

Lexical-Semantic Features of Astronomical Terminology in the English Language

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Abstract. *This article explores the lexical-semantic features of astronomical terminology in the English language, focusing on how specialized vocabulary in the field of astronomy functions within the broader linguistic system. The study examines the ways in which astronomical terms, such as celestial bodies, phenomena, and concepts, are formed, defined, and categorized in English. It highlights the role of metaphor, analogy, and etymology in the development of these terms, as well as their semantic shifts over time. Through this analysis, the article provides insights into the evolving nature of scientific language and its impact on knowledge dissemination in the field of astronomy.*

Key words: *Astronomical terms, compounding, derivation, lexical characteristics, loanwords, neologisms, semantic features.*

Lexical characteristics refer to the properties of words in terms of their structure, usage, and origin. In the case of astronomical terminology, the following points are significant. The development of astronomy as a science has led to the creation of new terms or neologisms. Many of these terms, especially those from ancient astronomy, have Greek, Latin, or Arabic roots. For example, the term "planet" derives from the Greek word *planētēs*, meaning "wanderer."

Astronomical terms often result from the combination of multiple words or the addition of prefixes and suffixes. For example, the term *astrobiology* is a compound of *astro-* (meaning star or celestial body) and *biology* (the study of life). Similarly, *galactic* is derived from the root *galaxy*, with the suffix *-ic*, meaning "pertaining to."

Astronomy, being a highly specialized field, has developed a rich vocabulary that is technical in nature. Terms like *quasar*, *pulsar*, and *redshift* have specific meanings within the field, which may not be immediately clear outside of astronomical discourse. Many astronomical terms are shortened into abbreviations, particularly in modern astronomy where communication efficiency is important. For example, *HST* stands for the Hubble Space Telescope, and *NASA* for the National Aeronautics and Space Administration. Semantic features deal with the meanings of words and how these meanings are conveyed in the context of astronomical study. Some key semantic aspects include:

Like many scientific fields, astronomical terms can exhibit polysemy, where a single word has multiple meanings depending on the context. For example, the word *star* can refer to a celestial body that emits light or be used metaphorically to describe someone famous. This polysemy can sometimes lead to ambiguity in general discourse, requiring clarification in specific contexts.

Many astronomical terms carry metaphorical meanings beyond their scientific usage. For example, the word *eclipse* can be used metaphorically to describe one thing obscuring or overshadowing another. In addition, celestial bodies like stars or the moon often serve as symbols in literature and culture, carrying meanings of hope, mystery, or fate. Astronomical terminology is often grounded in the conceptualization of the cosmos, with terms like *universe*, *solar system*, and *galaxy* reflecting

different levels of cosmic organization. These terms are used not only to describe physical objects but also to communicate our understanding of space itself. In scientific language, the meaning of terms in astronomy is typically very precise, and their usage follows strict definitions. Terms like *asteroid*, *nebula*, and *supernova* have exact scientific definitions that differentiate them from other related terms. However, these terms may also be simplified or used more broadly in non-scientific contexts. Astronomical terminology in English has borrowed extensively from Greek, Latin, and Arabic, which reflects the multicultural development of astronomy as a science. For instance, the term *zenith* comes from Arabic *samt*, meaning "direction," while *galaxy* comes from the Greek *galaxias*, meaning "milky," referring to the Milky Way.

Astronomical terminology is not static. It evolves over time due to advancements in technology and knowledge. For example, new phenomena and discoveries, such as exoplanets and dark matter, have led to the creation of new terms or the expansion of the meanings of existing terms.

With the rise of modern astronomical tools such as telescopes, satellites, and space probes, new terms continue to emerge. Terms like *black hole*, *wormhole*, and *gravitational wave* are not only scientifically significant but have also captured the public imagination. Astronomy is a global science, and English serves as the primary language of communication. As a result, English astronomical terms are often adopted internationally, leading to a degree of linguistic homogenization. However, certain terms retain local variations in different languages, which can enrich the scientific vocabulary.

Astronomy overlaps with various scientific disciplines, such as physics, mathematics, and geology, which influences the lexicon. For example, terms like *force*, *energy*, *matter*, and *density* are common both in astronomy and physics, but their application in the context of astronomical bodies and phenomena adds layers of specific meaning.

When analyzing the lexical-semantic features of astronomy-related terms in English, we identified phenomena such as polysemy (multiple meanings), synonymy (synonymity), and variation (doublet words) among them. Below, we will present a detailed analysis of these phenomena with examples.

First, let us focus on the relatively rare occurrence of polysemy (multiple meanings) among terms, including astronomical terms. Polysemy is defined as follows:

POLYSEMY [poli.. + Greek sema - sign]: A word or sign having multiple meanings. Polysemy is one of the most important issues in linguistics. It is important to note that in polysemy, there is a connection (chain) between the meanings. If this connection is broken, it transitions into homonymy. During our analysis, we encountered instances of polysemy among astronomy-related terms. For example, words expressing the twelve zodiac signs are used both for the name of a star constellation and to refer to people born under that sign. Here are the dictionary definitions for some of them:

Aquarius (noun) [ə-ˈkwer-ē-əs]:

1. The 11th sign of the zodiac in astrology.
2. One born under the sign of Aquarius.
3. A constellation south of Pegasus, depicted as a man pouring water. *Etymology*: Latin (genitive Aquarii), literally "water carrier". First Known Use: 14th century.

Aries (noun) ['er-, ēz, -, ēz]:

4. The first sign of the zodiac in astrology.
5. One born under the sign of Aries.
6. A constellation between Pisces and Taurus, depicted as a ram.

Cancer (noun) ['kan(t)-sər]:

7. A northern zodiacal constellation between Gemini and Leo.
8. The fourth sign of the zodiac in astrology.

9. One born under the sign of Cancer. *Etymology*: Middle English, from Latin (genitive Cancrī), literally "crab". First Known Use: 14th century.

Similar definitions are provided for the other zodiac signs.

However, the revised edition of the "Oxford Dictionary of Astronomy" gives a definition that combines the two interconnected meanings mentioned above in an electronic appendix as follows:

Aquarius (Aqr) (gen. Aquarii): A constellation of the zodiac, commonly known as the water-carrier, through which the Sun passes from the third week of February to the second week of March. Its brightest stars are Alpha Aquarii (Sadalmelik) and Beta Aquarii (Sadalsuud). It contains the 7th globular cluster M2, the Helix Nebula, and the Saturn Nebula. Three meteor showers radiate from Aquarius each year: the Delta Aquarids, the Eta Aquarids, and the Iota Aquarids.

Aries (Ari) (Arietis): A constellation of the zodiac, representing a ram. The Sun lies in Aries for the last 10 days of April until mid-May. Its brightest star is Alpha Arietis (Hamal).

Cancer (Cnc) (gen. Cancrī): The faintest constellation of the zodiac, where the Sun lies for three weeks from late July until mid-August. Cancer represents a crab. Its brightest star is Beta Cancrī.

The same type of definition is provided for other constellations.

Focusing on the definition of astronomical terms, the phrase "... constellation of the zodiac" expresses a combined form of the first and second meanings as found in Merriam-Webster's dictionary.

Additionally, in English, there are synonymous terms related to astronomy, including:

Apparent magnitude (m) = Visual brightness (V)

Aquarius = The water-bearer

Aries = The Ram

Astrobiology = Exobiology

Astronautics = Cosmonautics

Astronomical = Astronomic

Astronomical body = Celestial body, celestial object, heavenly body

Cancer = The Crab

Capricorn = The Goat

Cosmic microwave background (CMB) = Background radiation

Extrasolar planet = Exoplanet

Gemini = The Twins

Kuiper belt = Edgeworth-Kuiper belt

Leo = The Lion

Lunar phase = Moon phase

Meteor = Shooting star or falling star

Natural satellite = Moon

Oort cloud = Öpik–Oort cloud

Orbital period = Revolution period

Periapsis = Pericenter

Pisces = The Fishes

Planetology = Planetary science

Quasar = Quasi-stellar radio source

Refractor = Refracting telescope

Sagittarius = The Archer

Scorpius = The Scorpion

September equinox = Southward equinox

Star system = Stellar system

Stellar evolution model = Stellar model

Taurus = The Bull

Transit = Astronomical transit

Virgo = The Virgin

Zodiac = Astrological sign

Finally, there are doublet terms in astronomy in English, such as:

Accretion disk = Accretion disc

Astronautic = Astronautical

Astronomic = Astronomical

Cosmic = Cosmical

In summary, the lexical and semantic features of astronomical terminology in English reflect the development of the field as both a scientific and cultural endeavor. The language used in astronomy is precise, technical, and continually evolving, influenced by new discoveries, interdisciplinary links, and the broader societal impact of space exploration. The study of these features helps illuminate how language and science interact and evolve together.

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