

*The Journal of the
Coventry and Warwickshire Astronomical Society*



In this issue of MIRA is a fascinating account of the strange labelling of one of Messier's objects, M102, and Karen Smith's investigation into the history of this object.
Comparison between M102 (NGC 5866) and M101, both images captured with a Dwarf 3 smart telescope and cropped to approximately the same field of view

M102: Messier's Unknown Journey

By Karen Smith

Introduction

The Astronomical League recently released a fascinating new observing challenge that I had to try! Called *M102: Messier's Unknown Journey*, the project centres on the historic debate surrounding Messier 102. My goal is to research the possible cosmic candidates, capture or observe them, and decide for myself which galaxy holds the rightful title.

Messier 102, was first published as the 102nd object of a catalogue compiled by the infamous French astronomer, Charles Messier (1730 – 1817). The publication was entitled: - *Détails des Nébuleuses & des amas d'Etoiles* (Details of Nebulae & Star Clusters) and was published in 1781, in the journal *Connaissance des Temps ou des Mouvements Célestes 1784* (Knowledge of the Times or Celestial Motions for 1784). The difference between the publication date and title date was common practice in the 1800's, allowing sufficient time for astronomers and sailors to obtain a copy before it was effectively "out of date"! In his catalogue, Messier had documented the location of 103 nebulous deep sky objects within the northern hemisphere. These nebulous objects appeared as diffuse patches of light through a telescope and, as an avid comet chaser, Messier himself had discovered, they could easily be mistaken as a new comet. The Messier catalogue has since become a collection of the most studied, photographed and famous deep sky objects to date. This is rather ironic considering Messier's original objective: to prevent astronomers from wasting their time by observing these false comets, or "embarrassing objects" as he used to call them!

By the mid-20th Century, the Messier catalogue had been updated to include 110 objects. Not all of the objects were discovered by Messier himself. Several, were compiled from previously published catalogues and many were discovered by Messier's younger colleague, Pierre Méchain (1744 -1804). The final seven entries (M104 to M110), were discovered in historical documents belonging to these French astronomers and officially added to the catalogue posthumously.

The objects in Messier's original 1781 catalogue were not always easy for astronomers to identify; several errors were discovered which has thrown doubt over the true identity of some of

the targets. For example, Messier's catalogue position of both M47 and M48 were incorrect, both sets of coordinates pointed to a patch of sky devoid of any deep sky objects. These errors were minor, M47 had the plus and minus signs reversed for the right ascension and declination, whilst the M48 coordinates were 5 degrees off in declination. M47 was identified as NGC 2422 and M48 as NGC 2548. The most mysterious and problematic of all, however, was the identification of Messier Object M102.

Most modern astronomy sources, including NASA, now generally accept the galaxy NGC 5866 as the true M102. But why was NGC 5866 selected, who was involved in identifying M102 and what were the other candidates? Within the following pages, I will tell the story behind the identification of M102, from the original discovery, to the current general consensus that it is galaxy NGC 5866. I will also include a couple of suggestions of my own and finally conclude by deciding which "embarrassing object" I believe is the true M102.

The History behind Messier's Object: M102

On 13th April 1781, Messier had identified the 100th object for his catalogue of Nebulae and star clusters. Just prior to the publication deadline, Messier received a note from his colleague, Pierre Méchain, stating that he had discovered three additional targets. Méchain had provided a brief description about their appearance and location (**Table 1**), but had only provided coordinates for the first object. Despite not having time to verify these targets himself, Messier decided to include them in his catalogue as M101, M102 and M103. The heading for these three late additions read 'Par M. Méchain, que M. Messier n'a pas encore vue' (By M. Méchain, which M. Messier has not yet seen).

Object	English translation of Méchain's description from <i>Détails des Nébuleuses & des amas d'Etoiles, Connaissance des Temps 1784</i>
M101	<i>A starless nebula, very dark and quite large, 6 to 7 arc minutes in diameter, located between the left hand of Boötes and the tail of Ursa Major. It is barely visible even when shining a light on the wires.</i>
M102	<i>A nebula between the stars omicron in Boötes and iota in Draco, it is very faint; near it is a star of sixth magnitude.</i>
M103	<i>Nebula between the stars epsilon and delta of the leg of Cassiopeia</i>

Table 1 – English translation of the appearance and location of M101, M102 and M103. *Connaissance des Temps 1784, page 267*

Out of the three new objects, M101 and M103 were easily identifiable from Méchain's notes, however, M102 was not. The stars used to locate M102, were omicron Boötis and iota Draconis, these stars are so far apart, astronomers were unable to pinpoint any object (**Image 1**).

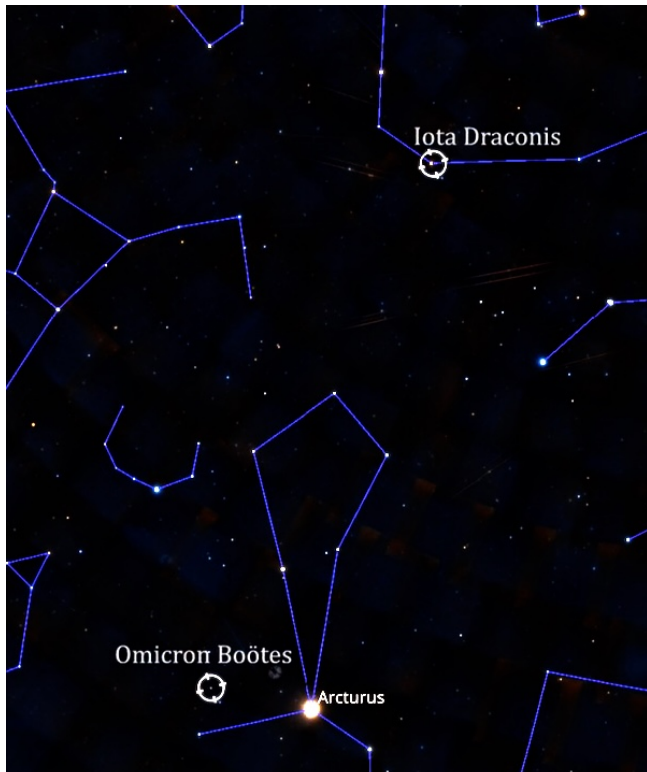


Image 1 – Edited screenshot from Stellarium. Showing the position of Omicron Boötis and Iota Draconis

A couple of years later, in 1782, Pierre Méchain retracted his observation of M102 by writing a letter of correction in the Histoire of the Berlin Academy 1782. In 1783, Méchain wrote a second letter to J. Bernoulli in Berlin, explaining that M102 was a mistaken duplicate observation of M101. The second letter of retraction was published in the *Berliner Astronomisches*



Jahrbuch (Berlin Astronomical Yearbook) for 1786, as follows: -

‘On page 297 of the “Connaissance des Temps 1784” M. Messier lists under No. 102 a nebula which I have discovered between omicron Boötis and iota Draconis: this is nothing but an error. This nebula is the same as the preceeding No. 101. In the list of my nebulous stars communicated to him, M. Messier was confused due to an error in the sky-chart.’

Because Méchain was the original discoverer, the explanation was accepted by those who had read it. However, Méchain's retraction was never published in *Connaissance des Temps* and therefore, the wider astronomical community never knew of either letters existence. As a result, the context lay hidden for many years.

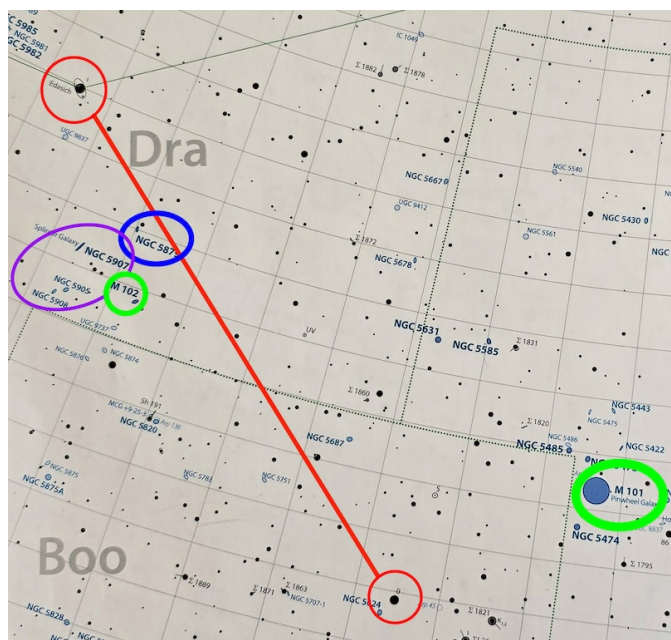
Several renowned astronomers have attempted to identify Messier's object M102. In 1844, Admiral William Henry Smyth (1788-1865) a British Royal Navy Officer & Astronomer wrote a catalogue entitled *‘A Cycle of Celestial Objects (The Bedford Catalogue)’*. Smyth had studied Messier's catalogue entry of M102 and theorised that omicron ‘o’ Boötis was the error. He believed that the actual star should have been theta ‘θ’ Boötis, where the ‘o’ in the original text, was mistaken for a badly written ‘θ’. Theta Boötis lies close to iota Draconis as shown in **Image 2a**, therefore enabling an astronomer to locate a possible celestial object. A cluster of five galaxies, lies between theta Boötis and iota Draconis (**Image 2b and Image 3**). Assuming theta

Image 2 - Left image (2a), Edited screenshot from Stellarium, showing the position of Omicron Boötis, Theta Boötis and Iota Draconis. M101 is also shown.

Right image (2b), Edited scan from my copy of the Deep Sky Atlas Interstellarum, (Ronald Stoyan and Stephan Schurig). Iota Draconis and theta Boötis are shown in red with a line segment.

NGC 5879 is shown in the blue eclipse, very close to the intersecting line between the two stars.

Notice M102 is also written here (green circle), the sky atlas has designated the galaxy NGC 5866 as M102. M101 is also shown (green eclipse), and the remaining galaxies of the cluster, NGC 5905, NGC 5907 and NGC 5908 are shown within the purple eclipse.



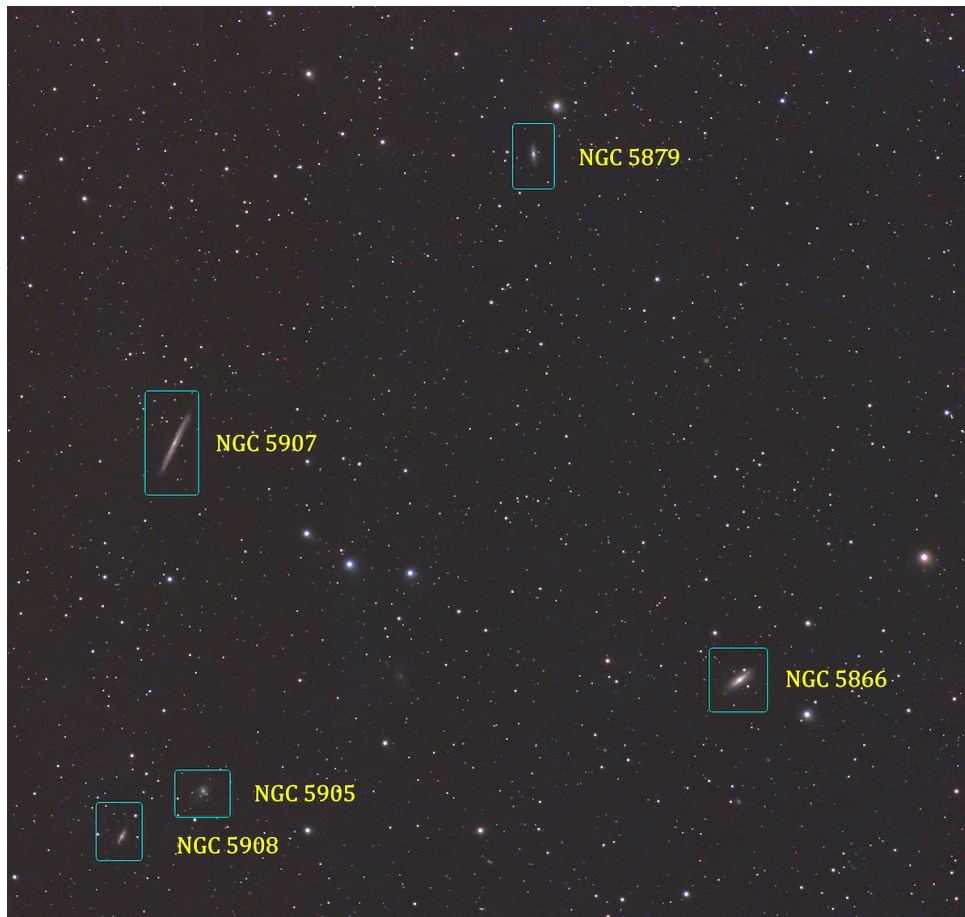


Image 3 – My image of the cluster located between theta Boötis and iota Draconis, taken with the Dwarf 3 smart telescope. 30 second exposures in EQ mode using the astro filter, gain 60. Total integration time 1 hour. Captured over two nights; 8th April 2026 and 13th June 2026

Boötis was the correct star, Smyth suggested a particular galaxy of the cluster as being M102.

This is the part of the story where things get even more complicated! Writing in *A Cycle of Celestial Objects (The Bedford Catalogue)*, Admiral Smyth recorded a detailed description of what this galaxy looked like through his telescope. The description read as follows: -

“Small but brightish nebula on the belly of Draco, accompanied by 4 small stars spreading across the field north of it”

The galaxy that Smyth observed through his telescope, is now designated as NGC 5879. However, while studying the galaxy cluster in William Herschel's *Catalogue of Nebulae and Stars* (3 volumes published between 1786 and 1802), Smyth mistakenly believed he was looking at the brightest “nebula” so he recorded the galaxy as being H I. 215; W. Herschel's name for the brightest “nebula” of the cluster and what we now call the galaxy NGC 5866. NGC 5879, which Smyth was actually observing has the W. Herschel designation H II. 757. NGC 5879 features four small stars, matching Smyth's description above, however NGC 5866 lacks these stars.

In The Bedford catalogue, Smyth also included the history behind the discovery of the galaxies, and for this, he relied upon John Herschel's catalogue, an 1833

updated revision of his father's W. Herschel *Catalogue of Nebulae and Stars*. Unbeknown to Smyth, John had actually made an error in his catalogue. John had accidentally mixed up the index numbers of two galaxies H I.215 and H I. 219. So, the coordinates, historic description and discovery date of H I.215 were not for NGC 5866 in John's catalogue, but for H I. 219, a completely unrelated galaxy, which we now designate as NGC 3665!

So, to cut a long story short,

1) Smyth theorised M102 lay between the stars theta Boötis and iota Draconis

2) A cluster of 5 galaxies lies between these stars and Smyth designated H II. 757 (NGC 5879) as M102.

3) Smyth looked at NGC 5879 through his telescope and wrote a visual description of this galaxy

4) Smyth mistakenly believed it was the brightest galaxy of the cluster, so called it

H I. 215 (NGC 5866)

5) Smyth then copied the history and coordinates from J. Herschel's catalogue which, due to John's error, was actually the history and coordinates of galaxy H I. 219 (NGC 3665)!

NGC 3665 (**Image 4a and 4b**) is a lenticular galaxy located in the constellation Ursa Major. It is positioned



Image 4a – My image of NGC 3665. Taken with my 8” Meade LX90 telescope, ZWO ASI2600MC Pro camera. 27 x 180 second exposures with the Optolong L-Pro filter



Image 4b - Edited screenshot from Stellarium. Showing the position of Alula Borealis and Psi Ursae Majoris and NGC 3665

between the stars Alula Borealis and Psi Ursae Majoris, near the "rear leg" of the Great Bear. With a faint visual magnitude of approximately 11.5, it would have been unlikely for either Messier or Méchain to have discovered this galaxy with their telescopes. NGC 3665 was discovered in 1789 by William Herschel. While Herschel made his discovery not long after Méchain observed M102, his custom-built reflecting telescopes were significantly larger and more advanced than those used by his French contemporaries. This superior light-gathering power allowed Herschel to regularly detect much fainter objects. Ultimately, due to its low magnitude and specific celestial position, NGC 3665 was never considered a true candidate for the missing identity of M102.

Setting aside the catalogue errors, Smyth had identified NGC 5879 as a strong candidate for M102. This galaxy lies very close to a 7th-magnitude star, and fits quite well with Méchain's original description of M102. However, Messier and Méchain primarily relied upon small, commercially available 3 to 4 inch refracting telescopes, which enabled them to view objects up to a visual magnitude of approximately 11. NGC 5879 has a visual magnitude of approximately 12.4, therefore making this target completely out of reach for their instruments. With the exception of NGC 5866, this optical limitation also ruled out the other members of the cluster—NGC 5905, NGC 5907, and NGC 5908, as valid M102 contenders, as all of their visual magnitudes fall past magnitude 11.

Several years later, John Louis Emil Dreyer (1852 – 1926) also suggested a possible target. Dreyer, was a Danish astronomer and historian, and throughout his life, he compiled both the original *New General Catalogue of Nebulae and Clusters of Stars* (NGC) in 1888 and Index Catalogues (IC) in 1895 and 1908. Both of which are still used today. Whilst researching the location of M102 for his catalogue, Dreyer also believed that that one of the stars in the original description of M102 was incorrect, but rather than Omicron Boötis being at fault, Dreyer believed the error lied with Iota Draconis. Dreyer wrote that he believed Iota Draconis was mistaken for Iota Serpentis. Omicron Boötis and Iota Serpentis are much closer together and between them, lies the faint galaxy NGC 5928 (*Image 5a and 5b*). Dreyer believed NGC 5928 was the real M102.

NGC 5928 is surrounded by several 7 to 8 magnitude stars, but the closest 6 magnitude star is quite distant, and would not be a good guide to help locate the galaxy as Méchain suggested in his original

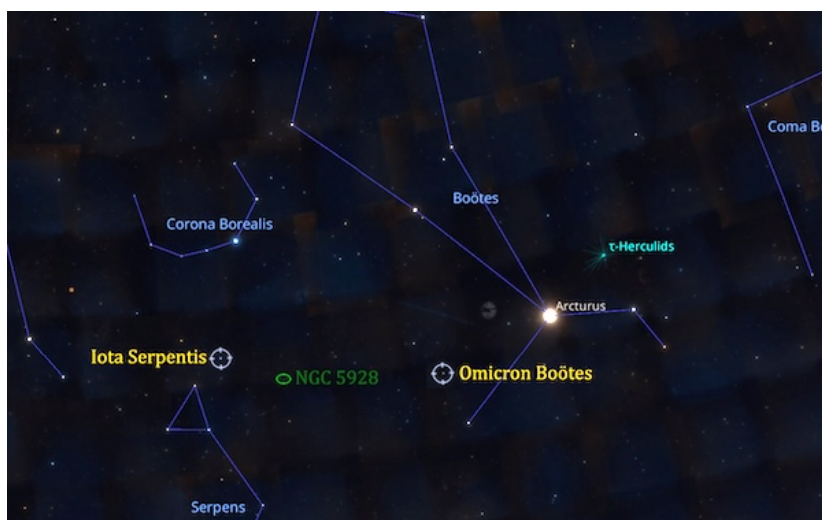


Image 5a: Top, edited screenshot from Stellarium. Showing the position of Omicron Boötis, Iota Serpentis and NGC 5928.

Image 5b: NGC 5928, above, taken with my 8" Meade LX90 telescope, ZWO ASI2600MC Pro camera. 32 x 180 second exposures with the Optolong L-Pro filter. NGC 5928 is close to an 8 magnitude star HIP 75560, the large star captured bottom left of the image

description. Moreover, NGC 5928 is also very faint, at a magnitude of approximately 14, it is therefore very unlikely that Méchain or Messier could have seen this galaxy through their telescopes. Therefore, NGC 5928 is also unlikely to be the true target of M102.

As a side note, whilst compiling the *New General Catalogue* (1888), Dreyer corrected several errors that he discovered in John Herschel's catalogue of 1833. One of the corrected errors was the mix-up between H I.215 (NGC 5866) and H I. 219 (NGC 3665), which later helped to clarify the confusion within Admiral Smyth's M102 theory.

Nicholas Camille Flammarion (1842 - 1925) was the first person to purposefully suggest the most likely target for M102 was NGC 5866. Flammarion was an accomplished astronomer from Paris. In 1877, Flammarion purchased a copy of *Connaissance des Temps* for 1784 from a local Paris book stall, and as luck would have it, this turned out to be Messier's own personal copy!

Flammarion wrote about discovering Messier's personal copy of *Connaissance des Temps* in the Bulletin of the Astronomical society of France in 1917: -

"It is now about 40 of years ago - in 1877, precisely - when I published the first edition of Terres de Ciel at the academic Library of Didier, at the Quai Grand-Augustins, I still had time to sauter sometimes for half an hour along the quays, and notably to stop by in front of the boxes of the bouquinistes (booksellers) fully

filled, open in the wind, opposite of the Institute, where I had been able to find, a long time before (1858 to 1862), the old yearbooks of the Bureau des Longitudes [Bureau of Longitudes], since their origin in 1795, at a price of about ten to twenty centimes; and I had the lucky chance to encounter, between the old antiques, the manuscript of the astronomer Messier, containing his cataloged discoveries of 103 nebulae and star clusters, destined for the Connaissance des Temps of 1783 and 1784, with his detailed remarks on each observation."

Over the years, Messier had hand written several notes in his personal copy, including the coordinates of M102 (**Image 6**). These coordinates were different to the M101 coordinates and lay between the stars theta Boötis and iota Draconis, the same pair of stars that were suggested by Admiral Smyth in 1844. Had Messier actually observed the galaxy after the publication of his catalogue, or did he notice the “θ” to “o” error, and write down coordinates between these two points for future reference?

Unfortunately, no identifiable object existed at Messier's coordinates for M102; however, they were only 3° away from NGC 5866 (**Image 7**), the brightest galaxy of the same galaxy group that was suggested by Admiral Smyth. Messier's coordinates were not always spot on, as seen with the locations of M47 and M48, but these coordinates were much closer to NGC 5866

than they were to any other observable galaxy at that time, suggesting that NGC 5866 is more likely to be the real M102. Flammarion published this theory in the Bulletin of the Astronomical society of France in 1917.

Flammarion also discovered another new deep-sky object while examining Messier's personal copy of his 1784 catalogue. Messier had added this object by hand, and Flammarion designated it as M104. This target is now known as the Sombrero Galaxy (NGC 4594).

Harlow Shapley and Helen Davis, two astronomers who worked together at Mount Wilson Observatory during the late 1910s and early 1920s, also researched possible

DATE des OBSERVATIONS.	Nombres des Nébuleuses	ASCENSION DROITE.		DÉCLINAISON.	Diamètre en degrés & minutes.
		En Temps.	En Degrés.		
		H. M. S.	D. M. S.	D. M. S.	D. M.
1781. Avril 13	98.	12. 3. 23	180. 50. 49	16. 8. 15 B	
	99.	12. 7. 41	181. 55. 19	15. 37. 12 B	
	100.	12. 11. 57	182. 59. 19	16. 59. 21 B	
1781. Mars 27	101.	13. 43. 28	208. 52. 4	55. 24. 25 B	0.7
		14. 20. 2			B

Image 6. Scan of Messier's personal copy of Connaissance des Temps 1784. Taken from <https://www.bradyharanblog.com/blog/messiers-missing-object> - provided by Hartmut Frommert from SEDS (<http://www.messier.seds.org/m/mindex.html>). The description of M102 is highlighted, together with the extremely faint hand written coordinates of M102 on the adjacent page



Image 7 – Edited screenshot from Stellarium. Showing the position of Theta Boötis and Iota Draconis and the galaxies NGC 5879 and NGC 5866. The location of the coordinates Messier had hand written for M102 = RA 14h 46m / Dec 55° 1' (adjusted for Coordinate system J2000) is also shown

candidates for Messier's M102. In Volume 29 of the *Proceedings of the Astronomical Society of the Pacific* 1917, Shapley and Davis also settled on NGC 5866 being the true M102. NGC 5866 has a visual magnitude of approximately 10.7, it is therefore more likely that NGC 5866 was seen by Méchain and possibly Messier. NGC 5866 is quite close to HIP 73909, which is a 5.2 mag star. This star lies 70 degrees south of NGC 5866 so fits quite nicely with Méchain's original description that the galaxy lies close to a 6th magnitude star.

Helen Sawyer Hogg (1905 - 1993) on the other hand, sided with the theory that M102 was really a duplicate observation of M101. She had rediscovered the letter written by Méchain which retracted the discovery of object M102, stating that it was a duplicate observation of M101. Hogg published her findings in the *Journal of the Royal Society of Canada* (vol 41, p265) in 1947, and stated that "M102, may now be stricken from the records as a non-existing object". Hogg was an American-Canadian astronomer and the first female president of the Royal Canadian Institute. She was also involved in extending Messier's catalogue posthumously. In Méchain's letter retracting the discovery of M102, he had also written the location and description of 6 additional objects. Hogg was able to verify four of these new objects and designated them as M104, M105, M106 and M107. The Sombrero galaxy would have been M105, as it was the second

additional object in Méchain's letter, however, Hogg was aware of Flammarion's work, so also designated this galaxy as M104.

Kenneth Glyn Jones (1915 - 1995) also thoroughly researched the missing messier objects in a chapter of his book; *Messier's Nebulae and star clusters*, 1968 (1st edition). Jones also decided that Méchain's letter of retraction should be accepted at face value, and M102 should therefore be omitted from the Messier catalogue, although he also wrote that "a lingering doubt remains". The lingering doubt was that Jones also believed that Méchain could have observed NGC 5866. He suggested that Méchain possibly recorded the coordinates of his observation, but whilst writing them down, he made an error, recording the coordinates one hour of right ascension ahead of NGC 5866's true position. If this was the case, upon reviewing his notes, Méchain would have noticed these incorrect coordinates point very close to M101. This mistake could have led to him to believe that M102 was simply a duplicate observation of M101, which resulted in Méchain writing his letter to retract the observation.

After reading Méchain's retraction letter, Stephen O'Meara also sided with the theory that M102 was a duplicate observation of M101. Stephen is an acclaimed American astronomer and author, and in 1985, was the first person to visually detect the return of

Halley's comet! To make sense of Messier's handwritten coordinates, O'Meara noticed that theta Boötis lies at equal distance between Messier's coordinates and the real coordinates for M101 (*Image 8*). Had Messier or Méchain made a mistake and plotted the coordinates of M101 to the wrong side of theta Boötis?

Looking at how Messier and Méchain plotted the position of their nebulae, could offer an explanation as to how this suggested error occurred. In *M102: Mystery Solved*, for *Sky & Telescope* magazine 2005, O'Meara wrote that Messier and Méchain had used illuminated cross hair micrometres to determine the coordinates of their objects. The added light from the micrometre would have made it incredibly hard, if not impossible to see the faint dispersed light of M101 through the eyepiece. This would have forced them to use a reference star, but he believed they then mistakenly selected the wrong star, thus recording the wrong coordinates. O'Meara believes these coordinates accidentally pointed close to NGC 5866, and noticing they were different coordinates to M101, Méchain later assumed this was a separate object, and recorded this observation as M102. If this was the case, as O'Meara suggests, M102 really could be a duplicate entry of M101.

Although faint, the magnitude of M101 is approximately 8, and relatively close to M101 lies a 6 magnitude star known as 86 Ursae Majoris, so this also fits nicely with the original description of M102.



Image 9b, My image of NGC 5687 taken with the Dwarf 3 smart telescope. 30 second exposures in EQ mode using the astro filter, gain 60. Total integration time 20 minutes. Cropped. Captured on 19th June 2026

the missing messier object M102. I guess it is a bit of a leap to assume theta Draconis could have been mislabelled as omicron Boötis, as both the star name and constellation are different. And, in the case of NGC 5687, it is just too faint to have ever been considered.

Conclusion

The identification of M102 has been a fascinating topic that has puzzled many astronomers over the last 200+ years. Méchain's letter of retraction, stating that M102 was a duplicate observation of M101, split the astronomy community into two opposing groups; those who wanted M102 to be permanently stricken from the *Messier Catalogue*, and those who believed NGC 5866 was the real M102.

If M102 was a duplicate observation of M101, and Admiral Smyth's theory about the transcription error "θ"

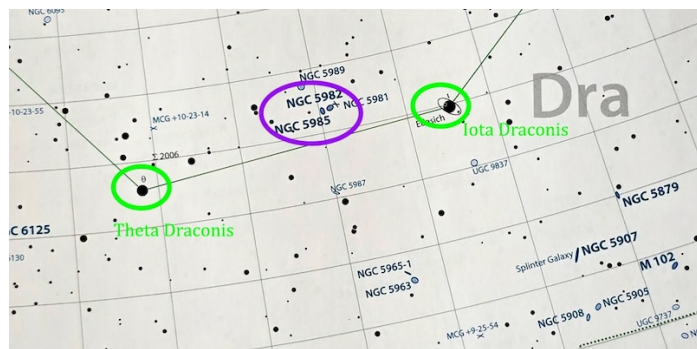


Image 10a, Edited scan from my copy of the *Deep Sky Atlas Interstellarum* (Ronald Stoyan and Stephan Schurig). NGC 5982, NGC 5985 and NGC 5981 are shown within the purple eclipse. These lie between the stars theta Draconis and iota Draconis (green eclipses). M102 (NGC 5866) is also shown bottom right, together with the other 4 galaxies of the cluster NGC 5879, NGC 5905, NGC 5907 and NGC 5908

to "o" was correct, using the star theta Boötis as a locating star, makes sense, but why would Méchain select iota Draconis to locate M101, surely, he would have selected the double star Mizar & Alcor in Ursa Major instead (*Image 11*)? In addition to this, M101 is two magnitudes brighter and much larger in diameter than NGC 5866. Through a telescope, the light from M101 is highly diffused, whereas the light from NGC 5866 is much more condensed, so the two targets look totally different visually (*Cover Pictures*). M102 was presumably observed sometime shortly after Méchain observed M101, so I would have thought Méchain would have recognised M101, if indeed it was a duplicate observation, and therefore realised it was not a new "nebula". Furthermore, since Méchain provided a distinct description for M102, he clearly considered it a unique discovery at the time. The duplicate theory, more likely arose sometime after the initial observation, when Méchain and Messier recognised the vast distance

between the reference stars omicron Boötis and iota Draconis, and realised they had lost M102's exact coordinates.

The *Messier Catalogue* was reprinted in 1784, in the *Connaissance des Temps* for 1787. This again included the entry M102. If Messier and Méchain believed M102 to be a duplicate observation of M101, why was M102 again included? Had they forgotten to delete this entry, or did they now believe the letter to J. Bernoulli was incorrect, and M102 was indeed a unique object. We do not know when Messier added the M102 coordinates to his person copy of his 1781 catalogue, it is therefore possible that Messier discovered NGC 5866 after the letter of retraction was published, and realised that M102 was indeed a unique object.

Méchain served as editor-in-chief of the *Connaissance des Temps* from 1785 to 1792, managing the volumes for the years 1788 to 1794. This position gave him the perfect opportunity to publish a retraction letter in the same astronomical almanac as the original Messier catalogue. And yet, even after the second complete reprint of the catalogue, no retraction was ever issued.

Admiral Smyth's theory about the transcription error "θ" to "o" was later identified as an error in a sky chart that Messier likely used. Hartmut Frommert discovered that in Jean Fortin's French edition of Flamsteed's *Atlas Celeste*, the *Atlas Céleste de Flamsteed* (Fortin 1776), on Chart 2, the star Theta Boötis is labelled Omicron! Maybe this was the error on the star chart that Méchain referred to in his retraction letter. Although identifying this error, does not support or contradict the theory that M102 and



Image 10b, My image of the Draco cluster, NGC 5982, NGC 5985 and NGC 5981, taken with the Dwarf 3 smart telescope. 30 second exposures in EQ mode using the astro filter, gain 60. Total integration time 1 hour. Cropped Captured on 14th June 2026

M101 are one and the same, as both lie close to theta Boötis.

As Hartmut Frommert pointed out on the Students for the Exploration and Development of Space (SEDS) Messier Database, no firsthand witnesses remain to definitively explain how M102 was observed and recorded by either Messier or Méchain. We can only rely on what has been published historically. Consequently, deciding which theory represents the historical truth is ultimately a matter of personal taste.

NGC 5866 is now officially listed as the true target of M102 by many major space agencies and databases like NASA and the International Astronomical Union's SIMBAD database. There was never a formal meeting to decide this, but historical evidence has created a general scientific consensus that NGC 5866 is the true M102, and therefore, M102 should not be recorded as a duplicate observation of M101.

NGC 5866, also known as the Spindle Galaxy, lies approximately 44 million light years away from us in the constellation Draco. It is believed to be a lenticular galaxy, but because it is orientated almost perfectly edge on, identification is difficult and some evidence suggests it could actually be a traditional spiral galaxy. NGC 5866 has also been identified as unusual due to its low Dark Matter percentage. The Dark Matter fraction usually increases with galaxy stellar mass, but the Dark Matter fraction of NGC 5866 is significantly lower than what the general model predicts. The reason for this is



Image 11: - Edited screenshot from Stellarium, showing the position of M101 in relation to Iota Draconis, Theta Boötis, Mizar and Alcor from Ursa Major

currently unknown.

NGC 5866 is a fascinating galaxy and a remarkably beautiful galaxy to photograph (*Image 13*), it would therefore be a great shame to exclude it from the Messier catalogue. Personally, I am happy to call NGC 5866, M102, and I believe neither Messier or Méchain would object. In fact, the relentless comet hunters would likely find it incredibly amusing that we are still debating the identity of this object 240 years later!

References: -

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 OpenAI's ChatGPT model to clarify dates and timelines, how past processes worked, such as what "Shining a light on the wires" meant with regard to locating nebulae, and to query things such as if NGC 5687 or NGC 5982 were ever published as possible candidates for the missing messier object M102
 Stellarium Windows Application for screenshots of sky maps



Image 13 – M102 (NGC 5866) taken with my 8" Meade LX90 telescope, ZWO ASI2600MC Pro camera. 67 x 180 second exposures with the Optolong L-Pro filter