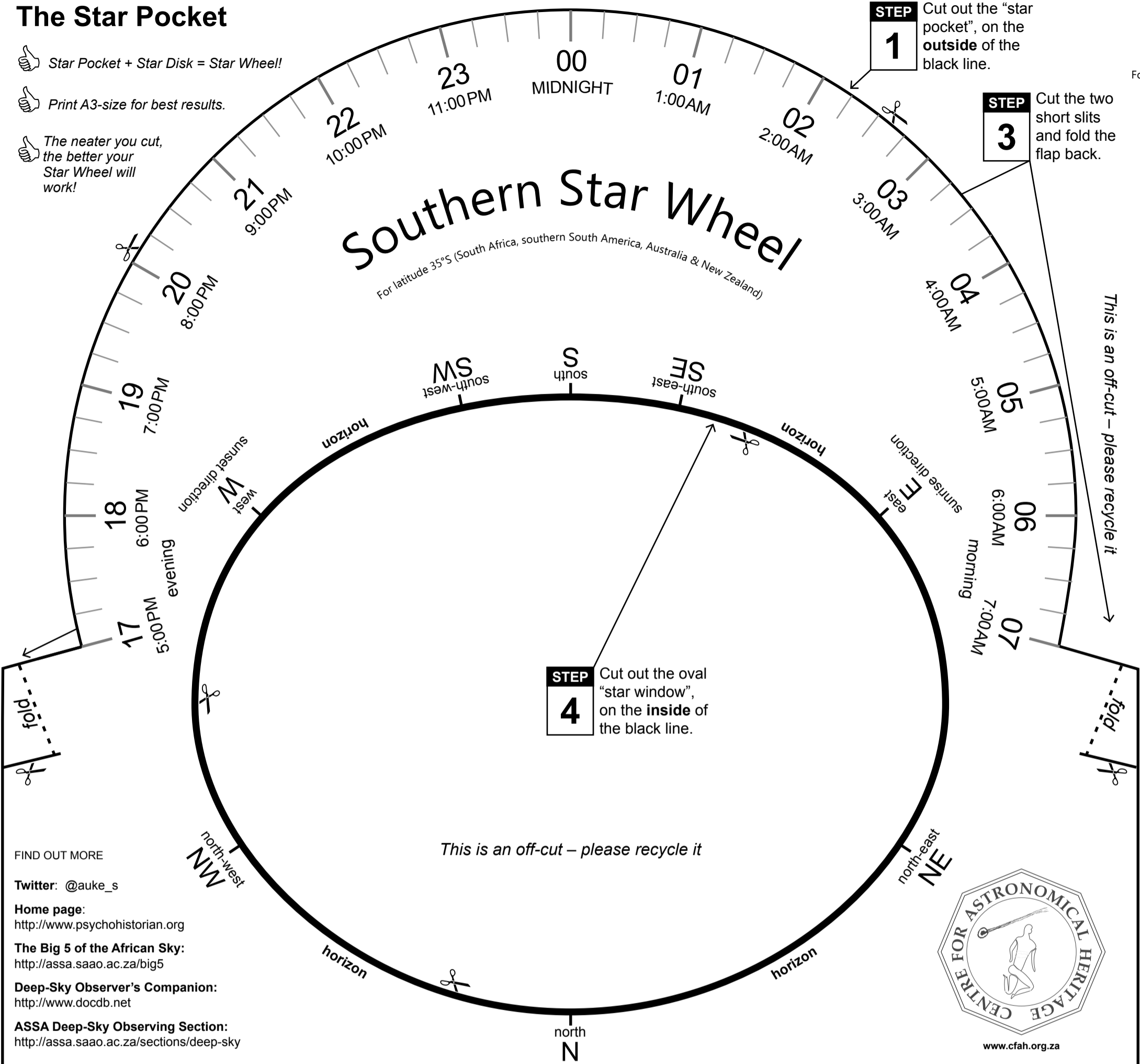


The Star Pocket

👍 Star Pocket + Star Disk = Star Wheel!

👍 Print A3-size for best results.

👍 The neater you cut, the better your Star Wheel will work!



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How to use your Southern Star Wheel

Cut out and assemble the Star Pocket. Then cut out Star Disk 1. Put the Disk into the Pocket – you now have a Star Wheel!

Note that the Star Disk has dates printed on its outer edge, and that the Star Pocket has time printed on its outer edge. When you rotate the Star Disk, it's like using a time machine!

To use the Star Wheel, decide when (date and time) you want to star gaze. Rotate the Star Disk until the date (on the Disk) aligns with the time (on the Pocket). Then, the stars shown in the oval star window will be the stars you can see in the sky!

The thick black line of the star window represents the horizon. The stars shown in the centre of the star window are the stars you can see overhead. To identify the stars visible towards the south, stand so that you are facing south. Hold the Star Wheel up in front of you and turn it so that the horizon marked "S South" is level with the ground. Make sure you don't accidentally turn the Star Disk – check that the date and time are still correctly aligned. Similarly, to identify the stars visible in the west, where the Sun sets, stand facing west and turn the Star Wheel so that the "W West" mark is at the bottom.

Compass directions

To figure out which way you are facing, you need to work out where north, south, west and east (the four **cardinal directions**) are. The Sun sets in the west, and rises in the east. If you stand facing the direction of sunset, then south is on your left, and north is to your right. You could also use a road map, a compass, or an app on your cellphone to help your find direction.

How many stars?

There are more than 200 billion (200,000,000,000) stars in our entire Milky Way galaxy, and about 1 000 billion billion (1,000,000,000,000,000,000,000,000) stars in the Universe! But we can't see all these stars – most of them are just too far away.

Using a big telescope (and a lot of patience!) you can count about 22 million stars in the night sky. A small telescope will show maybe one million stars. A pair of binoculars will reveal 360,000 stars. And if you use only your naked eye, you will see at most about 3000 stars on any clear, dark evening. (Keep in mind that a bright Moon makes it difficult to see the fainter stars.)

Perhaps you live in or near a big city? Then, you may only be able to see maybe 100 stars with your naked eye! Why? Because wasteful lights shine upwards into the night sky causing **light pollution**, robbing you of the pleasures of star gazing and wasting money and precious natural resources

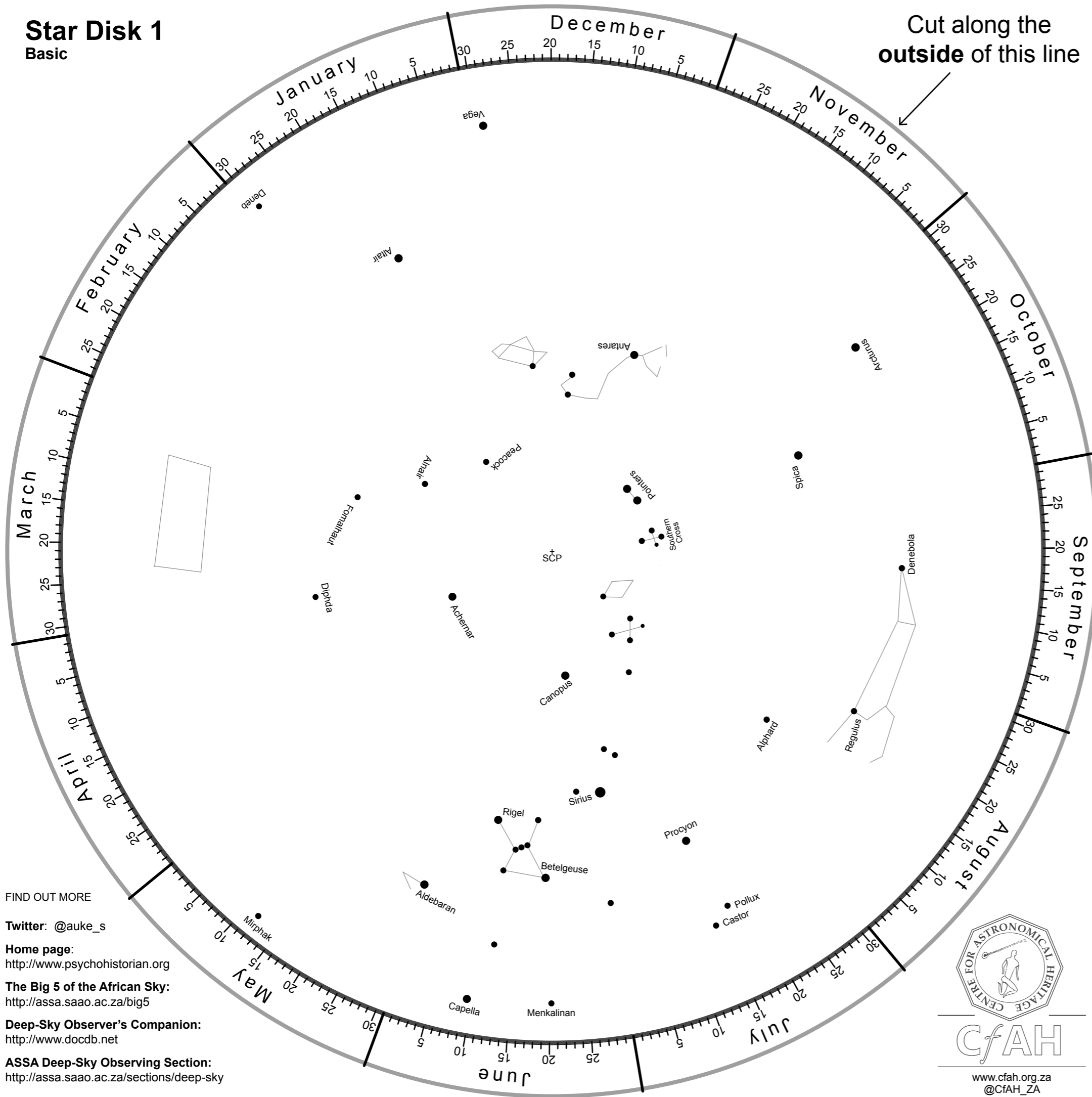
If you choose a dark spot somewhere, away from bright street lights, and give your eyes time to adapt to the dark, you will be able to see many more stars. Remember that your eyes become much more sensitive in the darkness, so avoid all bright lights (use a very dim torch or a torch app on your cellphone set to dimmest) when star gazing.

Learning the constellations

During the course of a single evening, new stars appear above the eastern horizon, while other stars set below the western horizon. This changing aspect is caused by the Earth's rotation on its own axis (once in 24 hours). During the course of a month, different stars can be seen as the nights follow each other. This more gradual change is caused by the Earth moving along its orbit around the Sun.

Star Disk 1

Basic



Cut along the outside of this line

Constellation abbreviations, names, and meanings

And	Andromeda (Chained Maiden)	Pup	Puppis (Stern of the Ship)
Ant	Antlia (Air Pump)	Pyx	Pyxis (Mariner's Compass)
Aps	Apus (Bird of Paradise)	Ret	Reticulum (Reticule)
Aql	Aquila (Eagle)	ScI	Sculptor (Sculptor's Workshop)
Aqr	Aquarius (Water Bearer)	ScO	Scorpius (Scorpion)
Ara	Ara (Altar)	Sct	Scutum (Shield)
Ari	Aries (Ram)	Ser	Serpens (Serpent)
Aur	Auriga (Charioteer)	Sex	Sextans (Sextant)
Boo	Boötes (Herdsman)	Sge	Sagitta (Arrow)
Cae	Caelum (Engraving Tool)	Sgr	Sagittarius (Archer)
Cap	Capricornus (Sea Goat)	Tau	Taurus (Bull)
Car	Carina (Keel of the Ship)	Tel	Telescopium (Telescope)
Cen	Centaurus (Centaur)	TrA	Triangulum Australe (Southern Triangle)
Cet	Cetus (Sea Monster)	Tri	Triangulum (Triangle)
Cha	Chamaeleon (Chameleon)	Tuc	Tucana (Toucan)
Cir	Circinus (Compass)	UMa	Ursa Major (Great Bear)
CMa	Canis Major (Big Dog)	Vel	Vela (Sails of the Ship)
CMi	Canis Minor (Little Dog)	Vir	Virgo (Maiden)
Cnc	Cancer (Crab)	Vol	Volans (Flying Fish)
Col	Columba (Dove)	Vul	Vulpecula (Fox)
Com	Coma Berenices (Berenice's Hair)		
CrA	Corona Australis (Southern Crown)		
CrB	Corona Borealis (Northern Crown)		
Crt	Crater (Cup)		
Cru	Crux (Southern Cross)		
Crv	Corvus (Crow)		
CVn	Canes Venatici (Hunting Dogs)		
Cyg	Cygnus (Swan)		
Del	Delphinus (Dolphin)		
Dor	Dorado (Swordfish)		
Equ	Equuleus (Little Horse)		
Eri	Eridanus (River)		
For	Fornax (Chemical Furnace)		
Gem	Gemini (Twins)		
Gru	Grus (Crane)		
Her	Hercules (Hercules)		
Hor	Horologium (Pendulum Clock)		
Hya	Hydra (Water Snake)		
Hyi	Hydrus (Small Water Snake)		
Ind	Indus (Indian)		
Lac	Lacerta (Lizard)		
Leo	Leo (Lion)		
Lep	Lepus (Hare)		
Lib	Libra (Scales)		
LMi	Leo Minor (Lesser Lion)		
Lup	Lupus (Wolf)		
Lyn	Lynx (Lynx)		
Lyr	Lyra (Lyre)		
Men	Mensa (Table Mountain)		
Mic	Microscopium (Microscope)		
Mon	Monoceros (Unicorn)		
Mus	Musca (Fly)		
Nor	Norma (Carpenter's Square)		
Oct	Octans (Octant)		
Oph	Ophiuchus (Serpent Bearer)		
Ori	Orion (Orion)		
Pav	Pavo (Peacock)		
Peg	Pegasus (Winged Horse)		
Per	Perseus (Perseus)		
Phe	Phoenix (Phoenix)		
Pic	Pictor (Painter's Easel)		
PsA	Piscis Austrinus (Southern Fish)		
Psc	Pisces (Fishes)		

Observing checklist

Con	Seen?	Con	Seen?
And		Lep	
Ant		Lib	
Aps		LMi	
Aql		Lup	
Aqr		Lyn	
Ara		Lyr	
Ari		Men	
Aur		Mic	
Boo		Mon	
Cae		Mus	
Cap		Nor	
Car		Oct	
Cen		Oph	
Cet		Ori	
Cha		Pav	
Cir		Peg	
CMa		Per	
CMi		Phe	
Cnc		Pic	
Col		PsA	
Com		Psc	
CrA		Pup	
CrB		Pyx	
Crt		Ret	
Cru		ScI	
Crv		ScO	
CVn		Sct	
Cyg		Ser	
Del		Sex	
Dor		Sge	
Equ		Sgr	
Eri		Tau	
For		Tel	
Gem		TrA	
Gru		Tri	
Her		Tuc	
Hor		UMa	
Hya		Vel	
Hyi		Vir	
Ind		Vol	
Lac		Vul	
Leo			

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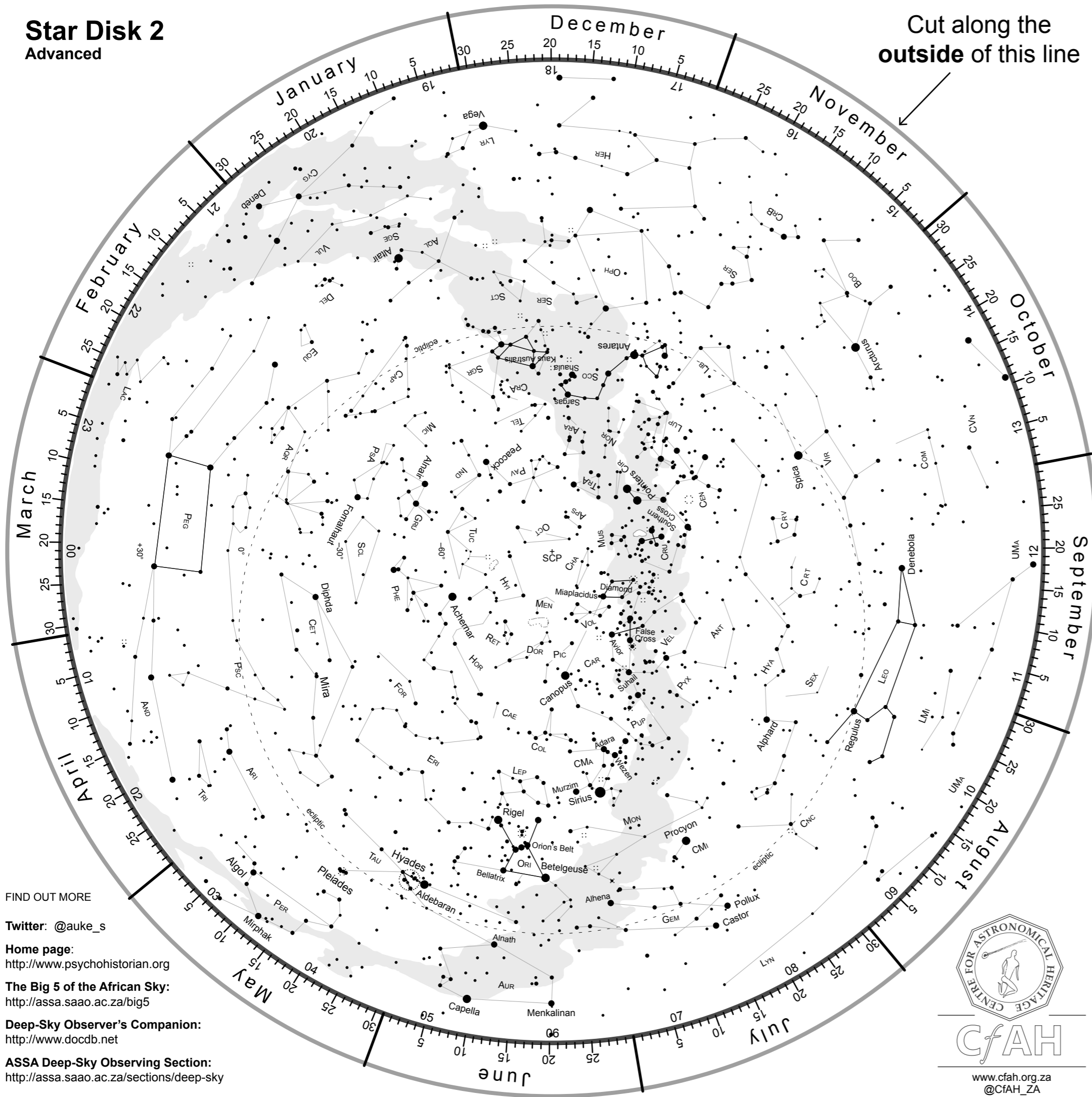
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Star Disk 2

Advanced

Cut along the outside of this line



Constellation abbreviations, names, and meanings

And	Andromeda (Chained Maiden)	Pup	Puppis (Stern of the Ship)
Ant	Antlia (Air Pump)	Pyx	Pyxis (Mariner's Compass)
Aps	Apus (Bird of Paradise)	Ret	Reticulum (Reticle)
Aql	Aquila (Eagle)	ScI	Sculptor (Sculptor's Workshop)
Aqr	Aquarius (Water Bearer)	ScO	Scorpius (Scorpion)
Ara	Ara (Altar)	Sct	Scutum (Shield)
Ari	Aries (Ram)	Ser	Serpens (Serpent)
Aur	Auriga (Charioteer)	Sex	Sextans (Sextant)
Boo	Boötes (Herdsman)	Sge	Sagitta (Arrow)
Cae	Caelum (Engraving Tool)	Sgr	Sagittarius (Archer)
Cap	Capricornus (Sea Goat)	Tau	Taurus (Bull)
Car	Carina (Keel of the Ship)	Tel	Telescopium (Telescope)
Cen	Centaurus (Centaur)	TrA	Triangulum Australe (Southern Triangle)
Cet	Cetus (Sea Monster)	Tri	Triangulum (Triangle)
Cha	Chamaeleon (Chameleon)	Tuc	Tucana (Toucan)
Cir	Circinus (Compass)	UMa	Ursa Major (Great Bear)
CMa	Canis Major (Big Dog)	Vel	Vela (Sails of the Ship)
CMI	Canis Minor (Little Dog)	Vir	Virgo (Maiden)
Cnc	Cancer (Crab)	Vol	Volans (Flying Fish)
Col	Columba (Dove)	Vul	Vulpecula (Fox)
Com	Coma Berenices (Berenice's Hair)		
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CrB	Corona Borealis (Northern Crown)		
Crt	Crater (Cup)		
Cru	Crux (Southern Cross)		
Crv	Corvus (Crow)		
CVn	Canes Venatici (Hunting Dogs)		
Cyg	Cygnus (Swan)		
Del	Delphinus (Dolphin)		
Dor	Dorado (Swordfish)		
Equ	Equuleus (Little Horse)		
Eri	Eridanus (River)		
For	Fornax (Chemical Furnace)		
Gem	Gemini (Twins)		
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Pav	Pavo (Peacock)		
Peg	Pegasus (Winged Horse)		
Per	Perseus (Perseus)		
Phe	Phoenix (Phoenix)		
Pic	Pictor (Painter's Easel)		
PsA	Piscis Austrinus (Southern Fish)		
Psc	Pisces (Fishes)		

Observing checklist

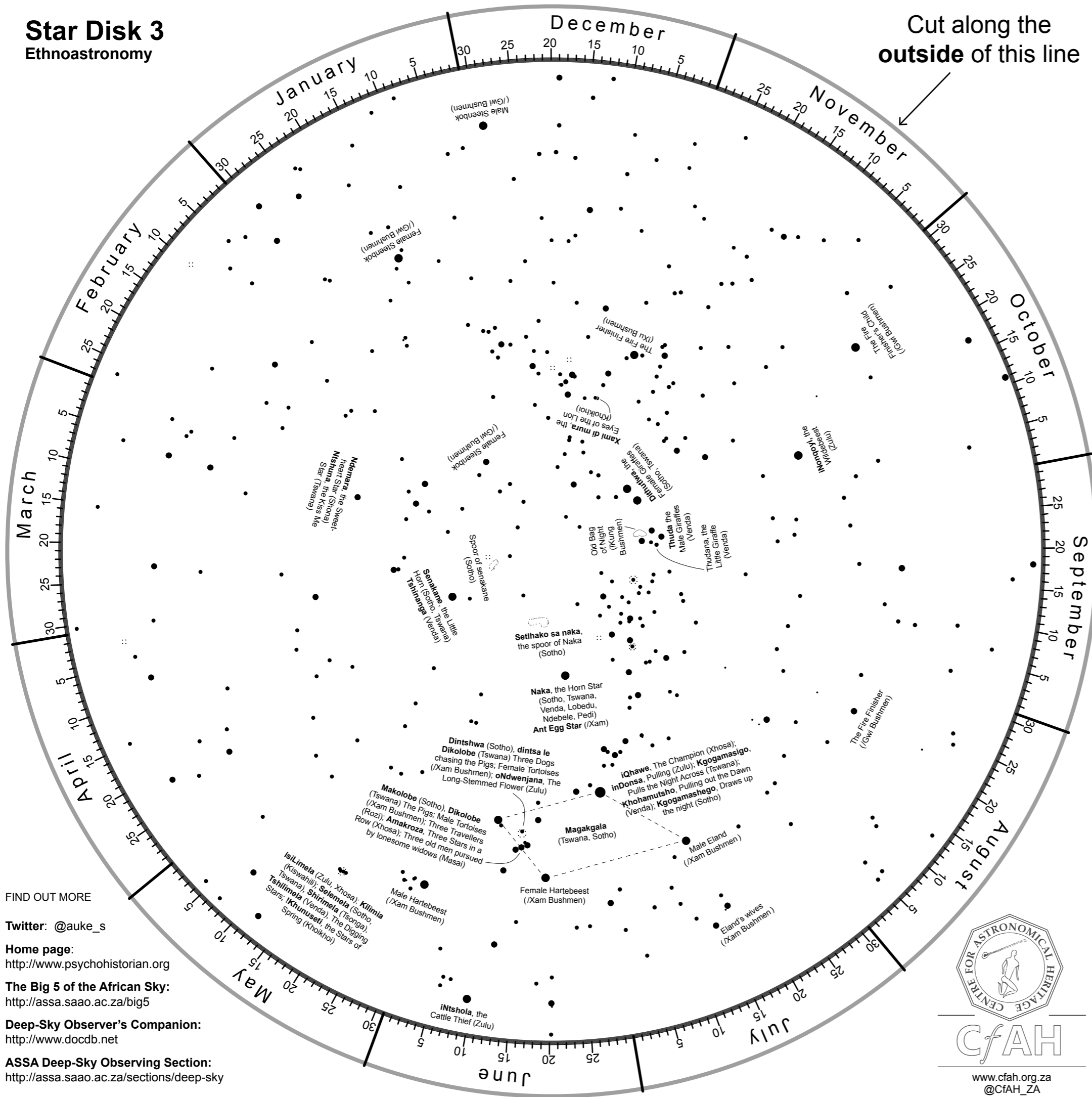
Con	Seen?	Con	Seen?
And		Lep	
Ant		Lib	
Aps		LMi	
Aql		Lup	
Aqr		Lyn	
Ara		Lyr	
Ari		Men	
Aur		Mic	
Boo		Mon	
Cae		Mus	
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Cen		Oph	
Cet		Ori	
Cha		Pav	
Cir		Peg	
CMa		Per	
CMI		Phe	
Cnc		Pic	
Leo		PsA	
Col		Psc	
Com		Pup	
CrA		Pyx	
CrB		Ret	
Crt		ScI	
Cru		ScO	
Crv		Sct	
CVn		Ser	
Cyg		Sex	
Del		Sge	
Dor		Sgr	
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Star Disk 3

Ethnoastronomy



Cut along the outside of this line

Indigenous stars shown on the *Southern Star Wheel*

Scientific name	English name	Indigenous name
Achernar	The Little Horn	Senakane (Sotho, Tswana); Tshinanga (Venda)
Aldebaran	The Male Hartebeest	/Xam Bushmen
alpha & beta Crucis	The Male Giraffes	Thuda (Venda)
Altair	The Female Steenbok	/Gwi Bushmen
Antares	The Fire-Finishing Star	!Xu Bushmen
Arcturus	The Fire Finisher's Child	/Gwi Bushmen
Betelgeuse	Female Hartebeest	/Xam Bushmen
Canopus	The Horn Star	Naka (Sotho, Tswana, Venda, Lobedu, Ndebele, Pedi)
Canopus	The Ant Egg Star	/Xam Bushmen
Capella	The Cattle Thief	iNtshola (Zulu)
Castor	The Female Eland	/Xam Bushmen
Coal Sack	Old Bag of the Night	Nyae Nyae !Kung Bushmen
Fomalhaut	The Sweetheart Star	Ndemara (Shona)
Fomalhaut	The Kiss Me Star	Ntshuna (Tswana)
gamma & delta Crucis	The Little Giraffe	Thudana (Venda)
Large Magellanic Cloud	The Spoor of the Horn Star	Setlhako sa naka (Sotho)
mu-1 & mu-2 Sco	The Eyes of the Lion	xami di mura (Khoikhoi)
Orion's Belt	The Pigs	Makolobe (Sotho); Dikolobe (Tswana)
Orion's Belt	The Male Tortoises	/Xam Bushmen
Orion's Belt	The Three Travellers	Rozi
Orion's Belt	Three Stars in a Row	Amakroza (Xhosa)
Orion's Belt	Three old men pursued by lonesome widows	Masai
Orion's Sword	Three Dogs chasing the Pigs	Dintshwa (Sotho); dintsale Dikolobe (Tswana)
Orion's Sword	The Female Tortoises	/Xam Bushmen
Orion's Sword	The Long-Stemmed Flower	oNdwenjana (Zulu)
Peacock	The Female Steenbok	/Gwi Bushmen
Pleiades	The Digging Stars	isiLimela (Zulu, Xhosa); Kilimia (Kiswahili); Selemela (Sotho, Tswana); Shirimela (Tsonga); Tshilimela (Venda)
Pleiades	The Stars of Spring	!Khunuseti (Khoikhoi)
Pointers	The Female Giraffes	Dithutlwa (Sotho, Tswana)
Pollux	The Female Eland	/Xam Bushmen
Procyon	The Male Eland	/Xam Bushmen
Regulus	The Fire Finisher	/Gwi Bushmen
Sirius	The Champion	iQhawe (Xhosa)
Sirius	Pulls the Night Across	Kgogamasigo (Tswana); Kgogamashego (Sotho)
Sirius	Pulling out the Dawn	Khohamutsho (Venda)
Sirius	Pulling	inDonsa (Zulu)
Small Magellanic Cloud	The Spoor of the Little Horn Star	Setlhako sa senakane (Sotho)
Spica	The Wildebeest Star	iNonqoyi (Zulu)
Vega	The Male steenbok	/Gwi Bushmen

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