

RASC Toronto Centre Members Night - January, 2016 - Observing Targets

By Chris Vaughan

Emphasis is on the must-sees and some overlooked gems and fun items seen only in winter (i.e., not circumpolar). For deep sky objects "M" designates Messier List object, "C" Caldwell List Object, "NGC" New General Catalogue, "IC" Index Catalogue for nebulae, and "Melotte" Open Cluster Catalogue.

For stars, I give the proper names (spellings may vary) or nicknames, plus Bayer designation (Greek letter plus Latin constellation name) and/or Flamsteed designation (numeral and Latin constellation name), and the visual magnitude "mag". For doubles/multiples I have provided mags, separations "sep" in minutes (') or seconds ("), colours, etc.

O-III and UHC filters will enhance nebulae by darkening surrounding the sky and stars. Planetary nebula benefit especially well, and cloud shapes become more apparent. Place the filter and re-focus after first finding/viewing the object without any filtering.

The Winter Hexagon / Football

The bright stars Rigel, Aldebaran, Capella, Castor, Pollux, Procyon, and Sirius form this shape across the southern winter sky

Orion (Orionis) plus Eridanus (Eridani) and Cetus (Ceti)

Menkar (Alpha Ceti) - Home to exiled Soonian Khan of Star Trek, a mag 2.5 class M red variable star

Keid / Omicron2 Eri (40 Eridani) - Vulcan's star system! A triple - yellow mag 4, white dwarf mag 9 (sep 83") (plus a red dwarf mag 11 visible in a larger scope)

Betelgeuse (Alpha Ori) - A class M1 old red supergiant. Watch for the supernova!

Orion Nebula / M42/43 / NGC1976,1982 - Try an O-III filter. How many Trapezium stars can you detect? Use a widefield EP and look around! Running Man Nebula NGC1977 is just to the north.

Nair al Saif / Hatsya (Iota Ori) - Nice double (mags 2.77 and 7, sep 11") likely ejected from Trapezium

Orion's Belt - E to W (left to right) are Alnitak (Zeta Ori), Alnilam (Eps Ori), and Mintaka (Delta Ori)

Alnitak (Zeta Ori) and Flame Nebula / NGC2024 - Double star in an area rich in nebulosity

Horsehead Nebula / IC434 - A very faint challenge object of dark molecular Hydrogen, use UHC filter

Mintaka (Delta Ori) - Double star mags 2.3 and 6.8, sep 52"

Sigma Ori - A gorgeous quintuple system near Alnitak! Mags range 3.7-6.3, ~51" across. Double star Struve 761 is nearby

Eta Ori - Close coloured double Yellow/Blue mags 3.4 and 4.9, sep 2"

Rigel (Beta Ori) - A blue-white supergiant double star mags 0.3 and 6.8, sep 9.3". Try to spot the companion within the glare if seeing permits

M78 / NGC2068 - The brightest reflection nebula in sky, NE of Alnitak is about 8'x6' in size, visible in moderate telescopes. It contains two mag 10 illuminating stars. Try an O-III filter

Meissa (Lambda Ori) - marks Orion's head - a close double (3.4 and 5.5, sep 4") interesting area to sweep includes phi1,2 Ori

Monkey Head Nebula / NGC2174 - A bright mag 7.8 compact nebula 40'x30' (suggested by Tom Luton)

Witch Head Nebula / IC2118 - A challenge object ~2.6 degrees west of Rigel is a faint but enormous 180' x 60' reflection nebula. Too faint to filter? A good widefield imaging object

Taurus (Tauri)

The Pleiades / M45 / Melotte 22 / Seven Sisters – More than 1° across its best observed in widefields, especially binoculars. Telescopes/imagers should try for the foreground reflection nebulosity, especially around **Merope** (the most southerly member)

Crab Nebula / M1 / NGC1952 – A supernova remnant mag 8.4 challenge object about 8'x4' (seen in an 8" SCT from Glen Major)

The Hyades / C 41 / Melotte 25 / Bull's Face – Contains some nice doubles including **77/78 (Theta) Tau**, the **Delta Tau** triple (Hyadum II, Cleeia, and Delta2, mags 3.76, 4.31, and 4.8 respectively), and **Sigma Tau**

Auriga (Aurigae)

Pinwheel Cluster / M36 / NGC1960 – A mag 6 open cluster about 10" across

M37 / NGC2099 – A mag 6.0 open cluster about 14' across

Flaming Star Nebula / Caldwell 31 / IC405 – An emission nebula of mag 10 about 30'x19' across. Emission star AE Auriga may have been ejected from Orion complex and is just passing through

Canis Major and Lepus

Sirius (Alpha CMa) – The brightest star in the night sky. Try to spot the nearby "Pup", a mag 8 white dwarf companion designated Sirius B, in the glare

Winter Albireo / 145 CMa / HR2764 – Gorgeous coloured double orange/blue, mags 4.8, 5.8, sep 27"

Hind's Crimson Star / R Lep – A very red, pulsating long period variable Carbon star in Lepus, mag ~8

M79 / NGC1904 – A mag 7.7 Globular Cluster in Lepus, about 1.3' across

Zenith Area – Perseus (Persei), Cassiopeia (Cassiopeia), and Triangulum (Trianguli)

California Nebula / NGC1499 – In Perseus, large (145'x40'), but faint (mag 5) imaging target north of O-star **Menkib (Xi Per)** which probably is the radiation source. An H-Beta filter is helpful to show brighter linear structures.

Pinwheel Galaxy / M33 / NGC598 – In Triangulum, a near face-on spiral galaxy situated near the zenith for optimal imaging. It's large 69'x42' and at mag 5.69 it might be the farthest object an unaided human eye can see (under black skies) – 2.8 Mly distant!

Iota Cass – Triple coloured system! White/Yellow/Blue of mags 4.7, 6.9, 8.3, sep 2.5" and 7.3"

Algol / Head of Medus / Demon Star (Beta Per) – A class B5V eclipsing variable with a period of 2.87 days and mag range of 2.2 to 12.7 (see Observers Handbook for minima)

Double Cluster / NGC869,884 / Caldwell 14 – In Perseus, a pair of large (each 30' across) bright open star clusters best seen in 1° fields of view

Melotte 20 / Alpha Persei Moving Group – A huge open cluster of nearby stars 5° across, binocular object surrounding **Mirphak** (Alpha Per)

Heart and Soul Nebulae / IC1805, 1848 – In Cassiopeia near the Double Cluster is a pair of large H2 structures that benefit from UHC and O-III filters.

Additional Caldwell/Messier Objects (with NGC designation)

C58 / NGC2360, C64 / NGC2362, M41 / NGC2287 (CMa), M46 / NGC2437, M47 / NGC2422, M93 / NGC2447 (Pup), M48 / NGC2548 (Hya), M77 / NGC1068 / Cetus A (Cet), C24 / NGC1275 / Perseus A galaxy group, M34 / NGC1039, M76 / NGC650,651 (Per)