

# Constellation Close-Up

## Taurus

Taurus, the Bull, is one of the original 48 ancient constellation figures passed down to us via Ptolemy's second-century *Almagest*. One of the twelve classical zodiacal constellations, Taurus lies along the ecliptic: the Sun passes through it in June. Covering an area of 797 square degrees, Taurus is one of the few constellations where the star-pattern readily calls to mind the figure it is supposed to represent. The prominent V-shaped grouping of the Hyades is the head of a charging bull, with orange-red Aldebaran as its baleful eye, and horns tipped by the stars beta ( $\beta$ ) and zeta ( $\zeta$ ) Tauri.

## Myth

In Greek mythology, Taurus was a snow-white bull (Zeus in one of his many guises!) who carried off the princess Europa. Alternatively, Taurus may represent the Cretan bull defeated by Hercules in one of his twelve labours.

## Features of Taurus

The brightest star in Taurus is Aldebaran, which takes its name from the arabic for 'the follower', since it follows the Pleiades across the sky. At magnitude +0.85, Aldebaran is the 13th brightest star in the sky; a spectral class K star, it may, like other red giants, vary slightly around this value. Aldebaran has a diameter about 40 times that of our Sun and an absolute luminosity some 125 times greater. Its surface temperature is around 3400 K. Although it appears superimposed on the Hyades, Aldebaran is, in fact, a foreground star 68 lightyears away in the line of sight between us and the cluster.

Beta has the arabic name of El Nath, 'The butting one', consistent with its depiction as the Bull's more northerly horn. Some books still, erroneously, portray beta as part of the neighbouring constellation Auriga, but the IAU unequivocally assigned El Nath to Taurus in the 1930s. At a distance of roughly 147 lightyears, El Nath is an intrinsically luminous B-class star, with apparent mag. +1.65.

Taurus' southern horn is marked by the visually-fainter (magnitude +3.03) zeta ( $\zeta$ ) Tauri, another intrinsically-luminous B-class star. Shining with a light equivalent to more than 4000 Suns, zeta lies 520 lightyears away. Zeta is a shell star, suspected of occasionally blasting away its outer atmosphere, but the associated light variations are too small to be detected with amateur instrumentation.

Most of the other prominent stars in Taurus are concentrated into the V-shaped 'head' of the Bull, marked out by the core of the



M1 by Nik Szymanek, based on information from the ING archive.

Hyades cluster. Lying 150 light years from the Solar System, the Hyades are the second-closest star cluster to us (closest is the Ursa Major moving group, which includes five members of the Plough), and as such are an important standard against which to measure distances to more remote objects in our galactic neighbourhood.

Around 200 stars belong to the Hyades; some 'outliers' have been identified beyond the boundaries of Taurus itself. Most members are found in a core region some 15 lightyears across. Measurements show the Hyades' stars share a common proper motion towards the general direction of Betelgeuse in our line of sight.

The north-eastern tip of the 'V' is marked by epsilon ( $\epsilon$ ) Tauri (a mag. +3.50 K-class star), whilst gamma ( $\gamma$ ) Tauri (mag. +3.65, G-class) lies at the western apex. Each arm of the 'V' is about 4.5 degrees long – neatly fitting the field of a pair of 10x50 binoculars, which probably offer the best view. The Hyades' stars have appar-

ent brightnesses in the range of magnitudes +3 to +4, but some are actually quite luminous, belonging to spectral classes A and K. The cluster formed some 400 million years ago – about the same time as the more distant Praesepe in Cancer.

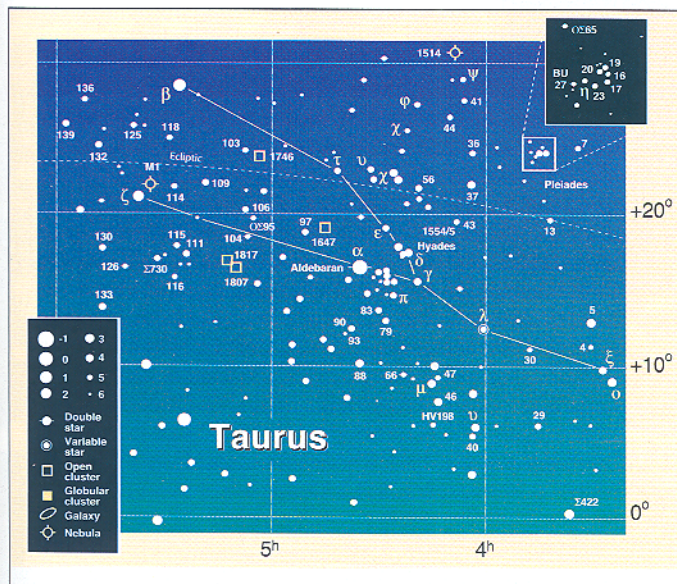
On the southern arm of the Hyades' 'V', A-class theta ( $\theta$ ) 2 and G-class theta1 Tauri, at respective magnitudes +3.40 and 3.80 make a wide, attractive naked-eye double separated by 5' 37".

The 'V' of the Hyades points westwards to another interesting member of the constellation, lambda ( $\lambda$ ) Tauri. Lambda is an eclipsing binary similar to Algol, undergoing a fade from its normal magnitude +3.4 to +3.9, with minima separated by 3.95 days. The system comprises a bright B-class primary, which is eclipsed by the dimmer A-class secondary.

Another interesting variable star is T Tauri, the prototype of a class of 'nebular variables' – young stars associated with the nebulosity from which they were formed. Observations of

## Finder chart for the constellation Taurus.

AN graphic by Mark McLellan.



## Objects in Taurus

Object	Type	RA (2000.0)	Dec
Pleiades	Open Cluster	03h 47.0m	+24° 07'
lambda	Variable Star	04h 00.7m	+12° 29'
NGC1554-55 Hind's Variable nebula		04h 21.8m	+19° 32'
T	Variable Star	04h 22.0m	+28° 27'
Hyades	Open Cluster	04h 27.0m	+16°
NGC1647	Open Cluster	04h 46.0m	+19° 04'
theta2 and theta1	Double Star	04h 28.7m	+15° 52'
M1 Crab Nebula	S'nova Remnant	05h 34.5m	+22° 01'
S 147	S'nova Remnant	05h 35.0m	+28°