



## *Pavo - A Fanciful Bird*

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The constellation Pavo the Peacock can be seen flying south of the constellations Sagittarius and the Southern Crown. The bird itself, long a symbol of immortality, does not fail to show off its true colours in spreading its tail for all to see. The brighter stars in this constellation closely resemble the shape of a peacock and it isn't difficult to see why a constellation should have been named after one of the most colourful land birds we know. Astronomers of old must have regarded the dance and extravagant, showy display, of the Peacock as special, hence it's prominence in the southern night skies.

Dutch navigators Pieter Keyser and Frederick de Houtman introduced a dozen new constellations while mapping the southern sky at the close of the 16th century, which included Pavo. It survived as one of the 88 constellations declared by the International Astronomical Union in 1930 and their boundaries were officially laid out by Belgian astronomer Eugene Delporte.

The constellation Pavo contains a multitude of bright stars, with alpha Pavonis, at magnitude 1.9, appearing as the bird's bright eye. Also known as the Peacock Star, it is the only star I know of that officially bears the name of the constellation

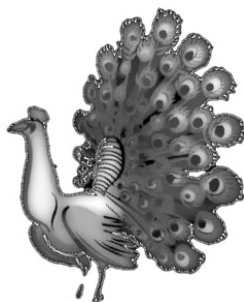


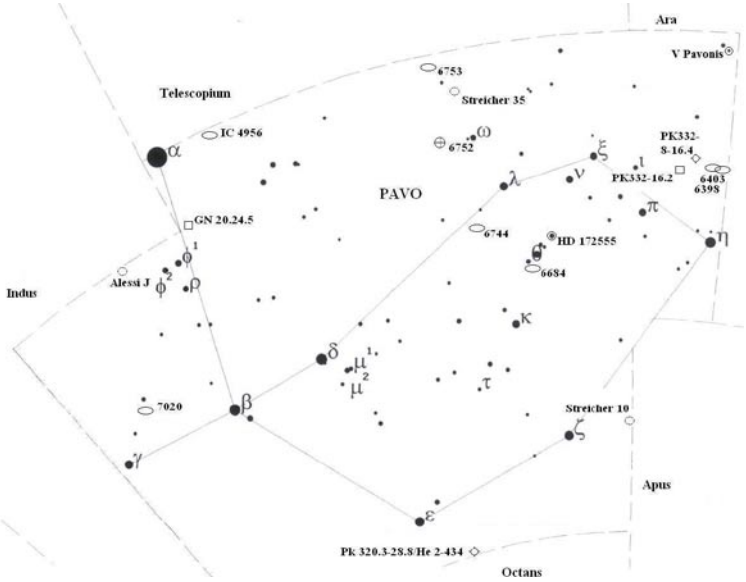
Image source: Stellarium.org

in which it is situated. It is a hot blue-white star, about 200 light years distant and its spectra shows that it has an unseen companion revolving around it every 12 days. The tips of the feathery tail are shown by magnitude 3.5 eta Pavonis and magnitude 4.3 xi Pavonis, towards the western part of the constellation.

The blood red star **V Pavonis**, situated in the far north-western corner of the constellation, could suggest one of Pavo's beautiful red feathers that dropped. It is a red, semi-irregular that varies between magnitudes 9.3 and 11.2 with a period of 225 days. Pavo also holds in its feathers a Cepheid variable, with kappa Pavonis sitting more or less in the middle of the constellation. The star varies in brightness from magnitude 3.9 to 4.7 with a period of 9.09 days. All Cepheid variable stars of a given type that vary at a specific rate have the same inherent brightness.

The Peacock's starry feathers are rich with galaxies and along the western border is a close pair of galaxies, **NGC 6398 and NGC 6403**, in an east-west position. They could well be twins, appearing as similar hazy ovals.

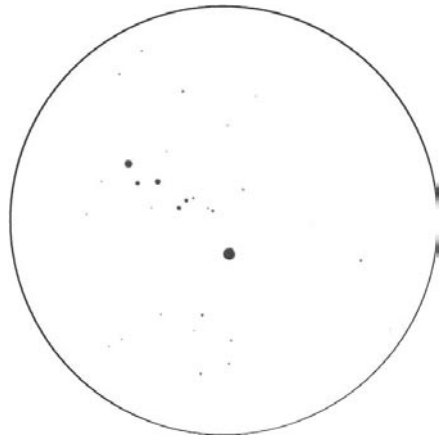
Planetary nebulae can be pretty faint and **PK 332.8-16.4** is no exception; It is situated only 1.6 degrees north-east of the galaxy pair mentioned above. A systematic close search of



the star-field only just reveals the planetary as a very faint out-of-focus spot. Only 30 arc minutes south of this nebula is another, equally faint and challenging diffuse nebula, **PK 332-16.2**. Filters will perhaps be your best tool to corner this nebula which is barely visible among the stars.

stars extend towards the north-east into the constellation Pavo. The stars in the centre area are somewhat fainter, but globally seen this uneven string exhibits well against the background star-field (see sketch).

Asterisms in various forms are among the most interesting groupings and searching for them in the star-field is most rewarding. I was fortunate enough to come across a star-string straddling the boundary between the constellations Pavo and Apus, 2 degrees west of zeta Pavonis. **STREICHER 10** (*Deep Sky Hunters Catalogue*) consists of eight stars strung together in a field crowded with galaxies. The beautiful white magnitude 6.7 star (HD 165861) marks the south-western end of the string and is situated in the constellation Apus. Seven fainter



**STREICHER 10**

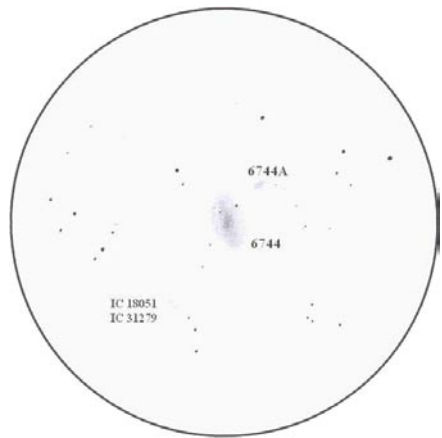
The galaxy **NGC 6684** is one of many in Pavo. It is situated only 6 arc-minutes south and very close to magnitude 5.7 theta Pavonis towards the middle area of the constellation. Although close to such a bright star it is easily seen as an oval haze, brightening to an almost stellar nucleus. Faint stars dot the way from theta Pavonis, extending in a half-moon around the galaxy's eastern side. It is advisable to place the intervening star outside the field of view to achieve a better view of the galaxy. A magnitude 9.5 star could be the reference point situated between theta Pavonis and the galaxy.

Barely 24 arc minutes north-west of theta Pavonis is a very special star in the constellation. The Spitzer Space Telescope detected the aftermath of a high-speed collision between two young rocky planets that occurred in the past few thousand years around the young star **HD 172555**. The star is believed to be 95 light years away.

Again use theta Pavonis as reference to another galaxy 2.6 degrees north-east. This area is galaxy territory par excellence – they appear like the many dots on the feathers of the bird's back. **NGC 6744** also known as Bennett 120 and is one of the largest of the barred spirals. This is an outstanding, easily seen oval-shaped galaxy in a north-north-east to south-south-west direction. The hazy outer edge appears misty, with a few faint stars on the galaxy's dusty surface. The nucleus is quite small and displays a soft envelope, slightly oval in shape. The galaxy stands

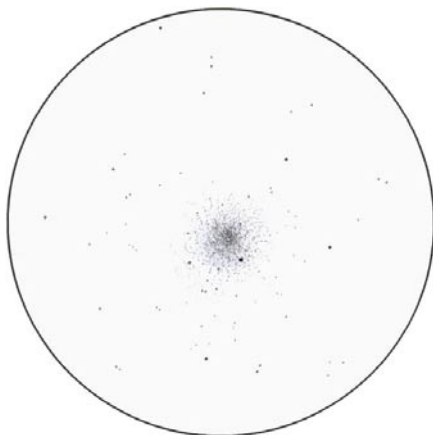
out well against the background star-field. Astronomers have detected several young massive star clusters in NGC 6744 that could be recently formed. **NGC 6744A** is a small spindle galaxy situated on the north-western rim of NGC 6744 (see sketch). Accompanying the system are a few others, possibly satellite systems, visible in the field of view. The star-field is quite pretty and displays a few lovely short strings of faint stars. Also found here is Delta Pavonis, an intriguing magnitude 3.5 naked-eye star. At a distance of 19.9 light years it is one of the closest single sun-like stars resembling, in a way, our Sun.

Also located here is a somewhat lone globular cluster, 1.6 degrees east of the magnitude 5 omega Pavonis. **NGC 6752** (Bennett 121), also known by its nickname, the "Starfish", is the showpiece of the constellation. James Dunlop discovered this globular on 28 July 1826 at Paramatta

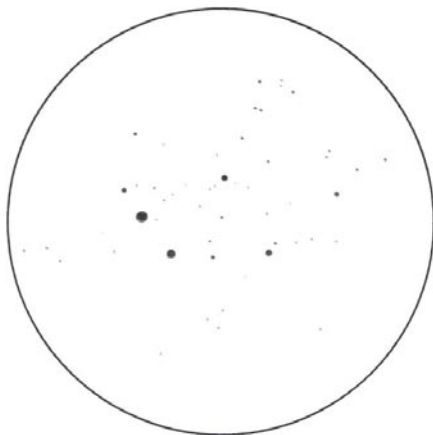


NGC 6744

Observatory near Sydney. The globular which is estimated to be 13 000 light-years distant, appears as a tight, well-resolved star-rich cluster with a small, bright condensed core. The cluster stars, running out in trails and loops, spreading out into the field of view. Higher power shows the core turned slightly oblong with very faint stars spouting out like a fountain (see sketch). A brighter outstanding circle of stars is situated on the south-eastern edge, accompanying a few doubles. An eye-catching whitish magnitude 6.7 star can be seen embedded in the southern outskirts of the globular cluster, while a few orange coloured stars can be spotted around the centre of the cluster. Our Deep-sky Section director, Auke Slotegraaf had this to say about NGC 6752: "The cluster is best observed slowly, letting your eye play with the shapes that the stars seem to trace out across the face of this cluster." He described the nucleus as banana-shaped. It is believed that M38 in the constellation Auriga has also been called by the nickname Starfish.



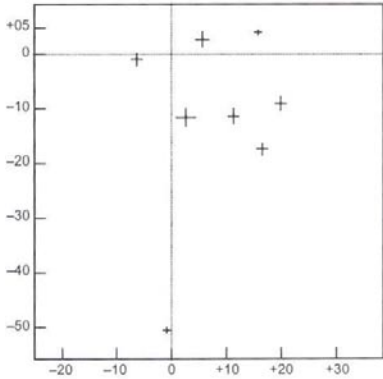
NGC 6752 (above) and STREICHER 35.



Regular investigation of star-forms have been rewarded with **STREICHER 35** (*Deep Sky Hunters Catalogue*), situated 2.2 degrees further north of globular cluster NGC 6752. Outstanding against the star-field is a half-moon shape consisting of five stars, with the brightest member the magnitude 6 star HD 176522 on the southern tip. The shape of the asterism reminds me in a way of a typical Japanese fan. The open side of the half-moon, facing north-east, appears to be filled

with a handful of faint splinter stars (see sketch). The vector-point diagram for the eight brightest stars in the asterism can be seen in the diagram provided by Slotegraaf (see illustration). The abscissa shows proper motion measured in milli-arcseconds per year, while the ordinate plots proper motion time cosine (declination). The diagram indicates the proper motion of the stars in different directions through space.

The galaxy **NGC 6753** is situated only 1.4 degrees further north-east of Streicher 35. The relatively bright small, round to oval, galaxy has an outstanding bright nucleus (see sketch). Companion galaxy member IC 4826 is 12 arc-minutes south.

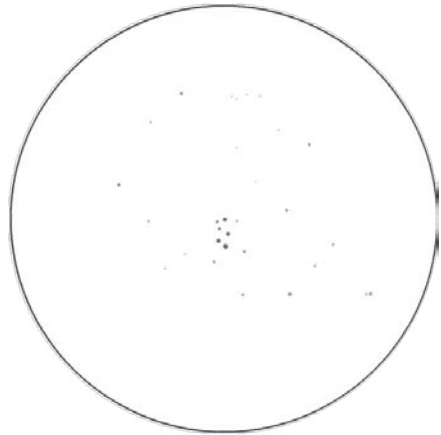
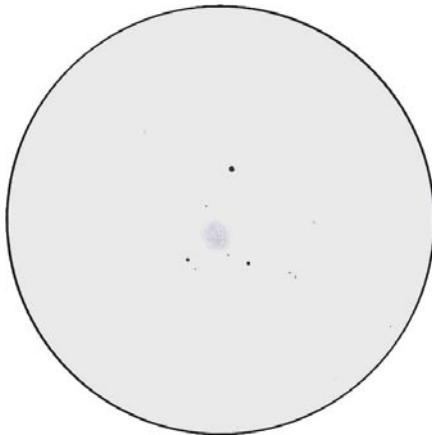


**Vector-Point diagram** vir the eight brightest stars in the Fan Asterism in Pavo. The abscissa shows proper motion in right ascension measured in milli-arcseconds per year and the ordinate the proper motion in declination. Diagram: Auke Slotegraaf

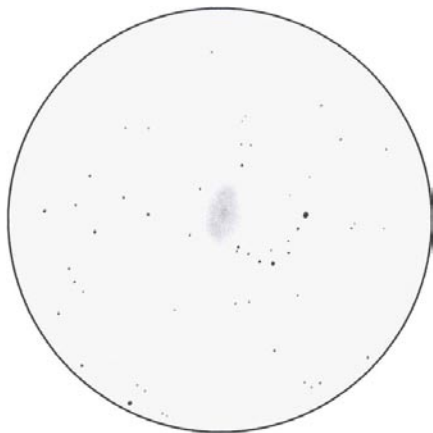
**IC 4965**, only 1.7 degrees west of alpha Povonis, in the far north-east, on the boundary between Pavo and Telescopium and close to the core of the Shapley super-cluster, an area also indicated as Abell 3667. The galaxy IC 4965 displays a very faint puff of haze, barely seen, with a slightly brighter nucleus.

Halfway between alpha and phi 1-2 Pavonis is another diffuse nebula, **GN 20.24.5**, about 4 arc-minutes in diameter, which could perhaps make it easier to detect. Once again, filters are the best tools to discern this kind of nebula.

Bruno Alessi is a keen amateur in search of exceptional star groupings. **ALESSIJ2053.8-5939** (*Deep Sky Hunters Catalogue*) is situated on the northern boundary between Pavo and Indus. This beautiful exceptional grouping



Sketches of NGC 6753 (left) and of the AlessiJ Asterism (right).



NGC 7020

lies in a north-south direction and resembles the shape of a mini-Cassiopeiae constellation. The brightest member is the magnitude 7.5 white-coloured star HD 198534 towards the south of this group of seven stars which are quite small in size but outstanding against the star-field. Between the three northern stars, very faint flickering points of light can be seen (see sketch).

Another special galaxy situated in the far eastern part of the constellation, 2 degrees north-west of magnitude 4.2 gamma Pavonis is **NGC 7020**, a known ring-type galaxy resembling a soft round cotton ball, with a bright small nucleus. Higher power turns the hazy round shape slightly into a north-south oblong. The galaxy is believed to be 150 million light years distant. The star-field to the west of the galaxy is interesting. A chain of faint stars connect a magnitude 8 star and the galaxy to each other, just like the old pocket watches with a gold chain attached (see sketch).

In the southern extreme of the constellation, in 1964 Karl Henize discovered the planetary nebula **PK 320.3-28.8**, also named He2-434. It is situated 2.4 degrees south-west of epsilon Pavonis and a few arc-minutes from the boundary with Octans. Averted vision is the best way of discerning the planetary's hazy appearance. Karl Gordon Henize was born on



**Henize's observatory on Naval Hill, Bloemfontein. Taken by Tim Cooper at the 2006 ASSA Symposium hosted in Bloemfontein.**

## deep-sky delights

17 October 1926 in Cincinnati, Ohio and died on 5 October 1993 from high-altitude sickness on the slopes of Mount Everest while attempting to climb the peak. Henize was an astronomer, space scientist and astronaut who had the third longest wait ever for a flight – 18 years. He flew on Space Shuttle Challenger in July/August 1985. During the 1950s he was an observer for the University of Michigan's Lamont-Hussey Observatory at Bloemfontein. A lifelong involvement saw him conducting an objective-prism survey of the southern sky for stars and nebulae showing hydrogen emission lines. Henize compiled a catalogue of over 2 000 Planetary Nebulae, now listed as *He* objects. In accord of his previously expressed wishes he was buried on Mount Everest. (Photo Credit: courtesy of NASA).

Colour your world with the excellent deep-sky objects that our own starry Peacock splashes out so liberally in a colourful array. ☆



**Karl Gordon Henize (NASA)**

Object	Type	RA (J2000.0)	Dec	Mag	Size
NGC 6398	Galaxy	17 <sup>h</sup> 43.4	-61°42'	13.4	2.0'x1.7'
NGC 6403	Galaxy	17 43.4	-61 41	13.5	1.1'x1.2'
V Pavonis	Red Semi *	17 43.3	-57 43	9.3-11.2	225 days
PK 332.8-16.4	Planetary Neb	17 47.3	-60 23	14	36"
PK 332-16.2	Diffuse Neb	17 54.4	-60 50	-	1'
Streicher 10	Asterism	18 15.3	-70 43	5.5	12'
NGC 6684	Galaxy	18 48.8	-65 10	11.3	4.0'x2.6'
HD 172555	Star	18 45.4	-64 52	4.7	*
Streicher 35	Asterism	19 03.7	-57 51	8	19'
NGC 6744	Galaxy	19 09.8	-63 51	9.1	20'x13.2'
NGC 6752	Globular	19 10.9	-59 59	5.4	20.4'
NGC 6753	Galaxy	19 11.4	-57 03	11.9	2.4'x2.1'
Pk 320.3-28.8	Planetary Neb	19 27.5	-74 39	13	10"
IC 4965	Galaxy	20 12.5	-56 50	14	1.1'x1.0'
GN 20.24.5	Reflection Neb	20 28.5	-59 15	-	4'
AlessiJ Asterism	Asterism	20 53.8	-59 40	9.1	7'x3'
NGC 7020	Galaxy	21 11.3	-64 02	12.6	3.5'x1.6'