Tonight's Novice topic is:

An overview of the Trumpler classification system

Compiled by Jim Wessel
Johnson Space Center Astronomical Society

Shapley's Classification scheme

a. Field Irregularities - features irregular star counts and associations. They differ from the normal distribution of stars, being more closely concentrated yet not enough to be studied.

b. Star Associations - This category contains clusters that have distantly spaced stars sharing the same motion. e.g. Ursa Major group

c. Very Loose and Irregular Clusters – These are very large and scattered clusters. e.g. Pleiades, Hyades, and the alpha Persei group.

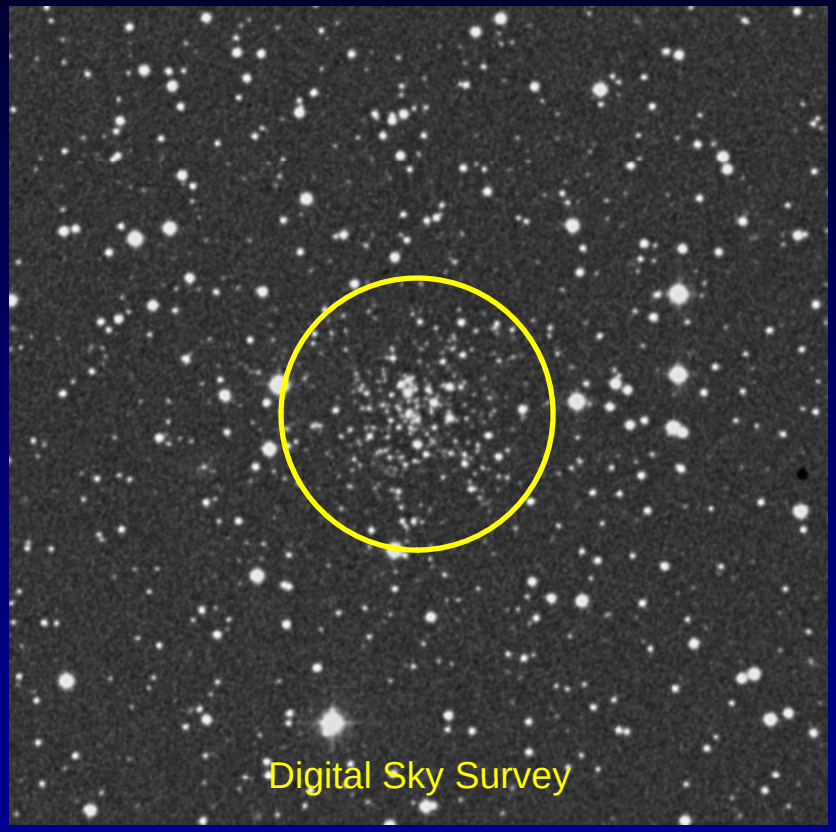
d. Loose Clusters - very small amounts of stars and appear loose. Shapley gave M21 and M34 as examples of this type.

e. Intermediate Rich & Concentrated – compact and concentrated. e.g. M38

f. Fairly Rich and Concentrated - This group is as compact as the 'e' group, yet with more stars; e.g. M37

g. Considerably Rich and Concentrated - This group is similarly compact as group 'f', yet contains more stars; the Jewel Box (NGC 4755) is in this class.

Hyades



Berkeley 29

Robert Julius Trumpler

- 1886-1956
- Swiss born, American Astronomer
- Allegheny Obs -> Lick Obs. -> Berkeley
- Independently discovered the absorption of light by interstellar dust (Boris Vorontsov-Velyaminov independently also found this).
- Introduced term *Galactic Clusters* in 1925.
- Elected to the National Academy of Sciences in 1932.
- His classification system is the most commonly used means of identifying OCs today.
- In 1930, he created a table of 37 Open Clusters that are now known as the Trumpler Catalog.

Trumpler Classification System

Degree of concentration

I. Detached clusters with strong central concentration.

II. Detached clusters with little central concentration.

III. Detached clusters with no noticeable concentration.

IV. Not well detached from surrounding star field.

Range of brightness

1. Most of the cluster stars are nearly the same apparent brightness.
2. Moderate range in brightness.
3. Cluster is composed of bright and faint stars.

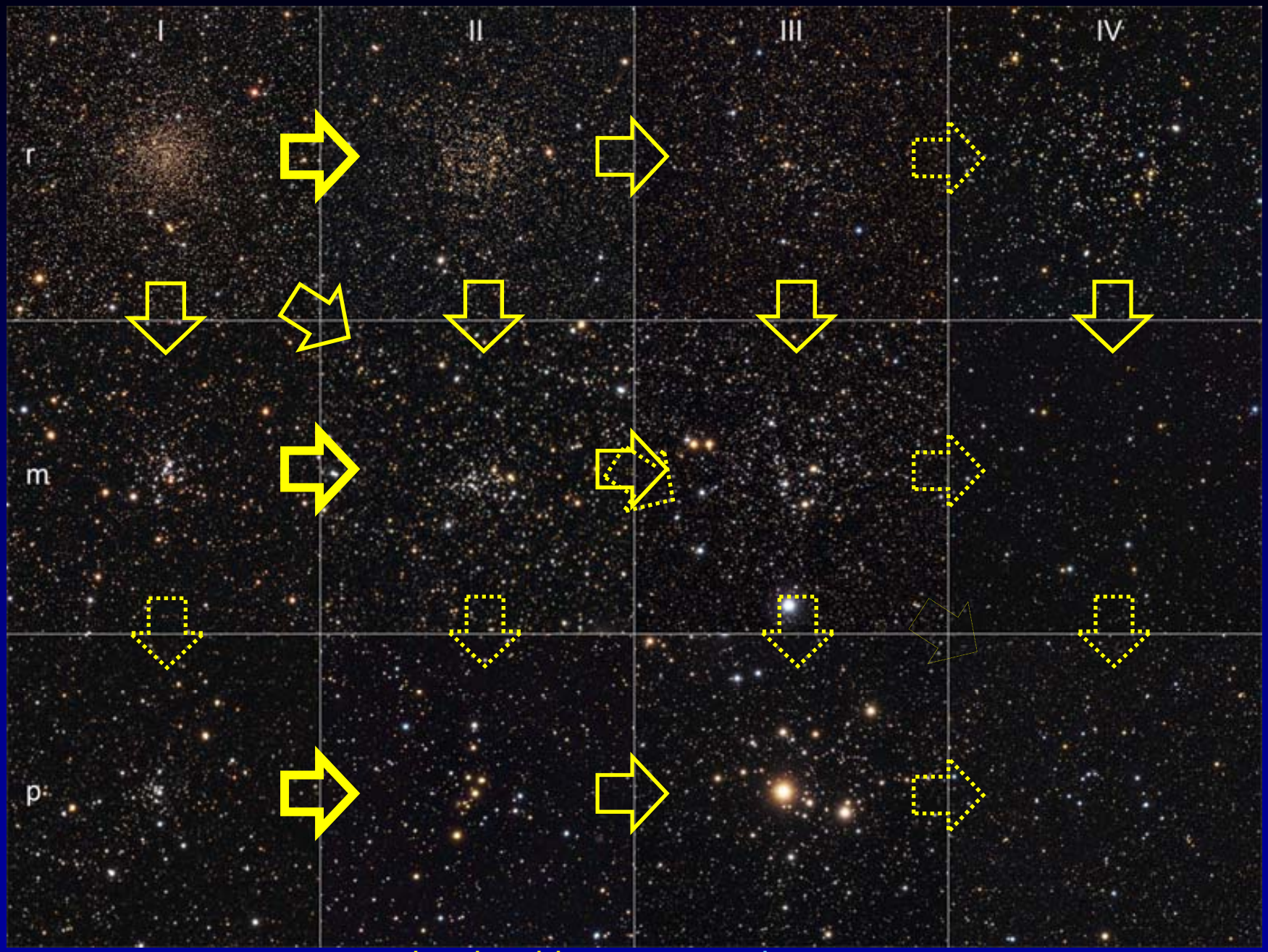
Number of stars in cluster

p = Poor (less than 50 stars).

m = Medium rich (50-100 stars).

r = Rich (more than 100 stars).

Concentration of cluster



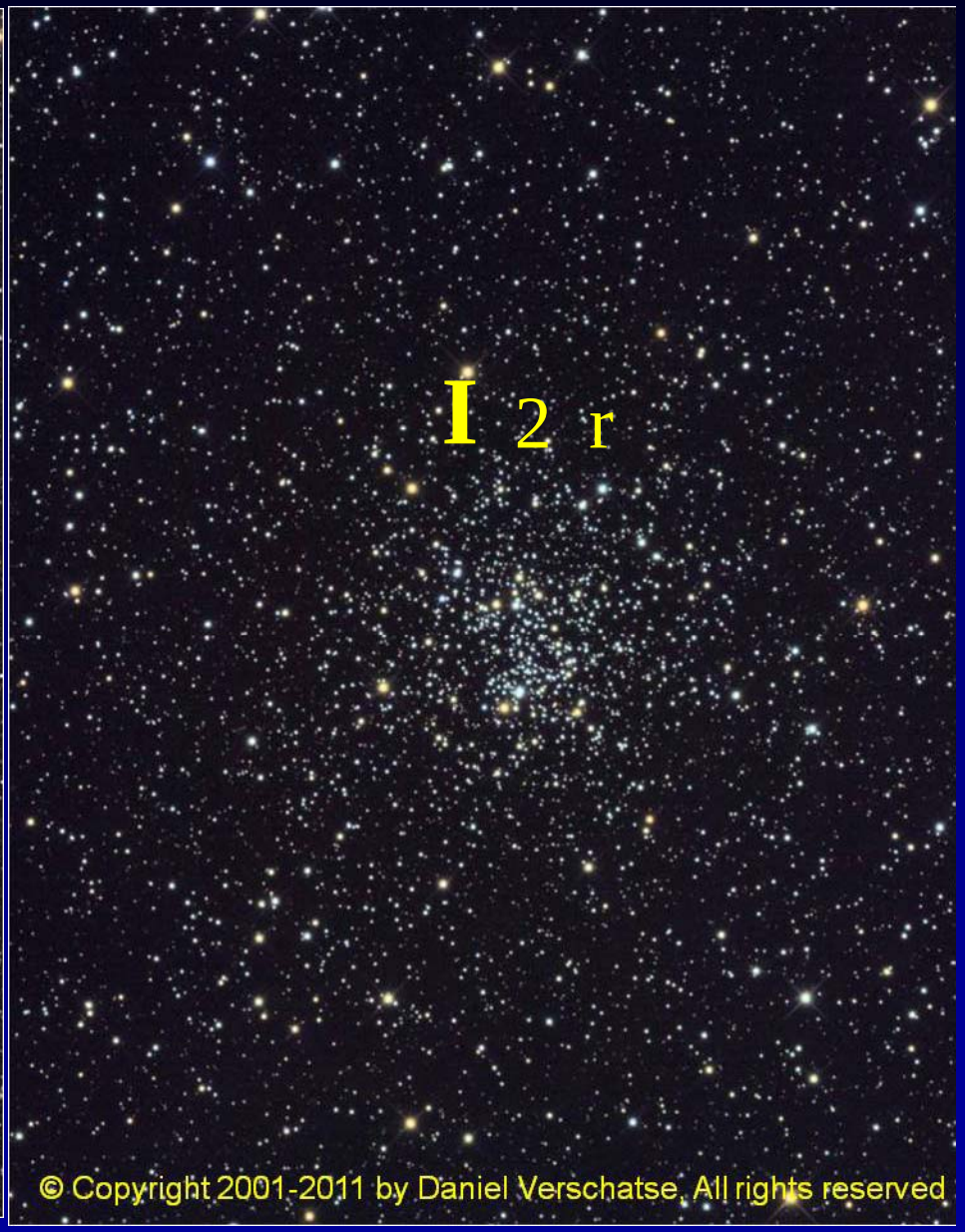
Number of stars in the cluster

Brightness for all 12 blocks is '2' or '3'

Bernhard Hubl, www.astrophoton.com

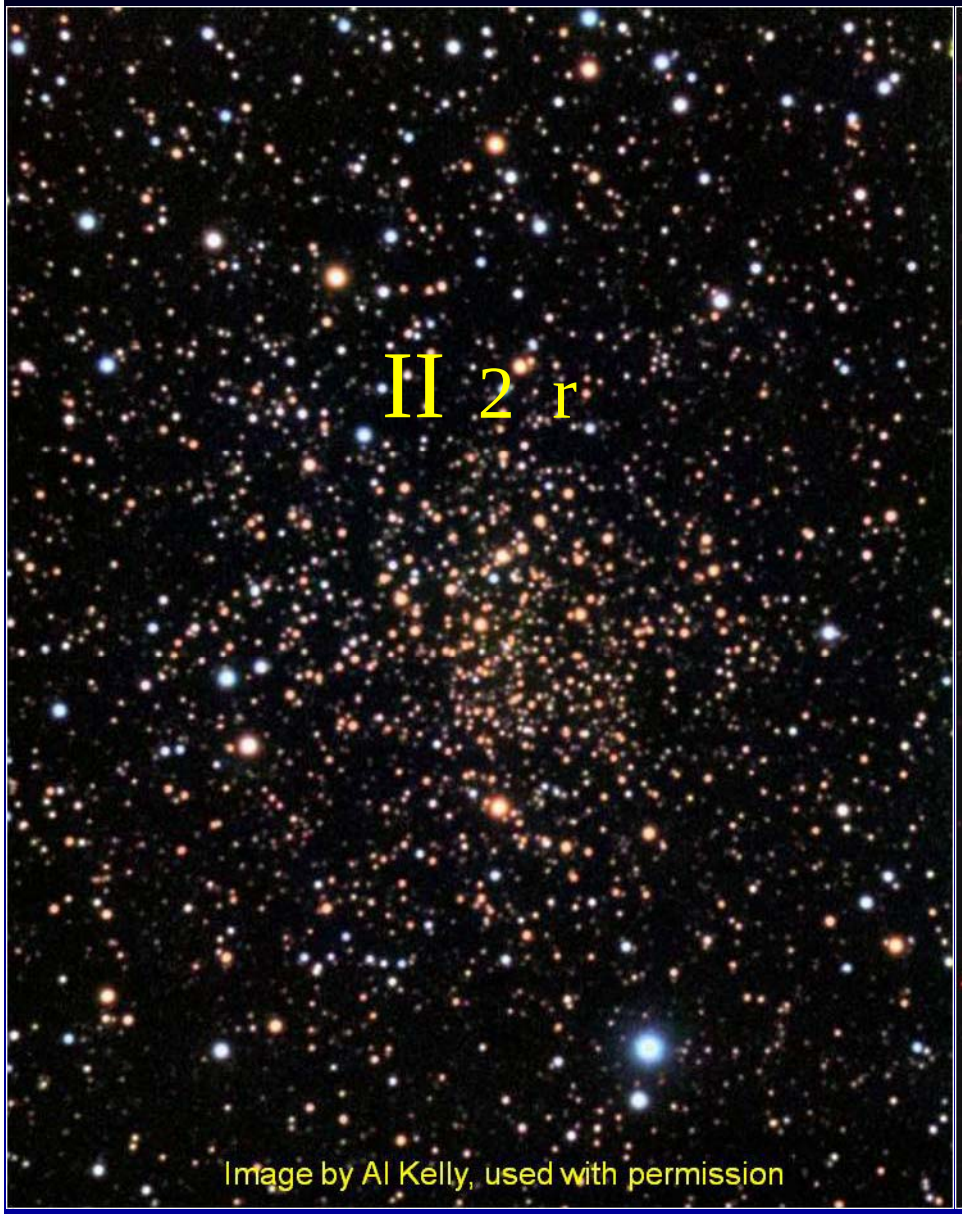
Degree of concentration

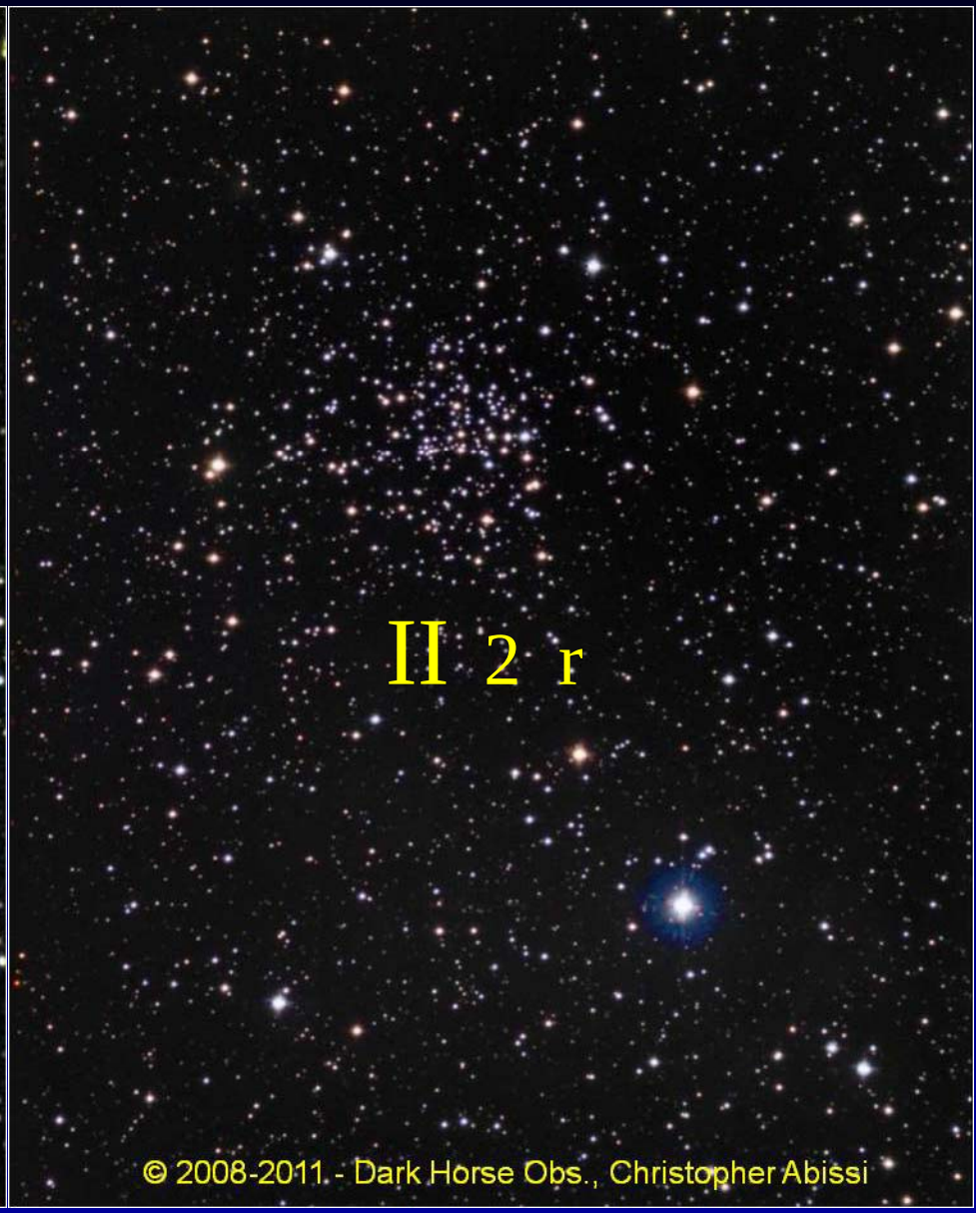
I. Detached clusters with strong central concentration.



Degree of concentration

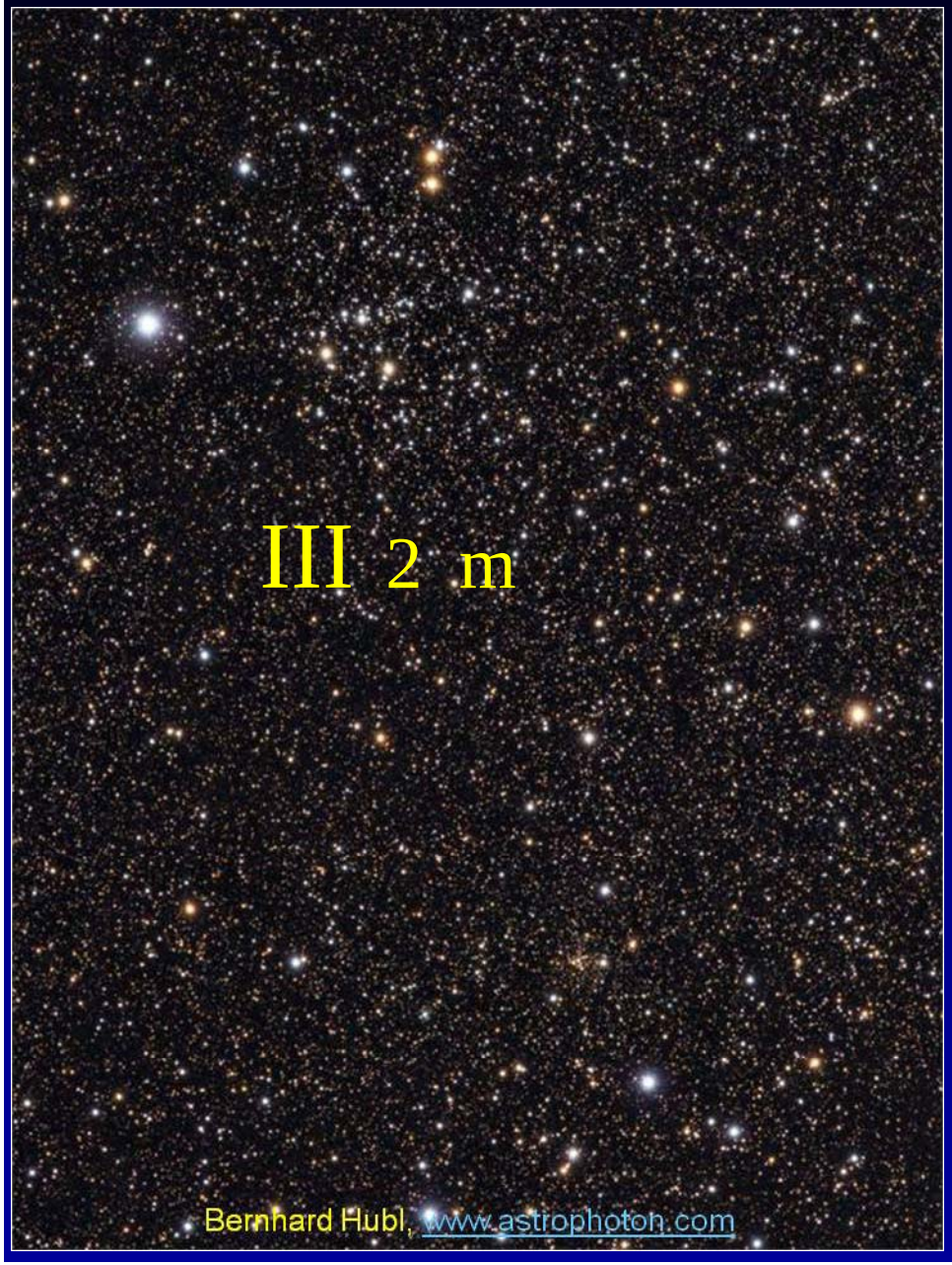
II. Detached clusters with little central concentration.

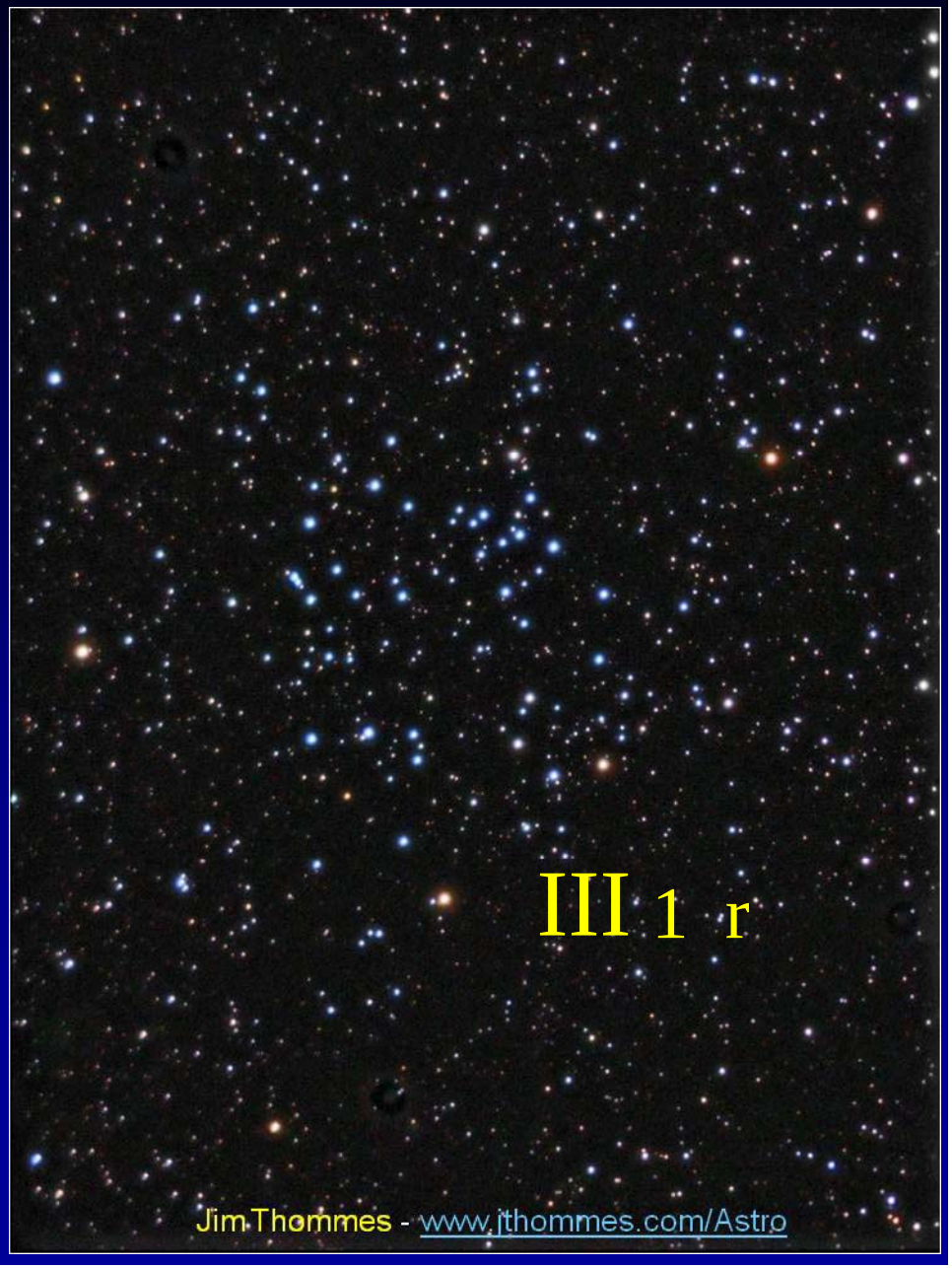




Degree of concentration

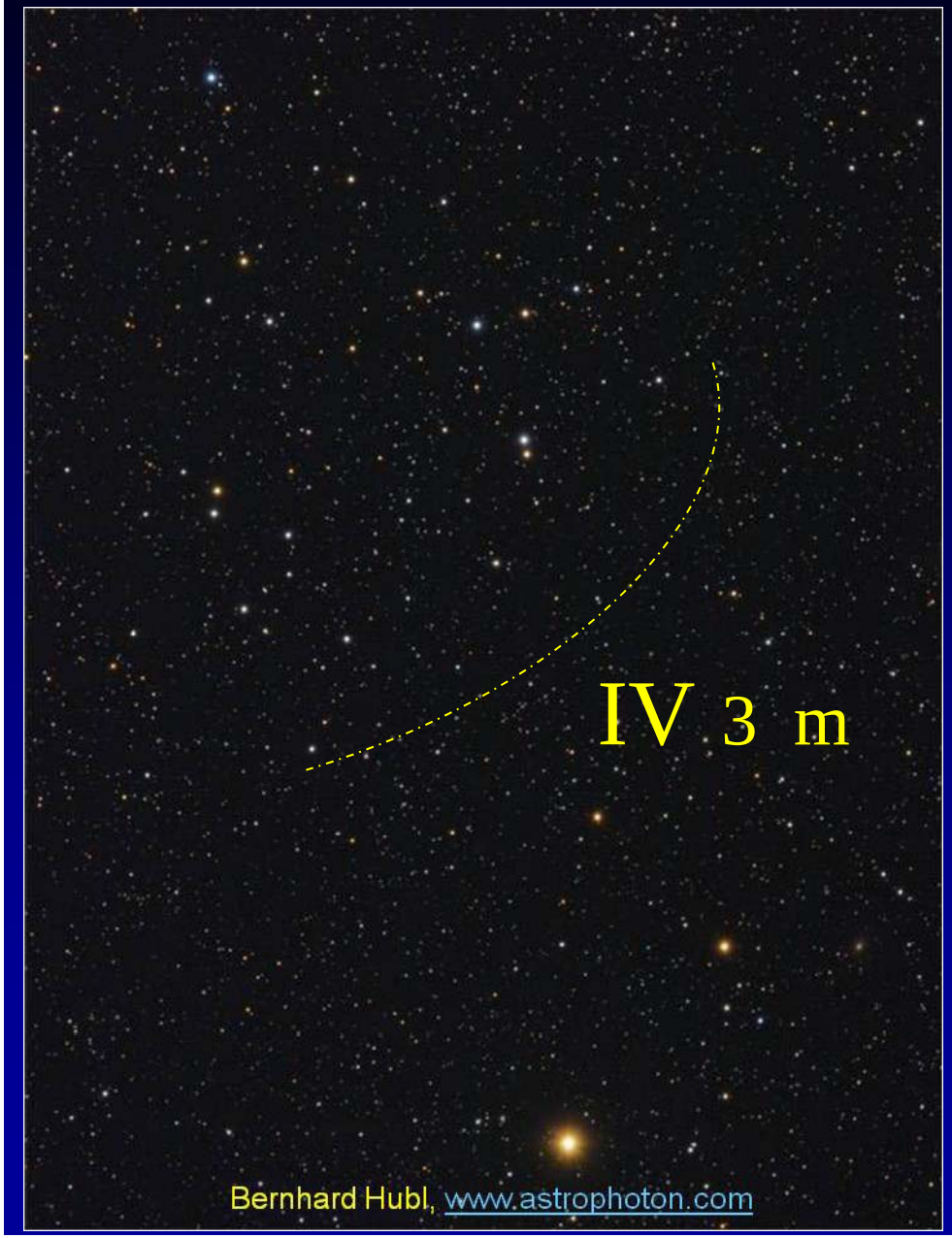
III. Detached clusters with no noticeable concentration.

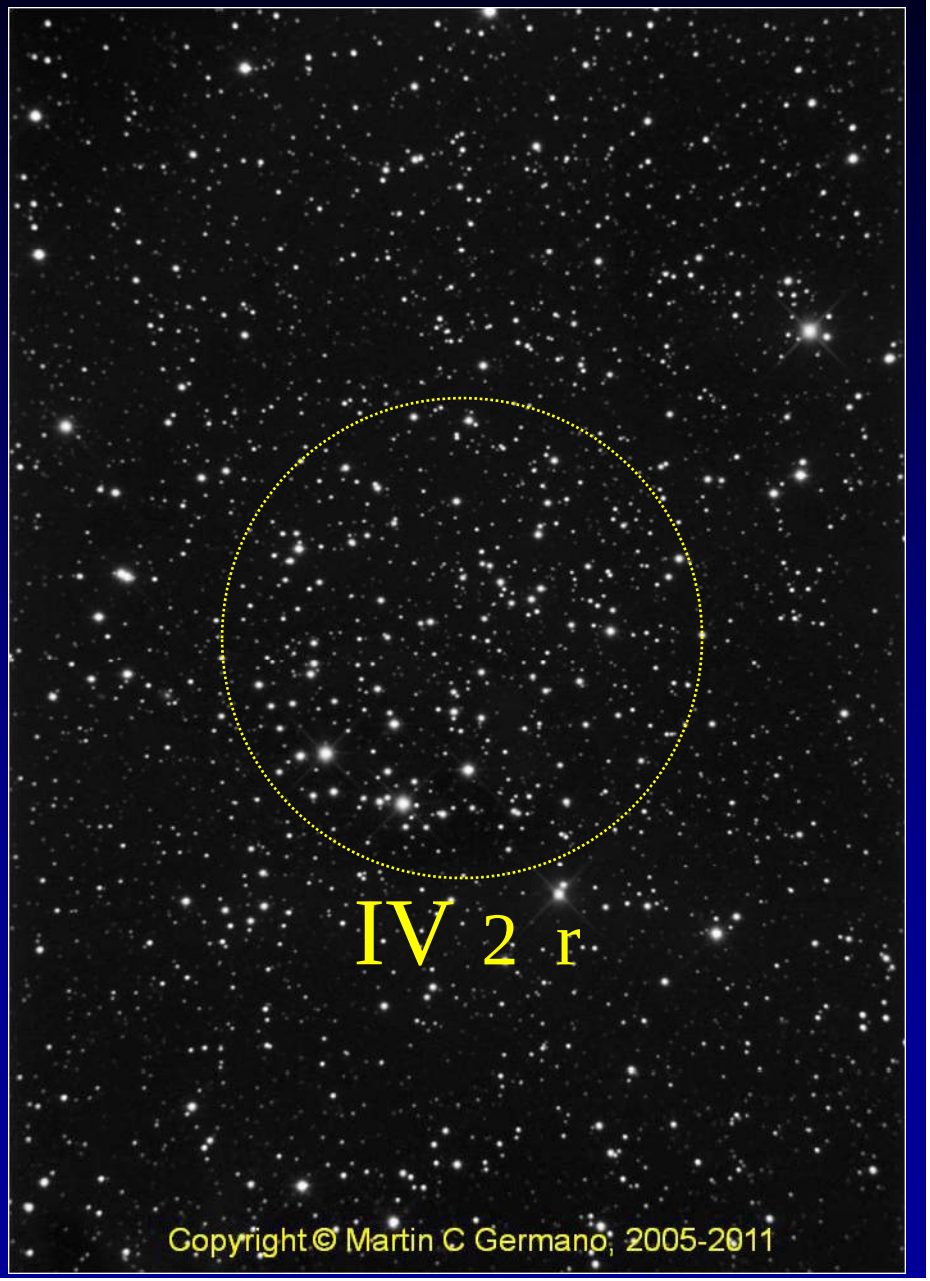




Degree of concentration

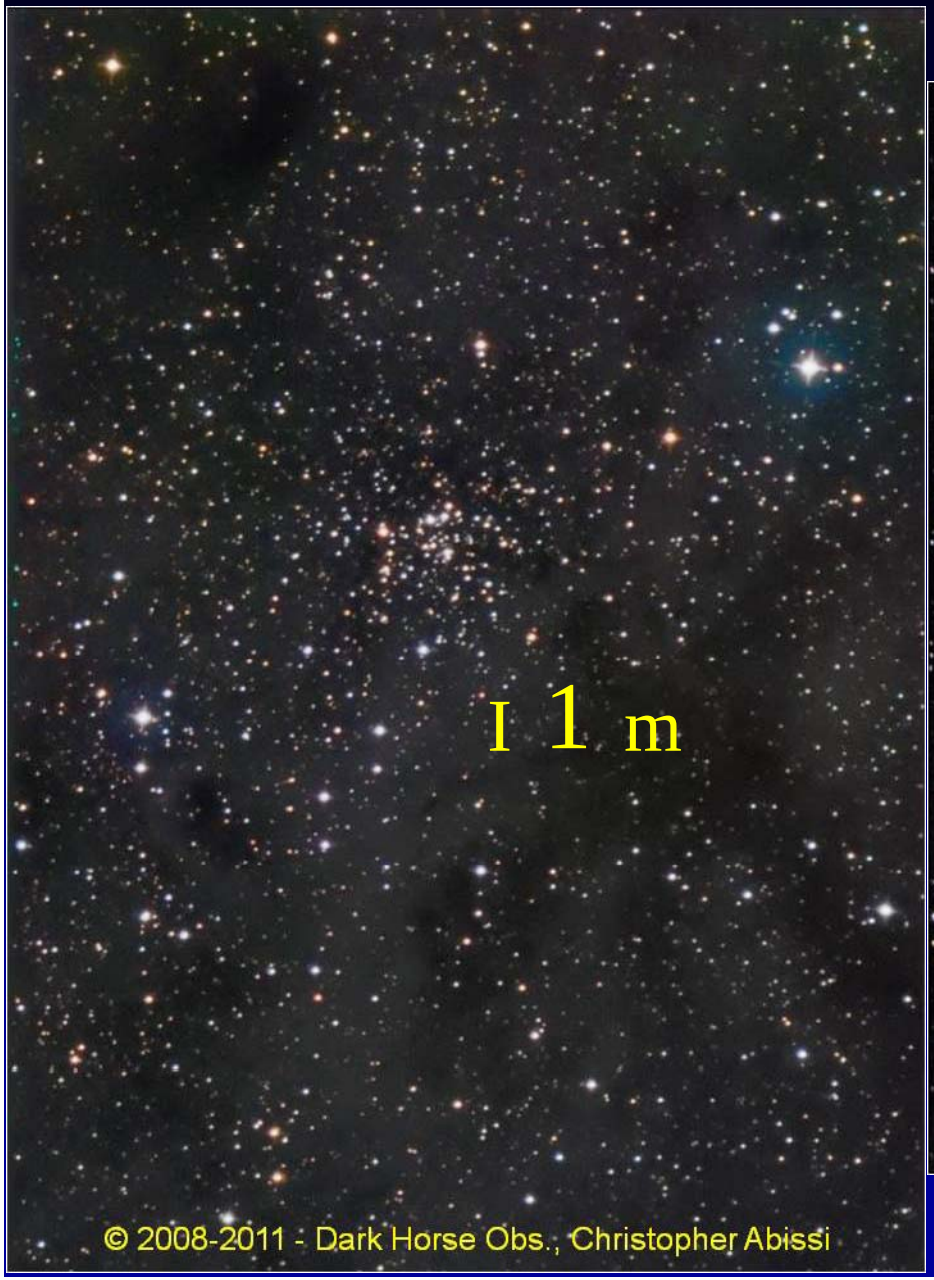
IV. Not well detached from surrounding star field.

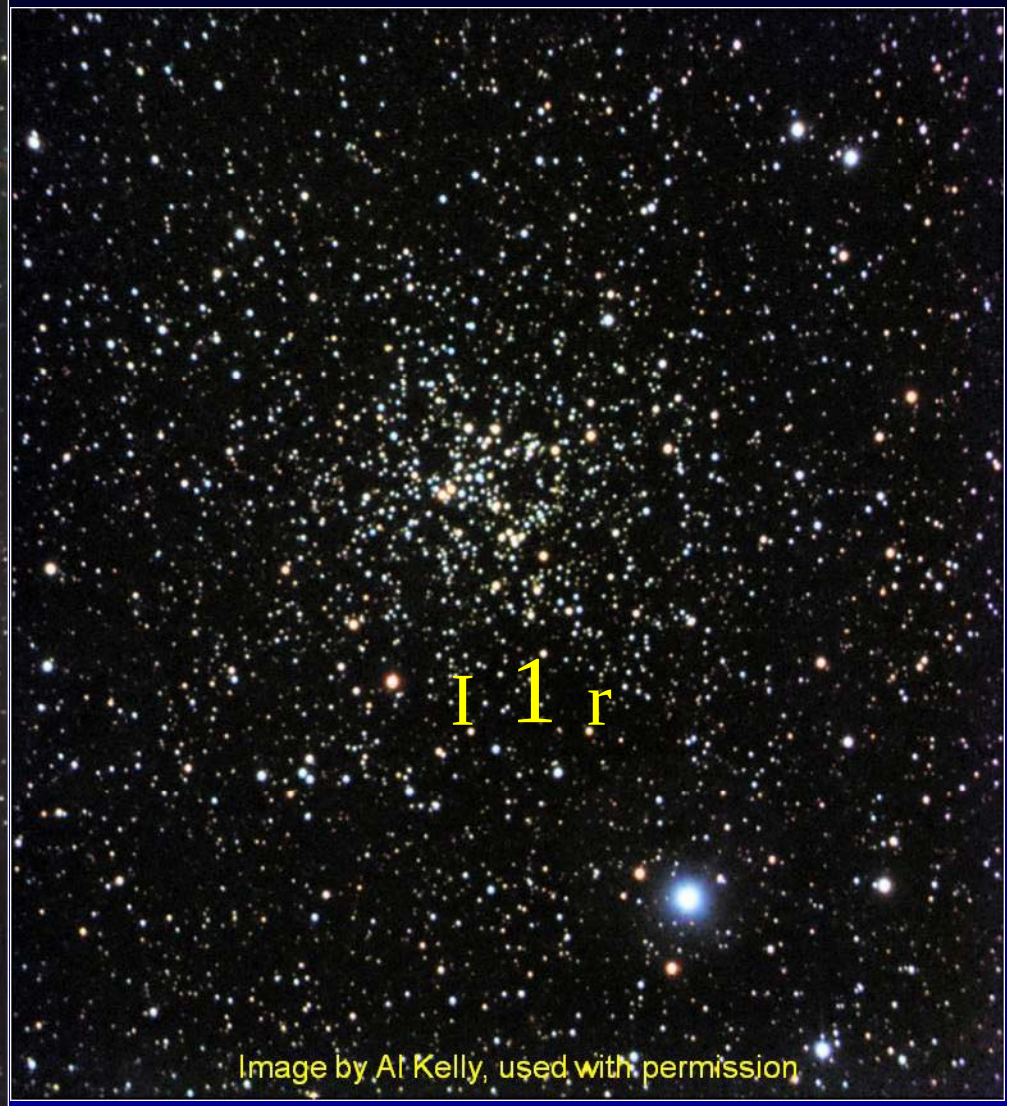




Range of brightness

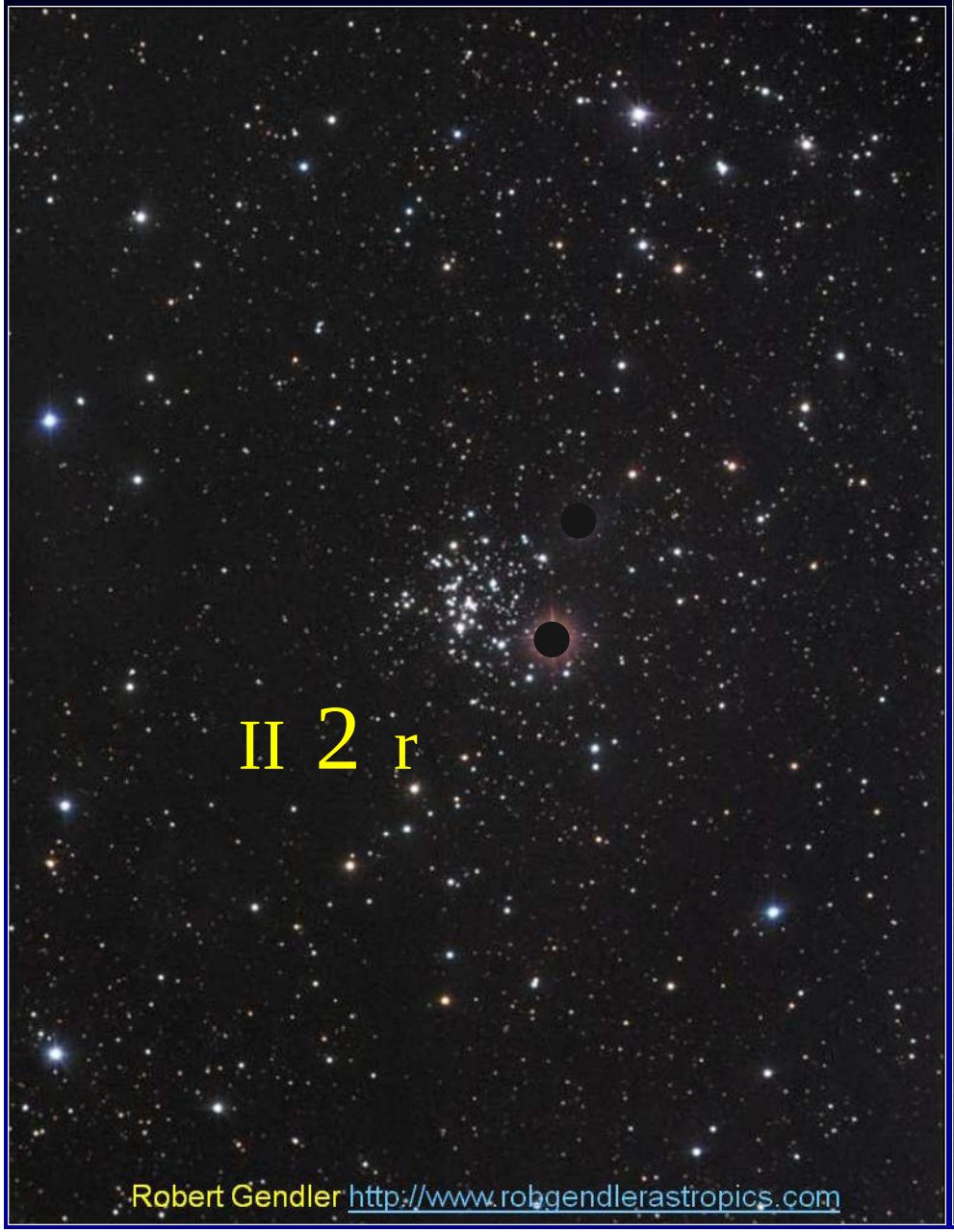
1. Most of the cluster stars are nearly the same apparent brightness.

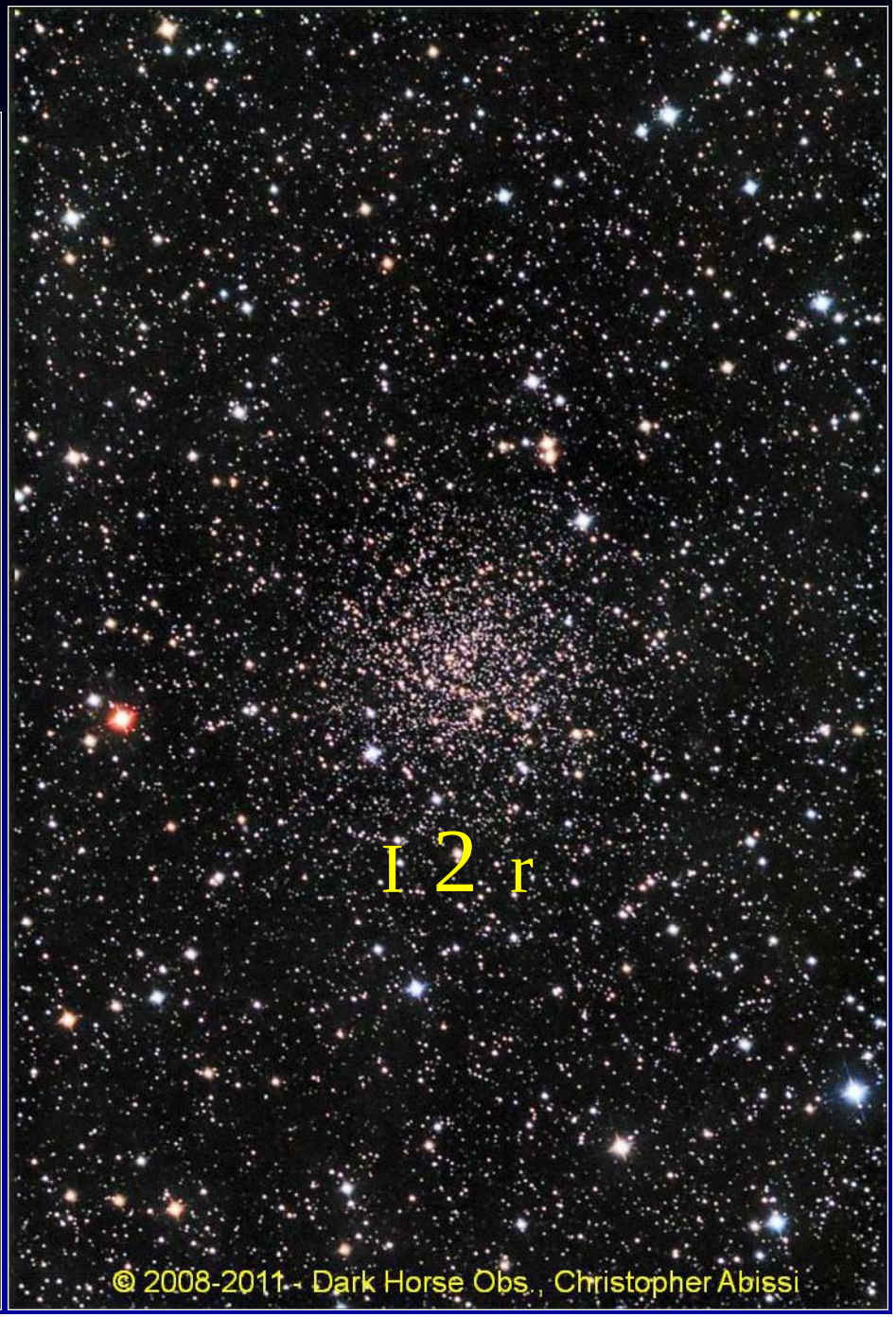




Range of brightness

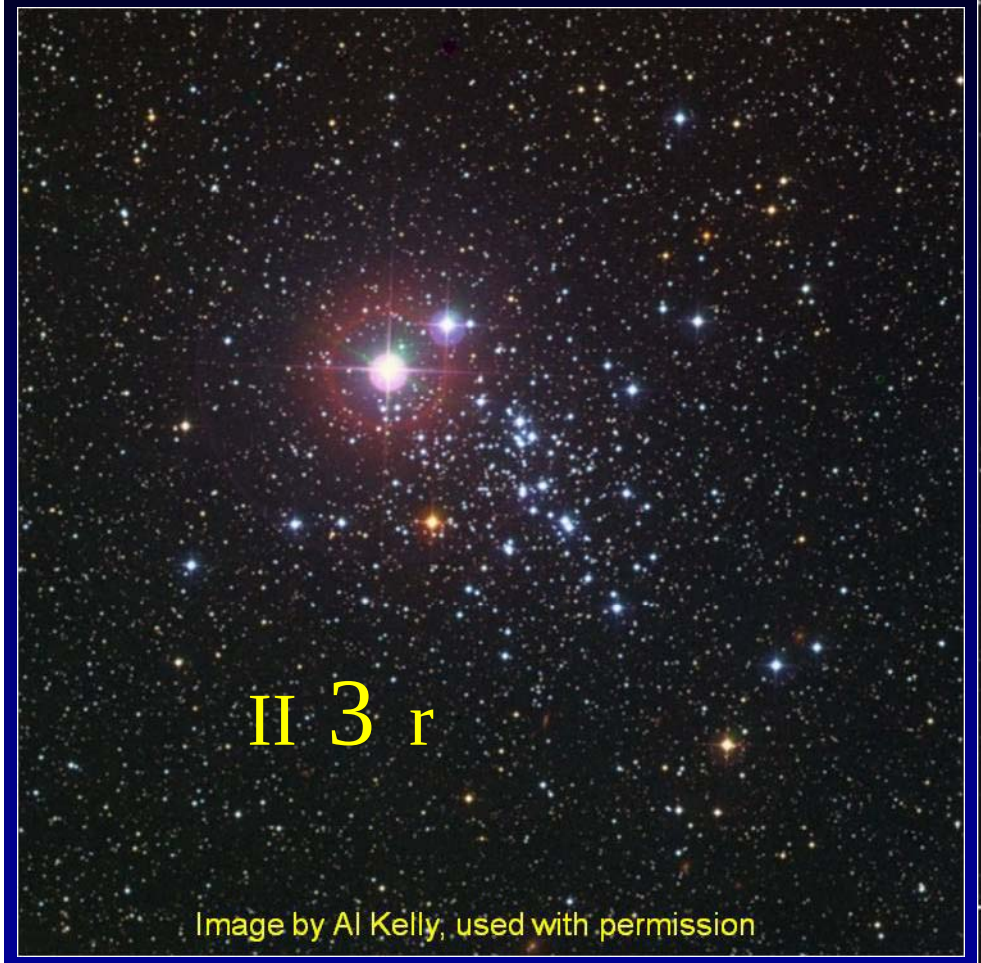
2. Moderate range in brightness.

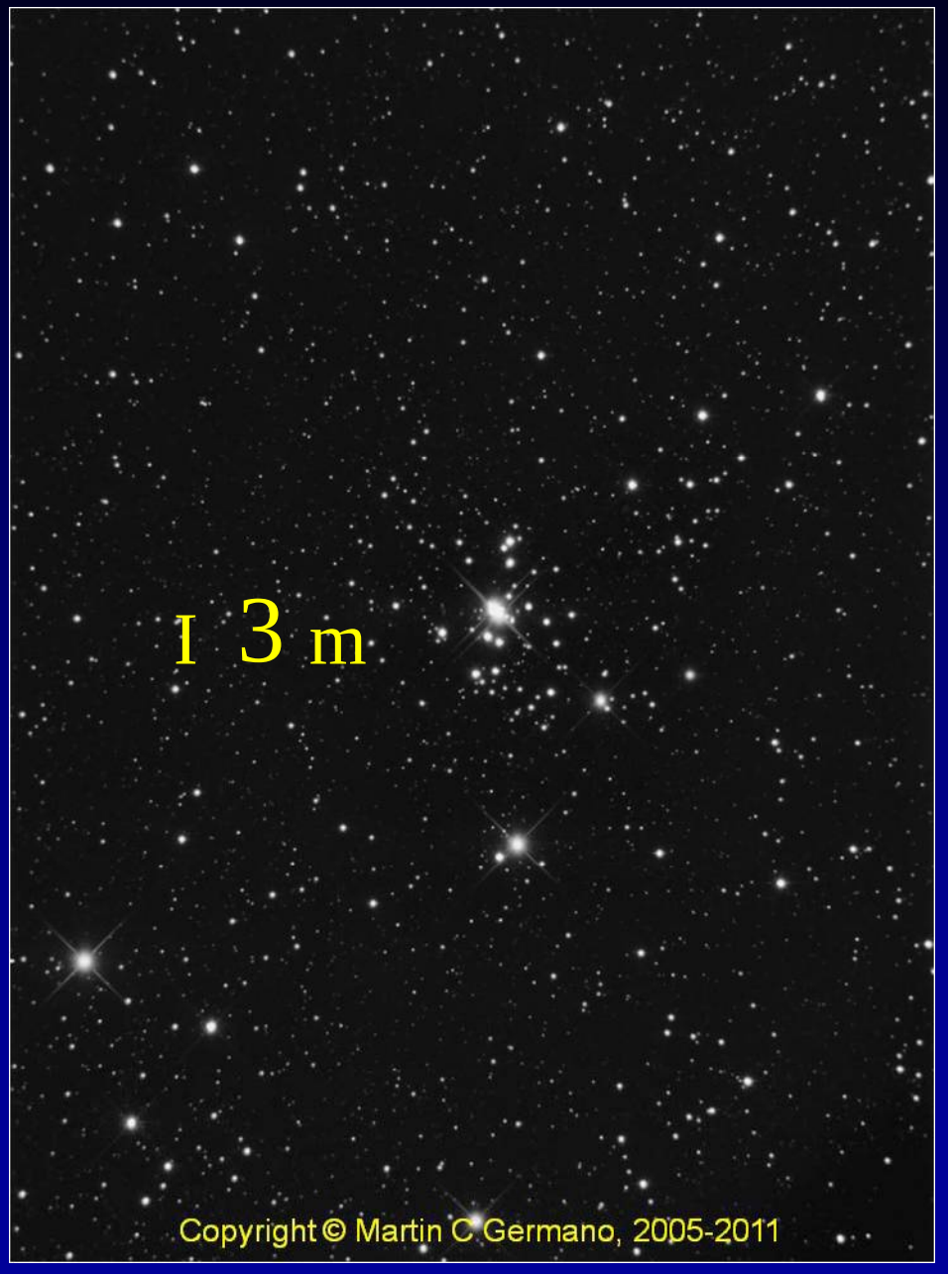




Range of brightness

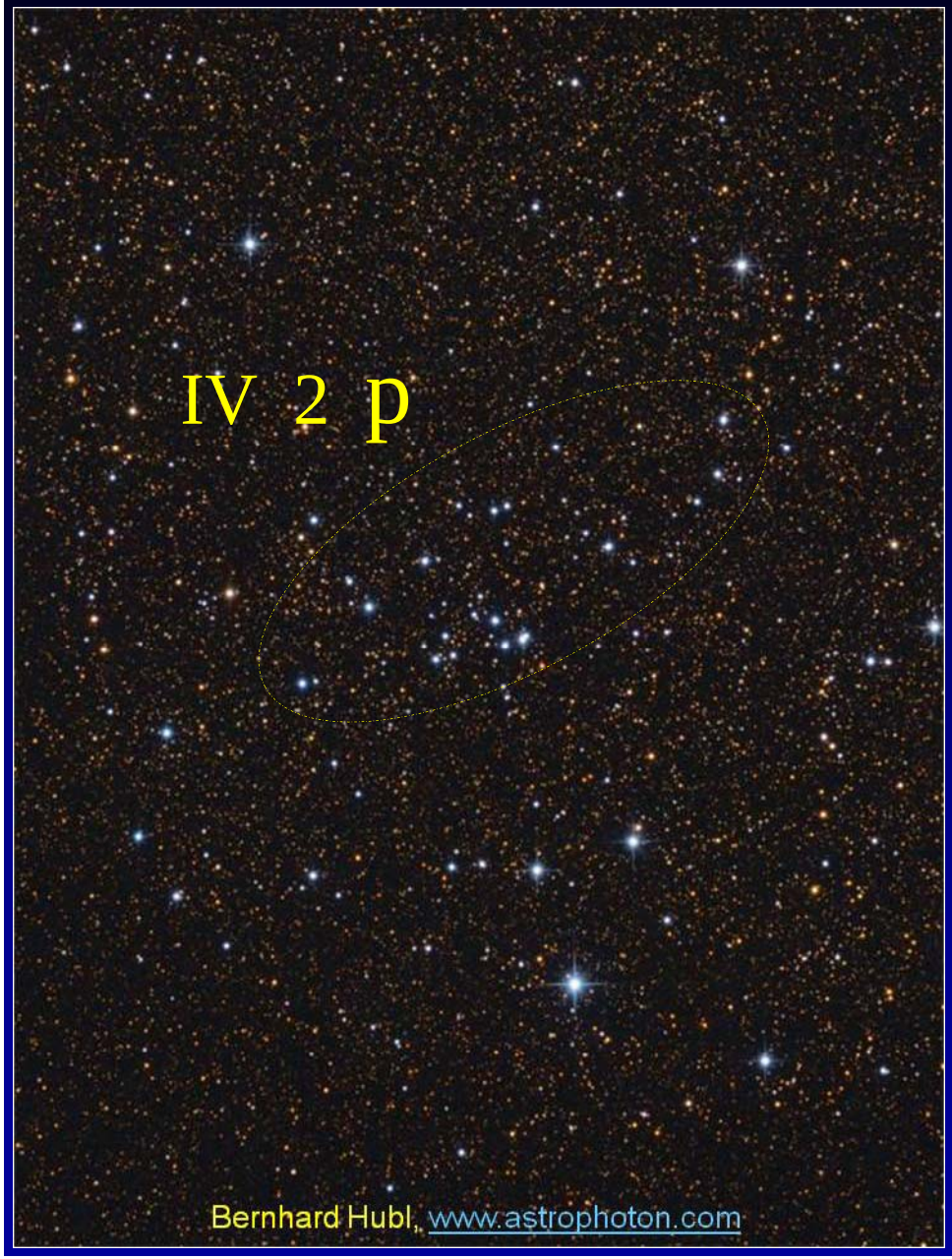
3. Cluster is composed of bright and faint stars.

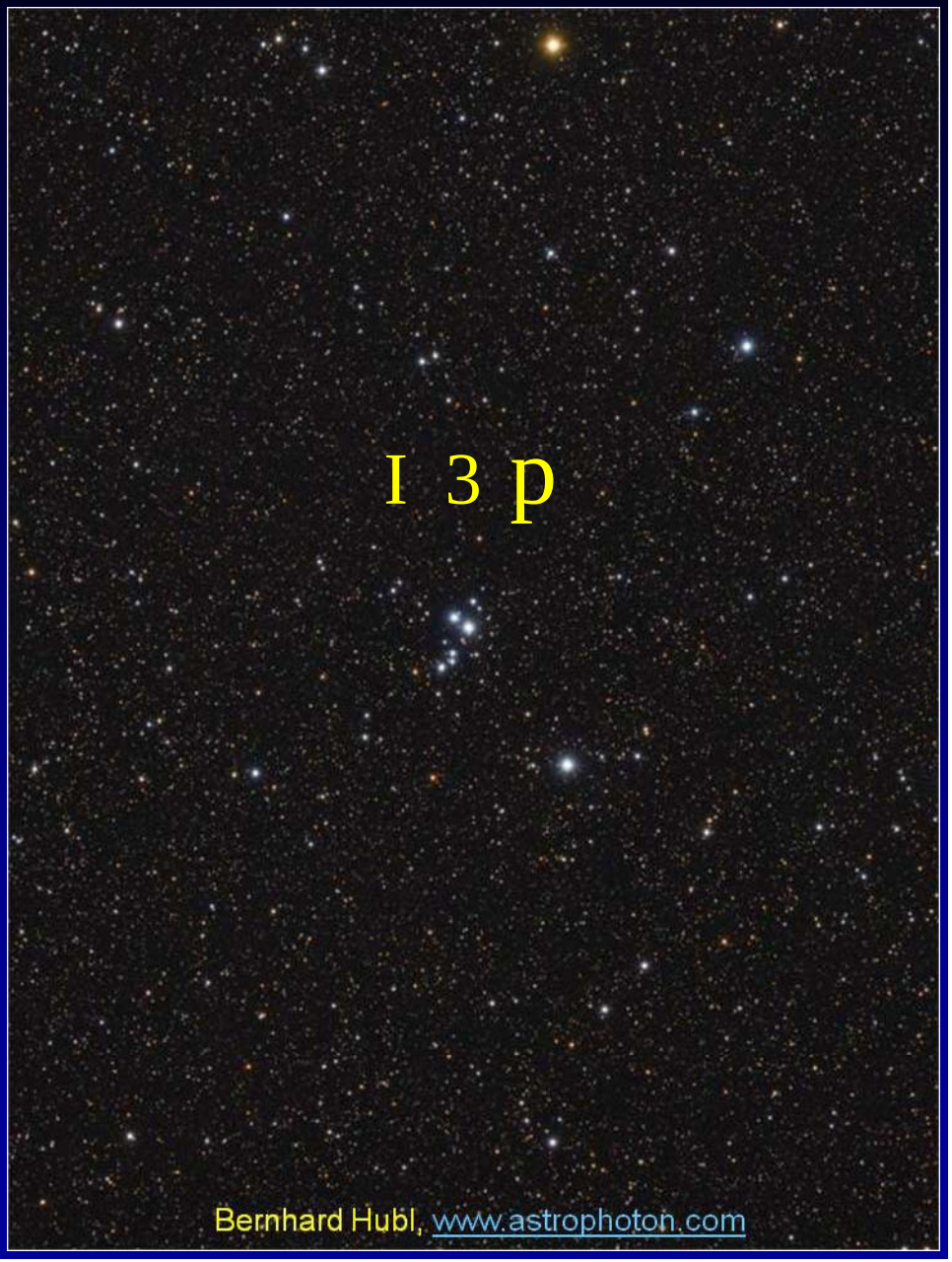




Number of stars in cluster

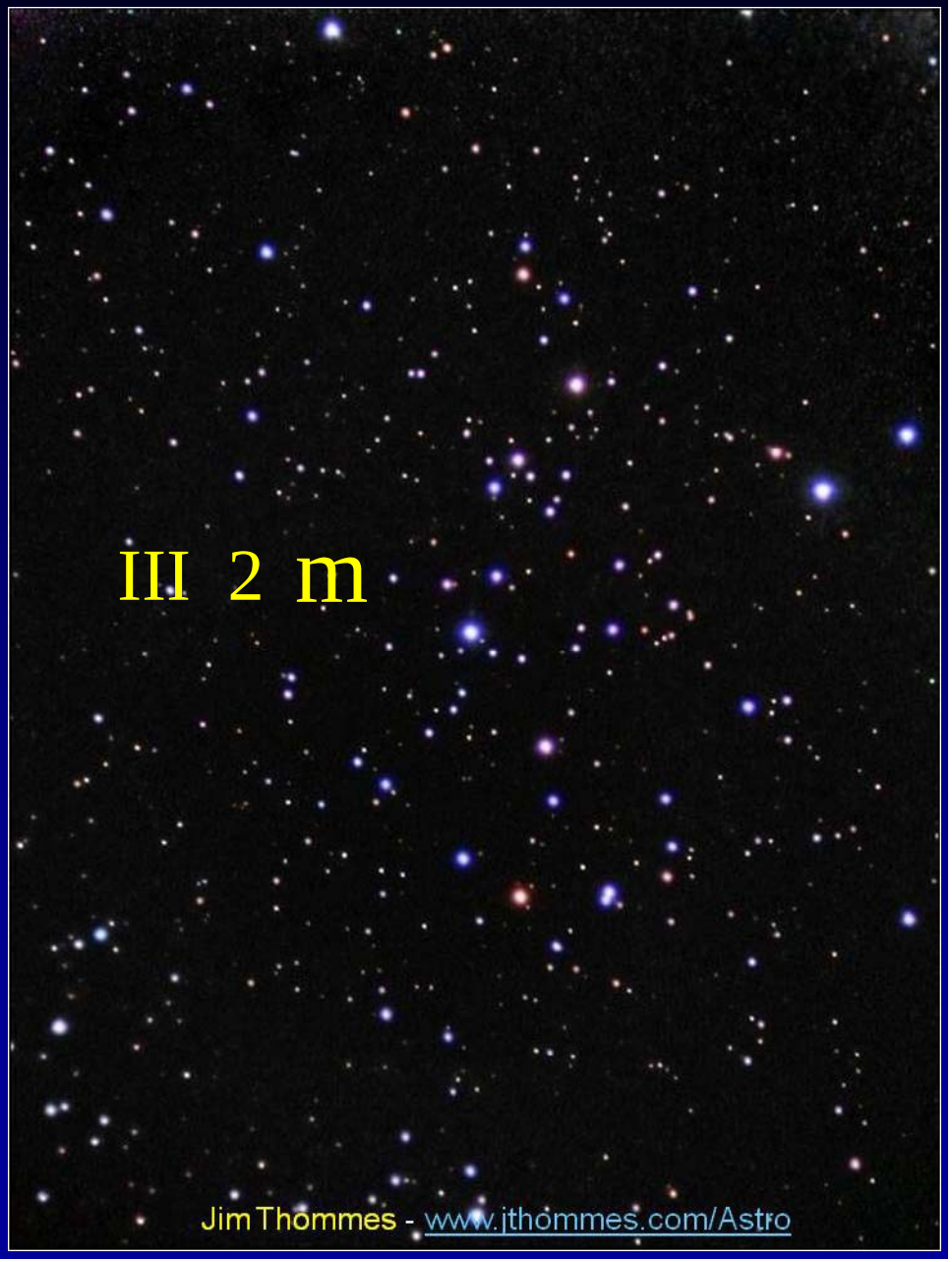
p = Poor (less than 50 stars).





Number of stars in cluster

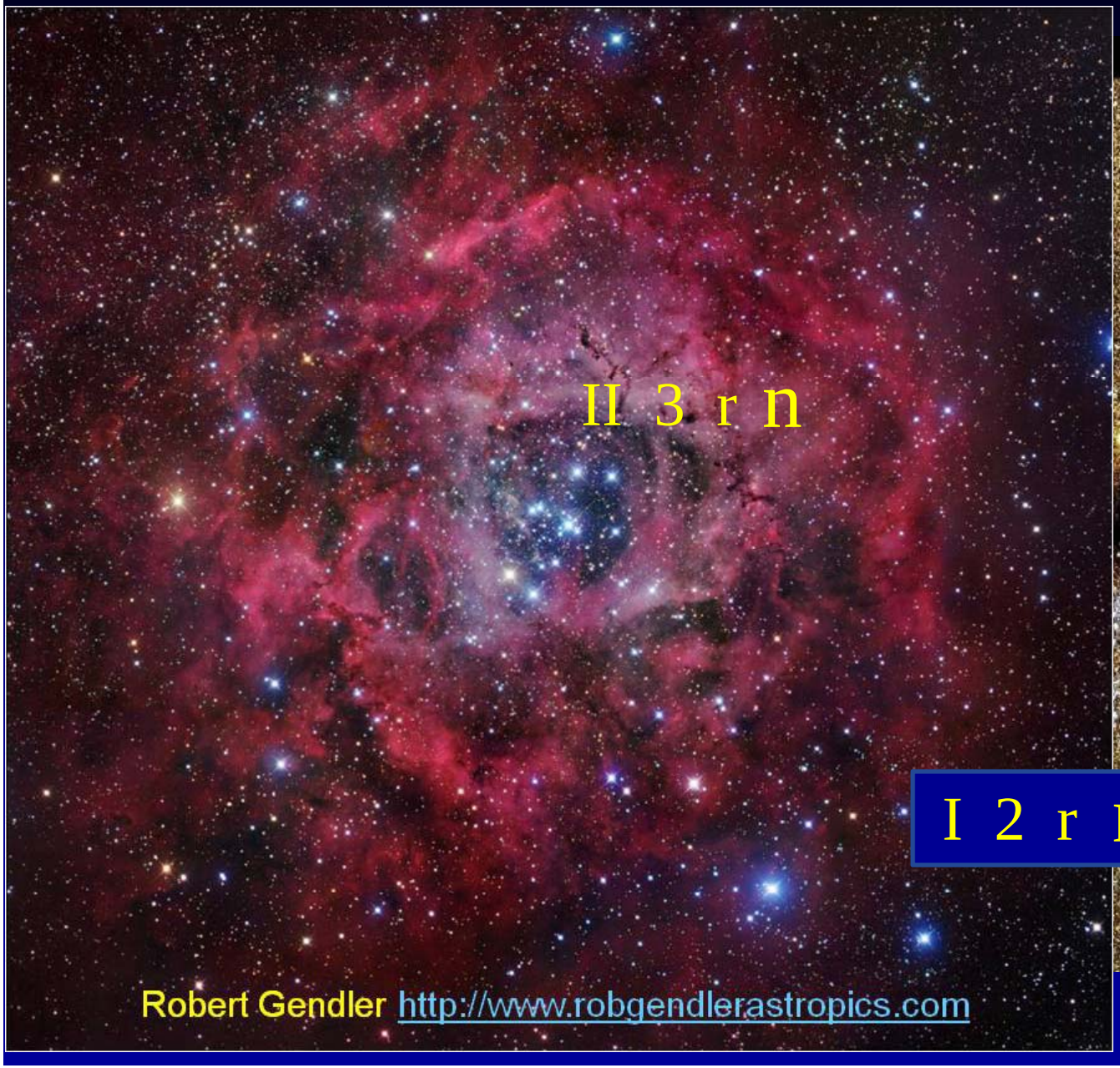
m = Medium rich (50-100 stars).

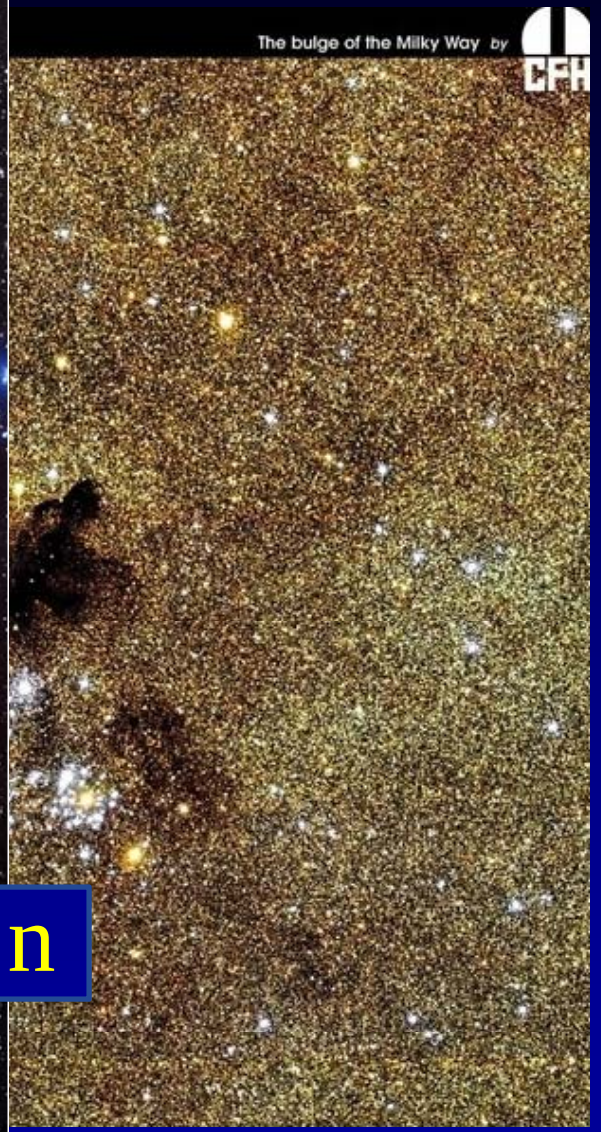


Number of stars in cluster

r = Rich (more than 100 stars).

The letter 'n' following the Trumpler type means that there is nebulosity associated with the cluster.





I 2 r n

Audience participation:

Degree of Concentration:

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III. Detached cluster w/ no noticeable concentration

IV. Not well detached from surrounding star field

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1. Most stars are about the same apparent brightness

2. Moderate range of brightness

3. Cluster is composed of both bright and faint stars

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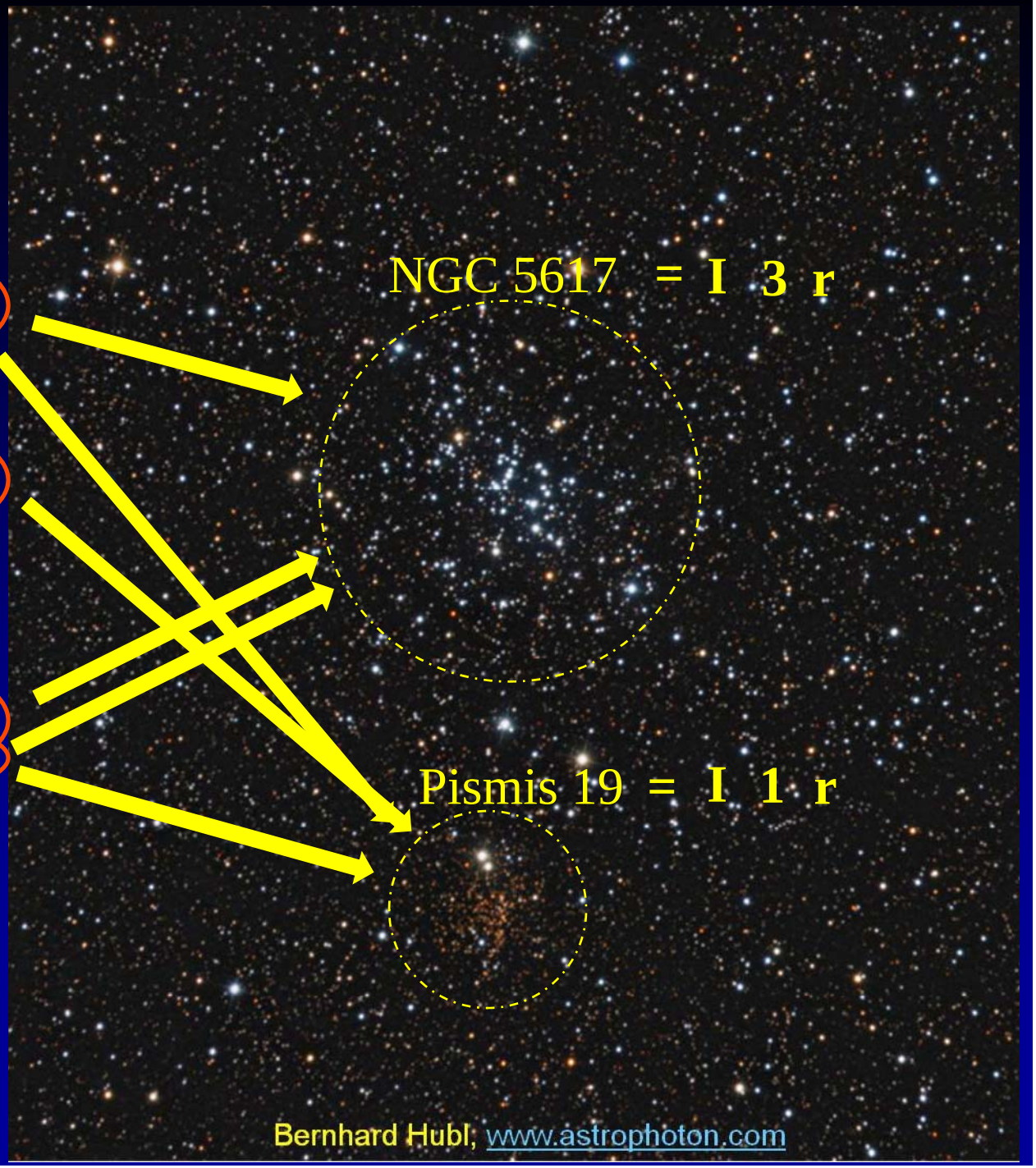

Audience participation:

M 73 =

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III. Detached cluster w/ no noticeable concentration

IV. Not well detached from surrounding star field

Range of brightness

1. Most stars are about the same apparent brightness

2. Moderate range of brightness

3. Wide range of brightness

Number of stars in cluster

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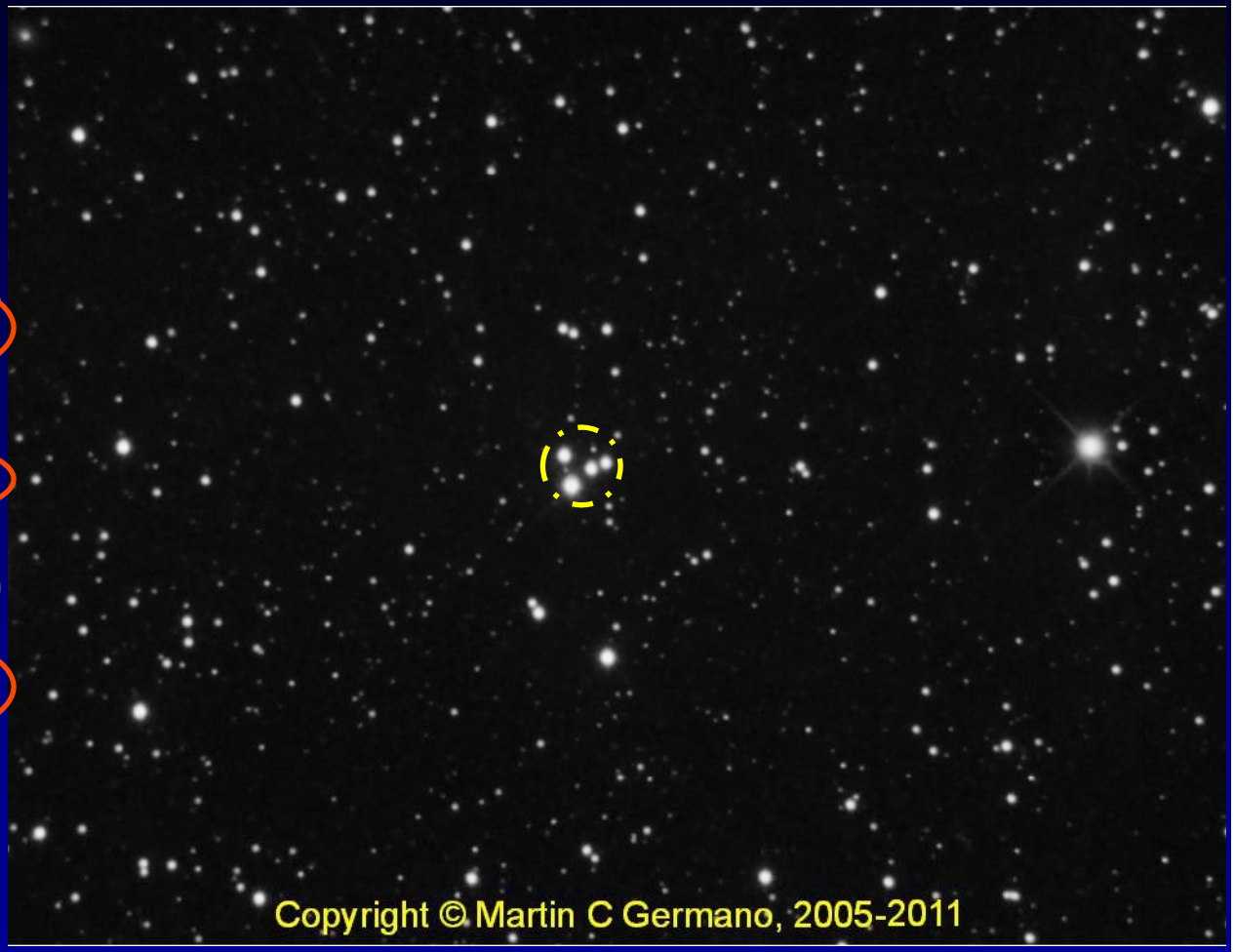
r = Rich (more than 100 stars)



IV 1 p

Audience participation:

M 45 =

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II. Detached cluster w/ some central concentration

III. Moderate concentration

IV. Not well detached from surrounding star field

Range of brightness

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2 = Moderate range of brightness

3 = Wide range of brightness, both bright and faint stars

Number of stars

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r = Rich (more than 100 stars)

Note: this image does not show edge of cluster stars

The letter 'n' following the Trumpler type means that there is nebulosity associated with the cluster.

I 3 r n

Why Observe Open Clusters?

1. They are always available, year round.

2. They aren't as susceptible to light pollution as other deep objects like nebulae and galaxies.

3. Quite a few of them are needed to complete the Messier observing list.

4. The Astronomy League's Open Cluster observing club.

Astrophotography credits and associated websites

Anthony Ayiomamitis – M 45
http://www.perseus.gr/

Christopher Abissi - NGC 559, NGC 6791, NGC 6939
http://www.darkhorseobservatory.org/index.php

Scott Alder - NGC 4755

Canada, France, Hawaii Telescope – NGC 2158, NGC 6520
http://www.cfht.hawaii.edu/

Jon Christensen – Double Cluster (NGC 869 & NGC 884)
http://christensenastroimages.com/

Astrophotography credits and associated websites (continued)

The Digitized Sky Survey (1 & 2) – Berkeley 29
http://archive.stsci.edu/cgi-bin/dss_form

John Drummond - Hyades
www.possumobservatory.co.nz/

Robert Gendler - NGC 2244
http://www.robgendlerastropics.com

Martin Germano – NGC 1502, NGC 1817, M 73
http://martingermano.com/index.html

Hubblesite.org (various contributors) – NGC 265, NGC 290
http://hubblesite.org/

Astrophotography credits and associated websites (continued)

Bernhard Hubl – Composite Trumpler Classification image, NGC 129, DoDz 9, NGC 6793, NGC 7169, NGC 5617 and Pismis 19,
www.astrophoton.com

Al Kelly – IC 188, NGC 457, NGC 6819,
http://www.kellysky.net/

Dean Rowe – Tombaugh 4
http://www.deanrowe.net/astro/

Jim Thommes – NGC 1342, NGC 6811
www.jthommes.com/Astro

Daniel Verschatse – NGC 2506
http://www.verschatse.cl/

Sources used for this presentation were:

Wikipedia, www.answers.com , www.seds.org , Publications of the Astronomical Society of the Pacific, Vol. 69, No. 409, p.304-307, http://www.astroleague.org/al/obsclubs/opencluster/

The end

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