Unique clusters in the Starry Ship

by Magda Streicher

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Image source: Stellarium

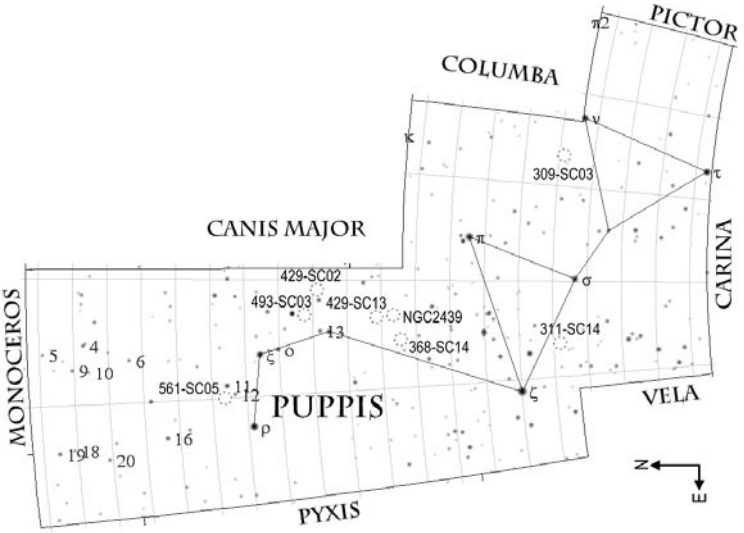
The Argo Navis constellation always reminds me of the first ships to sail around the Cape of Good Hope. No wonder then that a constellation by that name has been created amongst the stars of the southern hemisphere. Situated between Carina and Canis Major, this phenomenal ship-constellation, of which Puppis forms the stern or poop deck, was named by Benjamin Apthorp Gould (1824–1896) in 1877. Gould founded the *Astronomical Journal* in 1849. He did his doctorate in astronomy at Göttingen in 1847.

The Puppis constellation contains too many deep-sky objects to describe in one article. The so-called "ESO star clusters" are not that well-known. ESO (European Southern Observatory) is situated on the eastern slope of the La Silla mountains in Chile, through the Atacama Desert, high up into the Andes mountains. Deep-sky objects studied with their telescopes are given an ESO designation in different categories. I would like to share seven ESO objects with you in this Delight article.

The ESO clusters are in a class of their own and could very aptly be described as obscure. Stars in small groupings and strings read like a book full of surprises. Although these are not necessarily bright objects, they do have certain exceptional and unique characteristics. The use of high power is advisable and all the clusters in this issue have been observed with my 12-inch S/C telescope at 218x magnification in a 23 arc minute field of view.

The magnitude 2.7 slightly yellowish Rho Puppis is situated in the extreme north of the constellation Puppis. This star is 2.5 degrees SE of our first, very faint, ESO star cluster with a diameter of 7′. **ESO 561-SC05** consists of about a dozen very faint stars between magnitude 12 and 13 with a nice, uneven, snakelike curved string running from NW to SE. The brightest star is the 12.1 magnitude GSC 6554 2210 situated in the northern part of the string. Fainter stars extending to both its eastern and western sides allow the cluster to assume an uneven shape.

ESO 493-SC03 is 2.2 degrees SE of



Skymap produced using Cartes du Ciel

the magnitude 4.4 brilliant white Omicron Puppis in the northern part of the constellation. ESO 493-SC03 is one of the more outstanding and brighter ESO clusters, 12 arc minutes in size. A dozen stars between magnitude 10 and 12 form an uneven wide wishbone-shape with the two string ends pointing north. This grouping is very elongated in a NW-SE direction, 4′ in size. The brightest star is GSC 6547 684 (magnitude 10.6), situated towards the middle, with a few fainter stars seen spreading out towards the east and west in the field of view.

To locate these faint little star clusters in Puppis' rich star field is a challenge and extremely difficult, but the reward is assured. Only 2.6 degrees SW of the previous cluster, the grouping **ESO 429-SC02** can be found 28′ NW of the 4.6-magnitude star, HD 608639, in the NW part of Puppis. Again, like most of the ESO clusters, it consists of a handful of faint, stringy stars in an odd Y-shape, situated in a northern to southern direction. One string runs NNE and the other NNW, with the blue magnitude 9.3 star, GSC 6551 39 in the bend of this two-way string impression, which also appears double. The grouping consists of about 10 stars between magnitude 9 and 12. The star field in this part of the Milky Way is beautiful and forms rich star strings and groupings in different shapes.

Observatories – those giants found in distinctive and unique locations the world over – possess something of a mystical charm. They are the portals to new discoveries, offering an enduring view right into the very depths of the universe. When I study the tiny, faint star clusters it is with a great deal

of respect that I look up to the giant telescopes that explore the starry skies in great depth.

I remember, like it was yesterday, my visit back in 2001 to the Observatorio del Roque de los Muchachos on the island of La Palma. The dangerous runway of La Palma airport, which is right next to the sea, could engender no fear in me – my thoughts were focused only on the Observatory, regarded as one of the best astronomical destinations in the world with up to 90 percent clear skies during the course of a year. At a height of 2 426 meters above sea level the view is truly exceptional and the cluster of telescopes, perched on the edge of the crater, a definite highlight.

The stately Isaac Newton Telescope originally came from England in May 1984 with a new 2.5-metre mirror and upgraded instruments. The William Herschel Telescope was the proud owner of a 4.2 meter diameter mirror. What an awe-inspiring moment and a once-in-a-lifetime privilege when the astronomer, Max Pettini, allowed me to be present while the Herschel telescope was busy observing! Like the great William Herschel himself, the William Herschel Telescope is already fulfilling its promise of elucidating the structure of the universe.

From giant observatories to the petite **ESO 429-SC13**, a mere one degree north of the outstanding open star cluster NGC 2439, which can be used as a pointer, or direction finder. This part of the constellation Puppis is especially strewn with numbered small star clusters. The first impression of this ESO grouping is that of three stars between magnitude 11 and 12 in a N-S direction, which stand out quite clearly. The southern end boasts GSC 7106 3305 (magnitude 11.3) as the brightest member with a few fainter members towards the east. The grouping however extends to the north indicate two parts and together they extend

Sketches from observations done with my 12-inch telescope at 218x, yielding a field of 23 arc-minutes accross, showing stars down to magnitude 14. From left to right are ESO 309-SC03, ESO 429-SC02 and ESO 429-SC13.

to the size of 2.5′. I have not been able to find sizes for some of these smaller clusters in manuals.

Still on the NW stern of the star ship is another of the special little ESO Star clusters, only 1.8 degrees SE of NGC 2439, which once again can serve as a pointer. Three stars between magnitude 9 and 11 (the northern and brightest being GSC 7110 2597) lying in a N-S direction and stand out fairly well against the star field. This string points the way 3′ south to a handful of magnitude 13 stars, which indicate the **ESO 368-SC14** cluster, one of the faintest ESO clusters known. This grouping is situated in a N-S direction, 4′ in size, with GSC 9037 1186 (magnitude 13.3) the brightest member. (Note, ESO 368-SC14 should not be confused with the little star cluster, Haffner 15, situated a mere 18′ to the west.)

In the SE part of Puppis, NW of the Vela constellation, another handful of faint stars named **ESO 311-SC14** can be found. This cluster has been really difficult to make sense of. The brightest star, HD 63884 (magnitude 8.4), is situated in the northern part of this grouping, surrounded by fainter stars, the focus of this object. Fainter stars extend further south and are probably part of the cluster if one looks at its indicated size of 6'.

The western-most point of the Puppis stern is characterized by the magnitude 3.1 star, Nu Puppis. Situated only 2.3 degrees SW is the last ESO cluster to be discussed, **ESO 309-SC03**. This little star cluster is one of those rare types of groups which possesses unusual character, typical of the ESO clusters. This grouping consists of a short string with four magnitude 12-12.5 stars in a N-S direction, with the brightest star GSC 7636 1167. Towards the north-east a few stars of various magnitudes snuggle close together to form a near perfect letter J. The yellow star, GSC 7636 1260 (magnitude 10.9) can be seen just east of the grouping.

Tackling different projects is a challenge but each project is surprisingly unique. Even if it is only Magda passionately exploring these delicate, yet extremely fascinating, little ESO star clusters with her ordinary telescope ... ☆

Object	Type	RA (J2000.0)	Dec	Mag	Size
ESO 309-SC03	Open Cluster	$06^h50.7^m$	-42°23′	12.1	6′
ESO 429-SC02	Open Cluster	07 33.4	-28 11	9.3	5′
ESO 493-SC03	Open Cluster	07 39.7	-27 18	10.6	4′
ESO 429-SC13	Open Cluster	07 41.1	-30 44	11.3	1.5′
ESO 368-SC14	Open Cluster	07 47.0	-32 58	13.3	4′
ESO 311-SC14	Open Cluster	07 49.4	-42 42	8.4	4′
ESO 561-SC05	Open Cluster	07 59.3	-22 41	12.1	7′