# The Effect of Modern Sky Chart Software on Star Names


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**Abstract** New star names recently have been introduced in modern astronomy mobile applications, and in this paper we collect names that have appeared in the last 10 years in ten different applications. We search for the origins of these names, and find that some belong to Arabic, English, Latin, Chinese, Indian, Spanish, Italian, Greek, Roman and Turkish cultures, but many are of unknown origin. In this paper, we examine ten different astronomical software packages, and collect all new star names that have been entered on these since 2005. We then assemble a list of star names, and (where possible) include information on their language of origin and the associated software. We end this paper by trying to answer the question: "Who invented these new names?"

## 1 Introduction

According to Paul Kunitzsch; a German expert in star names and their origins, known star charts are thought to have been transferred to Greece by the Babylonians and Sumerians. Ptolemy wrote his *Almagest* around AD 150, which was then translated into Arabic many times (e.g. see Dalee, 2008).

Many scholars, including Al-Biruni, Ibn Al-Ajdabi and Al-Qazwini, made celestial spheres and sky charts and added stars names taken from the *Almagest*, but Abdul-Rahman al-Sufi (AD 903–986), found Arabic sky charts in disarray, so he decided to assemble *The Book of the Fixed Stars* or *Sowar Al-Kawakib* والأربعين الثمانية الكواكب صور (see Hafez et al., 2011), where he redrew Ptolemy's 48 star charts (e.g. see Fig. 1), and also mentioned the Arabic names of the stars, many of which (Betelgeuse, Rigel, Aldebaran Fomalhaut, etc.) are still used in modern star charts (Hafez et al., 2015b). Al-Sufi assigned an Arabic name to the brightest star in each constellation (Table 1), and he devised a new three-step magnitude system to record the brightness of each star (see Hafez et al., 2015a).

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**Fig. 1** Al-Sufi's depiction of the constellation of Scorpius (The Scorpion) as seen in the sky

Monitoring earlier sky charts allows us to see that many changes have occurred in star names over time, even though these are supposed to be sacrosanct.

In their book *A Dictionary of Modern Star Names*, Kunitzsch and Smart (2011), identified 250 named stars in sky charts and they then traced the origins of these names. In Table 2 we include some of the non-Arabic star names they mention.

Meanwhile, in *Star Names—Their Lore and Meaning*, Allen (1961) has collected names from many different civilizations, so the total number of the stars listed is triple of that mentioned by Kunitzsch and Smart.

After the twelfth century, translation of Arabic works by Latin writers and scholars (often based in Andalusia and Spain) accelerated. However, many of scholars were not familiar with Arabic and other languages, which led to errors in the names they assigned to different stars. We still face this problem today, where some modern sky charts list incorrect star names (see Fig. 2). Here are some examples: Yed Al-Jawzaa = Betelguese (α Ori), Tarazu = Tarazed (γ Aql), Yildiz = Yildum (δ UMi) and Alredif = Arided (α Cyg).

Before the appearance of modern computers and touchscreen astronomical software on cell phones, star naming was more-or-less controlled. But any interested person could quickly notice that new names were continuously appearing, and that these derived from many different languages. We, therefore, ask: How could many of these new names appear without the recognition of the International Astronomical Union?

**Table1** A list of the forty-two constellations where the first star (α) in each has an Arabic name

| # | Constellation | Star Name | Arabic name |
|---|---|---|---|
| 1 | α And | Sirrah/Alpheratz | سرة/ الفرس |
| 2 | α Aqr | Sadalmelik | سعد الملك |
| 3 | α Aql | Altair | النسر الطائر |
| 4 | α Ari | Hamal | الحمل |
| 5 | α Can | Acubens/Sertan | الزبانى/ الشرطان |
| 6 | α Car | Suhel/Tureis | سهيل/ تريس |
| 7 | α Cas | Schedir/Shedar | الصدر |
| 8 | α Cen | Rigil Kentaurus/Toliman | رجل قنطورس/ الظلمان |
| 9 | α Cep | Alderamin | مقدم الذراعين/ الذراع اليمين |
| 10 | α Cet | Menkar | منقار |
| 11 | α Col | Phact/Pheat | الفخيتة |
| 12 | α CrB | Alphecca/Alphekka | الفكة |
| 13 | α Crv | Alchiba/Alkiba | الخباء |
| 14 | α Crt | Alkes | الكأس |
| 15 | α Cyg | Deneb/Arided | ذنب/ الردف |
| 16 | α Del | Al Deneb Al Dulfim/Deneb/Thuban/ Adib | ذنب الدلفين/ ذنب/ الثعبان/ الذيب |
| 17 | α Dra | Thuban | الثعبان |
| 18 | α Equ | Kitalpha | قطعة الفرس |
| 19 | α Eri | Achernar | آخر النهر |
| 20 | α Gru | Alnair | النير |
| 21 | α Her | Ras Algethi | رأس الجاثي |
| 22 | α Hya | Alphard | الفرد |
| 23 | α Lep | Arneb | الأرنب |
| 24 | α Lib | Zubenel Genubi | الزباني الجنوبي |
| 25 | α Lyr | Vega | النسر الواقع |
| 26 | α Oph | Ras lhague | رأس الحواء |
| 27 | α Ori | Betelgeuse | يد الجوزاء |
| 28 | α Peg | Markab | المركب |
| 29 | α Per | Mirphak/Algenib | المرفق/ الجنب |
| 30 | α Pho | Ankaa/Nair Alzaurak | العنقاء/ نير الزورق |
| 31 | α Psc | Alreacha/Okda/Kaitain | الفكة/ العقدة/ الخيطين |
| 32 | α PscA | Fomalhaut | فم الحوت |
| 33 | α Pup | Tureis | التريس |
| 34 | α Sge | Sham/Alsahm | السهم |
| 35 | α Sgr | Rukbat/Alrami | الركبة/ الرامي |
| 36 | α Ser | Unuk Alhai | عنق الحية |
| 37 | α Tri | Muthallah/Ras al Muthallah | المثلث/ رأس المثلث |
| 38 | α Tau | Aldebaran | الدبران |
| 39 | α UMa | Dubhe | الدب |
| 40 | α UMi | Alruccabah | الركبة |
| 41 | α Vir | Azimech | السماك |
| 42 | α Vul | Anser | النسر |

**Table 2** Some Latin and Greek star names, and star names from other civilizations

| Stars of Latin and Greek origin | | | |
|---|---|---|---|
| Alkalurops | μ Boo | Muscida | o UMa |
| Ancha | θ Aqu | Polaris | α UMi |
| Antares | α Sco | Pollux | β Gem |
| Arcturus | α Boo | Porrima | γ Vir |
| Asellus Australis | δ Can | Procyon | α CMi |
| Asellus Borealis | γ Can | Propus | μ Gem |
| Bellatrix | γ Ori | Pulcherrima | ε Boo |
| Canopus | α Car | Regulus | α Leo |
| Capella | α Aur | Rotanev | β Del |
| Castor | α Gem | Seginus | γ Boo |
| Cujam | ω Her | Shualocin | α Del |
| Gemma/Alphecca | α CrB | Sirius | α CMa |
| Graffias | β Sco | Spica | α Vir |
| Grumium/Juza | ξ Dra | Syrma | ι Vir |
| Kornephoros/Retilius | β Her | Vindemiatrix | ε Vir |
| Stars of Chinese origin | | | |
| Choo or Tchou | α Ara | Raz/Tso Hea | β Crv |
| Tsih or Cih | γ Cas | Han | ζ Oph |
| Ma Wei | δ Cen | | |
| Stars of Persian origin | | | |
| Alshain | β Aql | Tarazed | γ Aql |
| Giausar | λ Dra | | |
| Stars of Turkish origin | | | |
| Yildum | δ UMi | | |
| Stars of Sumerian origin | | | |
| Sargas | δ UMi | Girtab | θ Sco |

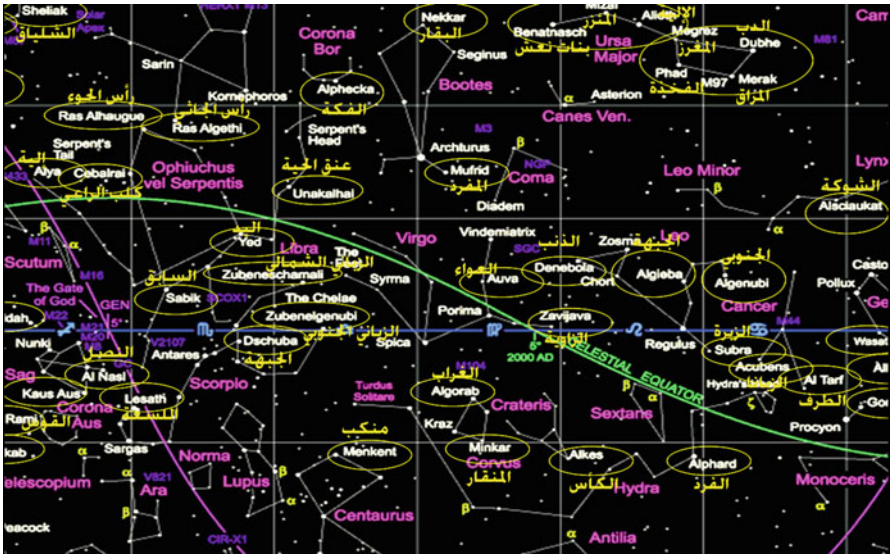


**Fig. 2** New star names assigned between the twelfth century and the present day

Have these new names had an effect on star charts, and what were the sources of these names? We believe that Allen's book (1961) has had the greatest impact on these changes because of its lists of stars written in English.

## 2 A Research Problem

Since modern astronomical software applications include new star names that previously were unknown to astronomers, we need to research the origins of these names and why they have been added, compare the names with those recognized by the International Astronomical Union (IAU), and count the final number of new names. In 2016, the IAU formed a Working Group on Star Names, specifically to catalogue and standardize approved names for stars, and their work is on-going.[1]

### *2.1 Hypothesis*

Our previous knowledge of star names and their origins will help greatly in solving a large part of how the new star names were added.

### *2.2 Rationale*

More than 140 new star names were found in different mobile phone astronomical applications, and it is very important that amateur astronomers (at very least) are not confused when using different sky charts, even though more than 80% of the stars appearing recently are dim, with magnitudes fainter than +4.

### *2.3 Objectives*

Our main goal is to find out the sources of new star names, and make these results available to professional and amateur astronomers.

[1]The IAU WG lists these new stars on the following web site: http://www.pas.rochester.edu/~emamajek/WGSN/IAU-CSN.txt

## 2.4 Methodology

We surveyed ten selected astronomy-sky chart applications noted for their fame and popularity, and found that only four of them included significant numbers of new star names. The six remaining applications contained relatively few star names. Some only mentioned the basic and very popular star names, while others merely repeated or copied the first four applications.

We downloaded all ten applications, then surveyed them one-by-one, searching for new star names. Upon encountering a new star name we screen-shot it in order to retain relevant details of the star. This procedure was followed for many new stars that we studied.

We then used Wikipedia and Allen's book to search for the meanings of the names attached to the stars. We found that many of them have been derived from ancient mythologies, but many others had no known meanings. Because of my own background, I was able to easily recognize stars of Arabic origin. In addition, I contacted a number professional astronomers of different nationalities, and they were able to report the meanings of a few star names of Indian and Chinese origin.

## 2.5 Research Results

Ten software programs (Fig. 3) were adopted for this study. Four of them (Sky Guide, Stellarium, Sky Portal and Sky Chart) included new star names, while the other six (Sky Rover, Sky View, Stars, Star Tracker, Starlight and Star Walk) simply copied the names of the most famous stars. All new star names repeated in more than one application were only mentioned once.

Details of these various astronomical applications are presented individually below.

### 2.5.1 Stellarium

In Stellarium we found 40 new star names: 11 Arabic, 19 Latin, 2 Chinese, 1 Babylonian, 1 English, 1 German, 1 Greek, 1 Indian, 1 Italian and 2 of unknown origin (see Table 3).

One of the new names is Miram for η Persei (see Fig. 4a). This appears to be an incorrect copy of the name Misam (Arabic = the arm), which was assigned to κ Persei and is shown in the book *Fixed Stars and Constellations in Astrology* (Robson, 1923; see Fig. 4b).

But the strangest new Arabic-like name is Al'dzhabkhakh for μ Leo (Fig. 4c). This name is composed of an Arabic prefix, Al'dzhab, and the suffix khakh, which has no meaning whatsoever.

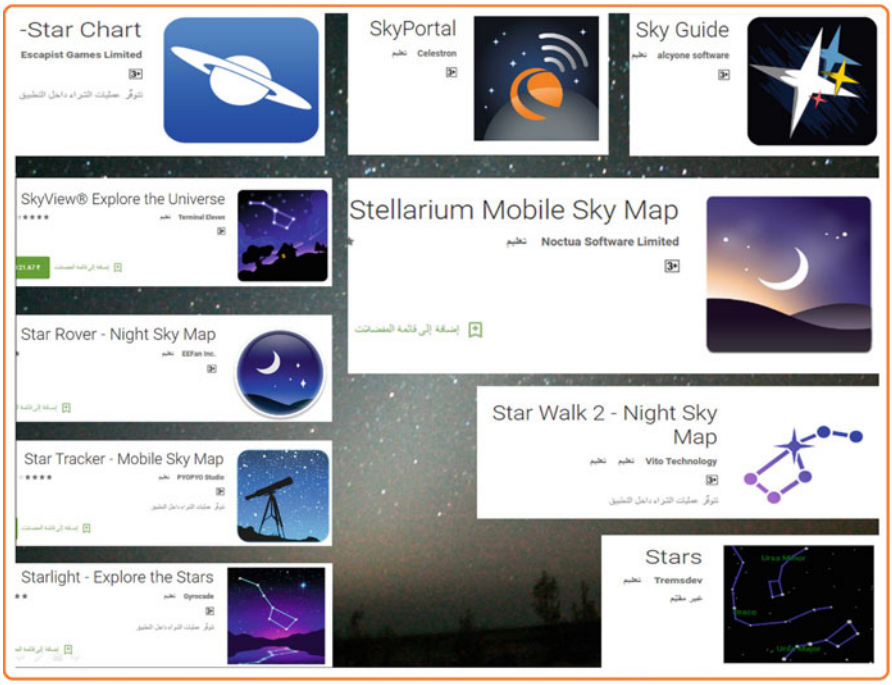


**Fig. 3** The software programs used in this study

There were only two new stars that were found in Stellarium and on the IAU list; Miaplacidus (β Car) and Tegmine (ζ1 Cnc).

### 2.5.2 Sky Guide

In Sky Guide we found 10 new star names: 6 Arabic, 3 Latin and 1 unknown (see Table 4).

Al Minliar (miswritten from Minkhar) al Asad (Arabic = the nose of the Lion) is a name that seems to be given to different stars in the sky by different applications, and it is now the star κ Leo. Arabic mythology says that the Lion has a nose represented by what is now known as the Beehive open cluster in Cancer (Fig. 5, left).

Miaplacidus (β Car) is found in the list of IAU star names.

Terebellum, a Latin word meaning borer or auger, is the name given to two adjacent stars (see Fig. 5, right).

**Table 3** Stars found in Stellarium

| No | Star name | Bayer designation | Magn | Origin & Meaning |
|---|---|---|---|---|
| 1 | Achird | η Cas | 3.5 | German/? The back of the camel ظهر الناقة |
| 2 | Al'dzhabkhakh | μ Leo | 3.45 | Arabic/? μ Leo (Ras Elased Borealis) |
| 3 | Aldhibah | ζ Dra | 3.1 | Arabic/The plural of Hyena |
| 4 | Alphekka (Alfecca) Meridiana | α CrA | 4.1 | Arabic-Latin/The central jaw (CrA) |
| 5 | Armus | η Cap | 5 | Latin/Alien life |
| 6 | Asellus Primus | θ Boo | 4 | Latin/The first donkey |
| 7 | Asmidiske | ξ Pup | 3.3 | Arabic/Azemich --Spica |
| 8 | Brachium | σ Lib | 3.25 | Latin/The forearm (of the balance) |
| 9 | Castra/Kastra | ε Cap | 4.5 | Latin/A building, or a plot of land (single = Castrum) |
| 10 | Cleeia (Kleeia) | δ3 Tau | 4.3 | Greek/One of the Hyades |
| 11 | Deneb Dulfim | ε Del | 4 | Arabic/The tail of the dolphin |
| 12 | Gorgonea Quatra | ω Per | 4.6 | Latin/The fourth Gorgon -- a female creature |
| 13 | Gorgonea Secunda | π Per | 4.7 | Latin/The second Gorgon -- a female creature |
| 14 | Gorgonea Tertia | ρ Per | 3.3 | Latin/The third Gorgon -- a female creature |
| 15 | Haedus 1 | ζ Aur | 3.65 | Latin/The first kid |
| 16 | Haedus 2/Haedi | η Aur | 3.7 | Latin/The second kid |
| 17 | Hatsya | ι Ori – 44 Ori | 2.75 | Latin/? |
| 18 | Hyadum 1 | γ Tau | 3.75 | Latin/The first of the Hyades |
| 19 | Hyadum 2 | δ1 Tau | 3.65 | Latin/The second of the Hyades |
| 20 | Hydrobius | ζ Hya | 3.1 | Latin/Hydrobius -- some kind of insects |
| 21 | Kraz/Raz | β Crv | 2.65 | Arabic/The sack الخرج |
| 22 | Kullat Nunu | η Psc | 3.8 | Babylonian/The cord that connects the fishes |
| 23 | Labr | δ Crt | 3.55 | ? |
| 24 | Lucida, Lukida (Anser) | α Vul | 4.4 | Italian/A light-weight goose |
| 25 | Marsik | κ Her | 5 | Arabic/The forearm |
| 26 | Merga (Maraa) | 38 Boo | 5.75 | Arabic/The woman |
| 27 | Miaplacidus | β Car | 1.65 | Latin/The keel of the ship *Argo* |
| 28 | Minchir | σ Hya | 4.45 | Arabic/The nose |
| 29 | Miram/Misam | η Per | 3.8 | Arabic/The wrist |
| 30 | Nembus | 51 And | 3.5 | ? |
| 31 | Peannae Caudalis | π2 Cyg | 4.4 | Latin-Indian/The tail of Peannae Nee Arivai' |
| 32 | Praecipua | 46 LMi | 3.75 | Latin/To give an order |
| 33 | Printseps | δ Boo | 3.45 | English |
| 34 | Ruby Star | 119 Tau | 4.3 | English |

(continued)

**Table 3** (continued)

| No | Star name | Bayer designation | Magn | Origin & Meaning |
|---|---|---|---|---|
| 35 | Rukh | δ Cyg | 2.9 | Arabic/A huge legendary bird |
| 36 | Sarin | δ Her | 3.1 | Latin/? Toxic gas |
| 37 | Sinistra | ν Oph | 3.3 | Italian/The left |
| 38 | Tegmine/Tegmen | ζ1 Cnc | 4.67 | Latin/The shell (of the crab) |
| 39 | Torcularis Septentrionalis | o Psc | 4.3 | Latin/North press |
| 40 | Tseen Kee | φ Vel | 3.5 | Chinese/天紀 'Heavenly order' |

### 2.5.3 Celestron Sky Portal

In Celestron Sky Portal we found 75 new star names: 31 Arabic, 16 Latin, 10 Greek, 4 English, 2 Italian, 1 Albanian, 1 Egyptian, 1 French, 1 Indian, 1 Persian, 1 Spanish, 1 Thai and 5 unknown names (Table 5).

Some star names were derived mainly from recognizable words. ζ Cancri bore the traditional name Tegmine (Tegmen, 'the shell (of the crab)'—see Fig. 6) and the IAU Working Group on Star Names approved the name Tegmine for ζ Cancri A on 12 September 2016.

Musica (18 Del), Libertas (ξ Aql), and Titawin (ε Cas) are three names that also are found on the IAU list.

### 2.5.4 Star Chart

In Star Chart we found 21 new star names: 7 Arabic, 5 Latin, 1 Chinese, 1 Indian and 7 of unknown origin (Table 6).

One of the most interesting is the Indian star name Bharani which means Aries, the Ram (see Fig. 7 left).

Many star names in Star Chart are completely new (e.g. Sadira, Bunda, Sinistra, Kastra, Jih, Kijam and Neshmel), but not all of their meanings are clear (see Fig. 7 right). None of the names in Table 6 was found on the IAU list.

## 3 Recommendations

We all should recognize the IAU resolutions and accept the IAU's list of star names. It is not our right to add or omit specific names, and more collaboration is needed between researchers from different cultures and languages in order to further this important topic.

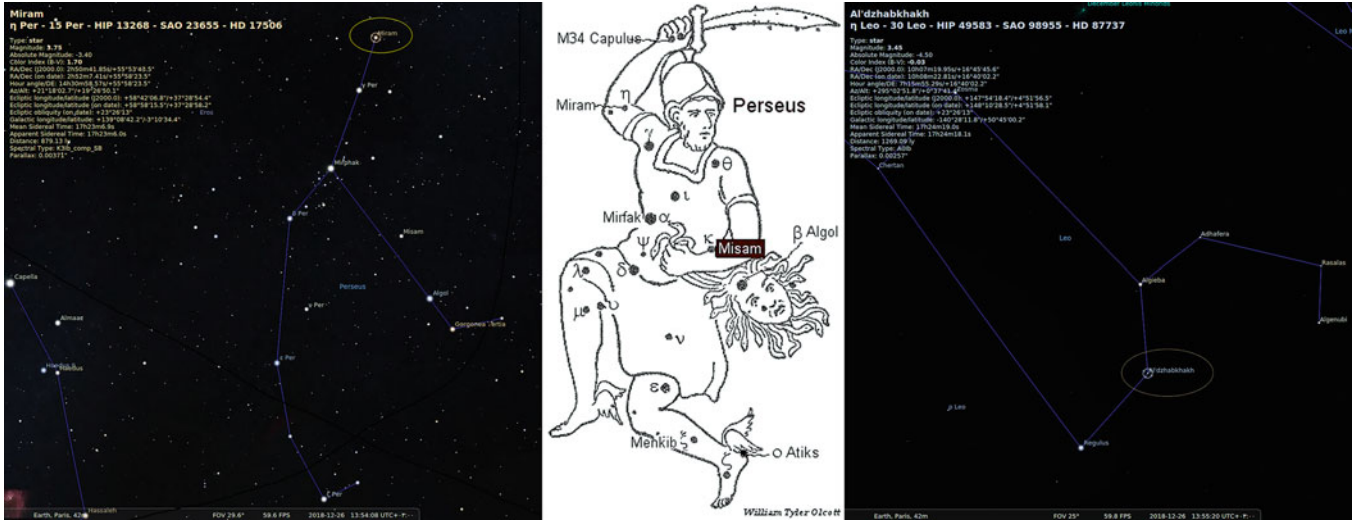


**Fig. 4** Miram (left and centre) and Al'dzhabkhakh (right) are two examples of new star names in Stellarium. Miram is believed to have been adopted from the book *Fixed Stars and Constellations in Astrology* (Robson, 1923)

**Table 4** Stars found in Sky Guide

| No | Star name | Bayer designation | Magn | Origin & Meaning |
|---|---|---|---|---|
| 1 | Al Minliar al Asad | κ Leo | 4.3 | Arabic/The nose of the lion, Alminhar Alasad |
| 2 | Ain al Rami | ν1 Sgr | 5 | Arabic/The eye of Sagittarius |
| 3 | Anser | α Vul | 4.44 | Arabic/The eagle |
| 4 | Menchir | δ Hya/σ Hya | 4.5 | Arabic/The nose |
| 5 | Miaplacidus | β Car | 1.67 | Latin/Miaplacidus is apparently a bilingual combination of the Arabic مياه miyāh for 'waters' and Latin placidus for 'placid' |
| 6 | Nodus Secundus | δ Dra | 3.1 | Latin/The second node |
| 7 | Ras al Muthallah | α Tri | 3.42 | Arabic/The vertex of the triangle |
| 8 | Rigil al Awwa | μ Vir | 3.9 | Arabic/The leg of Al-Awwa |
| 9 | Opic | SAO 24615 | 6.2 | ? |
| 10 | Terebellum | 59 Sgr | 4.53 | Latin/A borer or auger; in English, a genus of sea snails |

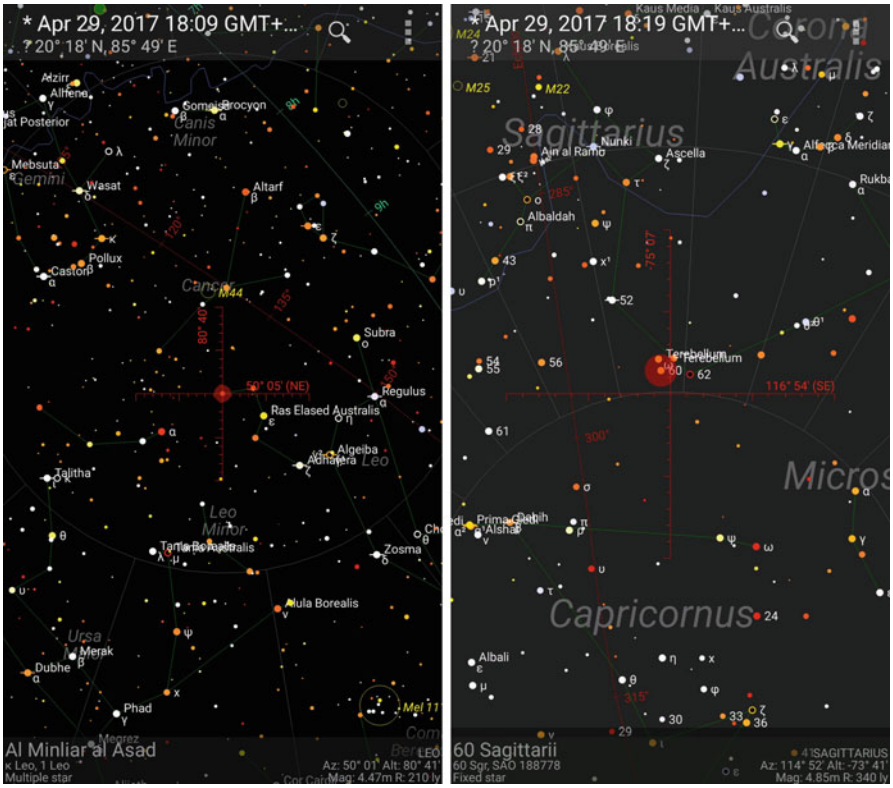


**Fig. 5** Al Minliar al Asad (left) and Treballum (right), two examples of new star names in Star Guide

**Table 5** Stars found in Celestron Sky Portal

| No. | Star name | Beyer designation | Magn | Origin & Meaning |
|---|---|---|---|---|
| 1 | Alherem | μ Vel | 2.7 | Arabic/The cover الحرام |
| 2 | Peregrini | | | Latin/The stranger |
| 3 | Adid Australis | ε Per | 2.9 | Arabic/عضد الثري The southern humerus |
| 4 | Adid Borealis | δ Per | 3 | Arabic/The northern humerus |
| 5 | Ahadi | π Pup | 2.7 | Arabic/One of أحد الـ |
| 6 | Al dhanab | γ Gru | 3.0 | Arabic/The tail |
| 7 | Ras Alkurki | | | Arabic/The head of the Crane (a bird) |
| 8 | Al Fakhbir (Alphecher) | γ Per | 2.9 | Arabic/"The Excellent One" الفاخر |
| 9 | Al fawaris | δ Cyg | 2.9 | Arabic/The knights |
| 10 | Urakhga | | | Arabic/Rukh, the Roc of Sindbad |
| 11 | Al Kab/Alkalb | ι Aur | 2.7 | Arabic/The dog |
| 12 | Al Kafza Borealis | λ UMa | 3.4 | Arabic/The (second) northern leap |
| 13 | Al Kirduh (Alkurha) | χ Cep | 4.4 | Arabic/A small circular shape on the face of the horse |
| 14 | Al Kirkab | κ Gem | 3.6 | Arabic/? |
| 15 | Al Minliar al Ghurab | α Cor | 4.0 | Arabic/The crow's beak |
| 16 | Algedi Prima | α1 Cap | 4.2 | Arabic/The first Capricorn |
| 17 | Algedi Secunda | α2 Cap | 3.6 | Arabic/The second Capricorn |
| 18 | Agena (Hadar) | B Cen | 0.6 | Latin/? |
| 19 | Alkibash | λ Gem | 3.6 | Arabic/? |
| 20 | Annika (Procyon) | α CMi | 0.4 | Indian/A name of the goddess Durg (from Sanskrit) |
| 21 | Brachium | δ Lib | 3.25 | Latin/The forearm (of the balance) |
| 22 | Cauda Hydrae | γ Hya | 3.0 | Latin/The head of the snake |
| 23 | Castula | υ Cas | 4.6 | Greek/Pure |
| 24 | Celaeno | 16 Tau | 5.5 | Greek/The harpy |
| 25 | Cerberus | η Lup | 3.4 | Greek/A monstrous multi-headed dog |
| 26 | Cervantes | μ Ara | 5.1 | Spanish/A servant |
| 27 | Chalawan | 47 UMa | 5.0 | Thai/(ชาละวน) named after a cave |
| 28 | Copernicus | ρ1 Cnc | 5.9 | English/Copernicus |
| 29 | Cornu | σ Lib | 3.3 | Latin/The horn |
| 30 | Coronis/ | ε Tau | 3.5 | Greek/Mother of Aesculapius |
| 31 | Oculus Borealis (Ain) | | | Latin/The eye |
| 32 | Dabih Major | β1 Cap | 3.1 | Arabic/The major slaughterer |
| 33 | Dabih Minor | β2 Cap | 6.1 | Arabic/The minor slaughterer |
| 34 | Danab al Shuja | γ Hya | 3.0 | Arabic/The tail of the male snake |
| 35 | Difda al Auwel | α PsA | 1.2 | Arabic/The first[t] frog |
| 36 | Os Pisces Meridiani | | | Latin/The central Pisces |
| 37 | Donces (Talitha) | ι UMa | 3.1 | ? |
| 38 | Double Double | ε Lyr | 6.0 | English |
| 39 | Eudora (Hyadum) | δ Tau | 3.8 | Greek/Name of five minor goddesses |

(continued)

**Table 5** (continued)

| No. | Star name | Beyer designation | Magn | Origin & Meaning |
|---|---|---|---|---|
| 40 | Fafnir | 42 Dra | 4.8 | Greek/The name of the great dragon in Nordic mythology |
| 41 | Gruid | β Gru | 2.1 | Latin/Belonging to Grus |
| 42 | Hatya (Meissa) (Heka) | λ Ori | 5.6 | Arabic/A miswritten version of Heka |
| 43 | Helvetios | 51 Peg | 5.4 | Latin/A Celtic tribe that lived in Switzerland during antiquity |
| 44 | Heze | ξ Vir | 3.4 | ? |
| 45 | Hydor | λ Aqr | 3.8 | Greek/Water |
| 46 | Iclarclau (Dschubba) | δ Sco | 2.3 | ? |
| 47 | Juba (Aljeba) | γ1 Leo | 2.2 | Arabic/The forehead |
| 48 | Kakkab | α Lup | 2.3 | Arabic /The star |
| 49 | Kalb (Regulas) | α Leo | 1.4 | Arabic/The dog |
| 50 | Lalande 27,173 | Kx Lib | 5.8 | French/Lalande's star |
| 51 | Libertas | ξ Aql | 4.7 | Latin/Roman Goddess of Liberty |
| 52 | Melucta (Mebsuta) | ε Gem | 3.0 | Arabic/Miswritten from Mebsuta (the stretched arm of the lion) |
| 53 | Metallah/ Muthallah | α Tri | 3.4 | Arabic/A triangle |
| 54 | Minbar | χ Dra | 3.6 | Latin/? |
| 55 | Batentaban Borealis | | | Arabic/The belly of the snake |
| 56 | Musica | 18 Del | 5.5 | Italian/Music |
| 57 | Myla | α Mus | 2.7 | Persian/The stork الدلقلق |
| 58 | Navi | γ Cas | 2.2 | Italian/The ships or the reverse letters of the name (Ivan) |
| 59 | Nehushtan/ Nusakan (Beta CrB) | ξ Ser | 3.5 | Arabic/The two fences |
| 60 | Persian | α Ind | 3.1 | English/? |
| 61 | Polis | μ Sgr | 3.8 | Coptic-Egypt/The foal المهرة |
| 62 | Pulcherrima (Izar) | ε Boo | 2.5 | Latin/Beautiful |
| 63 | Ruticulus (Kornephoros) | β Her | 2.8 | Latin/Golden red |
| 64 | Samoht | α Mon | 3.9 | Albanian/? |
| 65 | Sephdar | η Sgr | 3.1 | English/Shepard/(Namalwarid النعام الوارد) |
| 66 | Suhail al Muhlif/ Suhail | γ Vel | 3.4 | Arabic/Canopus |
| 67 | Talitha Australis | κ UMa | 4 | Arabic/The southern third leap |
| 68 | Titawin | υ And | 3.3 | Arabic/A city in Morocco تطوان |
| 69 | Taygeta | q Tau | 4.3 | Greek/The mythical King of Laconia |
| 70 | Urodelus | ε UMi | 4.2 | Latin/Urodele or salamander |
| 71 | Vathroz Prior | υ Car | 6.0 | Greek/? |
| 72 | Vathorz Posterior | θ Car | 2.7 | Greek/? |
| 73 | Venator (Ratanev) | β Del | 5.0 | Latin/Stellar |
| 74 | Veritate | 14 And | 5.2 | ? |
| 75 | Vulcan (Keid) | o2 Eri | 4.4 | Latin/God of fire |

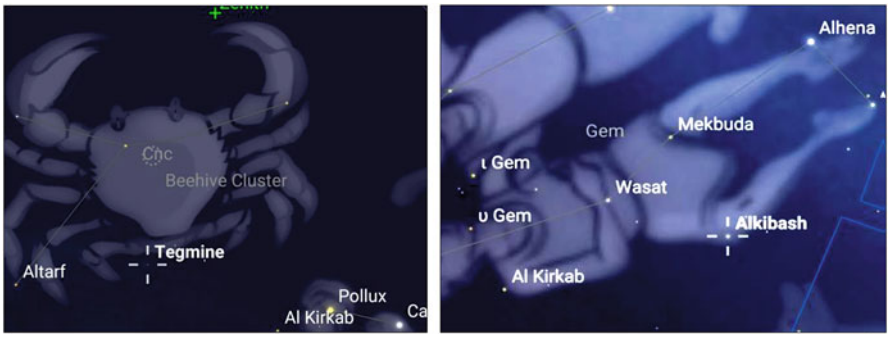


**Fig. 6** Tegmine (left) and Alkibash (right), two new star names in Celestron Sky Portal

**Table 6** Stars found in Star Chart

| No | Star name | Beyer designation | Magn | Origin & Meaning |
|---|---|---|---|---|
| 1 | Alwaid | β Dra | 2.8 | Arabic/The protectors |
| 2 | Al Kurud (≡ ζ CMa Alfurud) | θ Col | 5 | Arabic/The only ones |
| 3 | Arm/Armus | η Cap | 4.8 | Latin/Skin of Evil |
| 4 | Ashlesha/Açleshã | P Hya | 4.3 | ?/Embracer (according to Allen's book) |
| 5 | Bharani | 41 Ari | 3.6 | Indian/Aries (the ram) |
| 6 | Birdun | ε Cen | 2.3 | Arabic/Non-Arabic horses البـرذون |
| 7 | Birhan Last | 5 Tau | 4.1 | ? |
| 8 | Bunda | ξ Aur | 4.7 | ? |
| 9 | Chow | β Ser | 3.6 | Chinese/One of the Chinese imperial dynasties |
| 10 | Jih | κ Peg | 4.1 | ?/ The Sun |
| 11 | Kajam/Cujam | ω Her | 4.6 | Latin/(Club) |
| 12 | Ksora | δ Cas | 2.7 | Arabic/A chair (miswritten version of Korsa= Korsi) |
| 13 | Lanx Australis (≡ Zubeneschamali) | β Lib | 2.6 | Latin/A dish |
| 14 | Mahasim | θ Aur | 2.6 | Arabic/Plural of wrist |
| 15 | Neshmet | μ Lep | 3.3 | ? |
| 16 | Okul | π Cap | 5.1 | Arabic/Plural of (circular rope) العقال |
| 17 | Sadira | ε Eri | 3.7 | Latin/Mysterious female assassin |
| 18 | Salm | τ Peg | 4.6 | Arabic/The bucket السلم وهو الدلو |
| 19 | Sceptrum | 53 Eri | 3.9 | Latin/A sceptre الصولجان |
| 20 | Shurnarkabithashutu | τ Tau | 3 | ? |
| 21 | Ushakaron? | ξ Tau | 3.7 | ? |

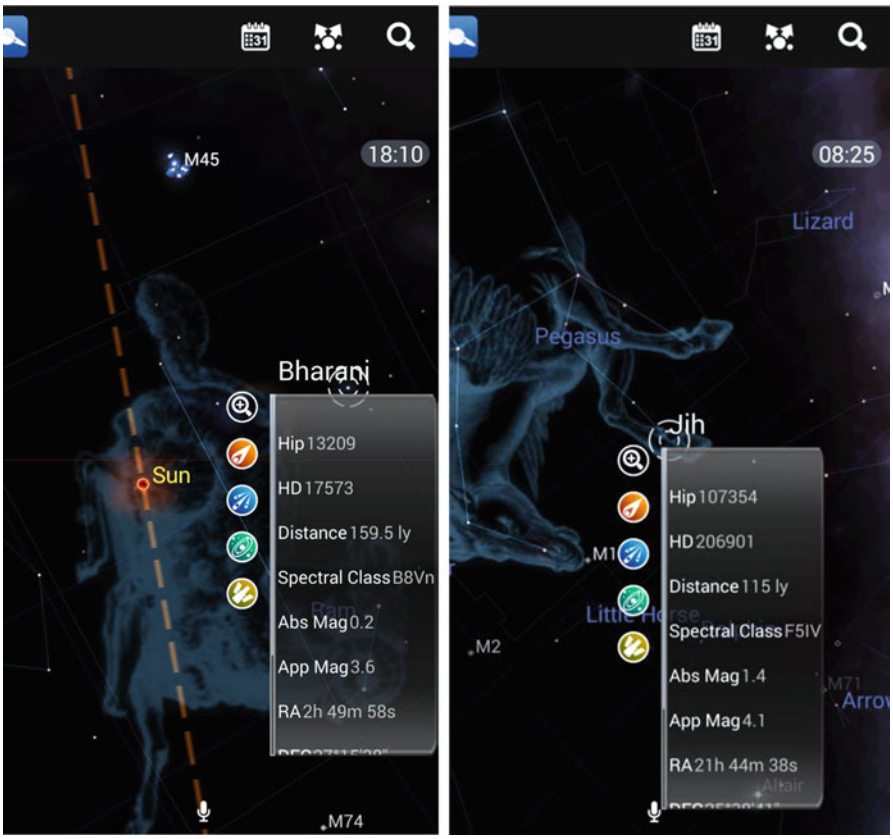


**Fig. 7** Bharani (left) and Jih (right), two new star names in Star Chart

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## References

Allen, R.H., 1961. *Star Name: Their Lore and Meaning.* New York, Dover.

Dalee, H., 2008. Arabic star names in the charts of the Sky. In Dalee, H. (ed.). Proceedings of the 1st International Conference on History of Science. Al-Sharja, UAE, 24–27 March 2008. Sharja, University of Sharja. Pp. 211–220.

Hafez, I., Stephenson, R., and Orchiston, W., 2011. Abdul-rahman al-Sufi and his *Book of the Fixed Stars*: a journey of re-discovery. In Orchiston, W., Naka-mura, T., and Strom, R. (eds.). *Highlighting the History of Astronomy in the Asia-Pacific Region*. New York, Springer. Pp. 121–138.

Hafez, I., Stephenson, F.R., and Orchiston, W., 2015a. Abdul-Rahman al-Sufi and his 3-step magnitude system. Orchiston, W., Green, D., and Strom, R. (eds.). *New Insights from Recent*

*Studies in Historical Astronomy: Following in the Footsteps of F. Richard Stephenson.* New York, Springer. Pp. 169–177.

Hafez, I., Stephenson, F.R., and Orchiston, W., 2015b. The investigation of stars, star clusters and nebulae in ʻAbd al-Raḥmān al-Ṣūfīʼs *Book of the Fixed Stars.* Orchiston, W., Green, D., and Strom, R. (eds.). *New Insights from Recent Studies in Historical Astronomy: Following in the Footsteps of F. Richard Stephenson.* New York, Springer. Pp. 143–168.

Kunitzsch, P., and Smart, T., 2011. *A Dictionary of Modern Star Names. A Short Guideto 254 Star Names and Their Derivations.* Cambridge (Mass.), Sky Publishing.

Robson, V.E., 1923. Fixed Stars and Constellations in Astrology. London, Cecil Palmer.