Fun Facts:

**M45: PLEIADES**

Computer Code: m45

* **Other Names:**
  + Seven Sisters
  + Subaru Cluster
* **Location:**
  + RA: 03h 48m 0s
  + Dec: +24⁰ 10’
* **Basics:**
  + Description: open cluster in Taurus
  + Visual Magnitude: +1.5
    - At least 6 stars are easily spotted with the naked eye. Under clear, dark skies that number can jump to more than a dozen.
    - With binoculars, it is easy to spot more than 100 stars.
  + Apparent Size: 120 arcminutes
  + Distance: 430 light years
  + Diameter: 15.1 light years across
    - Its tidal radius is about 43 light years.
* **Other Notes:**
  + This cluster of stars formed together about 100 million years ago. Its brightest members are all hot, young, blue-white giants and sub-giants. Some of these stars are rapidly rotating, with Pleione as the faster spinner. The cluster also contains many brown dwarf stars, which are objects without enough mass to start nuclear fusion (only about 8% of the Sun).
  + Modern observations reveal at least 500 stars belonging to this cluster, spread over a 2⁰ field, which is 4x the diameter of the Moon. There are over 1,000 confirmed members.
  + It is located only 4⁰ off of ecliptic, so Venus, Mercury & Mars will occasionally pass through it…as does the Moon.
  + The cluster is slowly moving toward the feet of Orion.
  + When viewed closely, the Pleiades seem to be full of nebulous material, especially around Merope. It is known as reflection nebula, reflecting the color (bluish in this case) and an exact copy of the spectra of the stars it surrounds.
    - The dust is actually moving at a different rate than the stars, so they are not likely physically connected or related to each other. The star cluster is likely just passing through a particularly dusty region of space.
  + November is a great month to view Pleiades, as it is visible from dusk until dawn during this time. The cluster shines brightly throughout the winter is usually visible in the evening sky until mid-April.
* **History** 
  + It has been used as a calendar star for centuries.
    - In Mediterranean cultures, the day that the Pleiades appeared in the morning sky before sunrise announced the opening of the sailing season. The Greek word *plain*, which means “to sail,” is closely related to the Greek name Pleiades.
    - The Zuni tribe of New Mexico called these stars the “Seed Stars.” Their disappearance in the evening sky every spring signaled that it was time to plant the seeds.
  + In 1846, German astronomer Madler noticed that the Pleiades stars to not move in relation to each other, so he correctly concluded that they are part of a physical group and connected to each other.
  + In 1769, Charles Messier included this cluster in his list of non-comet objects. Because this is obviously not a comet, some think Messier included it simply so he could have a larger catalog than his scientific rival, Lacaille, whose 1755 catalog included 42 objects.
* **Mythology:**
  + This cluster has been known throughout history to cultures all around the world. Other names include:
    - *Matariki* (Maori)
    - *Tzab-ek* (Mayans)
    - *Tianquiztli* (Aztecs)
    - *Kiymah* (Hebrew) – mentioned in Job 9:9-7, Job 38:31-33, and Amos 5:8
    - *Krittika* (Hindu) – known as the six mothers of the war God Skanda, who developed 6 faces
    - *Al thuraiya* (Arabic)
      * Some scholars of Islam suggest that the Pleiades are the Star in Najm which is mentioned in the Quran.
      * *Aldebaran* means “follower” in Arabic, so some think that Aldebaran was named because it follows the Pleiades across the sky.
    - *Soraya* (Persian) – after which a former Iranian empress was named
    - *Subaru* (Japanese) – after which the automaker derives its name and is represented in its logo
  + Old English & German names suggest it was compared to a “Hen with Chicks.”
  + *Pleiades* is of Greek origin, although of uncertain etymology. Some possibilities include:
    - *Pleios* means “full” or “many.”
    - *Peleiades* means “flock of doves.”
    - *Pleione* is a mythological mother and the name of one of the brighter stars. The nine brightest stars of the Pleiades are named for the Seven Sisters of Greek mythology: *Sterope, Merope, Electra, Maia, Taygeta, Celaeno*, and *Alcyone*. Rounding out the 9 stars are their father, *Atlas*, and their mother, *Pleione*.
      * Atlas had other daughters, for which the *Hyades* are also named. (The Hyades is another nearby open cluster.)
    - Homer wrote about the Pleiades in both the *Iliad* (750 BC) and the *Odyssey* (720 BC).
  + Legend of the Lost Pleiad –
    - Most people see 6, not 7, stars in the Pleiades.
    - There is a famous painting called “The Lost Pleiad” and there are legends about a lost star from this group in many different cultures, including European, African, Asian, Indonesian, Native American and Aboriginal Australian populations.
    - The “Lost Pleiad” may have basis in fact. Modern astronomy has found that the 7th brightest Pleiades star – Pleione – is a complicated and hard-to-understand “shell star” that goes through numerous permutations. These changes cause this star to vary in brightness.
  + Halloween has its origins with the Pleiades. The festival partly originates from an old Druid rite that coincided with the midnight culmination of the Pleiades cluster. It was believed that the veil dividing the living from the dead is at its thinnest when the Pleaides culminates – reaches its highest point in the sky – at midnight.