Celestial Sphere Models 1

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The author can be contacted at:

Laurence D. Finston
c/o Free Software Foundation, Inc.
51 Franklin St, Fifth Floor
Boston, MA 02110-1301 USA
Laurence.Finston@gmx.de

Table of Contents

1. Instructions ................................................................................................................. 1
2. Greek Alphabet ........................................................................................................... 2
3. Constellations .............................................................................................................. 2
4. Spherical Biangles ....................................................................................................... 4
   4.1. White on Black Background .............................................................................. 4
   4.2. Black on White Background ............................................................................ 6
5. Panels (Isocèles Trapezioids and Triangles) ............................................................. 8
   5.1. White on Black Background ............................................................................. 8
   5.2. Black On White Background ........................................................................... 10
6. Globes ....................................................................................................................... 12
7. Copying ..................................................................................................................... 14
   7.1. GNU General Public License ....................................................................... 14
   7.2. GNU Free Documentation License ............................................................... 20

Instructions

PLEASE NOTE! The author has tried to ensure that the following plans are correct, but as of September 6, 2021, he has not tested them yet himself. As mentioned above, this material is distributed without a warranty. I recommend that users check it themselves before investing a lot of time and effort into cutting out the paper models.

Any corrections will be gratefully received by the author. Contact information can be found on the title page.

The two models are provided in two versions each, white on black and black on white. They include the 200 brightest stars, except for Polaris, which would have been at an inconvenient location on the models, namely at the north pole.

The separate file clstsph1_a4.pdf in DIN A4 format contains data for the stars on the models.

The first model is made up of spherical biangles. They should not be folded but rather bent and attached to each other using the tabs on the left side, forming a sphere.

The second model uses “panels”. While the left and right sides of the sections appear to be curved, they are in fact made up of straight lines. The sections should be folded on the horizontal lines (declination) and again attached using the tabs. The result is an irregular polyhedron approximating a sphere.

The “globes” on pages 11–12 illustrate how the positions of the stars on the spherical biangles and panels were derived.
Assembling the models should present no particular difficulty except possibly for keeping the spherical biangles from slipping while attaching them to each other. A fast-setting glue might be helpful in this case, and/or patience. The longitudes of the stars are found by rotating counter-clockwise from right ascension 0h 0′ 0″. I believe that the result of this is that the model represents the celestial sphere as seen by an observer looking at it from the outside. I hope someone will correct me if I’m wrong. The famous early star atlas of Johannes Hevelius from 1690 also shows the stars in this way.

However, in principle it wouldn’t be difficult to reverse the representation. The difficulty would be in reversing the labels, but I think this problem could be solved.

The plans could also be generated for larger or smaller models. In addition, the limit of 200 stars is arbitrary and was chosen to correspond to the size of these versions of the models (sphere radius 7cm). As of September 6, 2021, the database table containing the star data has entries for over 1400 stars. However, not all of the entries contain all of the necessary data yet. If you want to make models of a different size and/or with a different number of stars, please send an email to the author at the address listed above.

Greek Alphabet

<table>
<thead>
<tr>
<th>Greek</th>
<th>Roman</th>
<th>Arabic</th>
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</thead>
<tbody>
<tr>
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<td>beta</td>
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<tr>
<td>λ</td>
<td>lambda</td>
<td>ψ, σ</td>
</tr>
<tr>
<td>μ</td>
<td>mu</td>
<td>ω, Ω</td>
</tr>
</tbody>
</table>

Constellations

Full name, genitive, abbreviation.

2. Andromeda, Andromeda, And
3. Antlia, Antliae, Ant
4. Apus, Apodis, Aps
5. Aquarius, Aquarii, Aqr
6. Aquila, Aquilae, Aql
7. Ara, Arae, Ara
8. Aries, Arietis, Ari
9. Auriga, Aurigae, Aur
10. Boötes, Boötis, Boo
11. Caelum, Caeli, Cae
12. Camelopardalis, Camelopardalis, Cam
13. Cancer, Cancri, Cnc
14. Canes Venatici, Canum Venaticorum, CVa
15. Canis Major, Canis Majoris, CMa
16. Canis Minor, Canis Minoris, CMi
17. Capricornus, Capricorni, Cap
18. Carina, Carinae, Car
19. Cassiopeia, Cassiopeiae, Cas
20. Centaurus, Centauri, Cen
21. Cepheus, Cephei, Cep
22. Cetus, Ceti, Cet
23. Chamaeleon, Chamaeleontis, Cha
24. Circinus, Circini, Cir
25. Columba, Columbae, Col
26. Coma Berenices, Comae Berenices, Com
27. Corona Borealis, Coronae Borealis, CrB
28. Corona Australis, Coronae Australis, Cra
29. Corvus, Corvi, Crv
30. Crater, Crateris, Crt
31. Crux, Crucis, Cru
32. Cygnus, Cygni, Cyg
33. Delphinus, Delphini, Del
34. Dorado, Doradus, Dor
35. Draco, Draconis, Dra
36. Equuleus, Equulei, Equ
37. Eridanus, Eridani, Eri
38. Fornax, Fornacis, For
39. Gemini, Geminorum, Gem
40. Grus, Grui, Gru
41. Hercule, Herculis, Her
42. Horologium, Horologii, Hor
43. Hydra, Hydræ, Hya
44. Hydrus, Hydri, Hyi
45. Indus, Indi, Ind
46. Lacerta, Lacertae, Lac
47. Leo, Leonis, Leo
48. Leo Minor, Leonis Minoris, LMi
49. Lepus, Leporis, Lep
50. Libra, Librae, Lib
51. Lupus, Lupi, Lup
52. Lynx, Lynxæ, Lyn
53. Lyra, Lyrae, Lyr
54. Mensa, Menseæ, Men
55. Microscopium, Microscopii, Mic
56. Monoceros, Monocerotis, Mon
57. Musca, Muscae, Mus
58. Norma, Normae, Nor
59. Octans, Octantis, Oct
60. Ophiuchi, Ophiuchiæ, Oph
61. Orion, Orionis, Ori

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62. Pavo, Pavonis, Pav
63. Pegasus, Pegasi, Peg
64. Perseus, Persei, Per
65. Phoenix, Phoenixis, Phe
66. Pictor, Pictoris, Pic
67. Piscis, Piscium, Psc
68. Piscis Austrinus, Piscis Austrini, PsA
69. Puppis, Puppis, Pup
70. Pyxis, Pyxidis, Pyx
71. Reticulum, Reticuli, Ret
72. Sagitta, Sagittae, Sge
73. Sagittarius, Sagittarii, Sgr
74. Scorpius, Scorpii, Sco
75. Sculptor, Sculptoris, Scl
76. Scutum, Scuti, Sct
77. Serpens, Serpentis, Ser
78. Sexant, Sextantis, Sex
79. Taurus, Tauri, Tau
80. Telescopium, Telescopii, Tel
81. Triangulum, Trianguli, Tri
82. Triangulum Australe, Trianguli Australis, TrA
83. Tucana, Tucanae, Tuc
84. Ursa Major, Ursae Majoris, UMa
85. Ursa Minor, Ursae Minoris, UMi
86. Vela, Velorum, Vel
87. Virgo, Virginis, Vir
88. Volans, Volantis, Vol
89. Vulpecula, Vulpeculae, Vul
Panels (Isoceles Trapezoids and Triangles)
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