

Review: Prof Werner Gitt, *Stars and Their Purpose: Understanding the Origins of Earth's "Nightlights"*, Master Books, Green Forest, AR, 1996 (2006 edn.)

Pages: 213

Stars of God

This is an even combination of theology and scientific understanding as they apply to astronomy, resulting in a deeper understanding and appreciation of both.

The appendix is quite lengthy and felt like two or three separate chapters; perhaps they should have been positioned earlier in the text after the introduction so as to provide more information before the main material.

“...*he made* the stars also.”
Genesis 1.16d, Authorized Version

Preface (pp. 7-11)

The only tangibles in astronomy are exposed photographic plates, radio signal recordings, moon rocks and meteorites.

Introduction (pp. 15-16)

πολος means “many”, σεμα “sign”, and σεμαντικος “having significance”.

I) Can the Stars Be Counted? (pp. 17-25)

The Milky Way has an estimated 200B stars and is 100kly in diameter.

NGC stands for *New General Catalogue of Nebulae and Clusters of Stars*. Andromeda is the most distant object visible by the naked eye.

About 100M galaxies have stellar magnitude up to 21.

The best telescope is from the European Organisation for Astronomical Research (ESO) in Chile.

Galaxies occur in clusters and have an average diameter of 3mly. While single-starlight is unobservable from such distances, a whole galaxy is bright enough to be seen.

There are an estimated 10^{24} stars in the universe.

Apparent magnitude starts off at a brightest of one.

FLOPS are Floating Point Operations Per Second and over five years a supercomputer could only count 1.5×10^{-9} of the total number of stars that exist.

II) In What Respect Do the Stars Differ? (pp. 27-37)

Stars are classified by mass, luminosity, radius, temperature, spectral class, average density, average emission per unit volume per second, gravitational acceleration at surface, rotation speed, magnetic field and chemical composition.

Sirius is the brightest star from earth.

Snowflakes are 1-3mm and form from ice crystals at -40°C in the upper atmosphere.

Exa Carinae is 6.4kly away. If it were in the sun's position, it would be 4m times brighter.

Variable stars change their properties over time.

The largest star is Alpha Herculi; 250b km in diameter or 180k times bigger than the sun

III) How Big Is the Universe (pp. 39-42)

Radio waves from Neptune take 4h and 6min to reach earth.

IV) Four Characteristics of Space (pp. 43-47)

If the Milky Way were evenly spread there would only be 40 H₂ atoms per cm³.

The best laboratory vacuum achieves 10⁻¹² pascals of pressure which still contains 270 molecules per cm³.

If both the universe and number of stars were infinite the night sky would be infinitely bright.

V) Why Were the Stars Created? (pp. 49-56)

When four H⁺ ions of AM 1.008 each combine they form one He atom. In the process, 0.029 AM is lost or 0.7% which is converted to energy (per E=mc²). Every second, 655M tons of H₂ are converted into 650M tons of He ions the sun; only 0.441 x 10⁻⁹ reaches the earth, which, over 30 min, is enough to power the earth for a year (8.75B MWh) if it could all be captured.

Energy incident per m² is called the solar constant (1.395kW/m²).

One Astronomical Unit (AM) is the Earth-to-Sun distance of 150M km.

One solar day is 24 hrs but a sidereal day is 23.93444 hours.

A sidereal year is 365.25 days.

The moon's synodic month is 29.530589 days.

The current Gregorian Calendar is a result of trial and error.

GPS relies on travel time differences of radio signals from various satellites.

The earth's axis between poles revolves around a top every 25,700 years.

VI) How Do the Stars Transmit Their Messages (pp. 57-60)

VII) What Do The Stars Proclaim? (pp. 61-100)

Up to 1945, Japanese Shintoists called Amaterasu the supreme sun-god.

In informatics, any agreed-on sign must have a unique meaning.

The sun passes through thirteen Zodiac signs on the ecliptic as seen from earth.

ICTHYS is also an acronym for "Iesous Christo Theou Huios Soter".

An archer who misses makes a $\acute{\alpha}\mu\alpha\rho\tau\iota\alpha$.

An eclipsed sun is only 1.6×10^{-6} times as bright.

During an eclipse, the moon's shadow travels across the earth's surface at 28km per min at the equator making a maximum possible duration of eight minutes for a total eclipse at any one location, however, the darkness at the crucifixion lasted for three hours.

Extending the long axis of from Gamma Crucis to Alpha Crucis in the Southern Cross Constellation (the "Acrux") gives the approximate south pole's position.

The southern and northern celestial poles are imaginary points about which the entire celestial sphere seems to rotate.

Directly underneath the Pole Star is the North Pole.

Ophiucus is between Scorpio and Sagittarius.

Declination is the angular distance between a star and the celestial equator.

The polar distance h of a star is the angular distance from the north celestial pole (0°) to 180° (at the south pole).

IX) The Star of Bethlehem (pp. 103-111)

Comets were always regarded as evil omens.

In 7 BC, there was a triple conjunction with Jupiter and Saturn.

The famous astrology school was at Sippur on the Euphrates.

The Catholic Church gave the Three Wise men names in the 8thC AD: Casper, Melchior, and Balthasar.

The Wise Men would have travelled at least 800km over sixty days.

King Herod was an Edomite, not a Jew.

Micah lived seven hundred years before Christ.

X) Who Created the Stars? (pp. 113-117)

The astronomical symbol for the earth is a cross standing on a circle.

XI) Knowing the Creator Personally (pp. 119-138)

Conclusion (p. 139)

Appendix (pp. 141-204)

There are nine planets and sixty-six moons in the solar system.

The earth's *eccentricity* is only 0.0167 and life could not exist on a planet with a more elongated orbit.

Moon gravity is only 1.63ms^2 .

Venus' atmosphere is 96.4% CO₂ while Mars' is 95%.

If air were less dense the UV and X-rays from the sun would be deadly.

The stratosphere is between 10km and 50km and contains small quantities of O₃. This absorbs all injurious UVA rays between 0.29 and 0.32 μm .

The moon's orbital inertia about the earth is greater than the earth's own axial moment of rotation.

The moon's orbit makes an angle of 5° with the ecliptic.

For an observer on the moon the earth would appear to stand still (due to "tidal lock") and it could not be seen from the far side at all.

Albedo means “white” and the moon’s is only 7% compared to Earth (39%) and Venus (79%).

The moon exerts a 2.5X stronger gravitational force on earth’s tides than the sun so that its waters heap towards the moon. This causes churning (braking friction) between the water and ocean floor, slowing the earth’s rotation by 0.0016s/century.

Most planetary orbital ellipses have $e < 0.1$.

Mercury temperatures range from 450°C during the day to -170°C at night. This is because it has no atmosphere as its escape velocity is only 4km/s.

Venetian rotation is retrograde and its atmospheric pressure is ninety times earth. Clouds of H₂SO₄ float on it.

Olympus Mons on Mars is 20km high.

Jupiter has sixty percent of the solar system's mass (excluding the sun) and the fastest rotation at 9h 50.5min. This makes it more elliptical and creates phenomena like the 300-year old Great Red Spot of NH₃, which Voyager I measured at 200km/hr. Galileo was the first to observe its moons (in 1616); Io, Europa, Ganymede [retrograde moons end in “e”], and Callisto.

Io is 5% bigger than the moon and -146°C at the surface.

Ganymede is the largest moon on the solar system, bigger than Mercury and Pluto.

Saturn’s Titan is the second biggest moon and has an 82% N₂ atmosphere but is -180°C.

Uranus rotates every 84 years with one pole facing the sun every 42 years due to its extreme axial tilt.

Neptune’s atmosphere is blue since the CH₄ absorbs orange and red light wavelengths.

Pluto and its moon Charon’s orbital periods are *synchronous* so that they will always appear to stand still to each other.

Mercury, Jupiter, Saturn, Uranus, and Neptune all have magnetic fields. At 6.2 Gauss, Jupiter's is the strongest (14 times the earth) and extends 750k km into space away from the sun. Mercury's is only a hundredth of the earth's.

The solar system *heliosphere* ends where the solar wind stops out 11.8M km (100 AUs). This is where it collides with interstellar gas forming a shockwave.

Solar eclipses always occur in 2s or 3s and the longest possible is 7min 31s. A total moon eclipse can last 100min.

Solar-to-lunar eclipses are ~3:2.

Zodiakos kyklos means "animal cycle".

88 constellations have been named.

17 galaxies have been identified in our local cluster.

The Milky Way is said to have half a million pulsars.

Escape velocity is $(2GM/r)^{1/2}$ and lighter gases escape before heavier.