

Introducing the New RiDK range



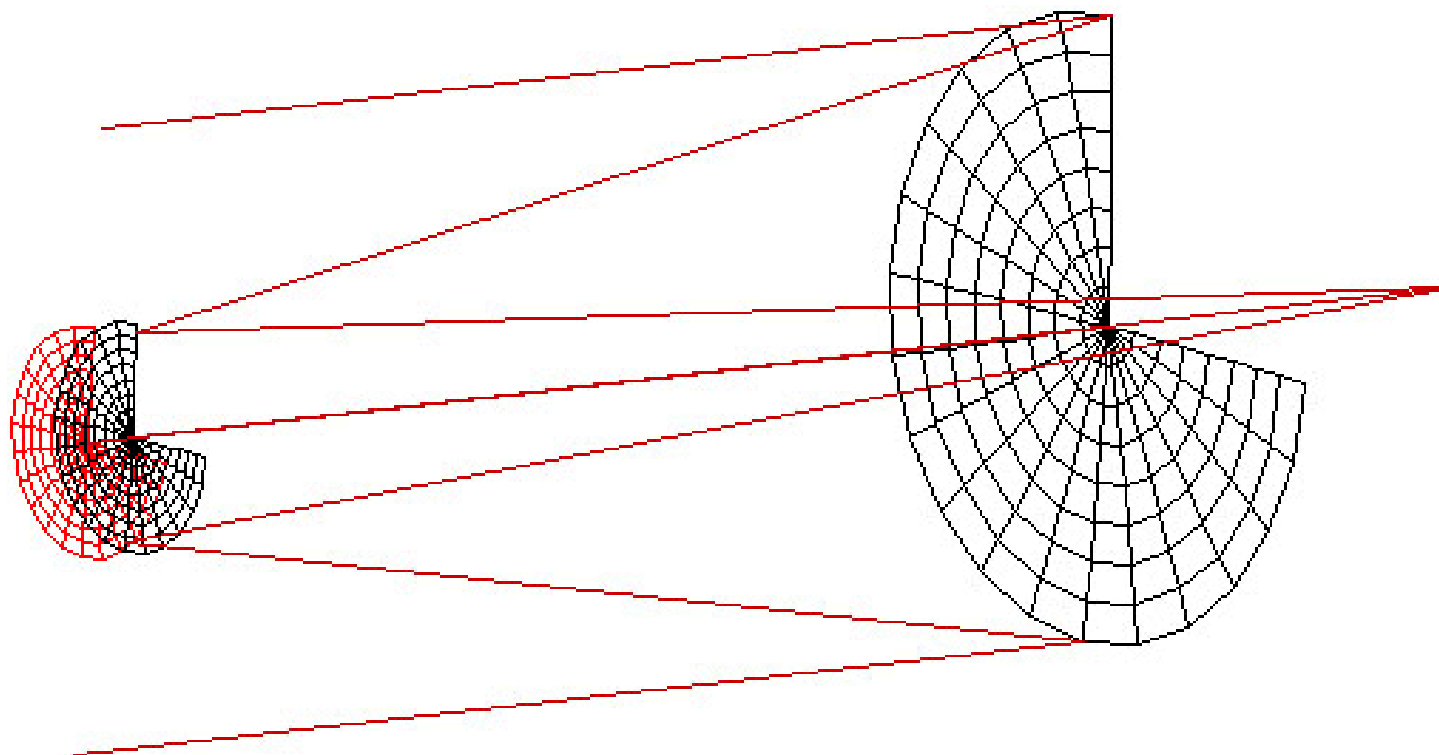
The Future of Astroimaging

Why an RC telescope?

Why a RiDK telescope?

(RiDK is better in most cases!)

Classic Cassegrain/Ritchey Chretien layout



Two mirrors:

Classic Cassegrain: primary parabolic, secondary hyperbolic.

Ritchey Chretien: primary hyperbolic, secondary hyperbolic.



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The **RC (Ritchey Chretien)** is a peculiar version of the Cassegrain family of telescopes (Cassegrains are interesting over other optical designs above all because of their compactness and good optical performance) that **offers a greater corrected field than any other two mirrors optical solution.**

There is nothing to invent, more or better. End of the story.

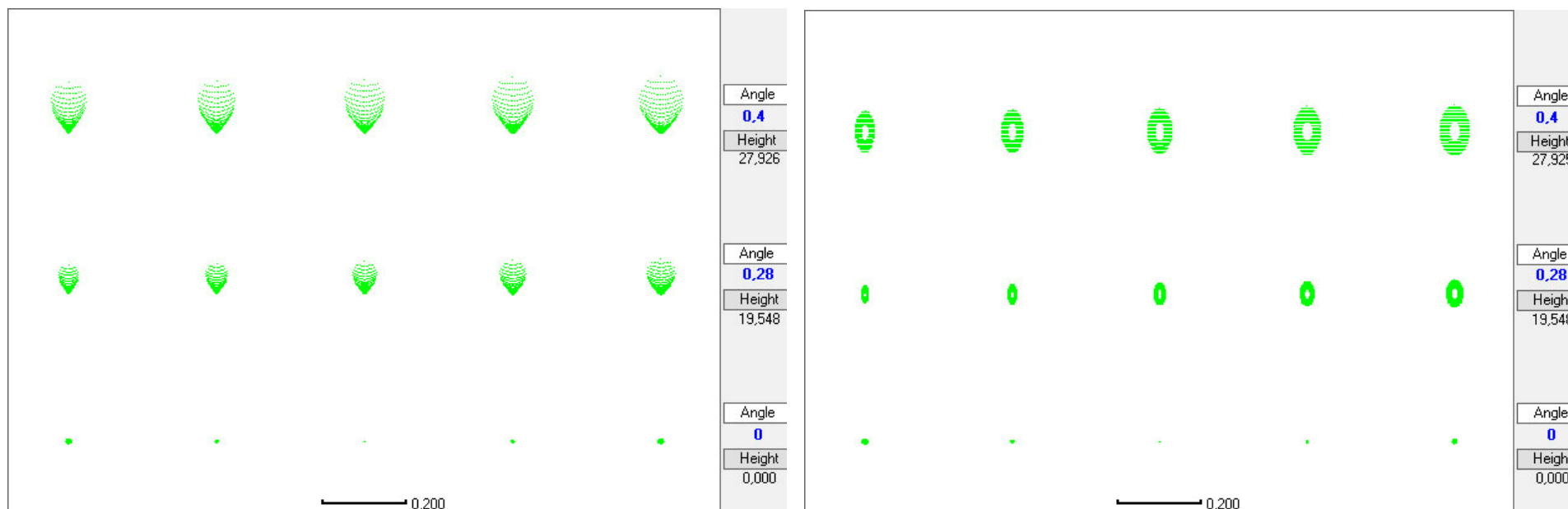
The **RC is theoretically the most corrected telescope** which can be produced with **ONLY two mirrors.**

This because through the use of a pair of hyperbolic shaped mirrors (not only the secondary as for Cassegrains) **the complete correction of coma aberration is achieved.**

This allows to have a better concentrated light spot also at a quite big distance from optical axis.

The "shape" of the RC off axis stars, because of the absence of coma aberration (which is still present in the classical Cassegrain design, with "drop" shaped off axis stars), is more "round" and this makes the performance of this optical layout more interesting.

Classical Cassegrain/Ritchey Chretien performance



Cassegrain

RC

**20 inch Cassegrain and RC F/8 comparison. Only mirrors.
Max light transmission. Wide bandwidth. No "coma" on RC.**

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In addition, using **only mirrors**:

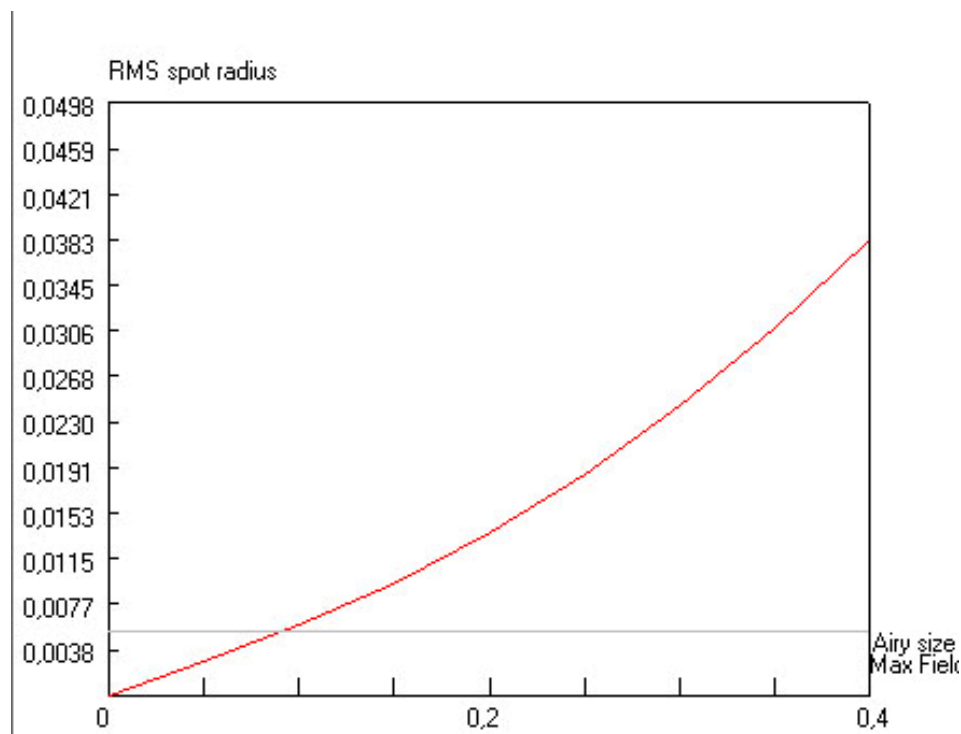
- the **pure RC scope is completely free from chromatic aberration**, and the performance is the same at any wavelength, with the only limitation of coating light reflectivity (easy to obtain a good light reflection from 350 nm to 5000 nm, or more, with classical metallic coatings: mean silver, aluminum or gold)

- the **pure RC scope has the maximum possible level of light transmission to focal plane** (no lenses absorption/reflection/scattering along light path)

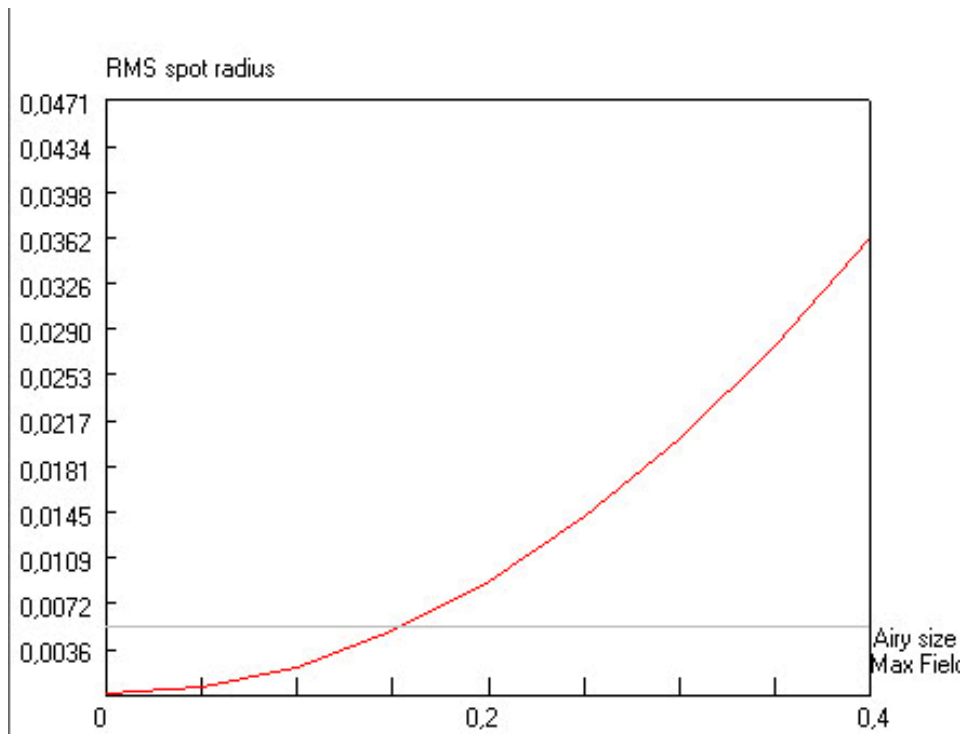
These performances make the RC, in most of the cases, the "perfect" scope for professionals, because they are usually interested in working with a larger visual wavelength range, with max performance over not so big CCD or different sensors at the focus (which are really expensive because other kind of features, for example the extremely high quantum efficiency).

By the way, the RC is not actually always the perfect scope even for researchers, especially when they are looking for a large field scope... But this is a different story. Of course, OS has the perfect solution also in that case (RH/RiFAST/RiLA)!

Classical Cassegrain/Ritchey Chretien performance



Cassegrain



RC

**20 inch Cassegrain and RC F/8 comparison. Only mirrors.
Spot size versus field.**

About 39 micron RMS at 60 mm field edge for both! Very BAD!

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On the opposite side there are also some important cons of the RC.

-the pure RC scope is really difficult to manufacture (the deep aspherization on both surfaces is difficult to achieve and to check, because of the great difference from the starting spherical surface and the final shape). **This means that the scope is more expensive** (more time required, more skills, etc) and, from a different point of view, with the same production capability it's quality will be lower than other optical designs (example: amateurs can make good newtonian, acceptable Cassegrains, but usually bad RC's...).

-the pure RC scope is quite difficult to align very well. Being both surfaces of mirrors with a single axis of symmetry, theoretically there is only one single ideal relative position where we can achieve 100% performance. As you can easily understand, this is a mission non so easily accomplished (but there are some tools can make this operation easier). You have to think that some studies are still on the way, today, examining the RC system and discovering new unknown problems about the difficulty of aligning an RC.

-the pure RC performance is not good for large field hi resolution imaging.



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Then, what is good for researchers... is not good enough for astroimagers!

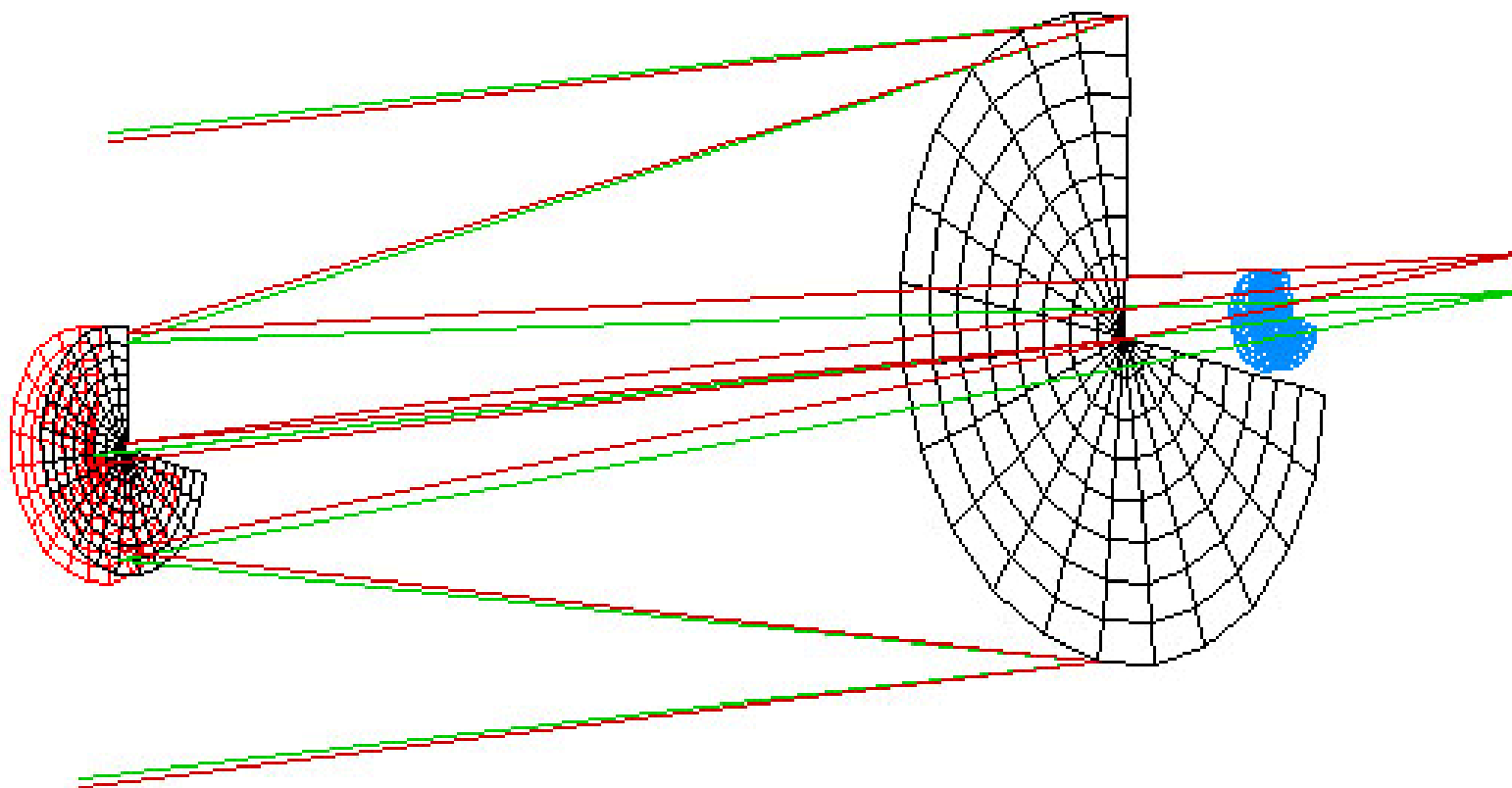
What astroimagers need is:

- a very large corrected field** (a couple of inches at least to cover the 16803)
- few micron spot size to the edge**, to grab the sky with high sampling rate on large field
- a typical F/7 or F/8 focal ratio**, to be able to explore also small details of small sky objects.

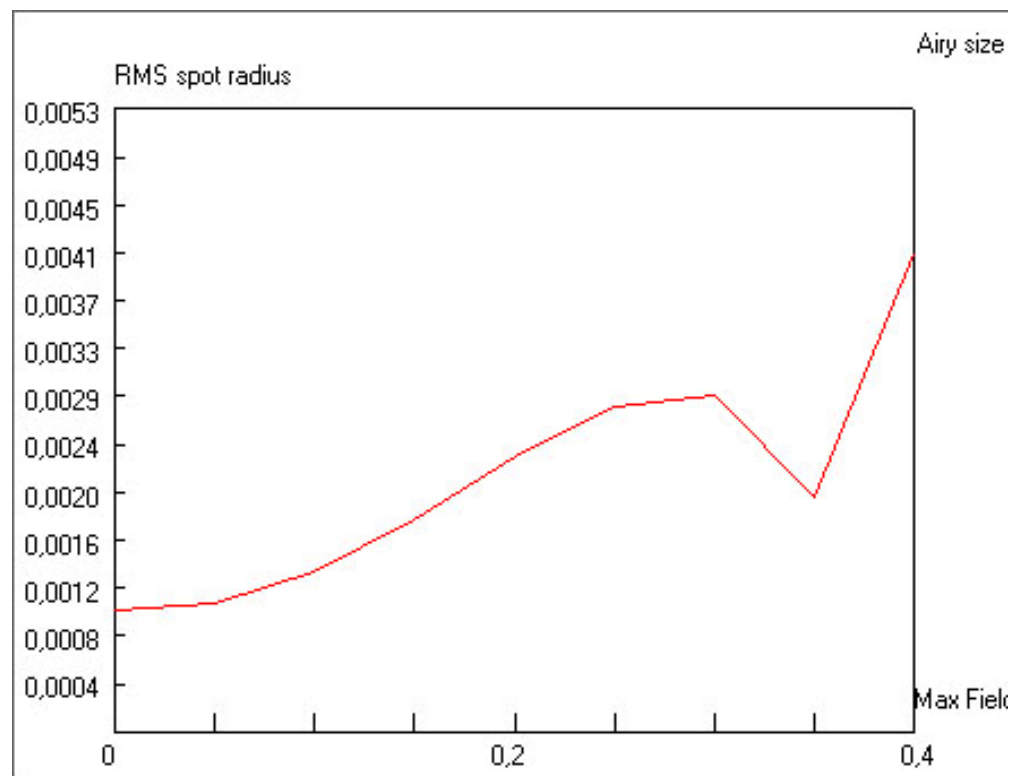
The pure RC optical design is not able to deliver us that, as you can see in the spot diagram above.

Then we have to add to the pure RC a... field flattener!

Corrected Ritchey Chretien layout



Officina Stellare corrected Ritchey Chretien performance



Officina Stellare 20 inch F/8 corrected RC.

4.1 micron RMS spot size at 60 mm field edge (410-750 nm)!

Very GOOD!



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Mission accomplished. But, this way you are now working with something different. No more an only mirrors reflective scope as the pure RC, with all the good things it has, but a catadioptric system, with mirrors, lenses, small chromatic problems, less bandwidth, more elements, a little light loss, etc etc.

The "purity" of the native RC, with its pros, is now completely disappeared, forcing it to do something different from its "nature".

Performances are now quite good, but the cons are still present: cost, collimation problems, etc.

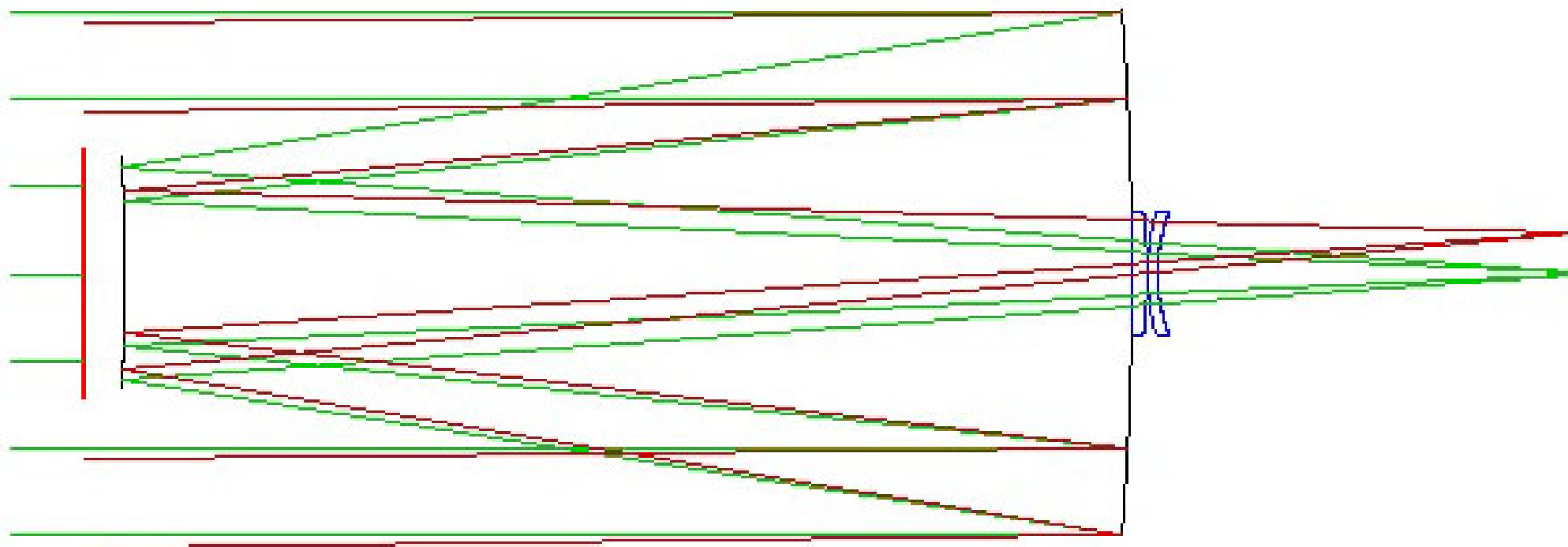
It is now clear that having a mirrors/lenses optical system **is necessary to the astroimager to obtain the required performance.**

Our challenge was to develop something different from a "Corrected RC", with the same number of elements, the same pros (large corrected field, small spot size), but not the same cons (then with a low cost and easy to align).

Is that possible?

Yes, it is possible. The answer is the new RiDK range from Officina Stellare.

The Officina Stellare RiDK layout



Spherical secondary mirror.

Aspherical primary mirror.

Corrector lens group before focus.



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Many of our customers were asking us why we don't have a Dall-Kirkham or a Corrected Dall-Kirkham (CDK) telescope between our arsenal of products. Well that's because of our way of thinking.

Many other manufacturers just take one classical optical scheme and add some sort of corrector to it, just to have a flatter field and/or a better spot size, we always try to get things better.

The RiDK (Riccardi Dall-Kirkham) represents the new reference point for all modified Dall-Kirkham instruments available on the market. The unique experience and creativity of Massimo Riccardi, Chief Optical Designer at Officina Stellare, gives birth to a new family of astrograph with superior performance and image quality.

The results are simply amazing: a system delivering more than 60mm large flat field that is over the diffraction and, more than this, over a very broad spectrum range!



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These outstanding optics are mounted inside the state of the art OS-Truss mechanics. The same mechanics approved and used by worldwide research institutes for professional studies.

The RiDK is 100% Made in Italy.

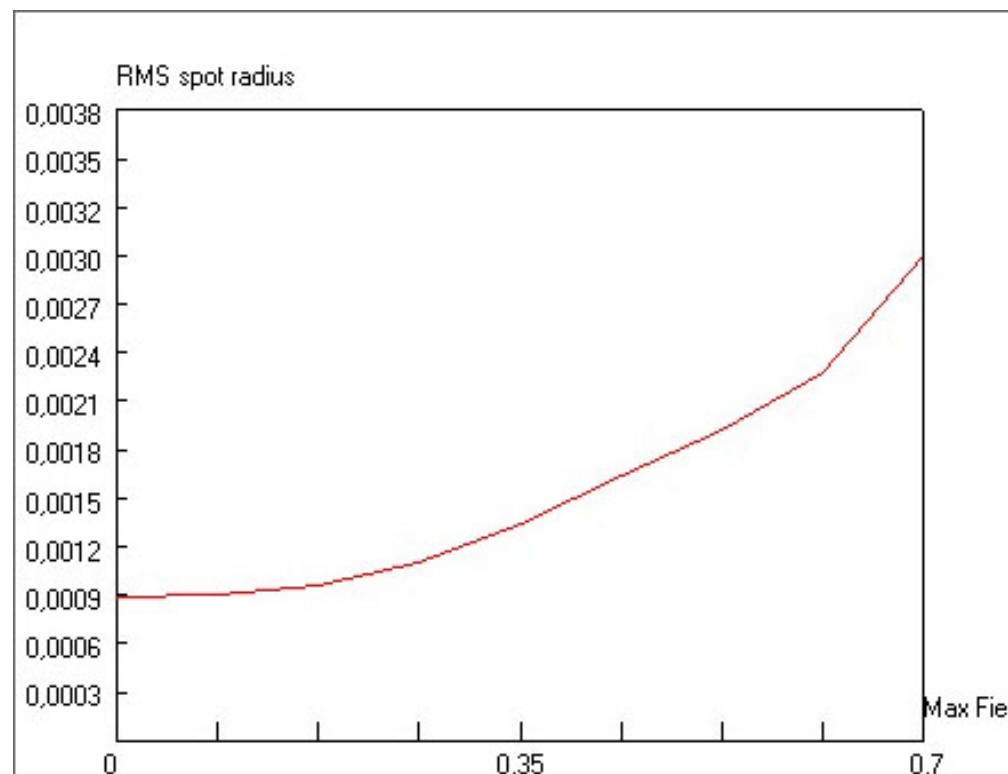
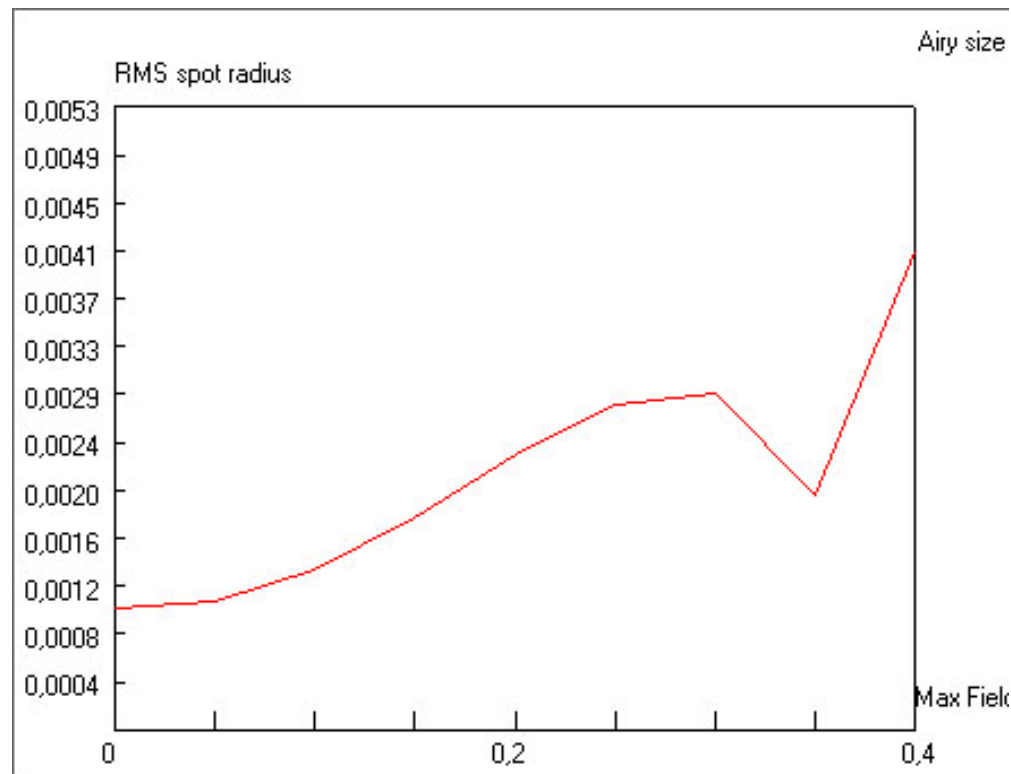
Optics are made in the Occhiobello Plant under the strict quality control of Massimo Riccardi. The mechanics, designed by our R&D Manager, Giovanni Dal Lago, are engineered, manufactured and assembled at the Thiene plant.

The RiDK is the ultimate astroimaging telescope for whoever desires just the best for imaging all of the deep sky wonders in a beautiful, compact and superbly manufactured instrument.

The long back focus allows to mount any type of accessories, including cameras and rotators.

It's the telescope for anyone who believes that imaging the Universe is one of the most important, serious and fulfilling experience for all night sky's lovers and for those who believe that image perfection is the minimum to which one can crave for.

Corrected RC F/8 versus RiDK F/7 performance



□

Corrected F/8 RC: 4.1 micron at field edge, 410-750 nm.

Corrected F/7 RiDK: 3.0 micron at field edge, 400-800 nm!

The New RiDK range:

Diameter and F/ratio	Field
RiDK 12" (300 mm) F/8	60 mm
RiDK 16" (400 mm) F/7	70 mm
RiDK 20" (500 mm) F/7	80 mm
RiDK 24" (600 mm) F/7	80 mm

The RiDK advantages:

- **Easy to align!**
- **Small spot size!**
- **Widest corrected field!**
- **Faster F/7 focal ratio!**
- **Diameters up to 24"!**
- **Thermal stability!**
- **Higher resolution, fainter stars detectable!**
- **Great focus extraction!**