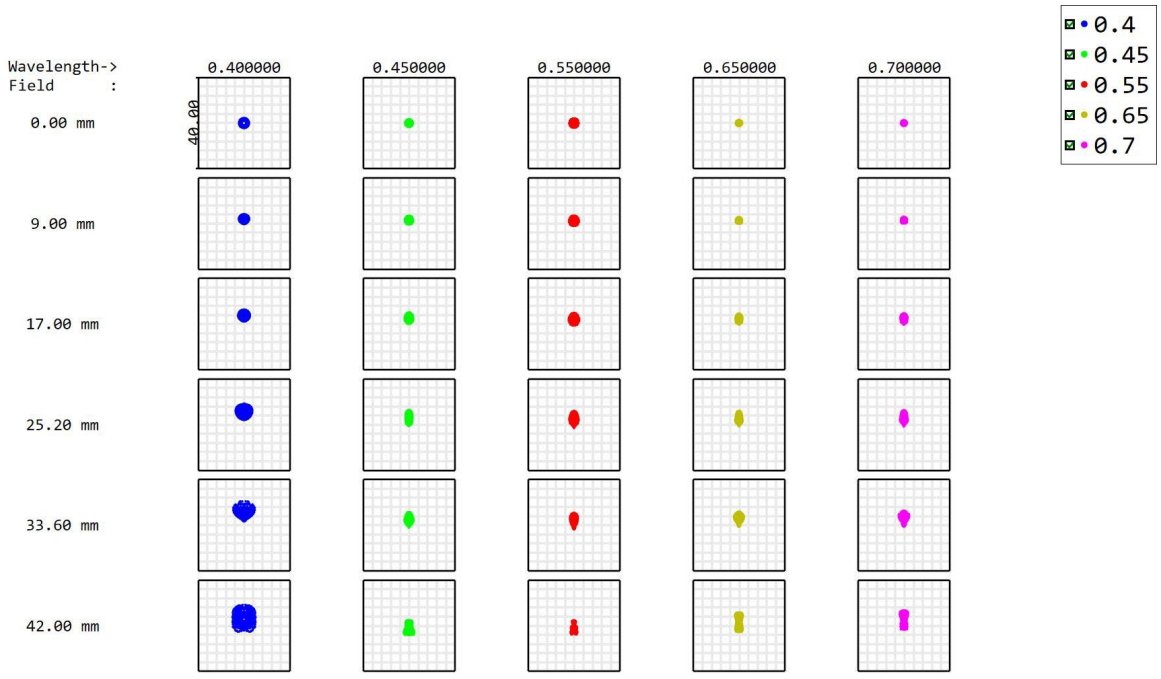
Optical performance



Surface: IMA

Spot Diagram	
UWF 1m f/1.3 , 6/29/2022 Units are µm. Legend items refer to Wavelengths Field : 1 2 3 4 5 6 RMS radius : 1.061 1.102 1.511 2.110 2.078 2.123 GEO radius : 2.201 3.348 4.806 7.174 8.935 9.113 Box width : 20 Reference : Centroid	ASA Astrosysteme Austria Zemax OpticStudio 15.5 SP1

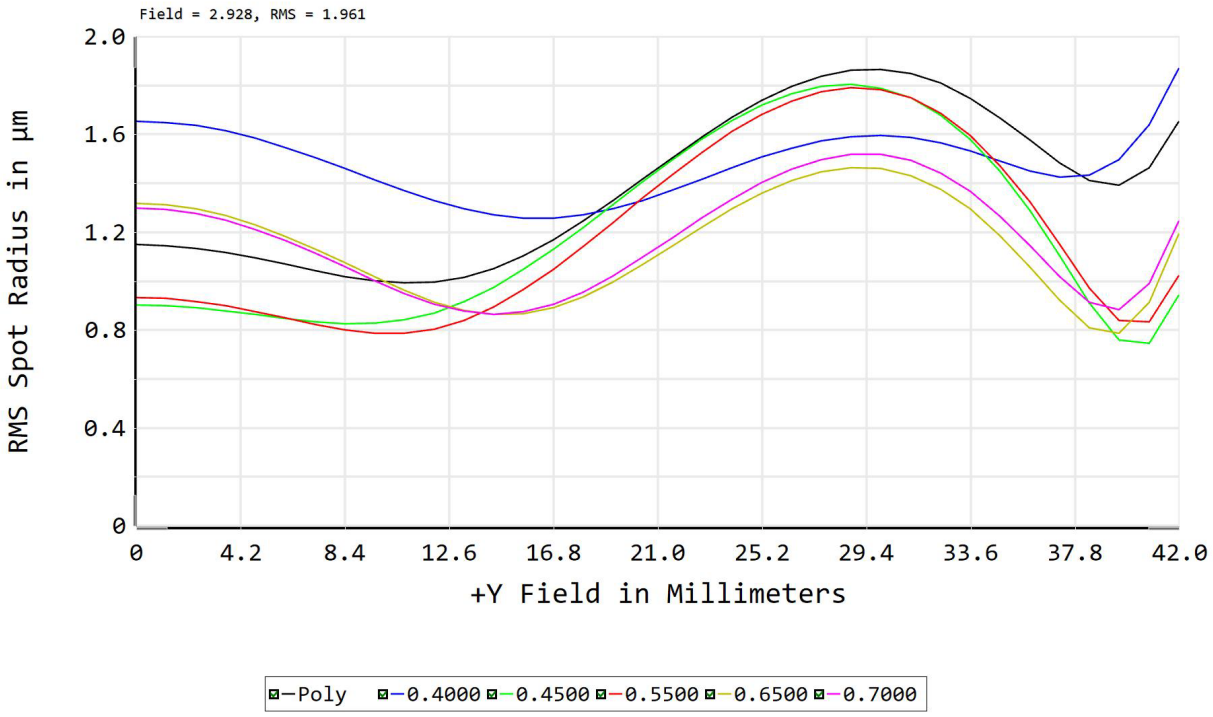
Figure 2 Spot Diagram (Box Size is 20 micron)



Surface: IMA

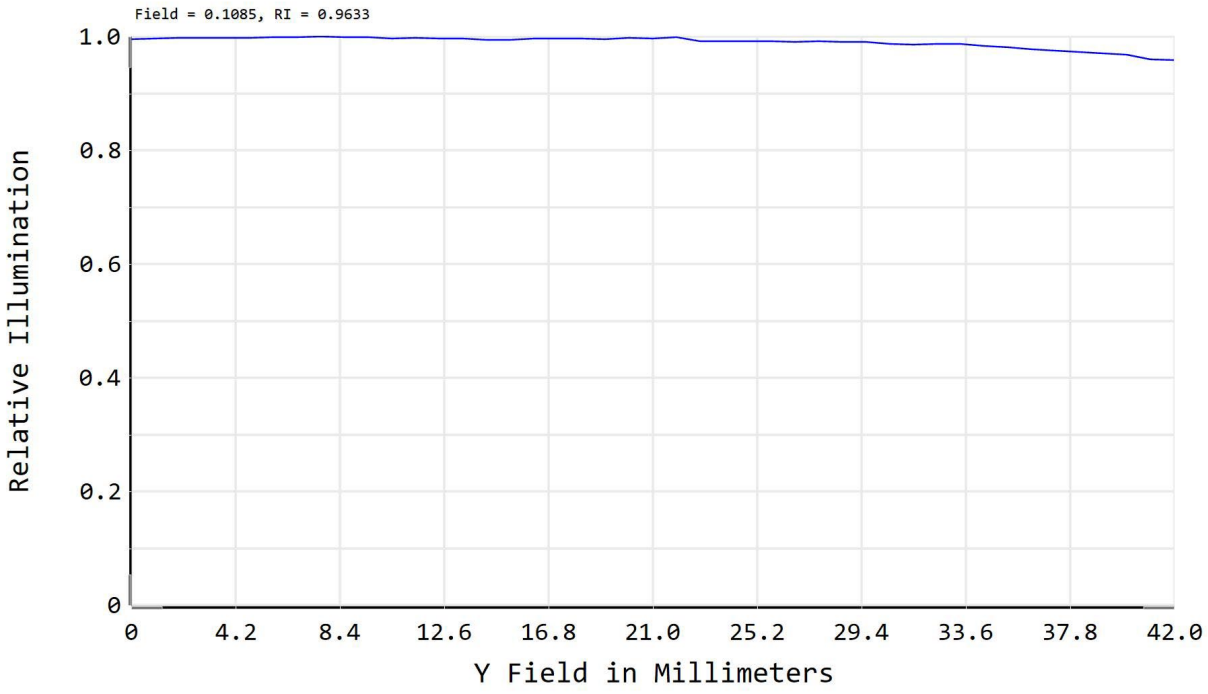
Matrix Spot Diagram	
UWF 1m f/1.3 6/29/2022 Units are µm. Legend items refer to Wavelengths Box width : 40 Reference : Chief Ray	ASA Astrosysteme Austria Zemax OpticStudio 15.5 SP1

Figure 3 Matrix Spot Diagram (Box size 40 micron)



RMS Spot Radius vs Field	
Large 11/22/2021 Legend items refer to Wavelengths Reference: Centroid	ASA Astrosysteme Austria Zemax OpticStudio 15.5 SP1

Figure 4 RMS Spot diameter vs Field



Relative Illumination	
Large 11/22/2021 Wavelength: 0.550000 µm	ASA Astrosysteme Austria Zemax OpticStudio 15.5 SP1

Figure 5 Light loss from center to edge

Mechanics

The truss tube is made with carbon truss tubes and CNC AL parts. The main mirror can be collimated fully electronic to allow an easy and fast remote collimation and the current position and tilt is displayed with absolute encoders. As one of the first telescopes in the market, the prime focus image plane can also be tilted fully electronic with 3 ball spindles with absolute encoder. This allows a very easy adjustment (we know no CCD or CMOS which would have an internal alignment accurate enough to cover the full resolution of our prime focus instrument without tweaking the image plane tilt). We only offer this telescope as a full package on a direct drive equatorial fork mount.

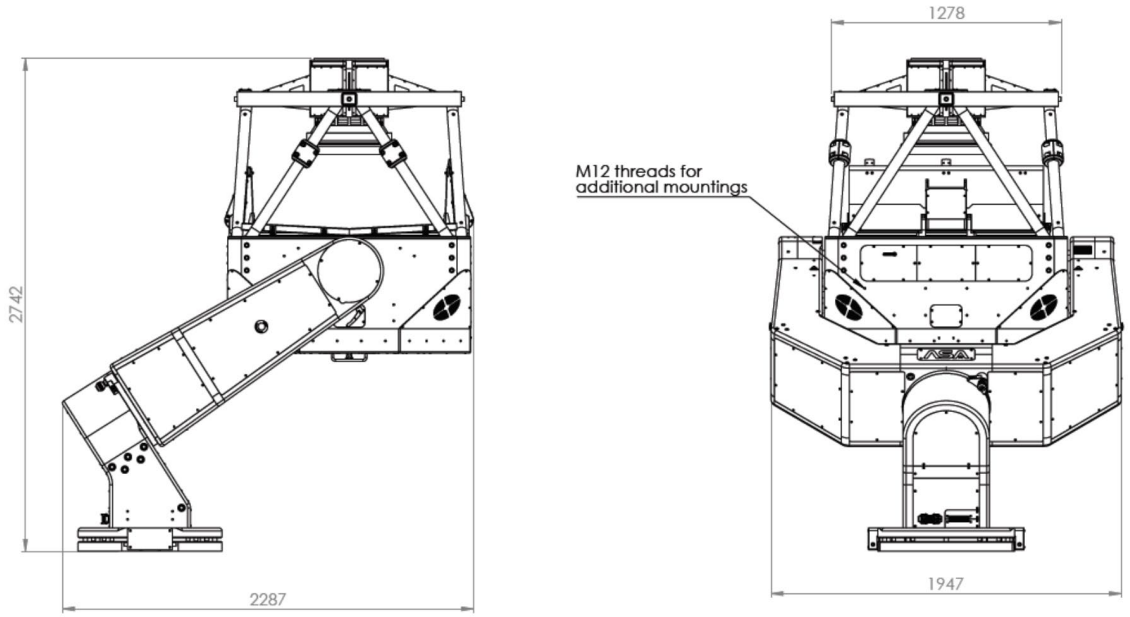


Figure 6 Tube dimensions