CONSTELLATION TUCANA, THE TOUCAN

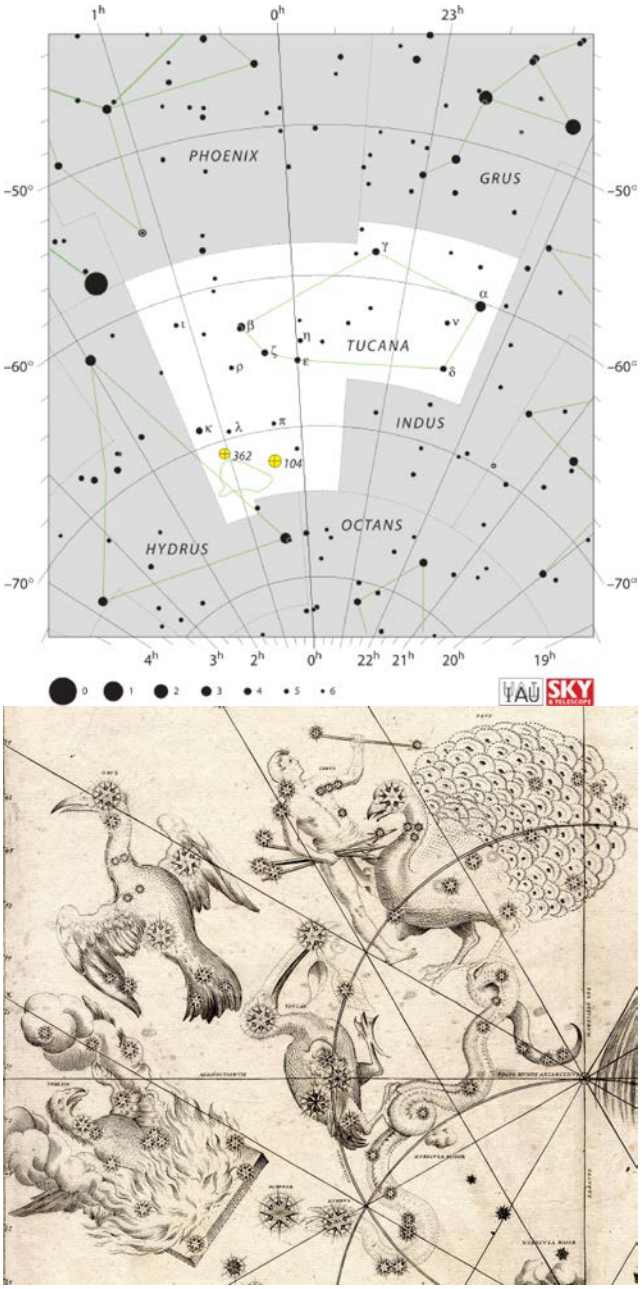
Tucana is a constellation of stars in the southern sky, named after the toucan, a South American bird. It is one of twelve constellations conceived in the late sixteenth century by **Petrus Plancius** from the observations of **Pieter Dirkszoon Keyser** and **Frederick de Houtman**. Tucana first appeared on a 35-centimetre-diameter (14 in) celestial globe published in 1598 in Amsterdam by Plancius and **Jodocus Hondius** and was depicted in **Johann Bayer's** star atlas Uranometria of 1603. French explorer and astronomer **Nicolas Louis de Lacaille** gave its stars Bayer designations in 1756. **Johannes Kepler** and **Giovanni Battista Riccioli** termed it Anser Americanus "the American Goose". The constellations Tucana, Grus, Phoenix and Pavo are collectively known as the "Southern Birds".

Tucana is not a prominent constellation. All of its stars are third magnitude or fainter and none of the stars are named, nor are there are any legends associated with it.

Alpha Tucanae is the brightest, with an apparent visual magnitude of 2.87. It marks the toucan's head. It is an orange subgiant of spectral type K3III around 199 light-years distant from the Solar System. A cool star with a surface temperature of 4300 K, it is 424 times as luminous as the sun and 37 times its diameter. It is 2.5 to 3 times as massive. *Alpha Tucanae* is a spectroscopic binary, which means that the two stars have not been individually resolved using a telescope, but the presence of the companion has been inferred from measuring changes in the spectrum of the primary. The orbital period of the binary system is 4197.7 days (11.5 years). Nothing is known about the companion

Beta Tucanae is a star system with six member stars, while Kappa is a quadruple system.

Gamma Tucanae is a yellow-white sequence star of spectral type F4V and an apparent magnitude of 4.00 located around 75 light-years from Earth. It marks the toucan's beak.

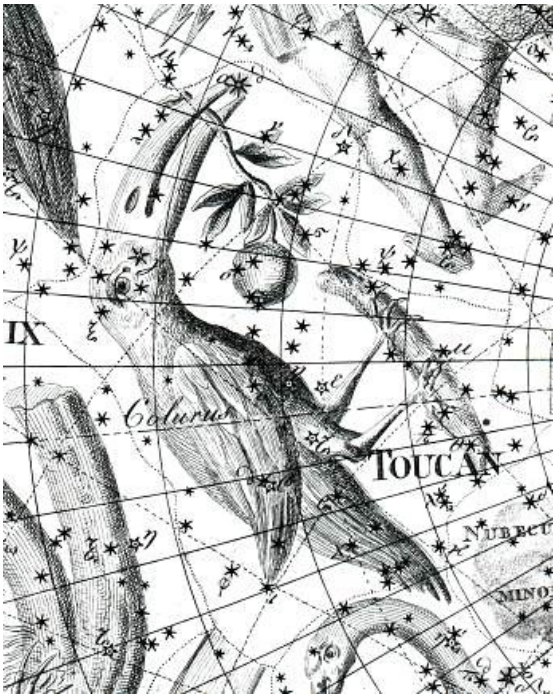


The "southern birds" as seen in Johann Bayer's Uranometria. Tucana ("Toucan") is in the middle

Five star systems have been found to have exoplanets to date. HD 4308 is a star with around 83% of the Sun's mass located 72 light-years away with a super-Earth planet with an orbital period of around 15 days. HD 215497 is an orange star of spectral type K3V around 142 light-years distant. It is orbited by a hot super-Earth every 3 days and a second planet around the size of Saturn with a period of around 567 days. HD 221287 has a spectral type of F7V and lies 173 light-years away, and has a super-Jovian planet. HD 7199 has spectral type KOIV/V and is located 117 light-years away. It has a planet with around 30% the mass of Jupiter that has an orbital period of 615 days. HD 219077 has a planet around 10 times as massive as Jupiter in a highly eccentric orbit. The constellation contains *47 Tucanae*, one of the brightest globular clusters in the sky, and most of the Small Magellanic Cloud.

CHARACTERISTICS

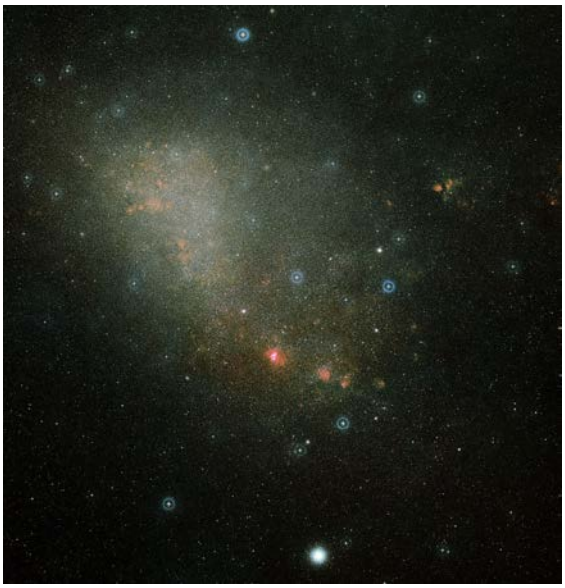
Irregular in shape, the layout of the brighter stars of Tucana has been likened to a kite. Within the constellation's boundaries are around 80 stars brighter than an apparent magnitude of 7. Tucana is bordered by Hydrus to the east, Grus and Phoenix to the north, Indus to the west and Octans to the south. Covering 295 square degrees, **it ranks 48th of the 88 constellations in size**. The recommended three-letter abbreviation for the constellation, as adopted by the International Astronomical Union in 1922, is 'Tuc'. The official constellation boundaries, as set by **Eugène Delporte** in 1930, are defined by a polygon of 10 segments. In the equatorial coordinate system, the right ascension coordinates of these borders lie between 22h 08.45m and 01h 24.82m, while the declination coordinates are between -56.31° and -75.35°. As one of the deep southern constellations, it remains below the horizon at latitudes north of the 30th parallel in the Northern Hemisphere, and **is circumpolar at latitudes south of the 50th parallel in the Southern Hemisphere.**



Although he depicted Tucana on his chart, Bayer did not assign its stars Bayer designations. French explorer and astronomer Nicolas Louis de Lacaille labelled them Alpha to Rho in 1756, but omitted Omicron and Xi, and labelled a pair of stars close together *Lambda Tucanae*, and a group of three stars *Beta Tucanae*. In 1879, American astronomer **Benjamin Gould** designated a star **Xi Tucanae** (this had not been given a designation by Lacaille who had recognized it as nebulous, and it is now known as the globular cluster 47 Tucanae. *Mu Tucanae* was dropped by Francis Baily, who felt the star was too faint to warrant a designation, and Kappa's two components came to be known as Kappa1 and Kappa2.

DEEP-SKY OBJECTS

Globular Cluster 47 Tucana is the second-brightest globular cluster in the sky after Omega Centauri, 47 Tucanae (NGC 104) lies just west of the Small Magellanic Cloud. Only 14,700 light-years distant from Earth, it is thought to be around 12 billion years old. Mostly composed of old, yellow stars, it does possess a contingent of blue stragglers, hot stars that are hypothesized to form from binary star mergers. 47 Tucanae has an apparent magnitude of 3.9, meaning that it is visible to the naked eye; it is a **Shapley class III cluster**, which means that it has a clearly defined nucleus. Near to 47 Tucana on the sky, and often seen in wide-field photographs showing it, are two much more distant globular clusters associated with the SMC: NGC 121, 10 arcminutes away from the bigger cluster's edge, and Lindsay 8.



NGC 362 is another globular cluster in Tucana with an apparent magnitude of 6.4, 27,700 light-years from Earth. Like neighboring 47 Tucanae, NGC 362 is a Shapley class III cluster and among the brightest globular clusters in the sky. Unusually for a globular cluster, its orbit takes it very close to the center of the Milky Way—approximately 3,000 light-years. It was discovered in the 1820s by **James Dunlop**. Its stars become visible at 180x magnification through a telescope.

Located at the southern end of Tucana, the **Small Magellanic Cloud** is a dwarf galaxy that is one of the nearest neighbors to the Milky Way galaxy at a distance of 210,000 light-years. Though it probably formed as a disk shape, tidal forces from the Milky Way have distorted it. **Along with the Large Magellanic Cloud, it lies within the Magellanic Stream, a cloud of gas that connects the two galaxies, named after the Portuguese explorer who organised the Castilian (Spanish) expedition to the East Indies from 1519 to 1522, resulting in the first circumnavigation of the Earth.**

NGC 346 is a star-forming region located in the Small Magellanic Cloud. It has an apparent magnitude of 10.3. Within it lies the triple star system HD 5980, each among the most luminous stars known.

The Tucana Dwarf galaxy, which was discovered in 1990, is a dwarf spheroidal galaxy of type dE5 that is an isolated member of the Local Group of some 20 galaxies, including its major components - the Milky Way and the Andromeda Galaxy. It is located 870 kiloparsecs from the Solar System and around 1,100 kiloparsecs from the barycentre of the Group—the second most remote of all member galaxies after the Sagittarius Dwarf Irregular Galaxy.


47 Tucanae (NGC 104)

The barred spiral galaxy NGC 7408 is located 3 degrees northwest of *Delta Tucanae*, and was initially mistaken for a planetary nebula. **In 1998, part of the constellation was the subject of a two-week observation program by the Hubble Space Telescope, which resulted in the Hubble Deep Field South**. The potential area to be covered needed to be at the poles of the telescope's orbit for continuous observing, with the final choice resting upon the discovery of a quasar, QSO J2233-606, in the field.

AK with Wikipedia Notes