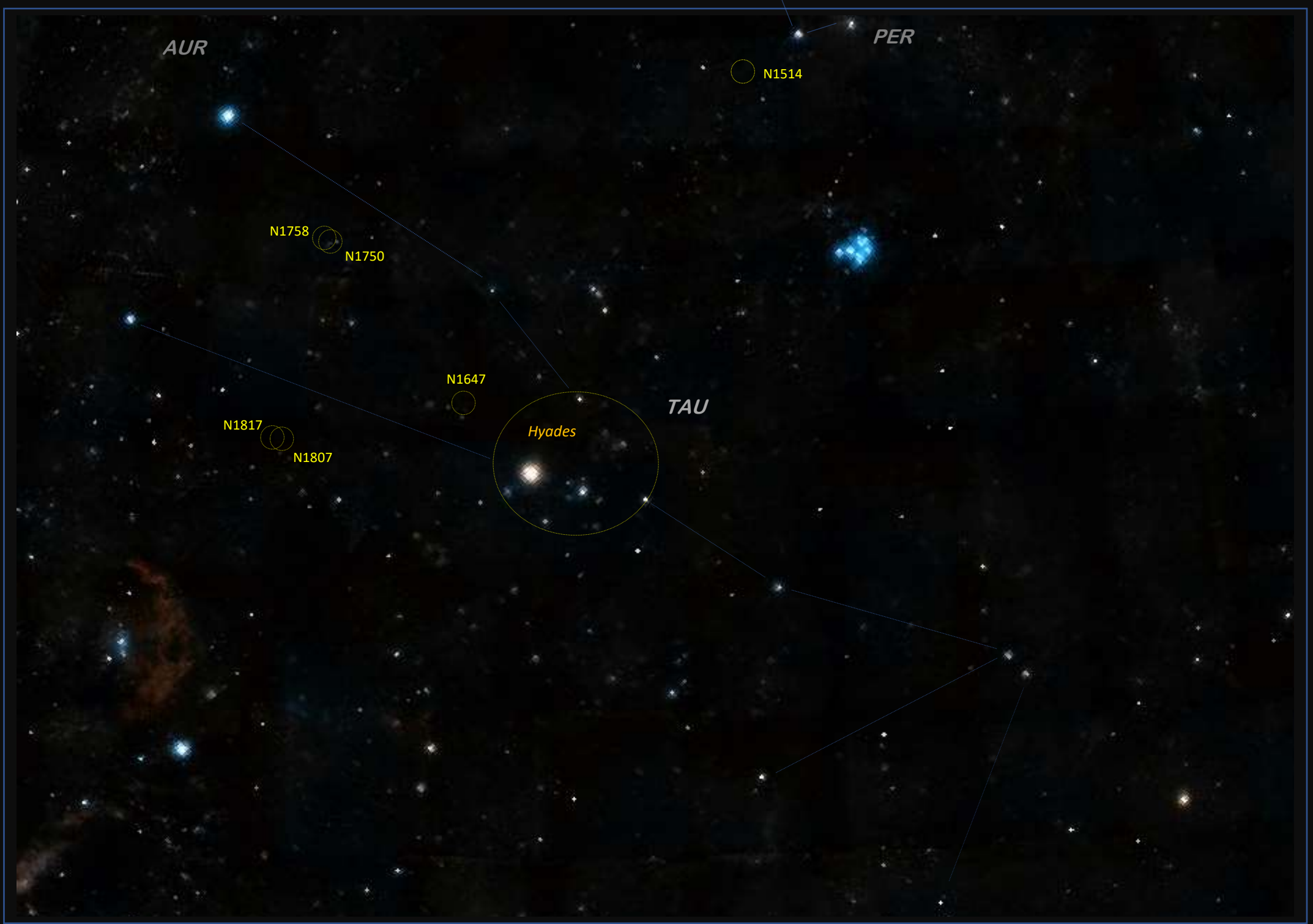


TAURUS

TAURUS (TAU)

√	NGC	RASC	SAC	CALD	HER-400	O-HT	O-SD	Season	Con	Type	R.A. H:m.s	DEC °,'	m_v	Size "	Comment
√	1514	R023					D015	W	Tau	PN	04:09.2	30.47	10.8	1'54"	Crystal Ball Nebula; faint glow around 9.4 mag central star.
√	1758						D018	W	Tau	OC	05:04.7	23.48	~7.5	10	# OC overlapping NGC 1750; Dist ~2.5 Kly
√	1750						D017	W	Tau	OC	05:04.3	23.44	~6th	30	# OC overlapping NGC 1758; Dist ~2 Kly
√	1817				H058 (7,4)		D021	W	Tau	OC	05:12.4	16.41	7.7	20	▣ Poor Man's Double, next to 1807, mod. Dim, 4* 9-10m
√	1807						D020	W	Tau	OC	05:10.8	16.31	7.0	12	▣ Poor Man's Double, next to 1817, 37*
√	HYADES			C041				W	Tau	OC	04:27.0	16.00	0.5	330	Hyades
√	1647				H055 (8,8)	T027		W	Tau	OC	04:46.0	19.07	6.4	40	Pirate Moon Cluster, near Taurus 'V', round, 9m double*
	2547					T044		W	Vel	OC	08:10.1	-49.13	4.7	25	Golden Earring, St. Peter's Cross OC;



AUR

PER

N1514

N1758

N1750

N1647

N1817

N1807

TAU

Hyades

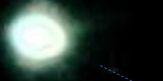
Part of
HYADES

N

56N 12E, Copenhagen DENMARK
2022-02-26, 19:00 Local (UT+1)
Temp.: 0°C, Hum.: 97%, DewPt.: 0°C
Trsp.: 5/7, Seeing: 8/10, Calm
LP:SQM 20.3 (NELM 6.2) Suburban

Zeiss 100/640 APQ
TV 55mm PLÖ + CLS filter
Photonis 4G Intens PVS14 NVD
iPhone Xs, NightCap app,
Exp.: 1s, Ave. 20s, ISO-40, Gain: Low

α TAU
Aldebaran
K5 III



A6 IV

K1 III

Φ_1

A7 V

$\Phi_{2\text{ A-B}}$

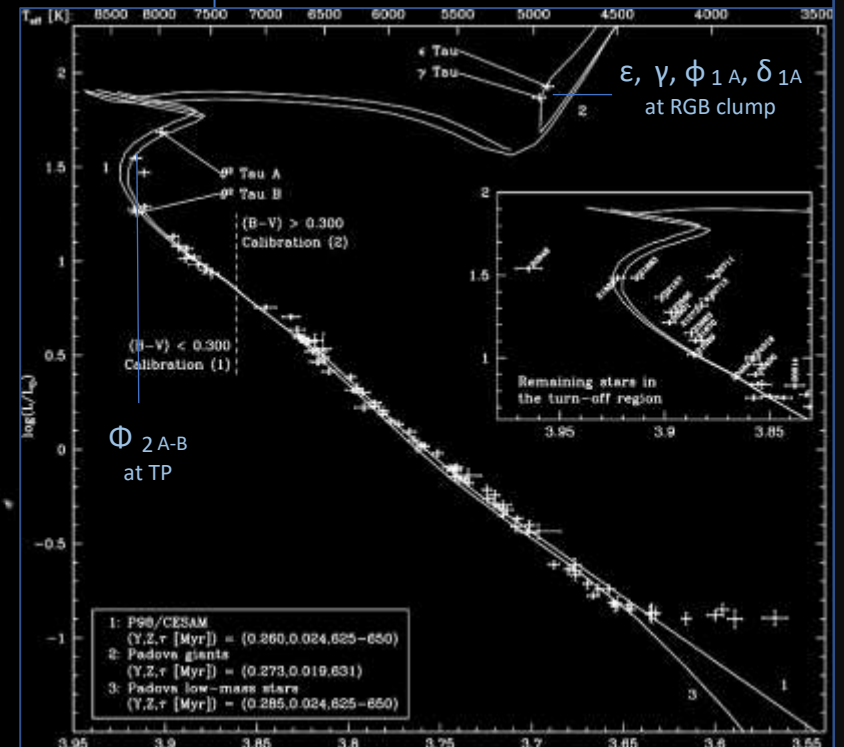
A7 III

W

The **Hyades** is the nearest OC to our Sun, located very close by at 45 pc in our local Spiral Arm, in the direction opposite to the galactic centre. The cluster is **young with an age of ~626 Myr**.

The CMD below is based on Hipparchos data from year 2000, which includes 233 of the ~300 member stars inside the tidal radius of ~10pc.

The diagram shows a well-defined Main Sequence with a turnoff-point (TP) around stellar type A7. Of more evolved stars, the Hyades has a red clump with 4 giants located inside the cluster's core that has a diameter of 2.7 pc: Φ_1 (G9 III), δ_1 (G9.5 III), ϵ (G9.5 III), and γ TAU (G9.5 III). There is also a dozen known white dwarfs ~14^m in the Hyades cluster.



56N 12E, Copenhagen DENMARK
 2022-02-26, 19:30 Local (UT+1)
 Temp.: 0°C, Hum.: 97%, DewPt.: 0°C
 Trsp.: 5/7, Seeing: 7/10, Calm
 LP:SQM 20.3 (NELM 6.2) Suburban

Zeiss 100/640 APQ
 TV 41mm PAN + 610nm RED longpass
 Photonis 4G Intens PVS14 NVD
 iPhone Xs, NightCap app,
 Exp.: 1s, Ave. 15s, ISO-1600,
 Gain: Medium

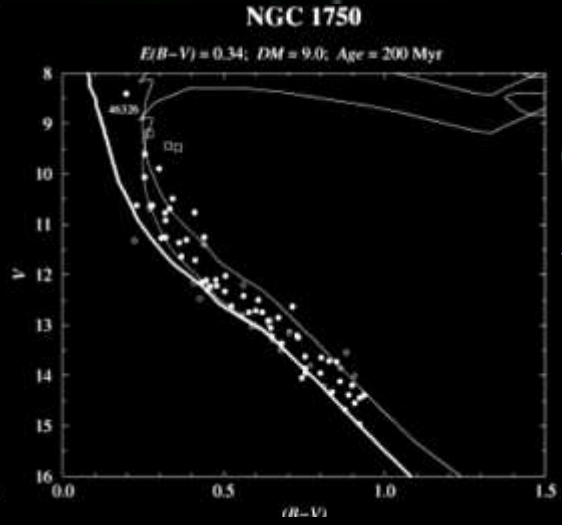
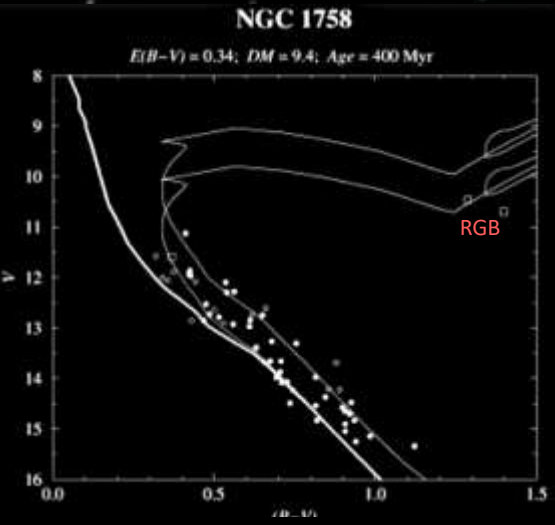
E



NGC 1750 OC (H VIII-43), 200 Myr, 0.75 Kpc
 NGC 1758 OC (H VII-21), 400 Myr, 0.6 Kpc
 [NGC 1746 Asterism]

NGC 1746 is an asterism 5° north of M-Tauri (104 Tau), in which resides the two ~300 Myr young open clusters: N1758 plus N1750. These OCs are located at a distance of ~0.7 Kpc in our Local spiral arm, towards the Milky Way anti-center at the outskirts of the dark Taurus molecular cloud complex (MCC). The two open galactic clusters are overlapping on the night sky, but they do not constitute a gravitationally bounded binary system.

Both clusters are rather loose and poor (N1758: 60 members, N1750: 80 members), with N1750 being slightly younger, closer and less concentrated, while N1758 has the most evolved stars, now on the RGB. The brightest members in the clusters are late type-B and early type-A stars

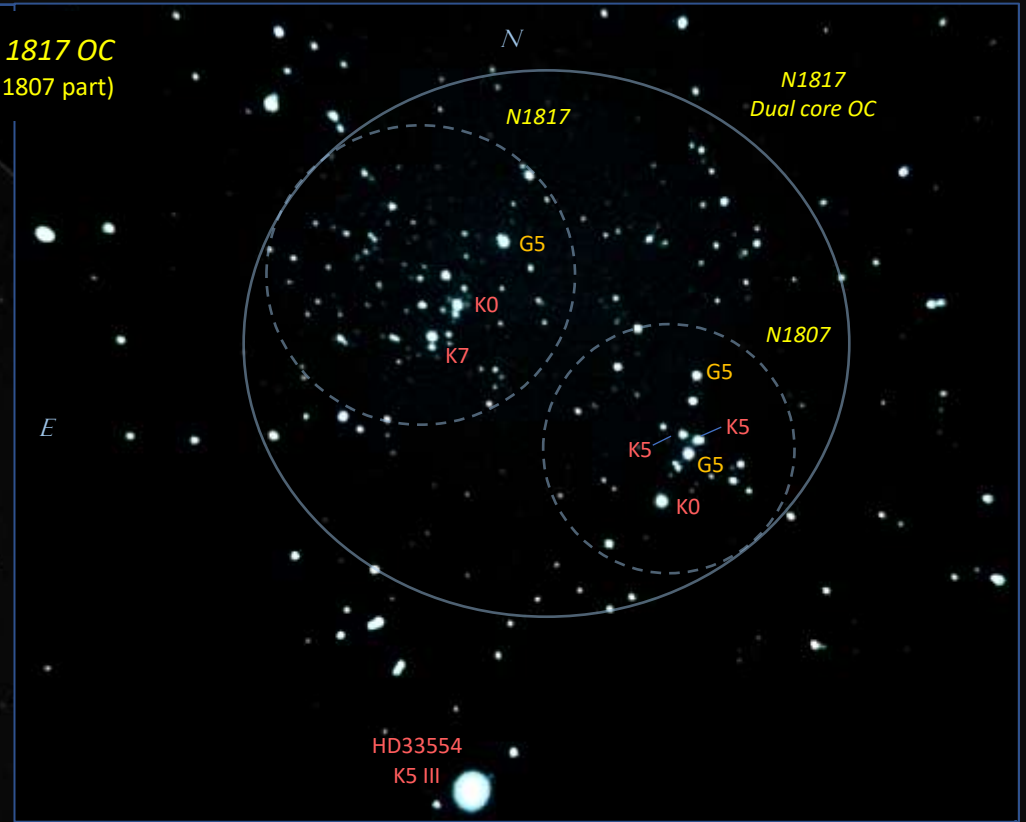


~9.5^m K2 III
 56N 12E, Copenhagen DENMARK
 2022-02-26, 20:00 Local (UT+1)
 Temp.: 0°C, Hum.: 97%, DewPt.: 0°C
 Trsp.: 5/7, Seeing: 7/10, Calm
 LP:SQM 20.3 (NELM 6.2) Suburban

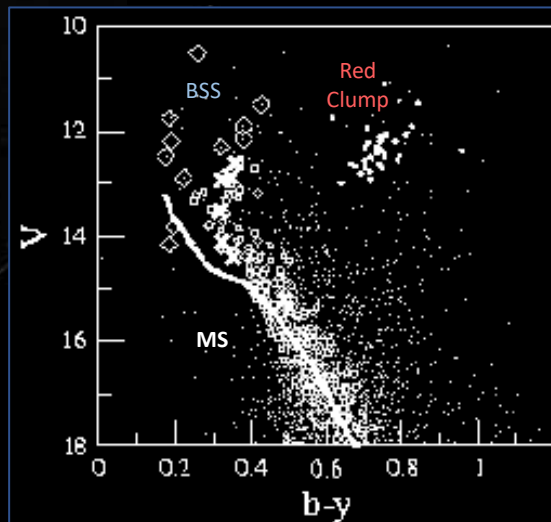
Zeiss 100/640 APQ
 TV 41mm PAN + 610nm RED longpass
 Photonis 4G Intens PVS14 NVD
 iPhone Xs, NightCap app,
 Exp.: 1s, Ave. 15s, ISO-50,
 Gain: High



NGC 1817 OC
 (NGC 1807 part)



NGC 1817 double core OC
 (NGC 1807 is part of NGC 1817)



NGC 1817 is an intermediate-age (~800 Myr) double-core open cluster at a distance of 1.8 Kpc.

The CMD shows a fairly well-defined main sequence (MS) with a clustering of helium-fusing post-RGB horizontal-branch stars (a so-called red giant clump); I've marked a few of these evolved K-type stars on my snapshot above.

It's interesting to compare the brightest stars of the two of young galactic cluster pairs: N1758 & N1750 (~300 Myr) with those of the older N1817 & 1807 (800 Myr); In N1758/50 the white type late-B/early-A stars dominate, while in N1817/07 the more evolved orange type mid-G to mid-K stars is most prominent.

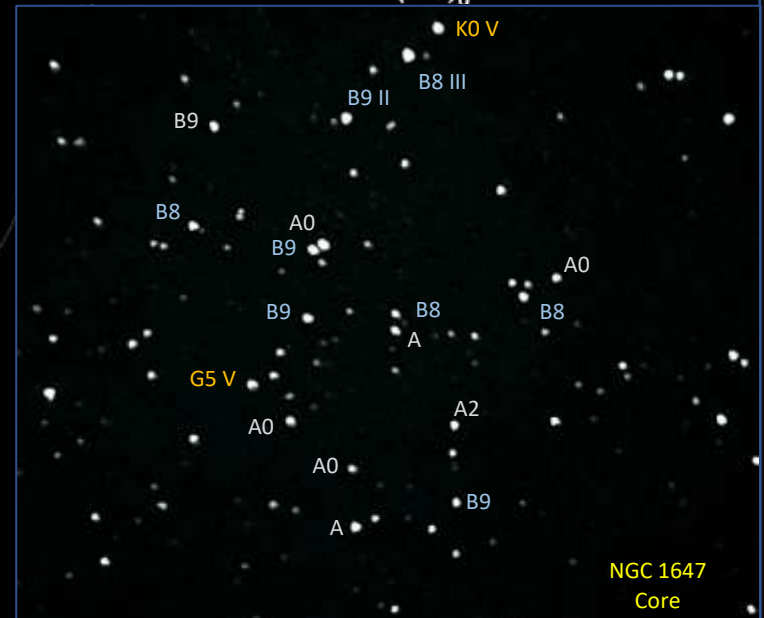
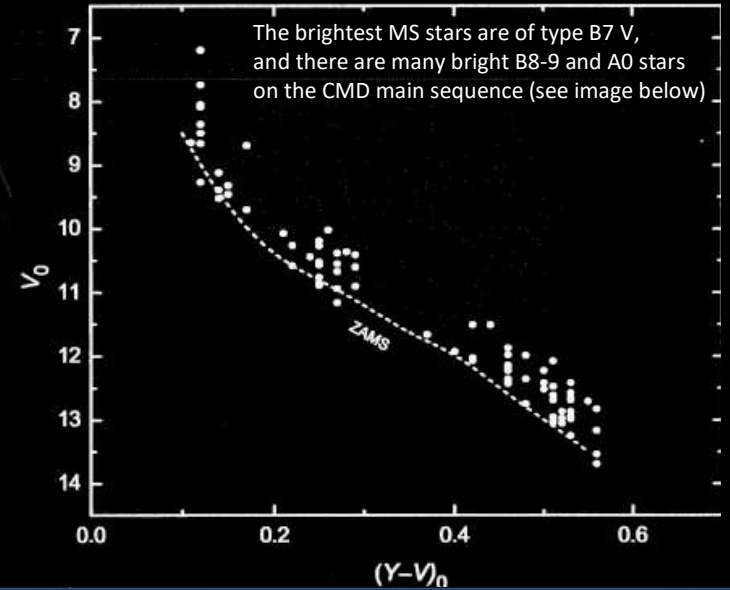
56N 12E, Copenhagen DENMARK
 2022-02-26, 19:15 Local (UT+1)
 Temp.: 0°C, Hum.: 97%, DewPt.: 0°C
 Trsp.: 5/7, Seeing: 7/10, Calm
 LP:SQM 20.3 (NELM 6.2) Suburban

Zeiss 100/640 APQ
 TV 41mm PAN + 610nm RED longpass
 Photonis 4G Intens PVS14 NVD
 iPhone Xs, NightCap app,
 Exp.: 1s, Ave. 15s, ISO-80,
 Gain: High

NGC 1647 OC
 (T027)

N1647 is a beautiful young (190 Myr) OC with ~100 stars, many of which in double or multiple star systems. It is located close by at a distance of ~0.5 Kpc, behind the Taurus molecular cloud complex in our Local spiral arm (extinction of 1-2 mag.) The OC is loose with a diameter of ~40'

N1647 is visible with the naked eye under a dark sky, and obvious in my 7x50 bino from a moderately LP backyard.



Many of the stars in N1647 are found in **double or multiple systems**, that overall seem so be "spiraling out" in curved arms from the 9^m type A0-B9 double at the center of the cluster.

56N 12E, Copenhagen DENMARK
 2022-02-26, 20:00 Local (UT+1)
 Temp.: 0°C, Hum.: 97%, DewPt.: 0°C
 Trsp.: 5/7, Seeing: 7->6/10,
 Calm, Increasing frost fog
 LP:SQM 20.3 (NELM 6.2) Suburban

Zeiss 100/640 APQ
 TV 41mm PAN + 610nm RED LP
 Photonis 4G Intens PVS14 NVD
 iPhone Xs, NightCap app,
 Exp.: 1s, Ave. 15s, ISO-50,
 Gain: High

NGC 1514
 Crystal Ball PN
 (D015)

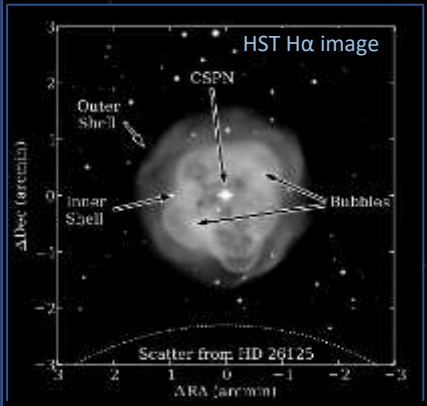
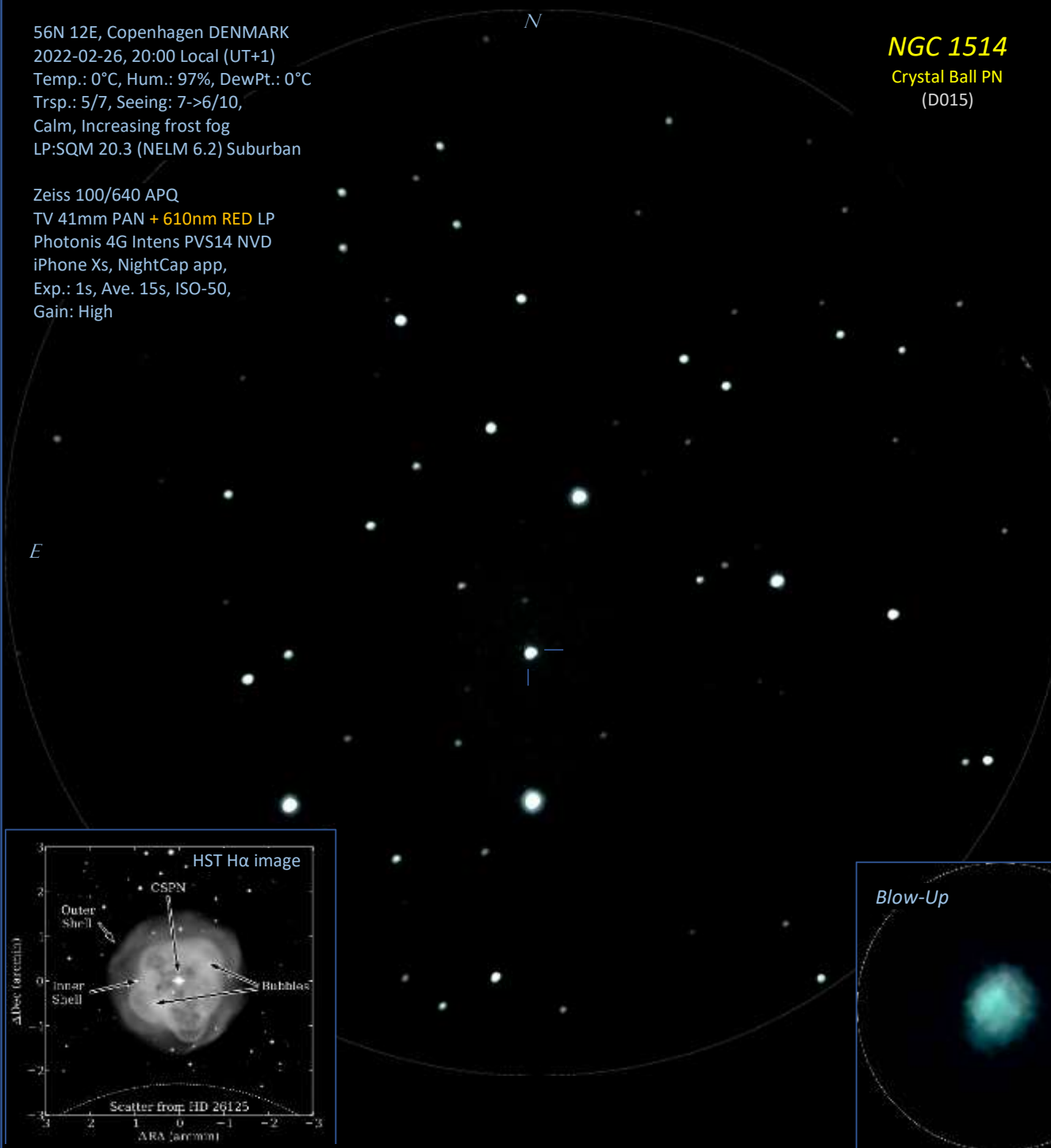
The **N1514 PN** is located close by at a distance of 0.47 Kpc in the direction of the galactic anti-center in our Local spiral arm.

The **central star** in this PN (the CSPN) is a binary, composed of an optically visible type A0 III giant horizontal-branch star that is accompanied by a sub-luminous type-O white dwarf; The hot O-star is the source of the UV radiation that is ionizing the PN.

The faint PN nebulosity is **not easy to study visually**: -- in my 4" refractor, the PN shows up as a 9.5^m star (the central A0 III giant) which looks a tiny bit "softer" than the surrounding 8-8.5^m stars. The planetary nebula should be resolvable visually from a dark site using a 5 inch or larger aperture scope.

On **high magnification images** (as from the HST), the N1514 PN shows a "lumpy" inner shell structure composed of many smaller uncollimated bubbles, which are pushing out an older, ellipsoidal outer shell ("halo").

N1514 is of historical interest as it was the object which convinced William Herschel that his **class IV of "planetary nebulae"** were not small unresolved star clusters, but rather consisted of a "shiny fluid of unknown nature"...



Some Star Hops

NGC 1514
PN

