

MARCEL DE KÉROLYR (1873/1969), ONE THE GREATEST ASTROPHOTOGRAPHERS OF ITS TIME

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Marcel Bonnemain de Kérollyr (Figure 1) was a professional violinist and one the greatest astrophotographers of its time. There is very little information regarding this renowned, yet forgotten amateur astronomer. Some of the best astronomical photographs produced in the 1930s were obtained by him from Forcalquier, the place where “Observatoire de Haute Provence” was later to be built.

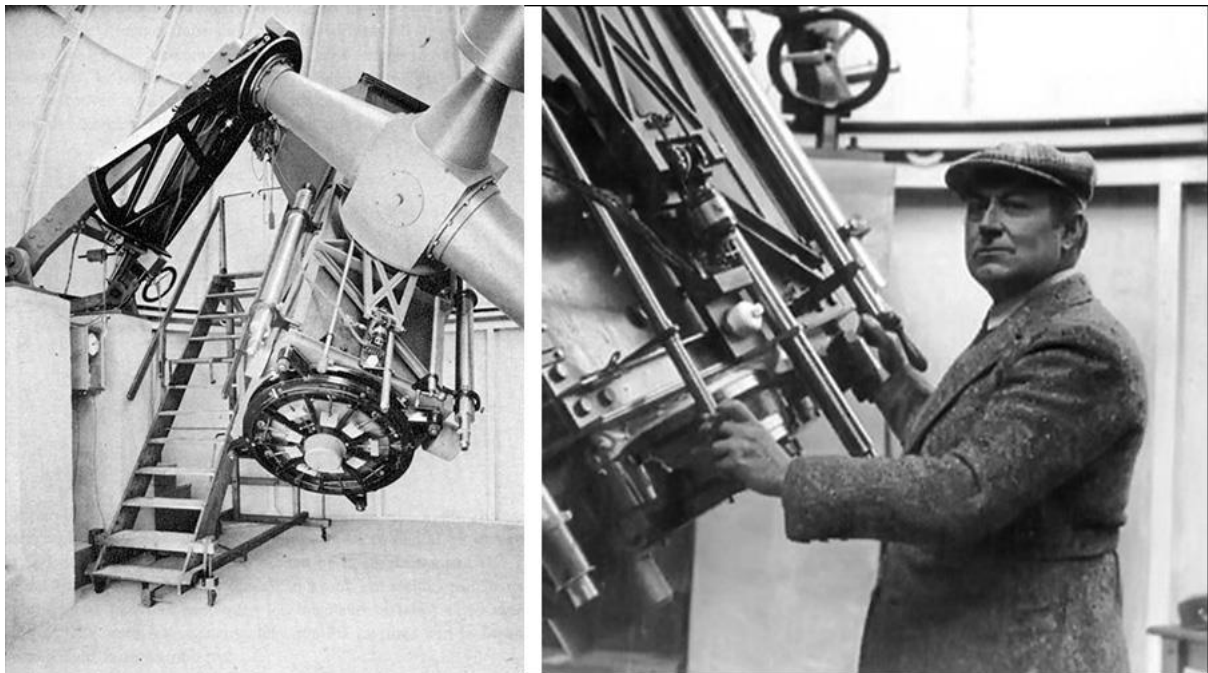


Figure 1- Marcel Bonnemain de Kérollyr and the 80 cm telescope.

Kérollyr was born in 1873. Being an accomplished violinist, he married a singer and toured Europe from 1914 to 1918 acting as accompanist to his wife. During this period Kérollyr performed a recital before Tzar Nicholas II and his wife. Between tours, the couple lived in Nice and were known to entertain a lot. In 1927 Kérollyr witnessed the fatal car accident of the actress Isadora Duncan at “Promenade des anglais”.

After this period his wife lost her voice and was unable to perform. After visiting the Nice observatory and getting in touch with several French amateur astronomers, Kérollyr decided to devote the rest of his life to astronomy and astrophotography was his main interest.

The couple bought a house in a place with very low levels of light pollution (Digne, Haute Provence Alps). Kérollyr built a roll-off-roof observatory that was described in *L’Astronomie* (October 1928). Housed in this observatory was an equatorial mount made with *Mecano* parts including a high-quality

worm wheel for astrophotography. Initially two photographic cameras were used: Derogy portrait lens 180mm, f/4.6); Berthiot aerial lens 120mm f/10 and a 250mm F/15 guiding telescope¹.

Kérolyr obtained all his plates, chemicals and photographic paper through the Lumière laboratories. Many of his first astrophotographs were published in *L'Astronomie* in 1928². Some of these photographs were of high quality and very unusual. A milky way wide-field image with a -12 magnitude fireball is one example. Another photograph featured the Andromeda galaxy imaged with a total exposure of 7 h over three different nights (*L'Astronomie*, May 1929).

In 1930 Kérolyr moved to Forcalquier, located about 50 km from Digne. The Haute Provence observatory was later built close to this location. The director of the Paris observatory wanted to conduct seeing conditions *in situ* and Kérolyr was right man in the right place to do the job.

André Couder and G. Prin made the optics and mechanical parts of an 80 cm Newton/Cassegrain reflecting telescope³ that was extensively used by Kérolyr. This Couder-Prin telescope is described in detail in Danjon and Couder classical book *Lunettes et Telescopes* (1935). The telescope was housed under a 8 m dome close to Kérolyr's house (Figure 2, Figure 3).

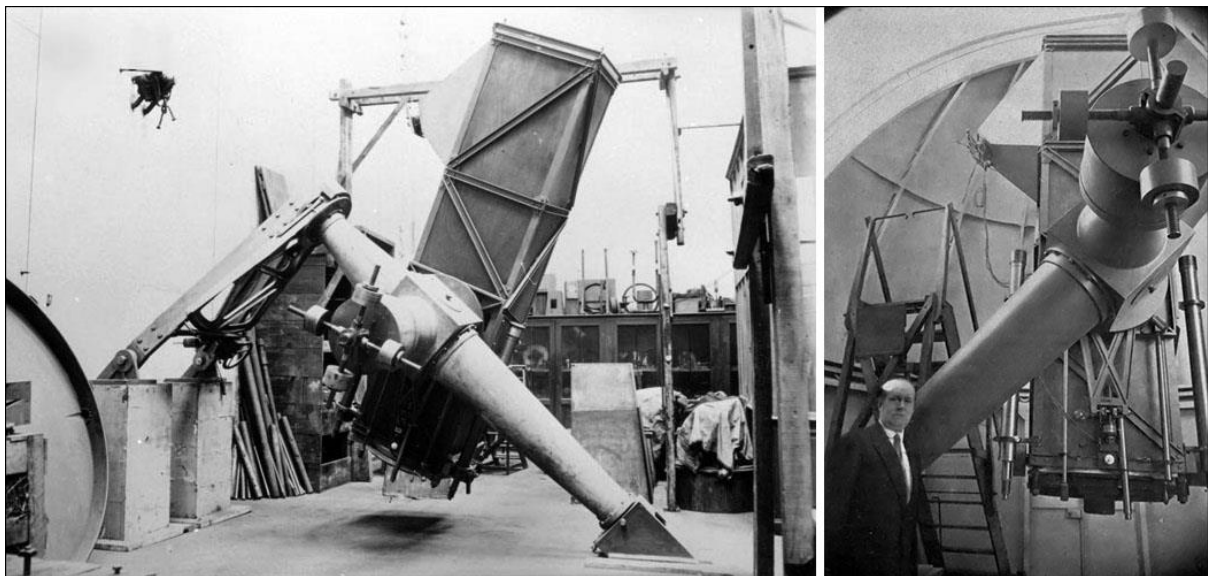


Figure 2- 80 cm Newton/Cassegrain telescope at Prin (left) and Forcalquier (right). Marcel Kérolyr is seen in the foreground (right).

Kérolyr's first deep-sky image (IC 405) obtained with the 80 cm reflector was published in 1933 (*L'Astronomie*, May)⁴. Several Kérolyr's plates were published in the same magazine until 1938⁵.

The observatory was known as "Paris Observatory Astrophysical Out-Station". Kérolyr worked as an observer and all cost were supported by the Paris observatory. He did not obtain an official position at the observatory an initially was not paid⁶.

¹ <https://youtu.be/WMKggqeffgA> Youtube Video

² *L'Astronomie, Bulletin de la Société Astronomique de France*

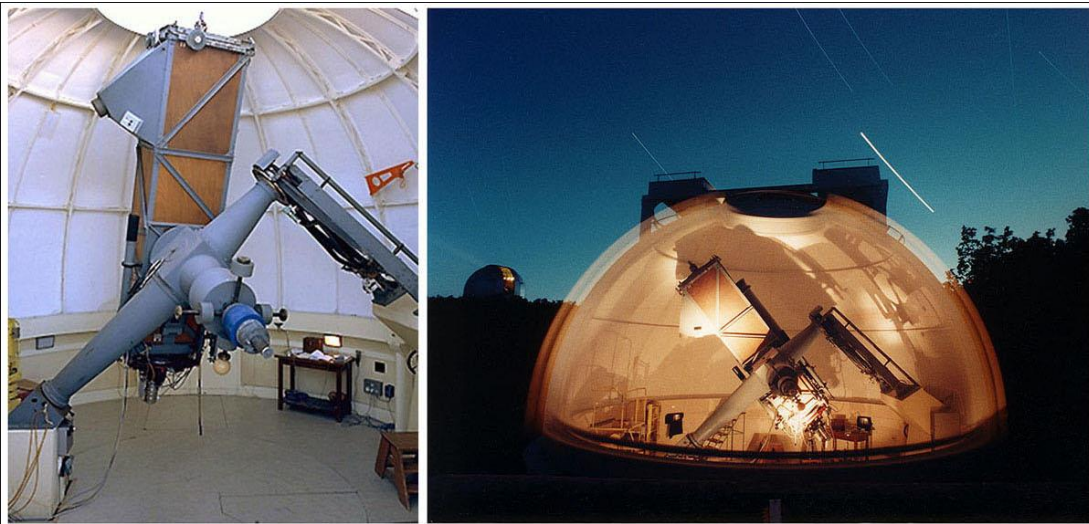
³ The 80 cm telescope was built by *Maison Prin*, Paris.

⁴ A test exposure of the Orion nebula of 12 h in four different imaging sessions was published in September 1932 (*L'Astronomie*).

⁵ The plates were very expensive to reproduce and were all paid by an anonymous donor X (later identified as Comte Aymard de la Baume Pluvinel).

⁶ Kérolyr received a small pension later.

Some of Kérolyr's best photographs were published in Jean Giono's book *Le Poids du Ciel* (1938) (Figure 8). A 7 m astrophotograph was printed for the *Exposition Universelle* exhibited at the new *Palais de la Découvert* (Paris) in 1937.



Télescope de 0,80 m

1. Generalités

Date de mise en service : 1932 à Forcalquier
1945 à l'OHP

Monture : Anglaise
Tube : Treillis fermé

Miroir principal : Parabolique Matériau : Glace St Gobain
Diamètre : 80 cm
Épaisseur : 8 cm
Diamètre du trou : 175mm

2. Foyer

CASSEGRAIN

Distance focale : 12m Ouverture f/15
Miroir secondaire : Hyperbolique Diamètre 250mm (Utile 242mm)
Épaisseur: 50mm

Déplacement du foyer de : 4cm à 50cm
depuis le plan inférieur du barillet

Système de rotation : 360° Baffles pour fond du ciel : oui

Poids maxi
appareil auxiliaire : 110 kg

Tromblon longueur : 700mm Diamètre entrée : 90mm
Champ : 2.8'/cm

S.A.Ilovaisky
7 Octobre 1996

<http://www.obs-hp.fr/guide/80.html>

Figure 3- 80 cm telescope today. Observatory of "Haute Provence".

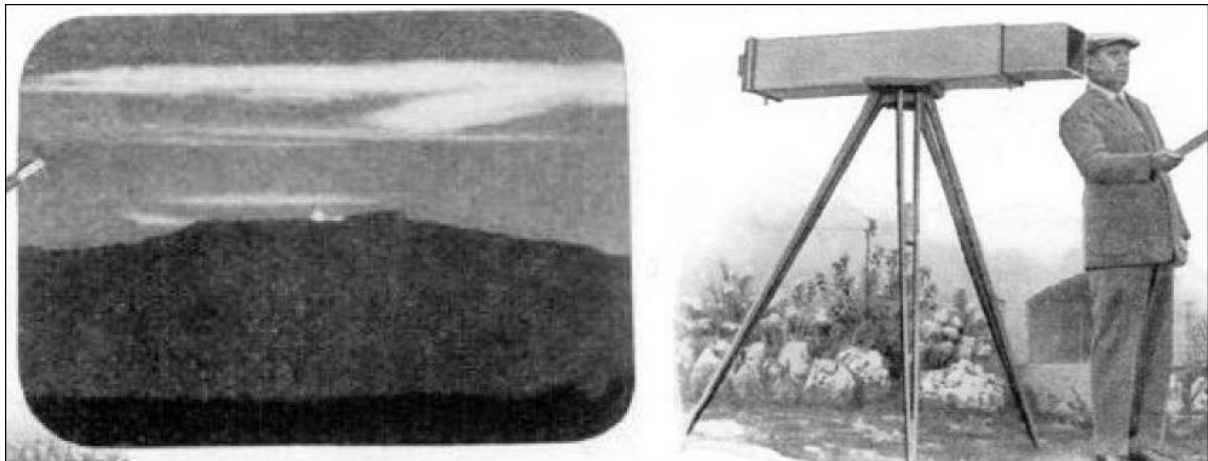


Figure 5- First colour photograph of the Green flash obtained by Kérolyr in 1931.



Figure 6- Moon images obtained by Kérolyr at Forcalquier (left Newton Focus, right Cassegrain focus).

Kérolyr is also known for being able to obtain the first colour photograph of the “green flash”. This photograph was taken in 1931 from his home at Forcalquier (Figure 5).

In 1933 (*L’Astronomy*, November 1933) Kérolyr published an astrophotograph of the southern part of the North America nebula with a total exposure time of 20 h. The faintest stars recorded in this photograph were as low as magnitude 20. Kérolyr wrote about this image:

This shows the optical and mechanical perfection of the equipment, particularly if one considers the length of the exposure, and if one remembers that the plate-holder had to be removed some forty times to ensure that focus was exact (by Focault testing).

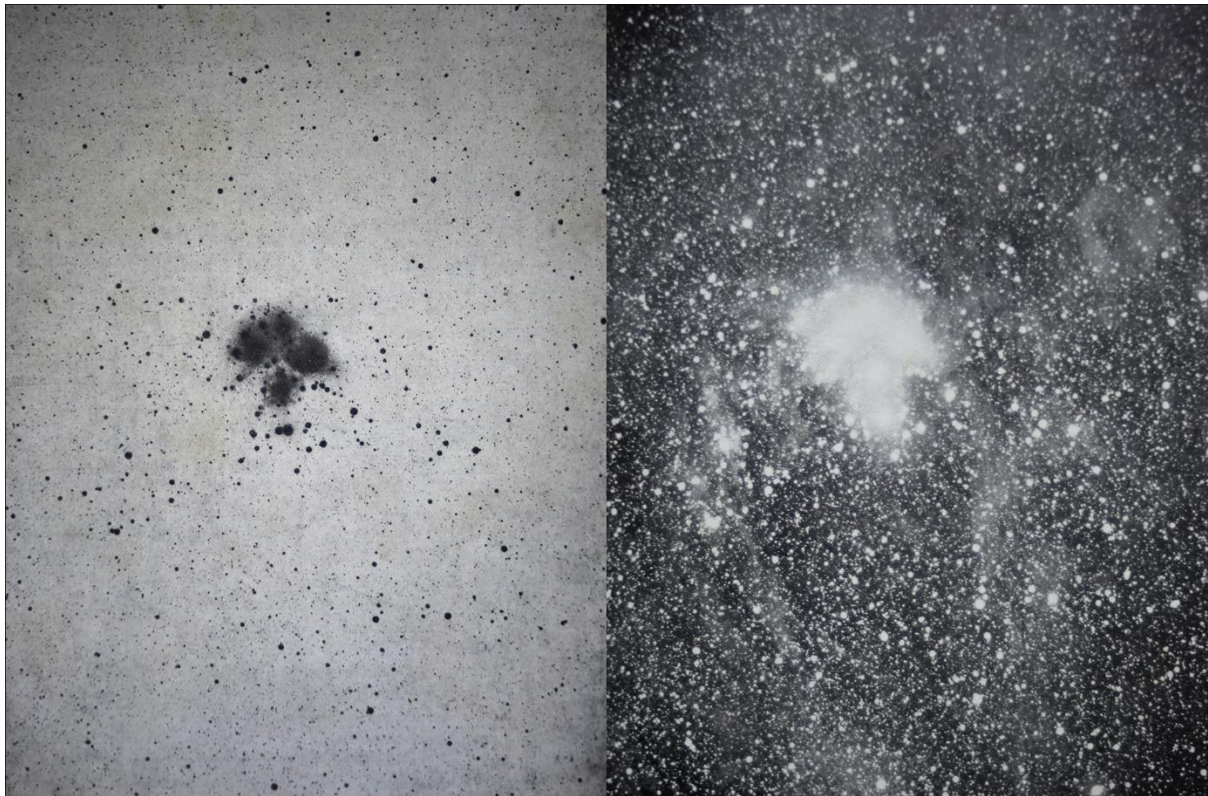


Figure 7- M45 (Pleiades) by M. de Kérollyr. Zeiss objective 1.2 m focal length. Lumière Super S-E.

The last astrophotograph obtained by Kérollyr was published in April 1938 (*L'Astronomie*, Mars 1938). A Zeiss objective was used, mounted piggyback on the 80 cm telescope. This image shows the faint reflecting nebulae that can be found in the Pleiades Cluster. It was a composite of two photographs, 18 h + 24 h exposure (42 h in total) (Figure 7).

Kérollyr wrote the following report in *L'Astronomie*:

(...) Cet hiver, je pus reprendre cette photographie des nébulosités extérieures des Pléiades – reproduite en planche hors texte – avec un objectif Zeiss d'aviation de 1200 millimètres de distance focale ouvert à F:7 et optiquement centré par A. Couder, mais voulant un éclairage uniforme sur toute la plaque, pour que, cette fois, les valeurs soient respectées jusque dans les angles, je diaphragmai à F:9, limite d'ouverture maximum à laquelle l'aire apparente du diaphragme, vue des angles du châssis porte-plaque, présent une forme à peu près circulaire. (...) Je fis sur plaque Lumière Super-S-E. (de très grande rapidité et à fort gamma de contrast) une première pose de 18 heures (30-31 décembre 1937, 1-2 Janvier 1938). Je fis ensuite un deuxième cliché de 24 heures de pose (10-20-21-23-24-25 janvier) et constatai, toujours après les renforcement-reports indispensables, que les détails était rigoureusement indentiques à ceux que montraient le premier négatif. Étant certain de n'avoir pas de fausses images – ce qui arrive quelquefois du fait de l'inégalité de sensibilité des plaques photographiques - je repris tout du commencement, surposai les deux négatifs originaux en les coulant sur les bords et en tirai par contact une série de positifs sur plaques en exposant les deux négatifs collés et chaque plaque positive à une grande distance d'une source lumineuse ponctuelle. Du fait de cette superposition les images des étoiles plus ou moins brillantes, taches d'argent très denses, ne sont pas intensifiées, tandis que les nébulosités, surfaces de grain d'argent très fins et disséminés, sont renforcées, c'est à dire se détachent mieux sur le fond. Du meilleur positif ainsi obtenu, il ne restait plus qu'à obtenir une série de deuxièmes négatifs et choisir parmi ceux-ci, celui que donnait la meilleure épreuve positive finale, ni trop douce, ni trop dure, ni trop empâté, bref montrant autant que possible les merveilleux détails que

l'n voit sur ces deuxièmes négatifs quando on les observe par transparence. L'épreuve finale représent donc 42 heures de pose, à F:9. J'aurait pu, les plaques Super-S E. étant extrêmement rapides em même temps qu'à contrastes, ne poser, par exemple que 20 heures à F:9, mais j'ai voulu par superposition n'avoir pas à trop forcer au laboratoire, respectant les valeurs et évitant un grain fâcheux.

Sources

Danjon, A, A. Couder (1935). *Lunetes et Telescopes*. Paris.

Giono, J. (1938). *Le Poids du Ciel*. Paris, Gallimard.

Hughes, S. (2013). *Catchers of the Light*. ArtDeCiel Publishing.

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Figure 8- Selection of Kérolyr's astrophotographs published in *Le Poids du Ciel* (1938).