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Names of Astronomical Objects from a Global and Local Perspective

1. Astronomical objects

The following article¹ deals with some aspects of naming astronomical objects that have not yet been onomastically explored in great detail (for onomastical and orthographical researches see KOZMA 2013). Nevertheless, amongst astronomers, celestial nomenclature “has long been a controversial topic. At its inaugural meeting in 1922 in Rome, the International Astronomical Union (IAU) standardized the constellation names and abbreviations. More recently IAU Committees or Working Groups have certified the names of astronomical objects and features” (<https://www.iau.org/public/themes/naming>).

What kind of astronomical objects are there? Here we will follow the approach of the International Astronomical Union (see <https://www.iau.org/public/themes/naming/>):

Solar System objects and features are: the major planets and the Moon, planetary features, dwarf planets, satellites of planets in the Solar System, minor planets and comets.

Objects outside the Solar System include: stars; nebulae, galaxies and other objects (the so called “deep-sky objects”); and exoplanets. In this paper, two categories of astronomical objects are added here: meteor showers and constellations.

(Human-made space objects, such as spaceships, rockets, space probes, satellites, etc. are beyond the scope of this paper.)

2. “Globality”: Naming conventions

2.1. Ancient names

The first objects to be named were objects visible to the naked eye: planets, bright stars and constellations. Many names from the Greco-Latin mythology are still in use today, e.g. the names of the major planets: *Mercury*, *Venus*, *Mars*, *Jupiter* and *Saturn*. Planets discovered later (*Uranus*, *Neptune*, *Pluto*) got their names from this thematic group, as well. *Moon* also has an ancient name. “The IAU does recognize official names for the major planets (*Mercury*,

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Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune) and Earth's satellite (*Moon*)" (https://www.iau.org/public/themes/naming/#def_planet). Pluto has been categorized as a dwarf planet since 2006 (<https://www.iau.org/public/themes/pluto/>).

More than half of the 88 modern constellations recognized by the IAU "were recorded in the seventh and eighth books of Claudius Ptolemy's *Almagest*, although the exact origin of these constellations still remains uncertain" (<https://www.iau.org/public/themes/constellations/>). Such ancient constellation names still in use today are, e.g. *Andromeda, Corvus, Triangulum* or *Ursa Minor*.

The brightest stars were already named in ancient times, as well. As of 1st June 2018, 330 star names are approved by the IAU. It may be interesting that "[b]efore the establishment of the WGSN [the Working Group on Star Names], the IAU had only ever officially approved the names of 14 stars, in connection with efforts to catalogue the names of newly discovered exoplanets" (https://www.iau.org/public/themes/naming_stars/). The vast majority of the approved star names are of Arabic (*Aldebaran, Rigel, Unukalhai*, etc.), Greek (*Antares, Merope, Procyon*, etc.) or Latin (*Capella, Pollux, Regulus*, etc.) origin.

2.2. "Modern names"

After the invention of the telescope in the early seventeenth century, more and more objects became visible to astronomers, and they had to be named, as well. *Uranus, Neptune* and *Pluto* as planets discovered later were already mentioned.

In 1610, Galileo Galilei discovered four star-like objects near Jupiter which he named the "Medicean Stars". These "stars" later turned out to be satellites of Jupiter. Simon Marius, following Kepler's recommendation, suggested the names *Io, Europa, Ganymede* and *Callisto* (lovers of Zeus) for them already in 1614, but these only became established in the 20th century (see: VAN HELDEN 1994: 1; https://www.iau.org/public/themes/our_moon/#3).

By the middle of the 19th century, eight moons of Saturn had been discovered by direct observation: *Titan* (discovered by Christian Huygens in 1655), *Iapetus, Rhea* (both: Giandomenico Cassini, 1671–1672), *Tethys, Dione* (both: Giandomenico Cassini, 1684), *Mimas, Enceladus* (both: William Herschel, 1789) and *Hyperion* (William Lassell, George Bond, independently of each other, 1848). The names were suggested by John Herschel in 1847. He recommended the usage of names of the mythological Titans, Saturn's brothers and sisters (see VAN HELDEN 1994: 2).

The first surface features of the Moon were also described and named in the early 16th century and some of them are still in use today, e.g. *Langrenus* (crater) or *Sinus Medii* (see PAPP-VÁRY 2007: 385–392). The convention of differentiating

between “highlands” (*terrae*) and “seas” (*maria*) also originated with the first telescopic observations (see e.g. MIZSER 2002: 211). Although 22 *mare* names are officially approved (*Mare Anguis*, *Mare Australe*, *Mare Cognitum*, *Mare Crisium*, *Mare Fecunditatis*, *Mare Frigoris*, *Mare Humboldtianum*, *Mare Humorum*, *Mare Imbrium*, *Mare Ingenii*, *Mare Insularum*, *Mare Marginis*, *Mare Moscoviense*, *Mare Nectaris*, *Mare Nubium*, *Mare Orientale*, *Mare Serenitatis*, *Mare Smythii*, *Mare Spumans*, *Mare Tranquillitatis*, *Mare Undarum*, *Mare Vaporum*), the *terrae* are not officially recognized by the IAU as standard lunar nomenclature (see <https://planetarynames.wr.usgs.gov/SearchResults?target=MOON&featureType=Mare,%20maria>).

During the Age of Discovery, constellations only visible from the southern hemisphere of the Earth were also defined. Johannes Hevelius, Frederick de Houtman, Pieter Dirksz Keyser, Gerard Mercator, Nicolas Louis de La Caille, Petrus Plancius and Amerigo Vespucci made particular contributions to the “new” constellations. Most southern constellations were named by La Caille in 1763, for example: *Mensa*, *Norma* or *Sculptor* (see: <https://www.iau.org/public/themes/constellations/>).

Between 1801 and 1900, 463 minor planets were discovered² and were named mostly after (female) mythological characters.³ They were referred to simply by these names until the early 1850s, when they got ordinal numbers reflecting their sequence of discovery (<https://www.minorplanetcenter.net/iau/info/OldDesDoc.html>): (1) *Ceres* (nowadays defined as a dwarf planet), (2) *Pallas*, (76) *Freia*, (129) *Antigone*, (209) *Dido*, (246) *Asporina*, (328) *Gudrun*, (342) *Endymion*, etc. From the beginning of 1925, a new style of provisional designation is in use for objects observed on at least two nights that cannot be identified immediately. “The standard designation consists of the following parts, all of which are related to the date of discovery of the object: a 4-digit number indicating the year; a space; a letter to show the half-month; another letter to show the order within the half-month; and an optional number to indicate the number of times the second letter has been repeated in that half-month period” (<https://www.minorplanetcenter.net/iau/info/OldDesDoc.html>). For example, 1999 OY₃ means that this is the 99th minor planet reported as discovered in the second half of July 1999.

2.3. “Newest names” and designation systems

More modern equipment and techniques, such as space telescopes and the use of computers made it possible to discover distant stars, exoplanets, more minor

² As of 10th September 2018, 523584 minor planets received permanent numbers (see <https://www.minorplanetcenter.net/iau/lists/NumberedMPs.txt>).

³ For a variety of name sources nowadays, see 3.8. below.



and dwarf planets and planetary surface features that also needed to be named or designated.

Catalogue numbers, especially for designating stars or sources of radiation outside the Solar System, have been in use since Johann Bayer's star atlas (*Uranometria*, 1603). He grouped „the stars by magnitude class, from first to sixth, then allocated letters to the members of each class as he saw fit. [...] In the larger constellations, once the 24 Greek letters from *alpha* to *omega* were exhausted Bayer turned to Roman letters, starting with a capital *A* followed by lowercase *b*, *c*, *d* etc. Hercules, with 48 stars, was the only constellation in which he reached *z*. (The letters *j* and *v* were omitted, but *o* was included.)” (RIDPATH 1988, Bayer letters). Later catalogues (such as Flamsteed, Hevelius, Bode and Gould) used numbers instead of Greek letters, and others (like the Bonner Durchmusterung) operated with positions and apparent magnitudes of the stars. “The same star can appear in several catalogues, each time with a different designation. As an example, *Betelgeuse* is known as *Alpha Orionis*, *HR 2061*, *BD +7 1055*, *HD 39801*, *SAO 113271*, and *PPM 149643*” (https://www.iau.org/public/themes/naming_stars/). The same applies to binary or multiple systems, e.g. the white dwarf companion of *Sirius* is catalogued as: *Sirius B*, *Alpha Canis Majoris B*, and *HD 48915 B*. (To find out the meaning of a specific acronym, you can use the Dictionary of Nomenclature of Celestial Objects at: <http://vizier.u-strasbg.fr/viz-bin/Dic>.)

To avoid confusion between designations for astronomical radiation sources outside the solar system, the IAU Commission 5 Working Group on Designations has published complete specifications (see <http://cds.u-strasbg.fr/vizier/Dic/iau-spec.htm>). Some recommendations are cited here: Designations should consist of an acronym and a sequence, and an optional specifier (latter written in brackets). Between these three parts are spaces (or underscores if necessary, such as within an electronic catalogue where blanks would be problematic). An acronym shall be unique, it shall consist of at least three characters (letters and/or numerals only, no special characters), but it shall not be excessively long. A sequence, a string of usually alpha-numerical characters (running numbers or coordinates of the objects) should also be unique to unambiguously identify the source within the catalogue. Existing designations should never be altered, and the title of a catalogue shall include the acronym by which it is to be known. The examples *NGC 205*, *PKS 1817–43*, *CO J0326.0+3041.0*, *H2O G123.4+57.6 (VLSR=–185)*, *3C 196* illustrate the recommended form of astronomical designations (see <http://cds.u-strasbg.fr/vizier/Dic/iau-spec.htm>). There are numerous star catalogues in use today, see <http://cdsarc.u-strasbg.fr/cats/cats.html>.

Based on the designation system for minor planets, a new designation system for comets was introduced at the beginning of the year 1995. Prior to that date, both a provisional (year/letter) and a definitive (year/Roman numeral) designation system were in use. In the new system “each cometary discovery is given a designation consisting of the year of observation, the upper-case code letter identifying the halfmonth of observation during that year according to the procedure used for minor planets, and a consecutive numeral to indicate the order of discovery announcement during that halfmonth” (<http://www.minorplanetcenter.net/iau/lists/CometResolution.html>).

Furthermore, an initial prefix indicates the nature of the object: For example, *P* stands for a periodic comet, *C* for a non-periodic comet, *X* for a comet with a non-computable orbit, etc. Finally, „[n]oting that some redundancy of nomenclature is desirable, it is proposed to retain in general terms the tradition of naming comets for their discoverers” (<http://www.minorplanetcenter.net/iau/lists/CometResolution.html>). As of 7th May 2018, 367 periodic comets are listed by the Minor Planet Center (<http://www.minorplanetcenter.net/iau/lists/PeriodicCodes.html>), some examples are: *1P Halley (P/1682 Q1)*, *29P Schwassmann–Wachmann (P/1927 V1)*, *277P LINEAR (P/2005 YQ127)*, *316P LONEOS–Christensen (P/2005 RV25)*, *362P (P/2008 GO98)*.

With the discovery of the minor planet *A/2017 U1*, a new problem of the nomenclature arose. The kinematics of this object indicate that it does not belong to our Solar System, and it might be the first asteroid outside the Solar System (SCHNEIDER 2017, MAMAJEK 2017). Because of its uniqueness, it should get a name of a new scheme. From now on, interstellar objects will get a provisional designation using a *C/* (for comets) or *A/* (for asteroids) prefix, and a permanent designation with the letter *I*. The new object should be referred correctly as: *I1*; *I1/2017 U1*; *I1/Oumuamua*; and *I1/2017 U1 (Oumuamua)* (see WILLIAMS 2017).

2.4. Naming rules of the IAU

As we saw in 2.3., there are special rules for different objects and features, but many suggestions or restrictions apply to all of them (see <https://www.iau.org/public/themes/naming/> and <http://www.minorplanetcenter.net/iau/info/Astrometry.html#nametype>). Some of these rules are listed and commented below.

A) The initial letters of the names of individual astronomical objects should be printed as capitals. Accented characters must be indicated by use of the TeX format.

B) The spelling or the pronunciation of a name should not be very difficult. Though, this rule might be rather subjective as difficulty of spelling or pronunciation can depend on one's mother tongue. As you will see later, there is a relatively large number of Hungarian names that cannot be spelled or pronounced easily by foreigners.

C) Names should not be very long and shall be preferably one word.

D) Names must be non-offensive, so "names of individuals, places or events with military or political connections are prohibited, unless at least one hundred years have passed since the individual died or the event occurred.

E) Names shall not be too similar to an existing name of another astronomical object. This rule may be also rather subjective, because there are name pairs of minor planets such as (11802) *Ivanovski* and (11814) *Ivanovsky*, (114) *Kassandra* and (3298) *Massandra* or (1760) *Sandra* and (11337) *Sandro* (see <http://www.minorplanetcenter.net/iau/lists/MPNames.html>).

F) Names of pet animals are discouraged.

G) Names of a purely or principally commercial nature are not allowed.

3. "Locality": Naming clusters of astronomical features

At this point, let us turn to the local perspective. "Locality" will be used in the astronomical sense, because astronomical objects or features with similar names or names connected to one thematic group can physically be very far away from each other. The following groups of objects or features are good examples of naming clusters.

3.1. Planetary features

As of September 2018, more than 15000 planetary features are named on 46 celestial bodies (see <https://planetarynames.wr.usgs.gov/>): 9139 on the Moon, 2034 on the Venus, 1923 on the Mars, 506 on the Mercury, 269 on Titan, 227 on Io, 202 on Ganymedes, 154 on Callisto, 145 on Rhea, 140 on Ceres, 112 on Europa, 106 on Vesta, 96 on Dione, 86 on Enceladus, 70 on Iapetus, 61 on Triton, 53 on Tethys, 43 on Mimas, 41 on Eros, 37 on Lutetia, 34 on Gaspra, 26 on Ariel, 25-25 on Ida and on Phoebe, 24 on Steins, 23 on Mathilde, 20 on Phobos, 18-18 on Miranda and Titania, 17 on Itokawa, 16 on Pluto (it got its first surface features named in September 2017; see <https://www.iau.org/news/pressreleases/detail/iau1704/>), 13 on Umbriel, 12 on Charon, 10 on Oberon, 5 on Hyperion, 4-4 on Janus and Amalthea, 3 on Puck, 2-2 on Deimos, Dactyl and Epimetheus, and 1-1 on Thebe and Proteus. Furthermore, rings of the giant planets are also named: 3 of Jupiter, 23 of Saturn (including its ring gaps and divisions), 13 of Uranus, and 9 of Neptune (including its ring arcs).



The Working Group for Planetary System Nomenclature set up several categories for naming features on planets and satellites. Names contain a descriptor term (<https://planetarynames.wr.usgs.gov/DescriptorTerms>), *crater* being implicated, and a proper name. To see the variety of approved names, consider some of Mercury's feature names (<https://planetarynames.wr.usgs.gov/Page/Categories>):

- A) Catenae are named after radio telescope facilities (*Arecibo Catena*).
- B) Craters are named after deceased artists, musicians, painters, and authors who have made outstanding or fundamental contributions to their field and have been recognized as art historically significant figures for more than 50 years (*Abedin, Chekhov, Ghiberti, Mofolo, Rameau, Sveinsdóttir, Ts'ai Wen-Chi*, etc.).
- C) Dorsa are named after deceased scientists who have contributed to the study of Mercury (*Antoniadi Dorsum, Schiaparelli Dorsum*).
- D) Fossae are named after significant works of architecture (*Pantheon Fossae*).
- E) Montes: Their names contain the word for "hot" in various languages (*Caloris Montes*).
- F) Planitiae, plana are named after Mercury (either the planet or the god) in various languages (*Catuilla Planum, Sihtu Planitia, Utaridi Planitia*, etc.).
- G) Rupēs are named after ships of discovery or scientific expeditions (*Calypso Rupes, Santa Maria Rupes, Vostok Rupes*, etc.).
- H) Valles are named after abandoned cities (or towns or settlements) of antiquity (*Angkor Vallis, Paestum Vallis, Timgad Vallis*, etc.).

3.2. Craters and satellite craters on the Moon

In the 1830s, Johann Mädler "established the system of naming the larger craters and assigning capital Latin letters to surrounding, smaller 'satellite' craters" (DE JAGER 1973: 205, citing an Interim Report of Dec. 11, 1972). There are e.g. *Kepler A, B, C, D, E, F, P, T* (<https://planetarynames.wr.usgs.gov/Feature/2990>), *Patsaev G, K, Q* (<https://planetarynames.wr.usgs.gov/Feature/4611>) or *Theon Senior A, B, C* (<https://planetarynames.wr.usgs.gov/Feature/5963>) satellite craters.

3.3. Planetary satellites

Satellites of other planets can be connected to their planet not just by gravity, but also by naming clusters: As of September 2018, a total of 190 known planetary satellites (including those of Pluto and Earth) are in the Solar System:



1 of Earth, 2 of Mars, 79 of Jupiter, 62 of Saturn, 27 of Uranus, 14 of Neptune and 5 of Pluto (see <http://home.dtm.ciw.edu/users/sheppard/satellites>). When a newly discovered natural satellite is “reported to the IAU Central Bureau for Astronomical Telegrams, the object is assigned a provisional name, consisting of the letter *S* followed by the year of discovery and a number indicating the order of discovery within that year” (<https://www.iau.org/public/themes/naming/#satellites>). The satellites are numbered by Roman numbers in order of discovery, and when they are confirmed, their discoverer may suggest a final name of a mythological character if possible.

The two Martian satellites are named for the horses that drew the chariot of Mars (see <https://planetarynames.wr.usgs.gov/Page/Planets>).

“The Jovian satellites have previously been named for Zeus/Jupiter’s lovers and favorites but now Zeus’ descendants are also included as an allowable source of names” (<https://www.iau.org/public/themes/naming/#satellites>). Furthermore, names of Jupiter’s “outer satellites with a prograde orbit generally end with the letter »a« (although an »o« ending has been reserved for some unusual cases), and names of satellites with a retrograde orbit end with an »e«” (<https://planetarynames.wr.usgs.gov/Page/Planets#Asteroids>).

“The satellites of Saturn have so far been named for the Greco-Roman Titans, descendants of the Titans, Giants and the Roman god of the beginning. In order to internationalize the names, we now also allow names of giants and monsters in other mythologies (so far Gallic, Inuit and Norse)” (<https://www.iau.org/public/themes/naming/#satellites>).

Satellites of Uranus are named for characters from Shakespeare’s plays and from Pope’s “Rape of the Lock”, those of Neptune for characters from Greek or Roman mythology associated with Neptune/Poseidon or the oceans. Its irregular satellites are named for the Nereids and the attendants of Neptune.

Pluto’s satellites are named for characters and creatures in the myths surrounding Hades/Pluto and the classical Greek and Roman Underworld (see <https://planetarynames.wr.usgs.gov/Page/Planets>).

Some examples of planetary satellite names are: *I Phobos*, *II Deimos* – moons of Mars; *VI Himalia*, *XIII Leda*, *XVIII Themisto (S/2000 J1)*, *XXIV Iocaste (S/2000 J3)*, *XXXVII Kale (S/2001 J8)* – moons of Jupiter; *VI Titan*, *XLV Kari (S/2006 S2)*, *LII Tarqeq (S/2007 S1)* – moons of Saturn; *II Umbriel*, *XI Juliet (S/1986 U2)*, *XV Puck (S/1985 U1)* – moons of Uranus; *I Triton*, *IV Thalassa (S/1989 N5)*, *XI Sao (S/2002 N2)* – moons of Neptune; *IV Kerberos (S/2011 P1)*, *V Styx (S/2012 P1)* – moons of Pluto.

3.4. Groups of constellations

Constellations can be ordered into thematic or mythological groups. One possible classification is that of Donald Menzel, the so called Menzel's Families (MENZEL 1964). He arranged eight groups, as follows:

The Ursa Major Family: *Ursa Major* (the Great Bear), *Ursa Minor* (the Little Bear), *Draco* (the Dragon), *Canes Venatici* (the Hunting Dogs), *Boötes*⁴ (the Bear Driver, sometimes called the Herdsman), *Coma Berenices* (Berenice's Hair), *Corona Borealis* (the Northern Crown), *Camelopardalis* (the Giraffe), *Lynx* (the Lynx), *Leo Minor* (the Smaller Lion).

The Zodiacal Family: *Leo* (the Lion), *Virgo* (the Virgin), *Libra* (the Scales), *Scorpius* (the Scorpion), *Sagittarius* (the Archer), *Capricornus* (the Sea Goat), *Aquarius* (the Water Carrier), *Pisces* (the Fish), *Aries* (the Ram), *Taurus* (the Bull), *Gemini* (the Twins), *Cancer* (the Crab).

The Perseus Family: *Cassiopeia*, *Cepheus*, *Andromeda*, *Perseus*, *Pegasus*, *Cetus* (the Whale or Sea Monster), *Auriga* (the Charioteer), *Lacerta* (the Lizard), *Triangulum* (the Triangle).

The Hercules Family: *Hercules*, *Sagitta* (the Arrow), *Aquila* (the Eagle), *Lyra* (the Lyre), *Cygnus* (the Swan), *Vulpecula* (the Fox), *Hydra* (the Sea Serpent), *Sextans* (the Sextant), *Crater* (the Cup [of Bacchus]), *Corvus* (the Crow), *Ophiuchus* (the Serpent Holder), *Serpens* (the Serpent), *Scutum* (the Shield), *Centaurus* (the Centaur), *Lupus* (the Wolf), *Corona Australis* (the Southern Crown), *Ara* (the Altar), *Triangulum Australe* (the Southern Crown), *Crux* (the Southern Cross).

The Orion Family: *Orion*, *Canis Major* (the Larger Dog), *Canis Minor* (the Smaller Dog), *Monoceros* (the Unicorn), *Lepus* (the Hare).

The Heavenly Waters: *Delphinus* (the Dolphin), *Equuleus* (the Little Horse, interpreted by Menzel as a small sea horse), *Eridanus* (the River), *Piscis Austrinus* (the Southern Fish), *Carina* (the Keel), *Puppis* (the Stern), *Vela* (the Sail), *Pyxis* (the Mariner's Compass), *Columba* (the Dove).

The Bayer Group: *Hydrus* (the Water Snake), *Dorado* (the Goldfish), *Volans* (the Flying Fish), *Apus* (the Bird of Paradise), *Pavo* (the Peacock), *Grus*⁵ (the Crane), *Phoenix*, *Tucana* (the Toucan), *Indus* (the Indian), *Chamaeleon* (the Chameleon), *Musca* (the Fly).

The La Caille Family: *Norma* (*et Regula*; the Level [and Ruler]), *Circinus* (the Compasses), *Telescopium* (the Telescope), *Microscopium* (the Microscope),

⁴ Written as *Bootes* in the original.

⁵ Written as *Crus* in the original.

Sculptor (the Sculptor's Apparatus), *Fornax* (the Furnace), *Caelum* (the Graving Tool), *Horologium* (the Clock), *Octans* (the Octant), *Mensa* (Table Mountain at Capetown), *Reticulum* (the Net), *Pictor* (the Easel), *Antlia* (the Air Pump).

3.5. Trojan asteroids

Trojan asteroids are minor planets with the same orbit as Jupiter. They “are to receive names associated with the Trojan War. Objects at the preceding L4 point are named for Greeks, objects at the trailing L5 point are named for Trojans” (<http://www.minorplanetcenter.net/iau/info/HowNamed.html>). According to the Minor Planet Center, there are 6703 Jupiter Trojans (stand: 6th November 2017). Some examples are: (588) *Achilles*, (911) *Agamemnon*, (1143) *Odysseus*, (5264) *Telephus* – Greek camp; (617) *Patroclus*, (884) *Priamus*, (1172) *Aeneas*, (6998) *Tithonus* – Trojan camp (see <https://www.minorplanetcenter.net/iau/lists/Trojans.html>).

3.6. Meteor showers

The IAU Meteor Data Center (MDC) is responsible for the designations of meteor showers, collaborating with the Working Group on Meteor Shower Nomenclature of IAU Commission F1 (Meteors, Meteorites, and Interplanetary Dust). As of 10th September 2018, 112 established meteor showers are listed by the MDC (https://www.ta3.sk/IAUC22DB/MDC2007/Roje/roje_lista.php?corobic_roje=1&sort_roje=0). In general, a meteor shower is named after the possessive Latin form of the constellation containing the nearest star to the radiant point (*Geminids*, *Orionids*, *Piscis Austrinids*, etc.). If needed, the name also contains the name of the nearest (if in doubt, the brightest) star in the constellation (e.g. *kappa Cygnids*, *h Virginids*, *49 Andromedids*), or the name of the month can be added to distinguish among showers from the same constellation (*April Lyrids*, *October Camelopardalids*, *January xi Ursae Majorids*, etc.). For restrictions, exceptions and other suggestions see: https://www.ta3.sk/IAUC22DB/MDC2007/Dokumenty/shower_nomenclature.php.

3.7. Exoplanet names

Basically, exoplanet names are also based on distant star names: “The scientific nomenclature for the designations of exoplanets usually consists of two elements: 1) a proper noun or abbreviation, sometimes with associated numbers 2) followed by a lowercase letter” (https://www.iau.org/public/themes/naming_exoplanets/). The first planet discovered in a system is designated with “b” (the host star is considered to be “a”), the second one with “c”, and later planets are given subsequent letters. The order of the lower case letters sign the order of discovery of the exoplanets, not their distance from the host



star (see https://www.iau.org/public/themes/naming_exoplanets). As of 14th November 2017, there are 3706 known exoplanets in 2776 planetary systems (621 multiple planet systems). Exoplanet *PSR B1957+20 b* was the first ever discovered exoplanet around star *PSR B1957+20*. Further examples are: *Ross 128 b*, *11/2017 UI*, *K2-137 b*, *EPIC 246393474 b* or *GJ 9827 d*, just to mention the most recent discoveries (see <http://exoplanet.eu/catalog/>).

Recently, the names of 19 ExoWorlds (14 stars and 31 exoplanets orbiting them) have been chosen by public vote in the NameExoWorlds contest, and accepted by the IAU. This was the first time it has been made possible for non-astronomers to name exoplanets, and their stars. “The public voted on the 247 proposed ExoWorld names submitted by a wide variety of astronomy organisations from 45 countries all over the world” (<https://www.iau.org/news/pressreleases/detail/iau1514/>). As a result of the contest, for example, *mu Arae* and its planets are officially named as *Cervantes*, *Quijote*, *Dulcinea*, *Rocinante* and *Sancho*.

3.8. A special case: Names given by one discoverer

Lastly, names given by one discoverer could be interpreted as a special case of “locality”. Take, for example, the most successful Hungarian minor planet hunter Krisztián Sárneczky. As of 10th September 2018, he is credited by the *Minor Planet Center* with the discovery of 208 and co-discovery of 163 numbered minor planets (<http://www.minorplanetcenter.net/iau/lists/MPDiscsNum.html>). He suggested names from the following thematic groups (see the last pages of the monthly *Minor Planet Circular [MPC]* at https://www.minorplanetcenter.net/iau/ECS/MPCArchive/MPCArchive_TBL.html):

- a) place names from the present or the former Hungary, e.g. (23718) *Horgos*, (82071) *Debrecen*, (111468) *Alba Regia*, (137066) *Gellért-hegy*;
- b) names of Hungarian observatories (a subcategory of the previous group), e.g. (37432) *Piszkéstető*, (86196) *Specula*, (117714) *Kiskartal*;
- c) names of Hungarian scientists, engineers, architects, explorers, etc., e.g. (38442) *Szilárd*, (126245) *Kandókálmán*, (163819) *Teleki*, (166886) *Ybl*, (250526) *Steinerzsuzsanna*;
- d) names of Hungarian astronomers (a subcategory of the previous group), e.g. (31872) *Terkán*, (113202) *Kisslászló*, (265490) *Szabados*;
- e) names of Hungarian artists, poets, writers, etc., e.g. (39971) *József*, (147421) *Gárdonyi*, (254846) *Csontváry*;

- f) names of (female) family members of his own or of his friends/co-discoverers: e.g. (44479) *Oláheszter*, (178156) *Borbála*, (266622) *Málna*, (269232) *Tahin*;
- g) names of deceased Hungarian politicians, e.g. (68114) *Deákferenc*, (91024) *Széchenyi*, (260601) *Wesselényi*;
- h) names of Hungarian athletes, e.g. (82656) *Puskás*, (151659) *Egerszegi*, (199687) *Erősszolt*;
- i) names of Hungarian animals or mythical creatures: e.g. (84921) *Morkoláb*, (161975) *Kincsem*;
- j) names of foreign astronomers, e.g. (171429) *Hunstead*, (231470) *Bedding*, (320260) *Bertout*;
- k) names of Hungarian actors/actresses, e.g. (180824) *Kabos*, (233893) *Honthyhanna*, (274810) *Fedáksári*;
- l) names of other famous Hungarian personalities, e.g. (209054) *Lombkató*, (235201) *Lorántffy*, (240757) *Farkasberci*, (253412) *Ráskaylea*.

4. Final notes

In this paper, I have attempted to show the variety of types of astronomical names and how one type can be linked to others, building naming clusters. But talking about astronomical names, one shall not forget that there are special scientific designations as well. “The IAU is keen to make a distinction between these two terms. In IAU publications, *name* refers to the (usually colloquial) term used for a star in everyday speech, while *designation* is solely alphanumeric and used almost exclusively in official catalogues and for professional astronomy” (https://www.iau.org/public/themes/naming_stars). Furthermore, a public name will not replace the scientific designation, but it may be used internationally along with, or instead of, the scientific designation, permanently and without restrictions (see https://www.iau.org/public/themes/naming_exoplanets/).

References

- Astronomy for the public*. Pages of the International Astronomical Union (IAU) at: <https://www.iau.org/public/themes/>. (Retrieved: 10.09.2018.)
- Catalogues and files available at CDS*. Main page: <http://cdsarc.u-strasbg.fr/cats/cats.html>. (Retrieved: 10.09.2018.)
- DE JAGER, CORNELIS 1973. *Reports on Astronomy*. Transactions of the International Astronomical Union. Volume XVA. D. Reidel Publishing Company. Boston, Dordrecht.



- The Extrasolar Planets Encyclopaedia*. Main page: <http://exoplanet.eu>. (Retrieved: 10.09.2018.)
- Gazetteer of Planetary Nomenclature*. Main page: <https://planetarynames.wr.usgs.gov>. (Retrieved: 10.09.2018.)
- KOZMA, JUDIT 2013. *Tulajdonnevek helyesírása a csillagászati és az űrtani szaknyelvben*. [Orthography of Proper Names in Astronomical and Space Research Terminology.] Doctoral thesis. Eötvös Loránd University. Budapest. Manuscript.
URL: <http://doktori.btk.elte.hu/lingv/kozmajudit/diss.pdf>. (Retrieved: 10.09.2018.)
- LORTET, MARIE-CLAIRE et al. 1994. *Second Reference Dictionary of the Nomenclature of Celestial Objects*. *Observatoire Astronomique de Strasbourg*. Regularly updated electronic look-up version: <http://vizier.u-strasbg.fr/viz-bin/Dic>. (Retrieved: 10.09.2018.)
- MAMAJEK, ERIC 2017. *Kinematics of the interstellar vagabond II/Oumuamua (A/2017 U1)*. Research Notes of the AAS.
URL: <http://iopscience.iop.org/article/10.3847/2515-5172/aa9bdc>. (Retrieved: 10.09.2018.)
- MENZEL, DONALD 1973. *A Field Guide to the Stars and Planets*. London, Collins.
URL: <http://www.arvindguptatoys.com/arvindgupta/menzel-fieldguide.pdf>. (Retrieved: 10.09.2018.)
- MIZSER, ATTILA 2002. *Amatőr csillagászok kézikönyve*. [Amateur Astronomers' Handbook.] Budapest, Magyar Csillagászati Egyesület.
- Pages of the Minor Planet Center (MPC) of the International Astronomical Union*. Main page: <https://minorplanetcenter.net>. (Retrieved: 10.09.2018.)
- PAPP-VÁRY, ÁRPÁD 2007. *Térképtudomány. A pálcikatérképtől az űrtérképig*. [Map Science. From Stick Charts to Space Maps.] Budapest, Kossuth Kiadó.
- RIDPATH, IAN 1988. *Star Tales*. Cambridge, Lutterworth Press.
URL: <http://www.ianridpath.com/startales/contents.htm>. (Retrieved: 10.09.2018.)
- SCHMITZ, MARION et al. 2008. *Specifications concerning designations of astronomical radiation sources outside the solar system*.
URL: <http://cdsweb.u-strasbg.fr/Dic/iau-spec.html#S1>. (Retrieved: 10.09.2018.)
- SCHNEIDER, JEAN 2017. *Is II/2017 U1 really of interstellar origin?*
URL: <http://iopscience.iop.org/article/10.3847/2515-5172/aa9af2>. (Retrieved: 10.09.2018.)
- VAN HELDEN, ALBERT 1994. Naming the Satellites of Jupiter and Saturn. *The Newsletter of the Historical Astronomy Division of the American Astronomical Society* 32: 1–2.



URL: <https://web.archive.org/web/20120314073252/http://had.aas.org/hadnews/HADN32.pdf>. Retrieved: 10.09.2018)

WILLIAMS, GARETH V. 2017. *MPEC 2017-V17: New designation scheme for interstellar objects*.

URL: <https://www.minorplanetcenter.net/mpec/K17/K17V17.html>. (Retrieved: 10.09.2018.)

Abstract

This paper focuses on a field that is onomastically rather unexplored yet: astronomical names. Firstly, an overview of the astronomical names is given from a “global perspective”. The most important astronomical objects are listed according to the International Astronomical Union (IAU). Their naming conventions in past and present times are presented, including some of the naming rules of the IAU. In the second half of the paper, we will turn to the “locality” (in astronomical terms), and some examples will be mentioned, how already existing names impact newer ones. Examples for naming clusters of planetary features, craters and satellite craters of the Moon, planetary satellites, groups of constellations, Trojan asteroids and exoplanets are given. Finally, a special case will be discussed in more detail: minor planet names given by one discoverer, the Hungarian astronomer Krisztián Sárneczky.

Keywords: astronomical objects, designation systems, International Astronomical Union, naming clusters