

Table of Contents – *Fundamentals of Stargazing* (March 2017 – February 2018)

Month	Sky Tours (North)	Sky Tours (South)	Deep-Sky Objects	Solar System Observing	Observing Tools and Techniques	Science of Astronomy
1- March	Orion, Taurus, Canis Major, Auriga; Monoceros and Lepus; Eridanus; Constellations vs. Asterisms	Orion, Taurus, Gemini, Canis Major, Auriga; Monoceros, Lepus, and Columba; Puppis, Eridanus; Constellations vs. Asterisms	Hyades; Pleiades; Orion Nebula; Orion OB1 Association; Crab Nebula; M41; M36,37,38; M46 and M47; NGC2451 and NGC2477	Layout of the solar system; a detailed look at the planet Jupiter	Visual observing - how the eye sees faint objects; dark adaptation; averted vision; tools: red flashlights	Layout of the sky: the celestial sphere, finding the celestial poles, equator, ecliptic; measuring angular distances
2- April	Gemini, Lynx, Cancer, Leo, Hydra	Gemini, Cancer, Leo, Hydra, Carina, Vela and the 'False Cross'	Castor, M35, NGC2392 (Eskimo), Iota Can, M44 (Beehive), M67, M48, Regor (Gamma Velorum) and NGC2547, IC2391, NGC2516 (Southern Beehive), NGC3372 (Eta Carinae), NGC3293, IC2602 (Southern Pleiades)	Geometry of the solar system; Retrograde motion	Evaluating the night sky; Estimating small angles	Apparent motion of the night sky; celestial coordinates; precession of the equinoxes
3- May	Ursa Major, Ursa Minor, Bootes, Corona Borealis, Coma Berenices, Canes Venatici	Bootes, Corona Borealis, Coma Berenices, Canes Venatici, Crux (Southern Cross), Centaurus	M81 and M82; M97; Regulus; Leo Triplet; Cor Caroli and La Superba; M51; M3; Izar; Melotte 111; NGC 4565; Acrux and Gacrux; NGC 4755 (Jewel Box); Coalsack; NGC 5139 (Omega Centauri); NGC 5128; Alpha Centauri; NGC 5281	A detailed look at the planet Mars	Binoculars: How to choose; image stabilization; giant binoculars; focusing and mounting; recommendations	Stellar magnitude; star names
4- June	Virgo, Corvus and Crater, Hercules, Draco	Virgo, Corvus and Crater, Libra, Hercules	Porrima, M104 (Sombrero), M87, Markarian's Chain, NGC 4216, M13 (Hercules Cluster); M92, alpha Herc, NGC 6543 (Cat's Eye)	Saturn: structure and geography; rings; moons, observing tips	Telescopes: overview, refractors, Newtonians, SCT and MCT reflectors, pros and cons	How stars form; star structure, star colors, stellar classification, the HR diagram
5- July	Lyra, Ophiuchus, Serpens, Scorpius	Lyra, Ophiuchus, Serpens, Scorpius	M57 (Ring Nebula), M56; epsilon Lyrae, 70 Oph, IC4665, M5, M10 and M12; Antares, M4, rho Oph, M6 and M7; False Comet	"Seas" on the Moon; lunar craters	Altazimuth and equatorial telescope mounts, go-to and push-to mounts; recommended mounts	Review of stars; how stars evolve
6- August	Cygnus, Aquila, Scutum, Vulpecula, Sagitta, Delphinus, Sagittarius	Cygnus, Aquila, Scutum, Vulpecula, Sagitta, Delphinus, Sagittarius	Milky Way, NGC 7000 (NA Neb), Veil Neb, M29, M27 (Dumbbell), Coathanger, M71, M11 (Wild Duck), M16 (Eagle), M17 (Swan), M24, M8 (Lagoon), M20 (Trifid), M22	Meteors, Meteoroids, Meteorites; Meteor showers	Eyepiece primer, wide-field eyepieces, planetary eyepieces; light-pollution filters	Distances to nearby stars; parallax; proper motion and radial velocity; double and multiple stars

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7- September	Cassiopeia, Cepheus, Capricornus, Lacerta	Capricornus, Pavo, Indus, Octans,	Herschel's Garnet Star (Mu Cep); Delta Cephei; NGC 7380; NGC 188; M52 and NGC 7635; NGC 7789 and Rho Cassiopeiae; Eta Cassiopeiae; NGC 281; M103; NGC 457; NGC 6752; NGC 6744; Epsilon and Theta Indi; Sigma Octanis	Zodiacal light and Gegenschein; Lunar mountains	Long-relief eyepieces; zoom eyepieces; telescope resolution; dew control	Emission, reflection, and dark nebulae
8- October	Pegasus, Aquarius, Piscis Austrinus, Sculptor	Pegasus, Aquarius, Piscis Austrinus; Sculptor, Phoenix, Grus, and Tucana	M15, NGC7331, NGC7662, NGC7479, M2, NGC7009, NGC7239(Helix), zeta Aqr, NGC253, NGC55 and NGC300	Uranus and Neptune	Binoviewers; Urban observing techniques, Bortle dark-sky scale	Variable stars
9- November	Pisces, Andromeda, Triangulum, Aries	Pisces, Andromeda, Triangulum, Aries	M31 (Andromeda Galaxy), NGC 404, M33 (Triangulum Galaxy), NGC 604, NGC 752, Gamma Andromedae, NGC 891, Gamma Arietis, Small Magellanic Cloud (NGC 292), 47 Tucanae, NGC 362	The Lunar 100	Finder scopes, Barlow lenses, Clear-sky charts, the Caldwell list	Open and globular star clusters; stellar populations
10- December	Perseus, Cetus, Camelopardalis	Perseus, Cetus, and the Deep-Southern Constellations	Alpha Persei Moving Group; Algol; M76; Double Cluster and Region; Heart (IC 1805) and Soul (IC 1848) Nebula; NGC 1333; M34; M77 and NGC 1055; Mira; M74; NGC 247; The Large Magellanic Cloud; NGC 2070 (Tarantula Nebula)	Venus and Mercury	Color filters, Moon filters, Solar filters (white light and H-alpha)	Galaxies and galaxy classification, structure of the Milky Way; distance scale of the Milky Way
11- January	Tour of the southern constellations	Tour of the northern constellations	Jewel-box cluster, the Coalsack, alpha Cen, Omega Cen cluster; IC2602 (southern Pleiades), eta Carinae Nebula, NGC3293 NGC3532, NGC2516 (Southern Beehive); 47 Tuc, Large Magellanic Cloud; M81/82, M51, La Superba, NGC4565, Melotte111, M97, NGC457, NGC7789, Mu Cephei, Double Cluster	Comets: names, historical, Great Comets, observing comets	Basics of astronomical imaging; sky portraits, nightscapes, afocal imaging, tracking with a DSLR	The cosmic distance scale; Type Ia supernovae
12- February	Orion revisited	Orion revisited	Challenge objects: NGC1514, M78, NGC1999, IC405, NGC2419	Solar Observation; Solar and lunar eclipses	Introduction to deep-sky video astronomy	Quasars: the farthest things you can see