Fun Facts:

**M42: ORION NEBULA**

Computer Code: M42

* **Other Names:**
  + NGC 1976
  + Great Nebula
  + Great Orion Nebula
* **Location:**
  + RA: 05h 36m 2s
  + Dec: -05⁰ 27’
  + This is easily spotted as the middle star of Orion’s sword.
* **Basics:**
  + Description: Bright diffuse emission nebula in Orion
    - The Orion Nebula is actually a small illuminated part of a much larger cloud of gas and dust covering half of the Orion constellation. This much larger nebula is called the Orion Molecular Cloud Complex, which we are actually looking at face-on. The Orion Molecular Cloud extends several hundreds of light-years and includes Barnard’s Loop, the Horsehead Nebula, the Flame Nebula and the reflection nebula M78.
  + Visual Magnitude: +4.0 (visible to the naked eye…but can’t really discern the nebulosity)
    - Can be viewed through binoculars and small telescopes
  + Apparent Size: 85 x 60 arcminutes
  + Distance: about 1,350 light years away
    - Light we’re seeing now left M42 around the 660s AD.
      * Islam was just getting going and rapidly expanding around the Middle East and northern Africa.
  + Diameter: about 24 light year across
* **History:**
  + The Mayans of Central America had a folk tale suggesting they knew of this nebula, but the despite being visible to the naked eye, it is not mentioned in any known historical record before the telescope.
  + In the early 1600s, Galileo detected faint stars and found this area to be a triple star system, but didn’t mention anything about nebulosity. This has led to speculation that the nebula’s illuminating stars have flared up since that time.
  + Christian Huygens is credited with its discovery, whose sketch in 1656 was the first of it to be published.
  + Edmond Halley included it in his list of 6 nebulae in 1716.
  + Charles Messier first noted the nebula in 1769 and made it #42 on his list.
  + In 1865, William Huggins studied it with spectroscopy and first revealed its gaseous nature.
  + In 1880, Henry Draper took the first photograph of the Orion Nebula through his 11-inch refractor, making it the first historical instance of deep-sky astrophotography.
* **Other Notes:**
  + This is the closest star-forming region to Earth. The youngest & brightest stars in the Orion Nebula are thought to be less than 100,000 years old. These young stars are especially massive and emit large quantities of ionizing UV radiation. This UV light causes the nebula to glow by fluorescence.
    - The four Trapezium stars are probably the most recent stars formed in this area. Two of the four Trapezium stars can be resolved into doubles, giving it 6 total stars.
    - Within this nebula, there are about 700 stars in various stages of formation. Among these young, unstable stars, there are at least 150 protoplanetary disks.
    - Each time a new star is formed, it creates stellar shockwaves that stir up the remaining gas causing other stars to be formed.
    - Eventually, most of the gas & dust will either be gathered into stars or ejected out. The remaining stars will form an open cluster, similar to Pleiades.
  + One of the most photographed and studied objects in the sky.
    - Regions of red & blue-violet are apparent in long-exposure photographs.
      * Red means ionized hydrogen.
      * Blue-violet is light reflected by the fine dust from the massive stars at the core of the nebula.
    - There is also a greenish tint to the nebula, which is very rare. This puzzled astronomers for a long time, but we now know that the green comes from doubly ionized oxygen.