

Celestial Sphere Models 1

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Created: September 3, 2021

Last updated: September 9, 2021

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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 way¹.

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

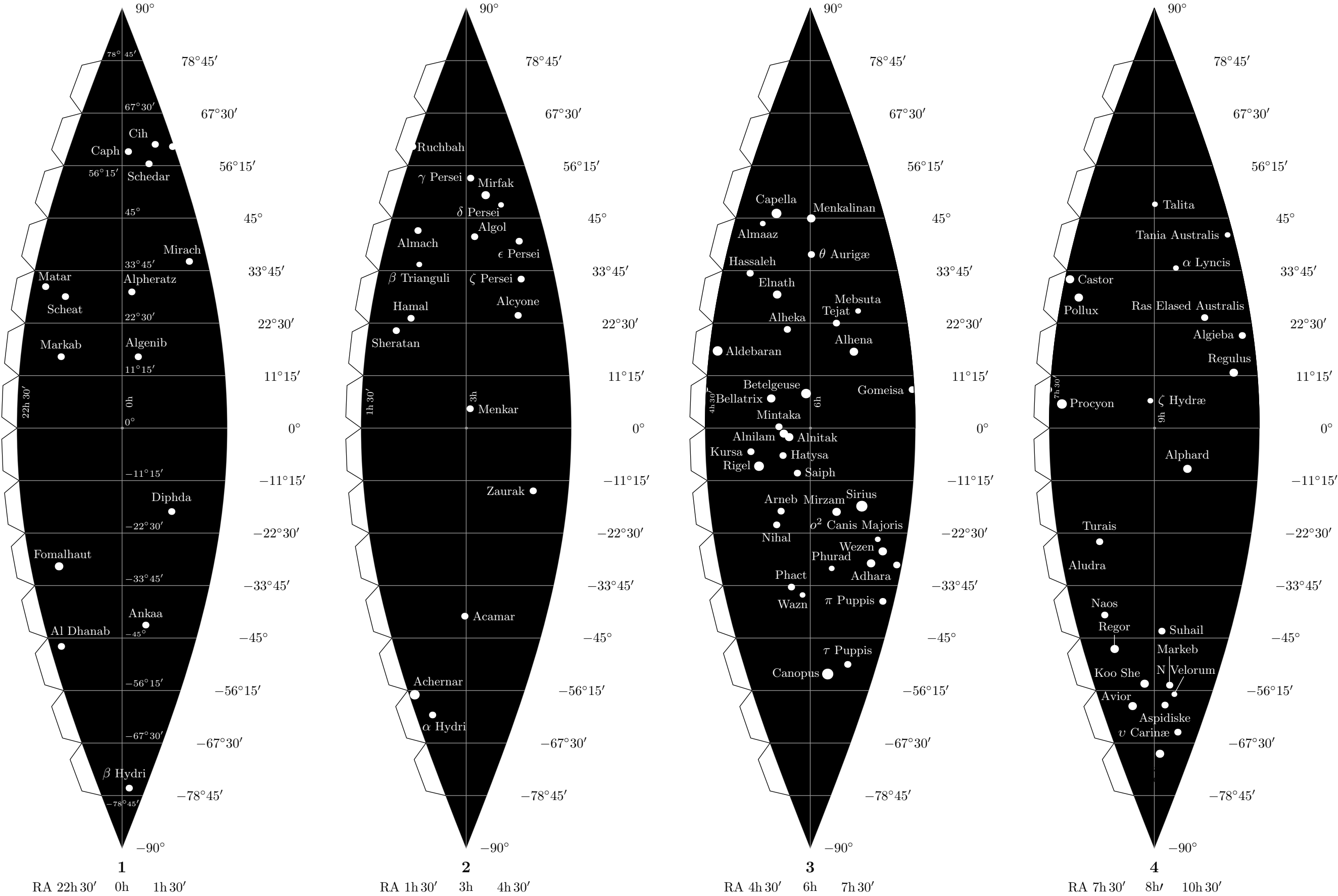
α	alpha	ν	nu
β	beta	ξ	xi
γ	gamma	o	omicron
δ	delta	π, ϖ	pi
ϵ, ε	epsilon	ρ, ϱ	rho
ζ	zeta	σ, ς	sigma
η	eta	τ	tau
θ, ϑ	theta	υ	upsilon
ι	iota	ϕ, φ	phi
κ	kappa	χ	chi
λ	lambda	ψ	psi
μ	mu	ω	omega

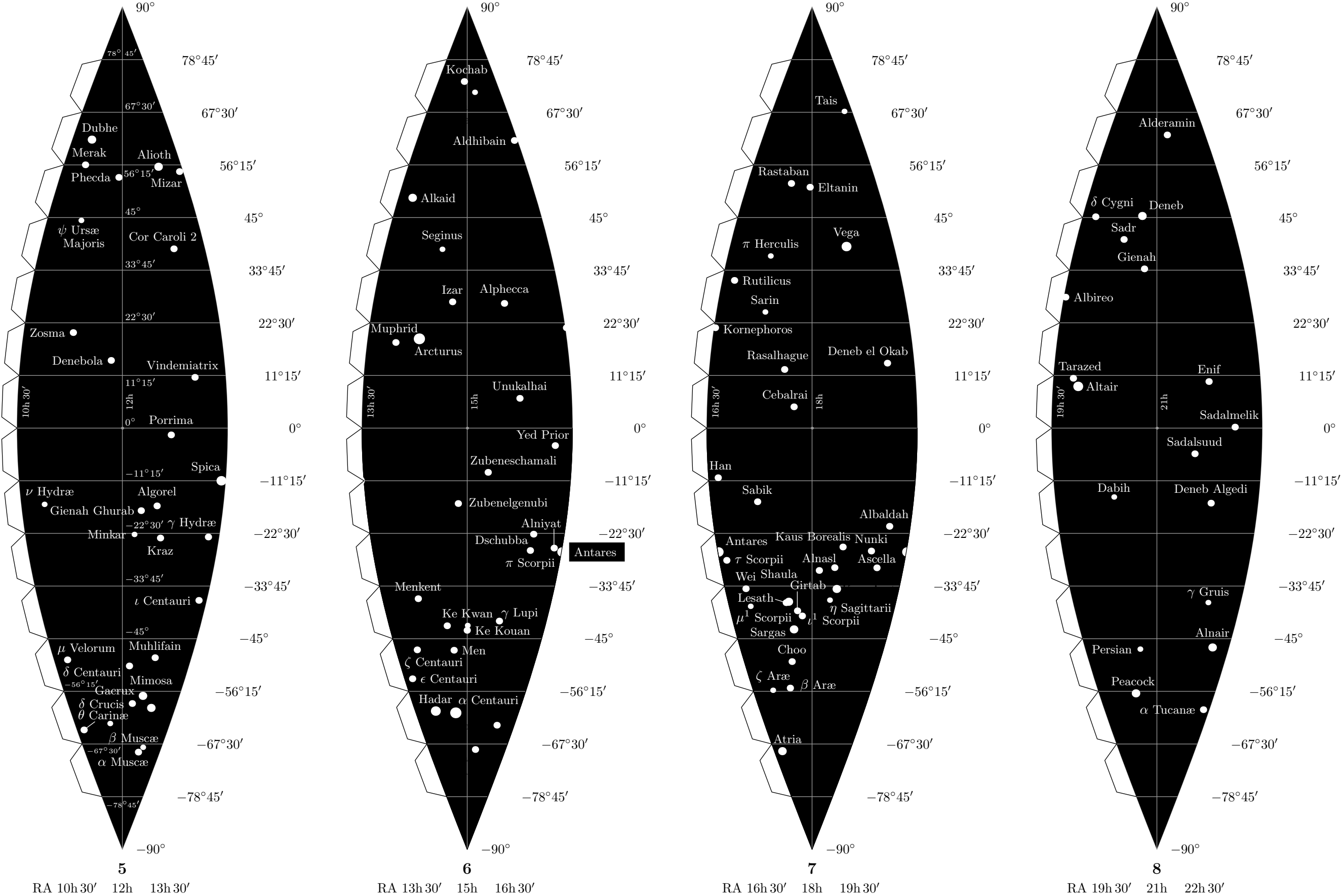
Constellations

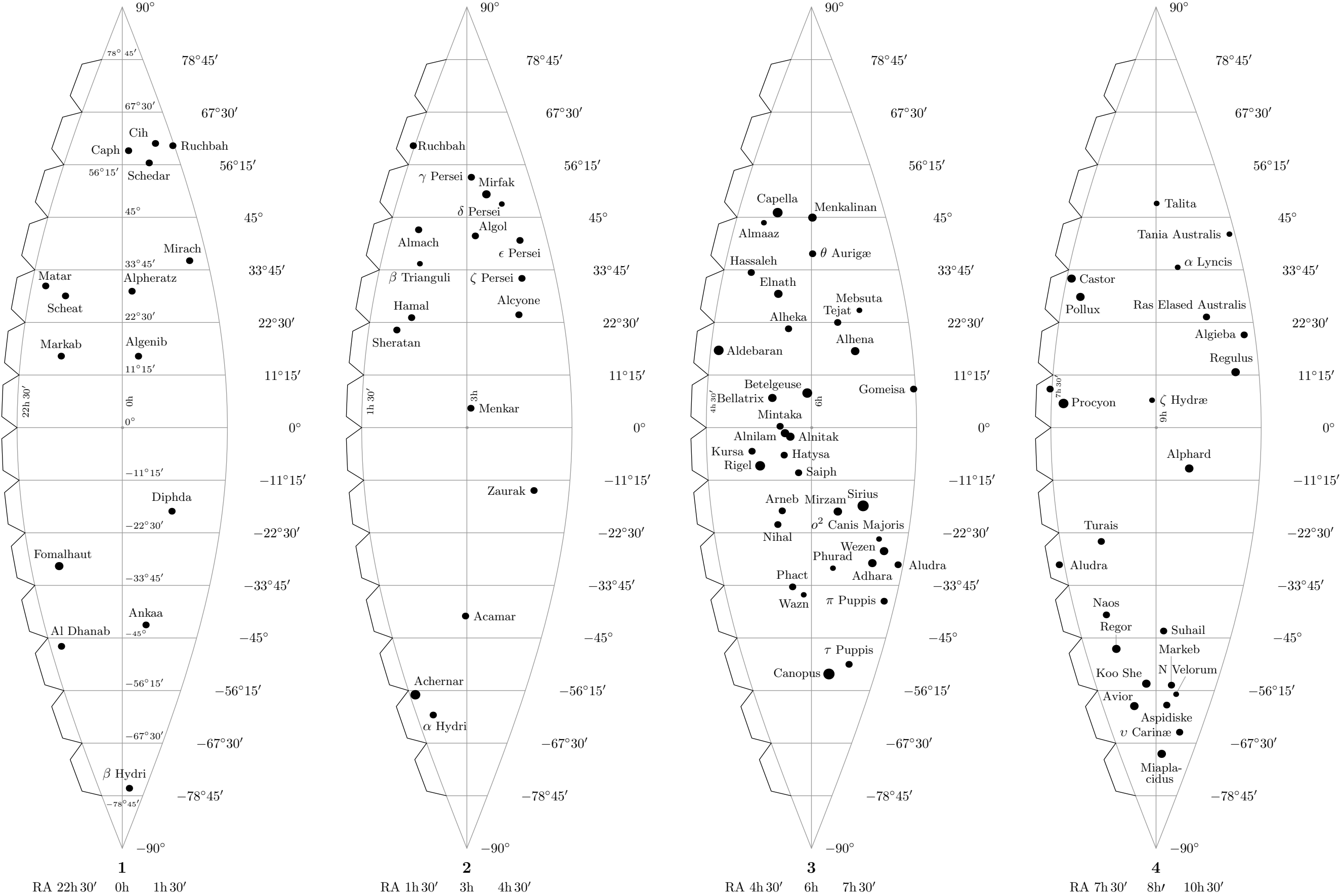
1. Andromeda	21. Cetus	41. Horologium	61. Pavo	80. Triangulum
2. Antlia	22. Chamaeleon	42. Hydra	62. Pegasus	81. Triangulum Australe
3. Apus	23. Circinus	43. Hydrus	63. Perseus	82. Tucana
4. Aquarius	24. Columba	44. Indus	64. Phoenix	83. Ursa Major
5. Aquila	25. Coma Berenices	45. Lacerta	65. Pictor	84. Ursa Minor
6. Ara	26. Corona Australis	46. Leo	66. Pisces	85. Vela
7. Aries	27. Corona Borealis	47. Leo Minor	67. Piscis Austrinus	86. Virgo
8. Auriga	28. Corvus	48. Lepus	68. Puppis	87. Volans
9. Boötes	29. Crater	49. Libra	69. Pyxis	88. Vulpecula
10. Caelum	30. Crux	50. Lupus	70. Reticulum	
11. Camelopardalis	31. Cygnus	51. Lynx	71. Sagitta	
12. Cancer	32. Delphinus	52. Lyra	72. Sagittarius	
13. Canes Venatici	33. Dorado	53. Mensa	73. Scorpius	
14. Canis Major	34. Draco	54. Microscopium	74. Sculptor	
15. Canis Minor	35. Equuleus	55. Monoceros	75. Scutum	
16. Capricornus	36. Eridanus	56. Musca	76. Serpens	
17. Carina	37. Fornax	57. Norma	77. Sextans	
18. Cassiopeia	38. Gemini	58. Octans	78. Taurus	
19. Centaurus	39. Grus	59. Ophiuchus	79. Telescopium	
20. Cepheus	40. Hercules	60. Orion		

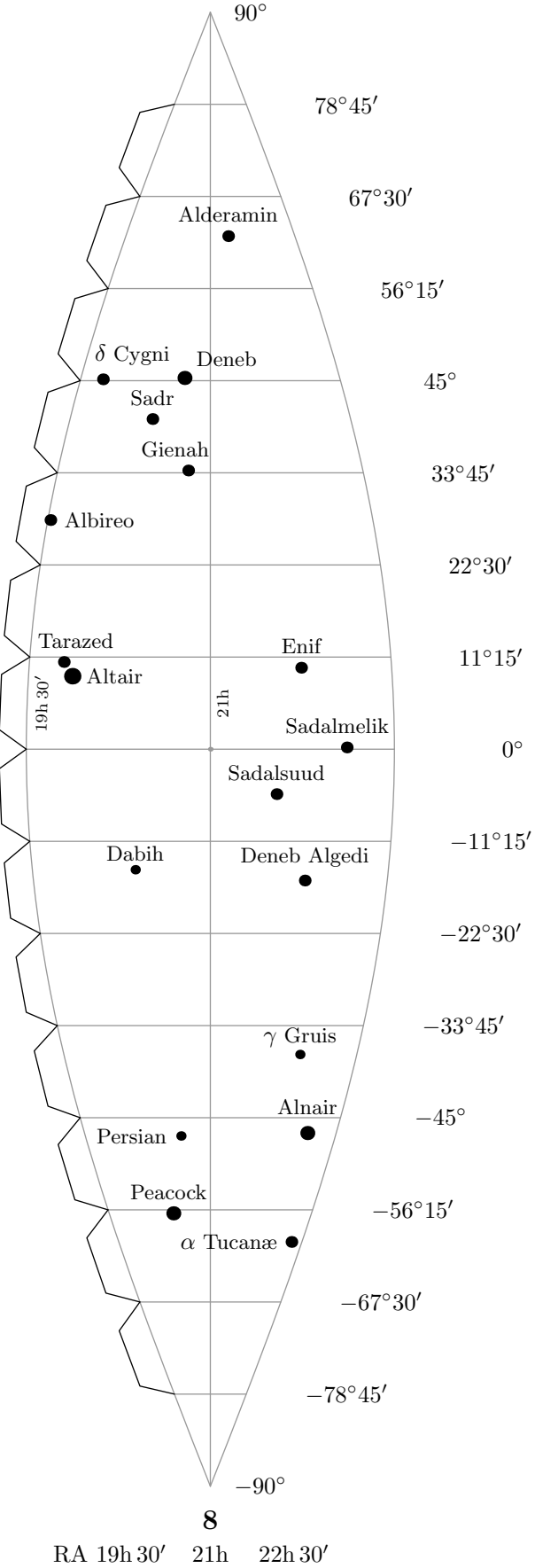
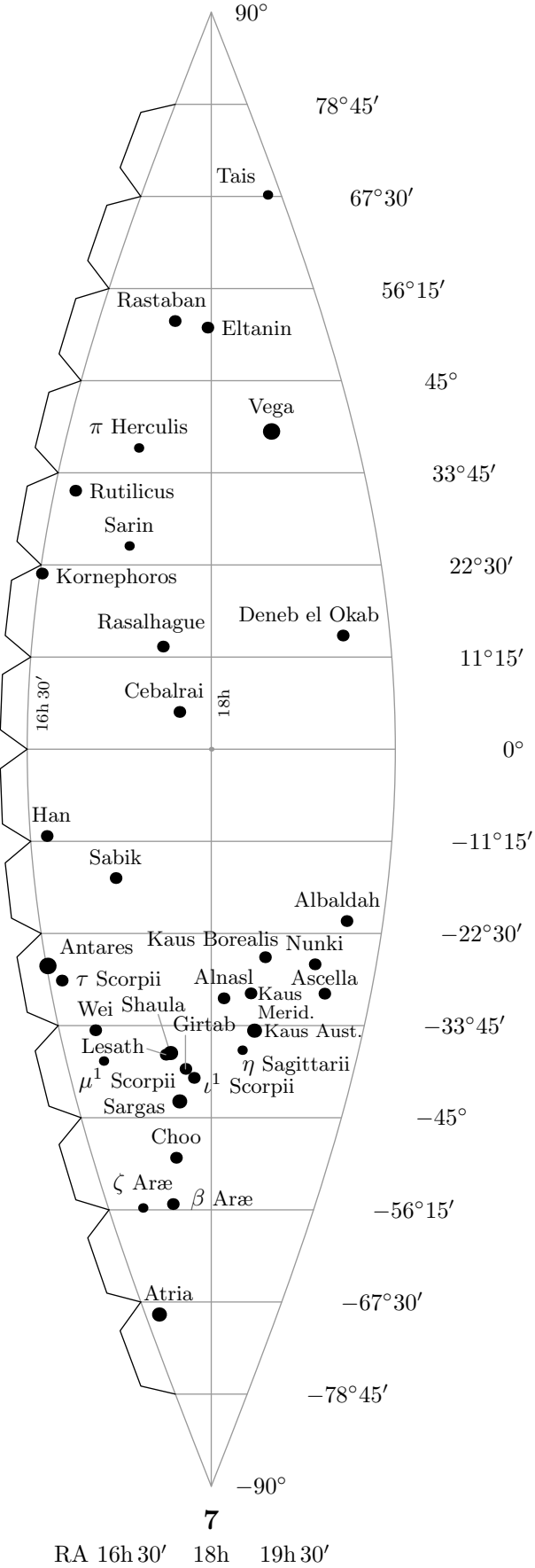
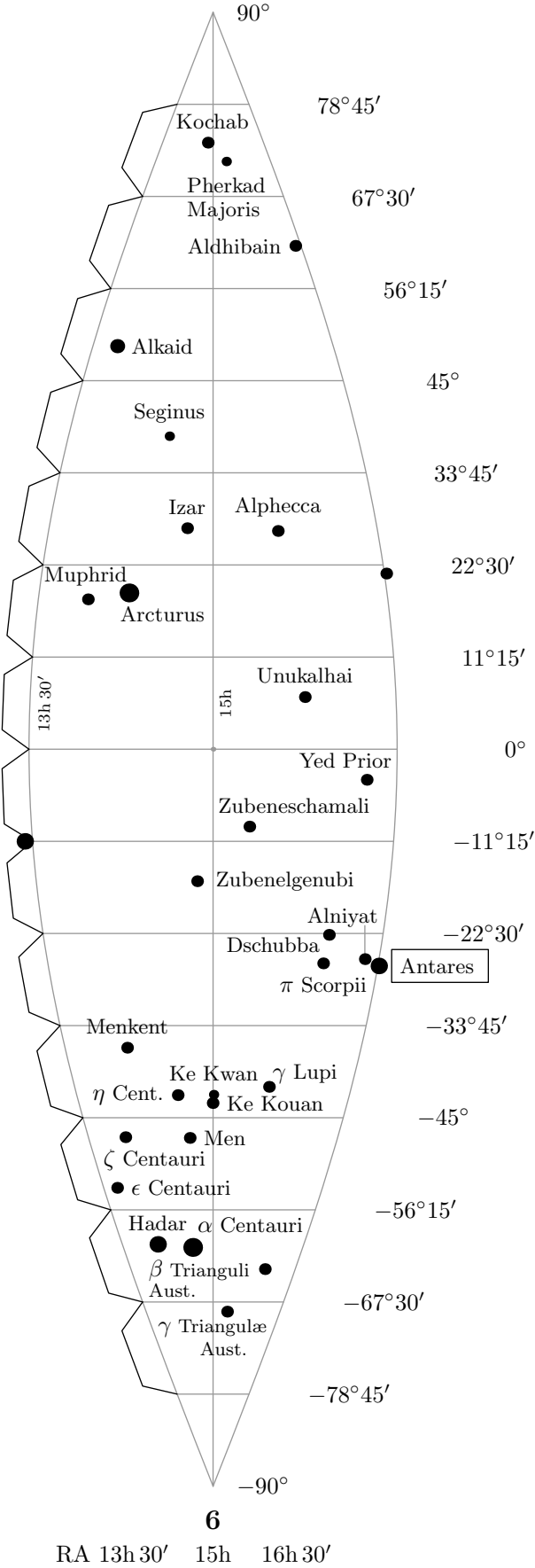
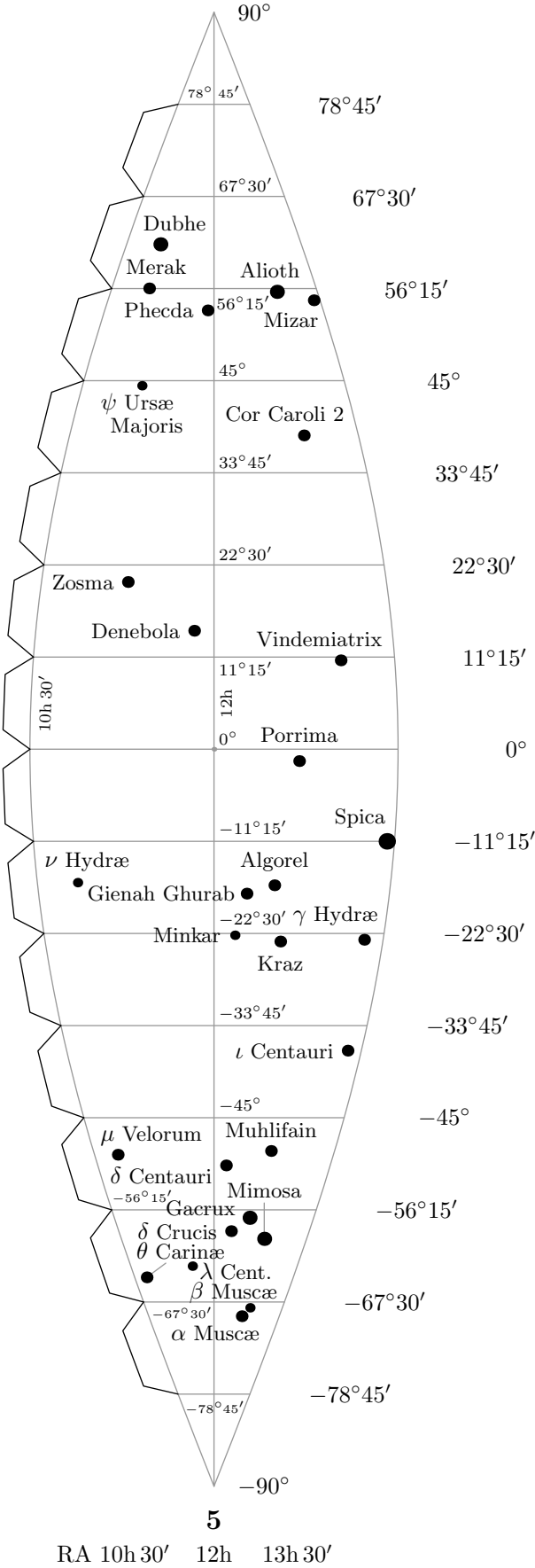
¹ Menzel, Donald H. and Pasachoff, Jay M., *Stars and Planets. Peterson Field Guides*, p. 21.

Spherical Biangles

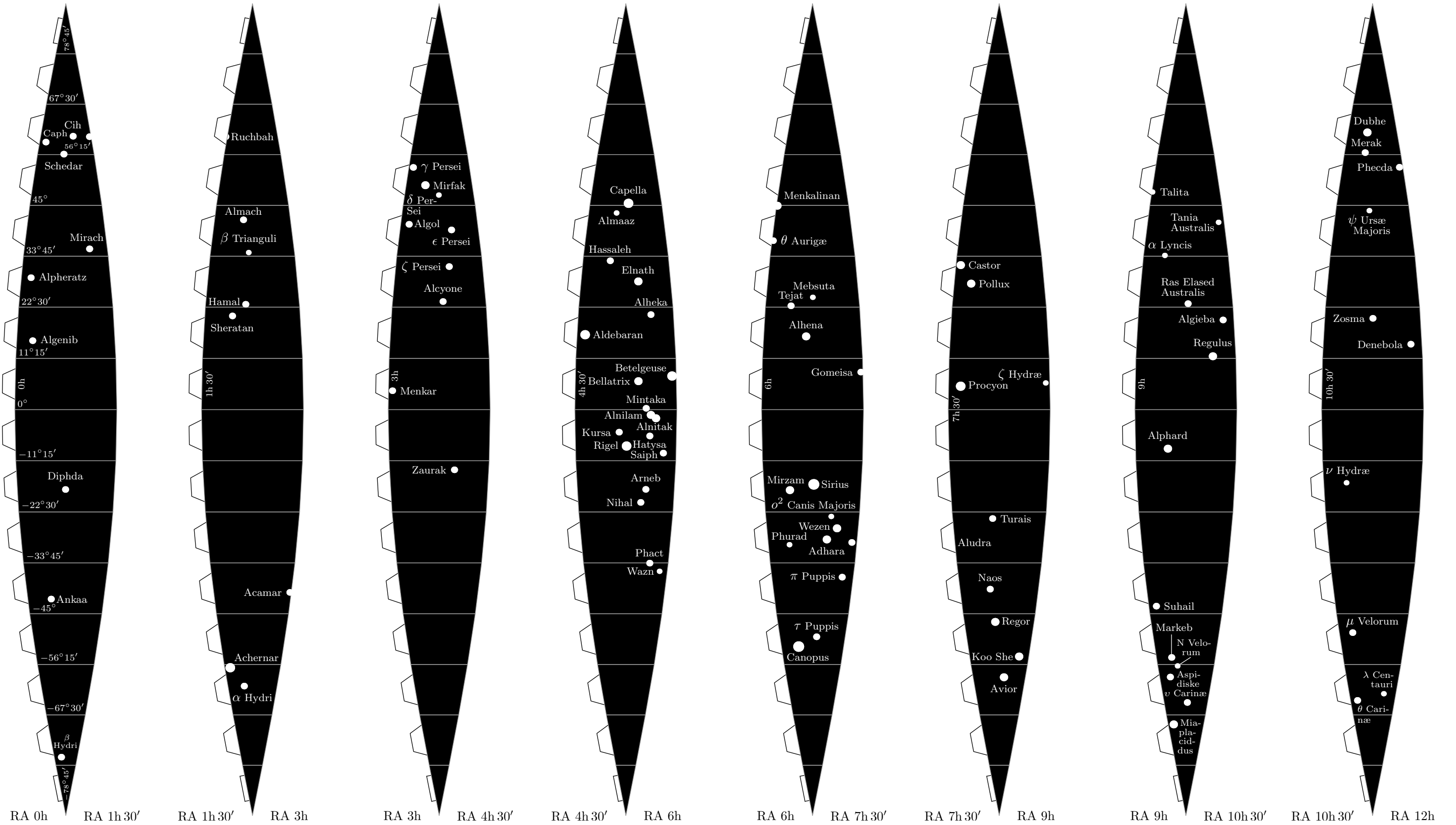


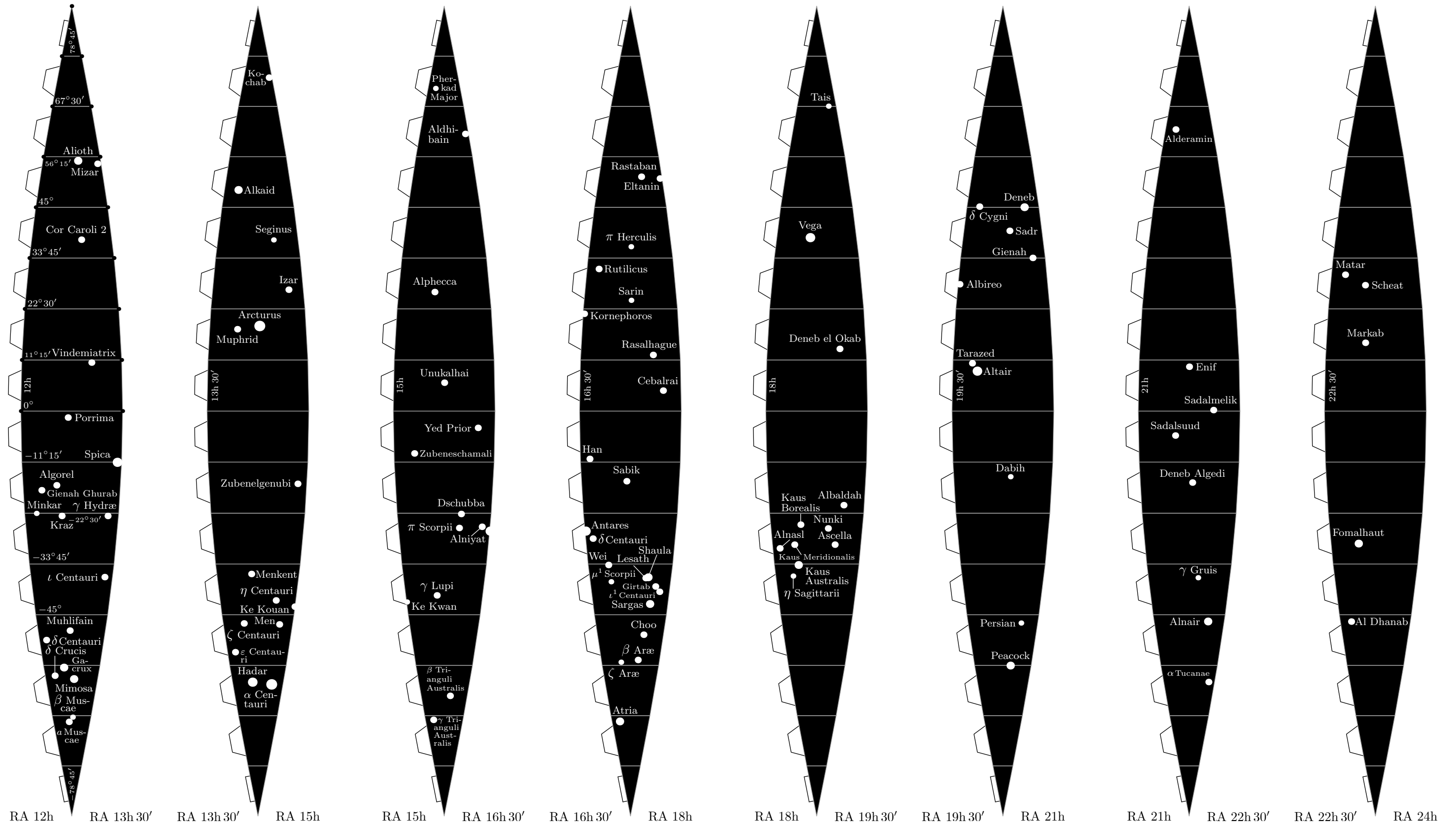


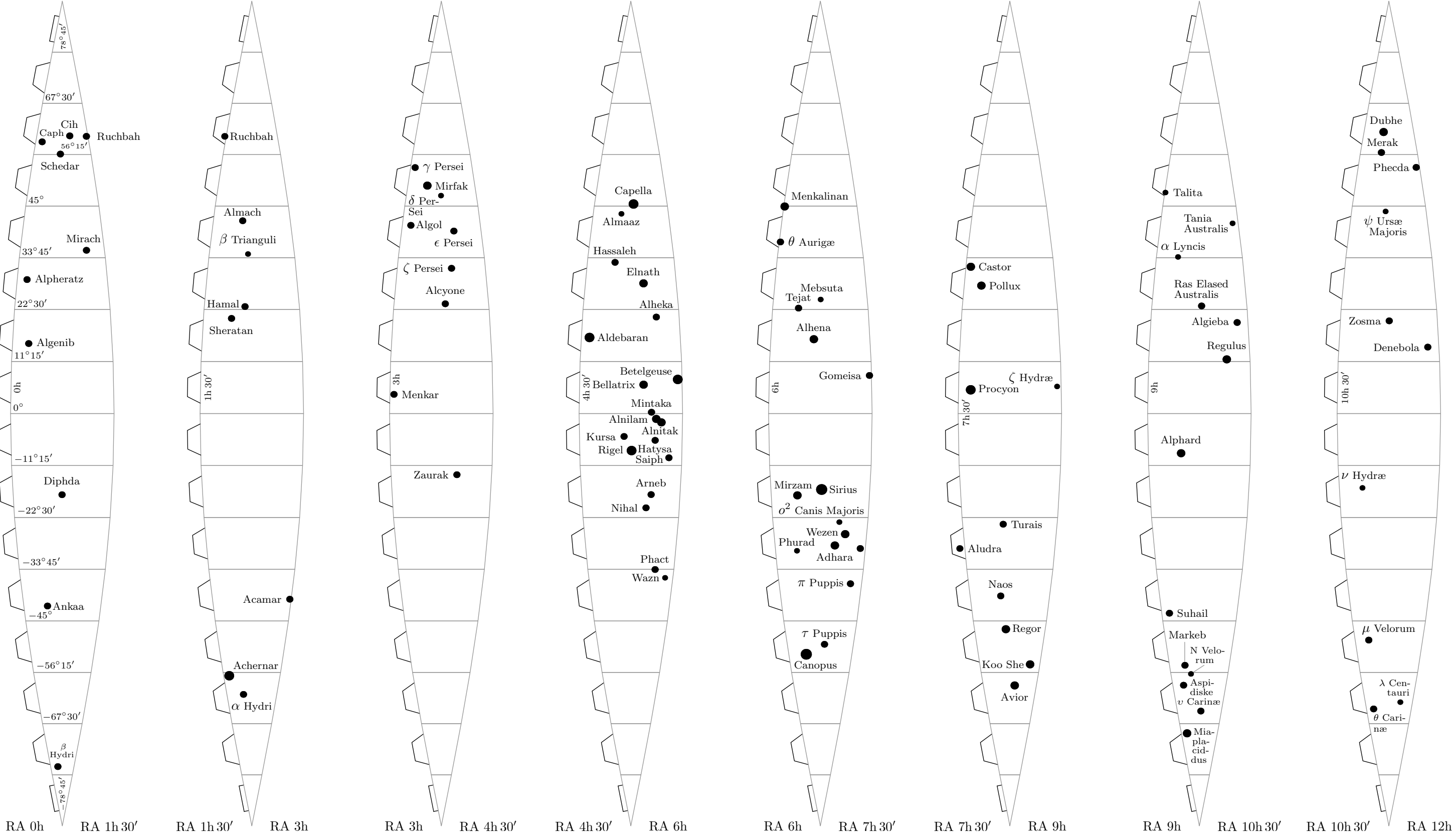




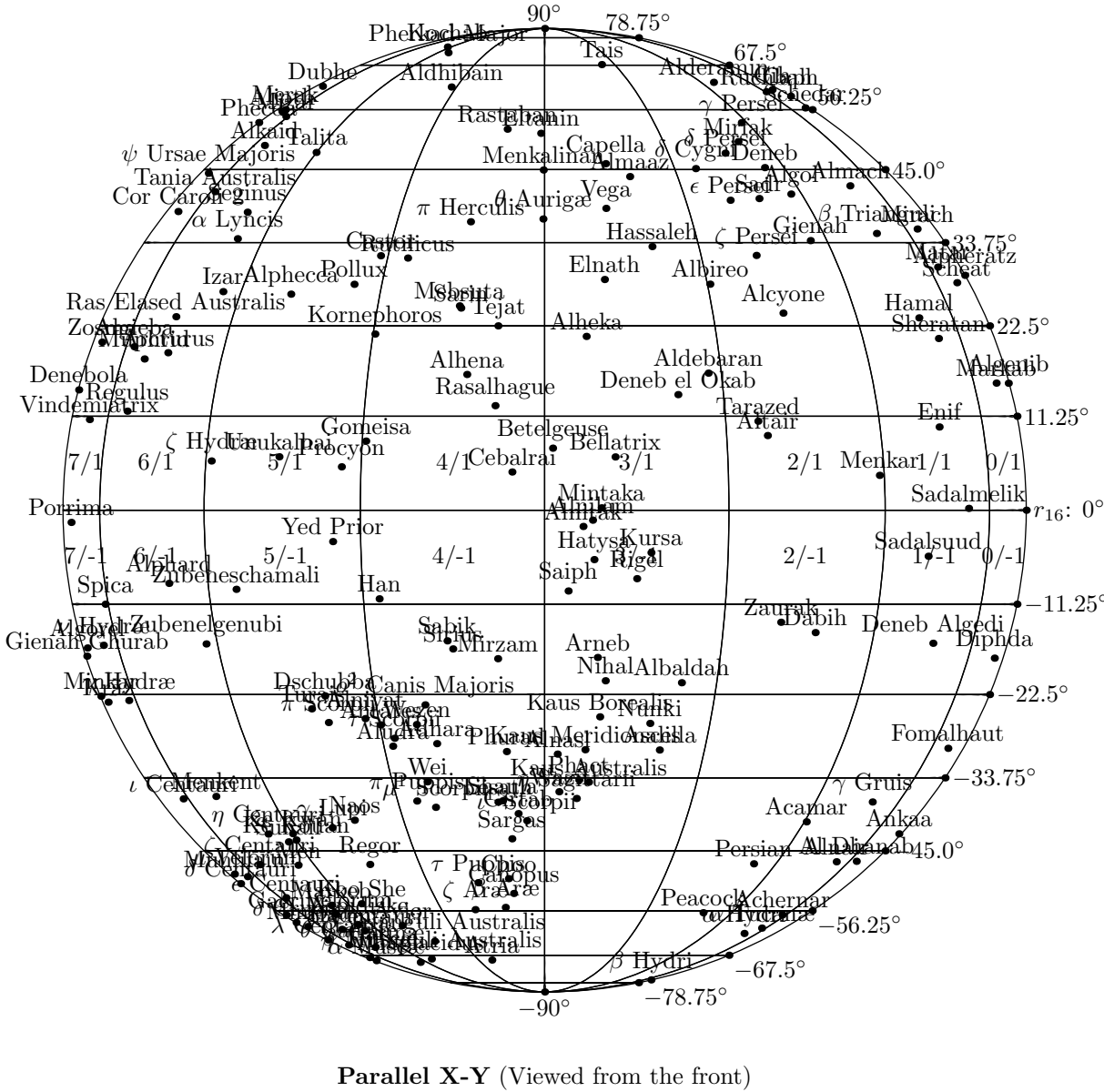
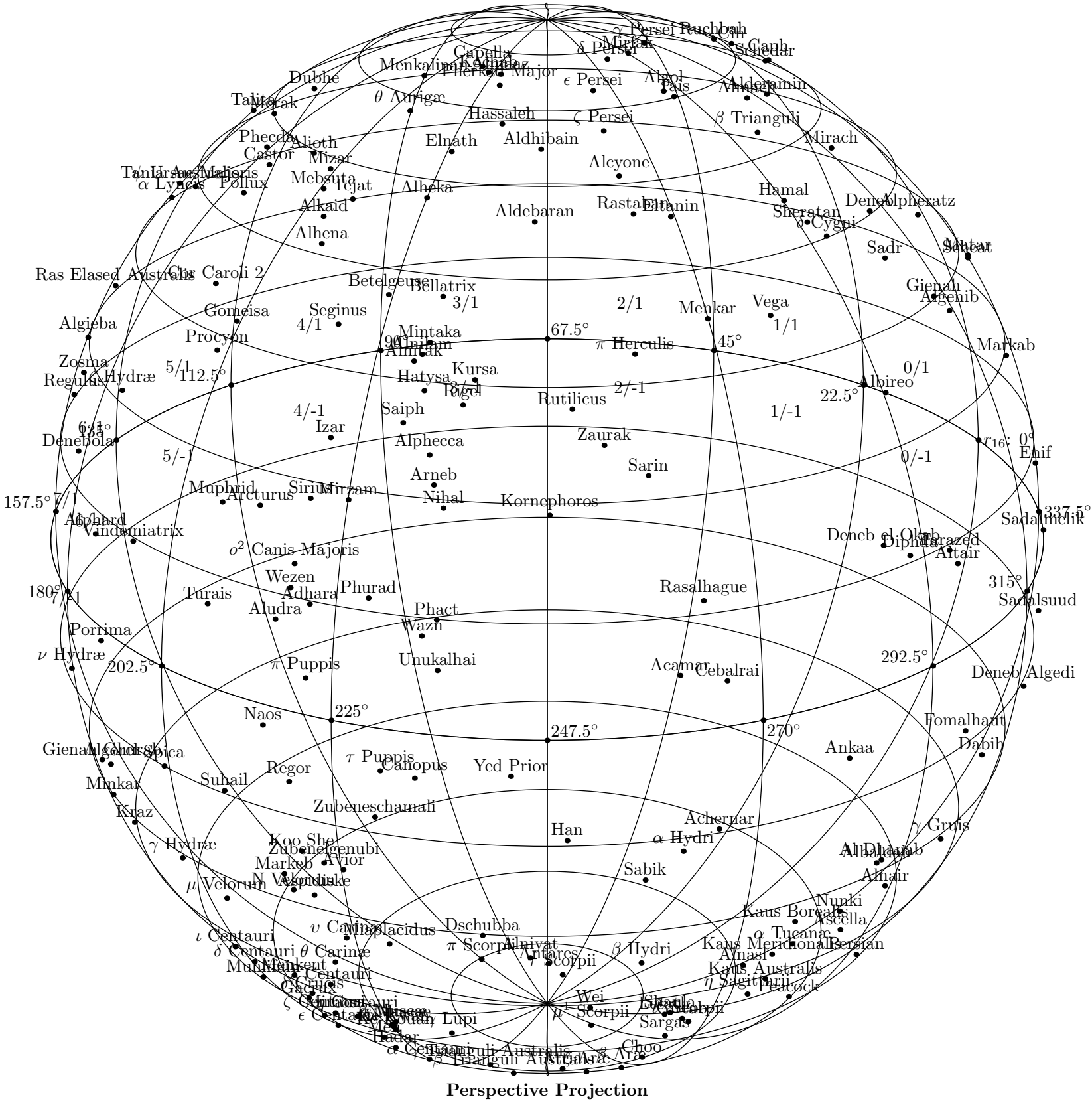
Panels (Isoceles Trapezoids and Triangles)

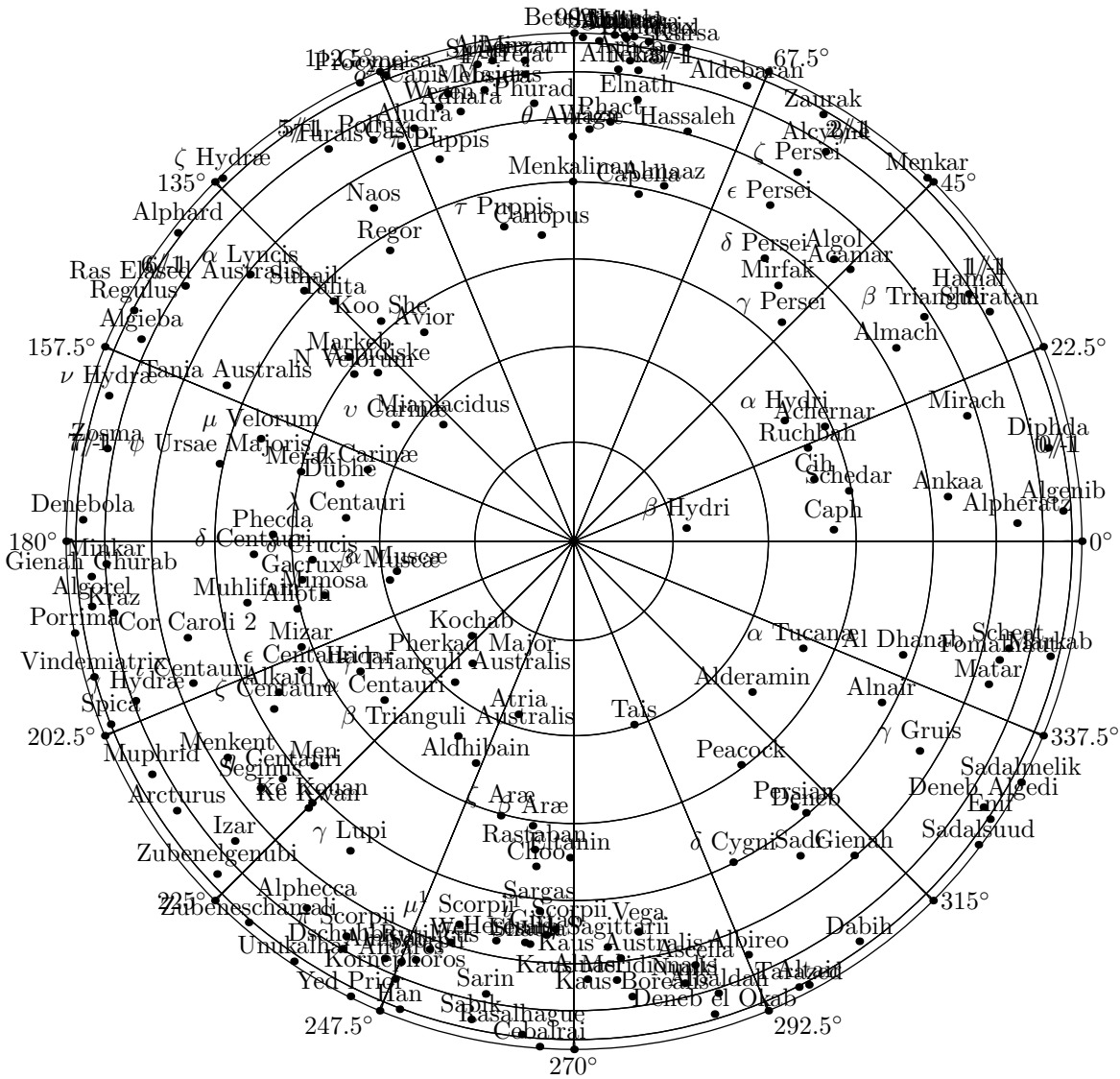




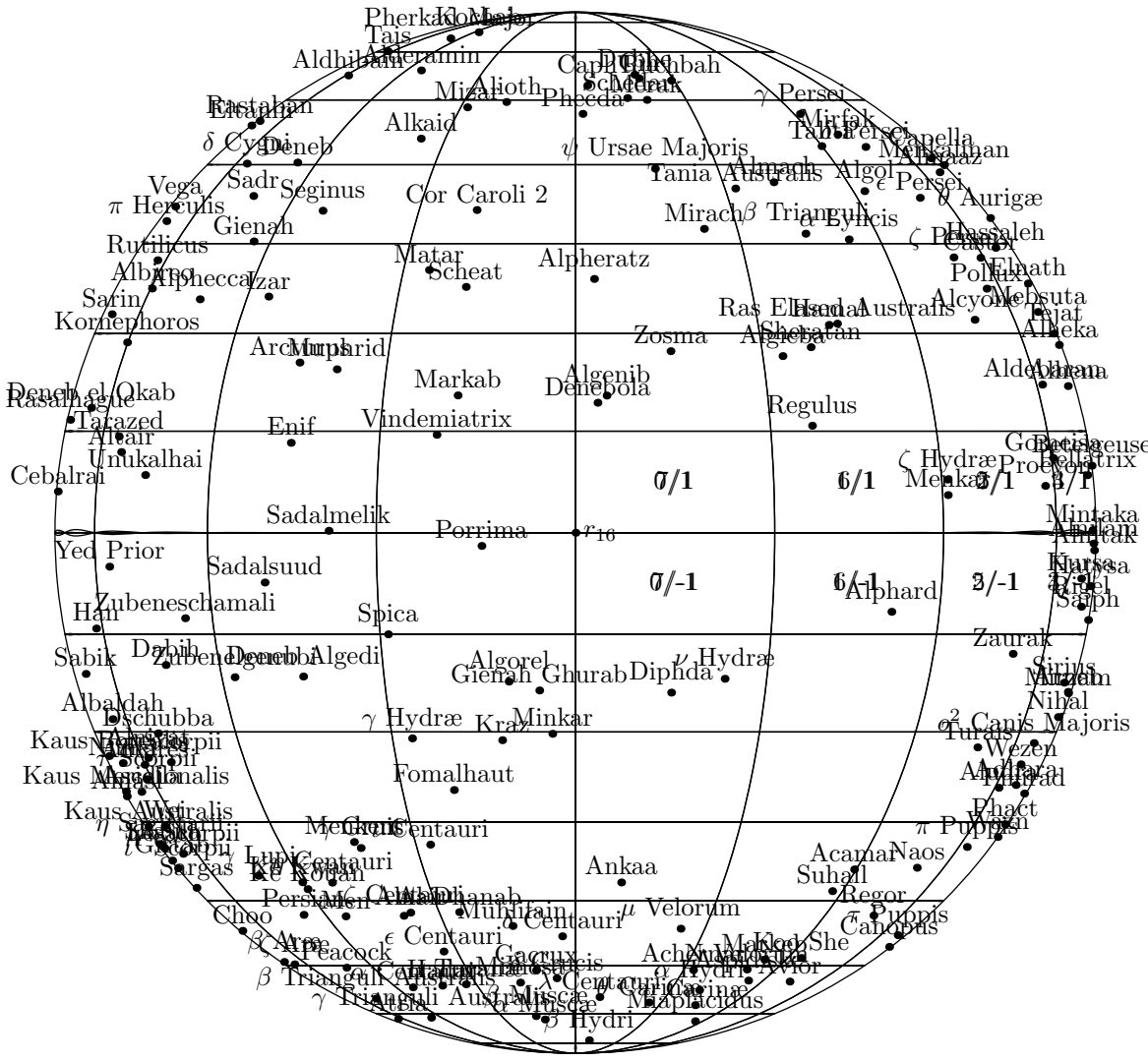


Globes





Parallel X-Z (Viewed from above)



Parallel Z-Y (Viewed from the right side)

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