Structure and star formation history of the Orion region from early Gaia data releases

Eleonora Zari

Leiden Observatory

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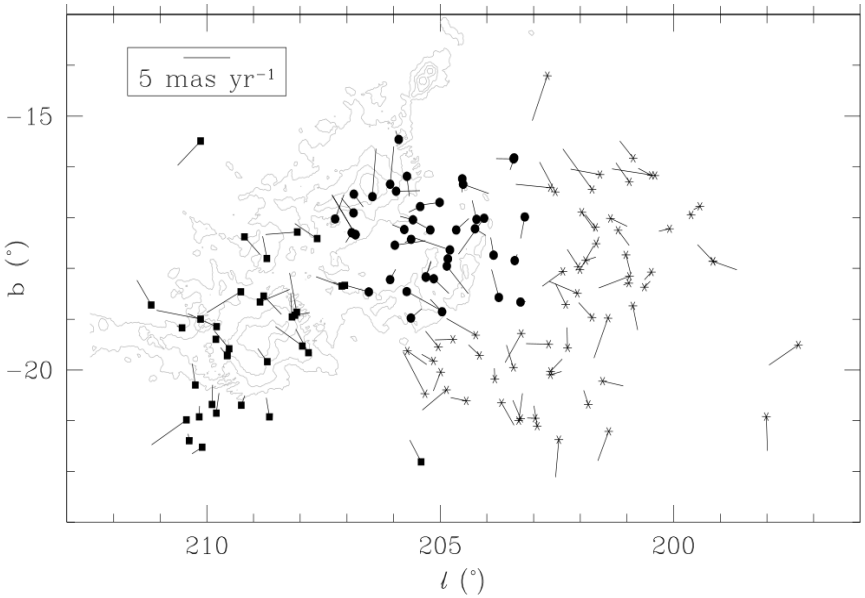

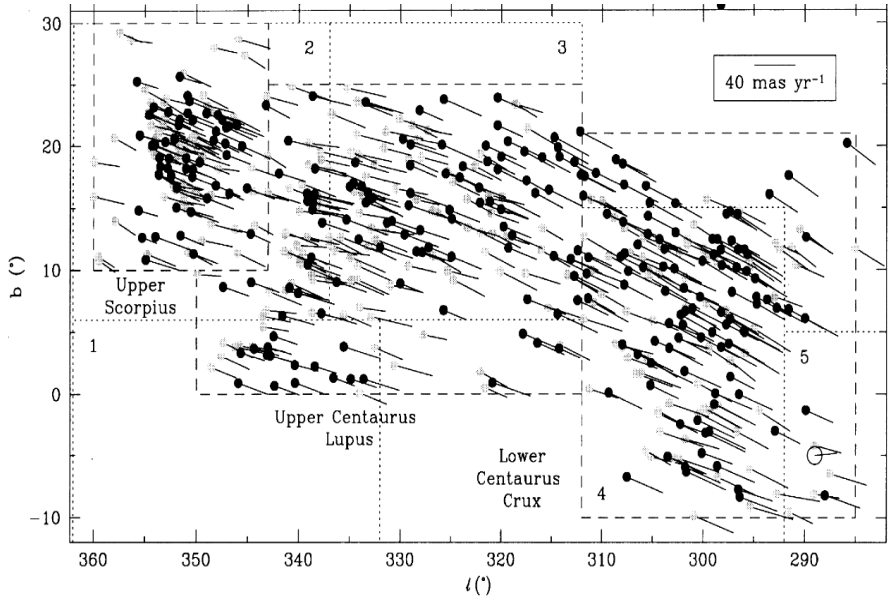

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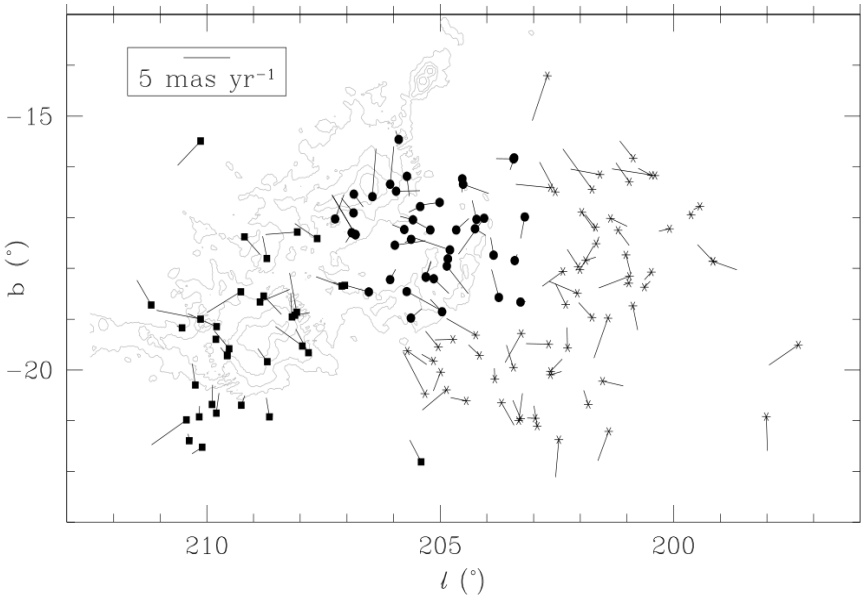
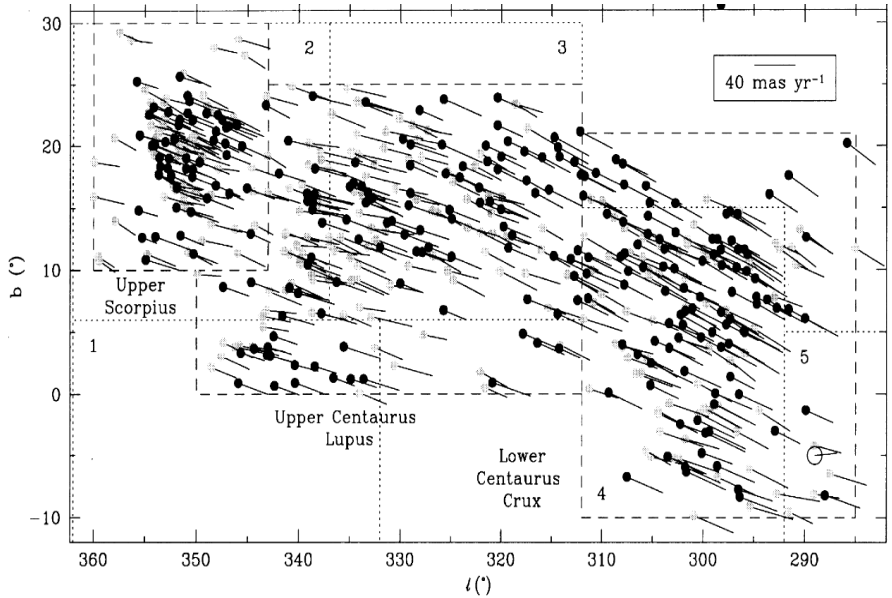


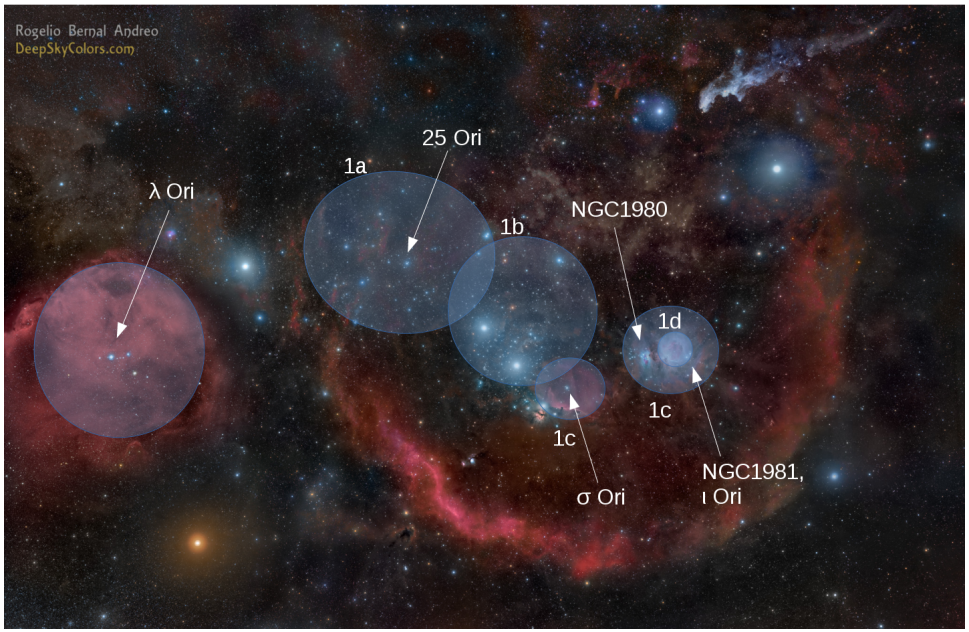


With Gaia accuracy we can expect to make great improvements in our understanding of the structure of the Orion region.

Stars in the Orion complex

Sequence of stellar groups of different ages superimposed along the line of sight:

- Distances of the subgroups between $\sim 330 - 460$ pc.
- The distribution of the population along the line of sight is currently uncertain $\rightarrow$ Bouy et al. (2014): population of young stars in the foreground of the ONC.



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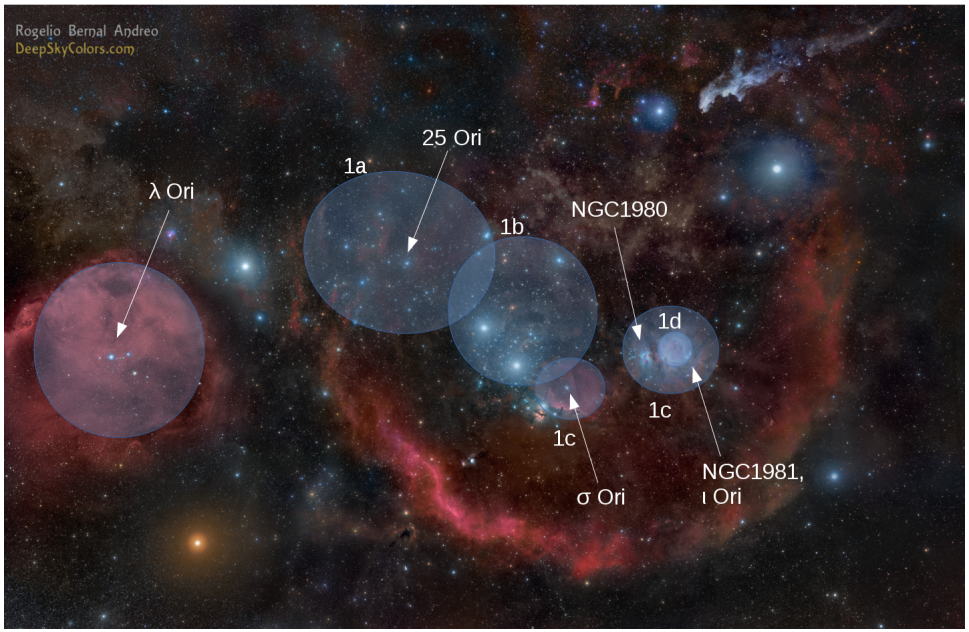

First Goal

$\rightarrow$ Precise division of the young stars into subgroups thanks to the accurate kinematics and distances.
$\rightarrow$ Characterization of the populations through Gaia photometry and complementary spectroscopic data.

Ages of the populations

Current age estimates:

Group	Age [Myr]
OB1a	8-10
OB1b	1.7 - 8
25 Ori	7-10
OB1c	2-6
OB1d	≤ 2
λ Ori	≤ 5
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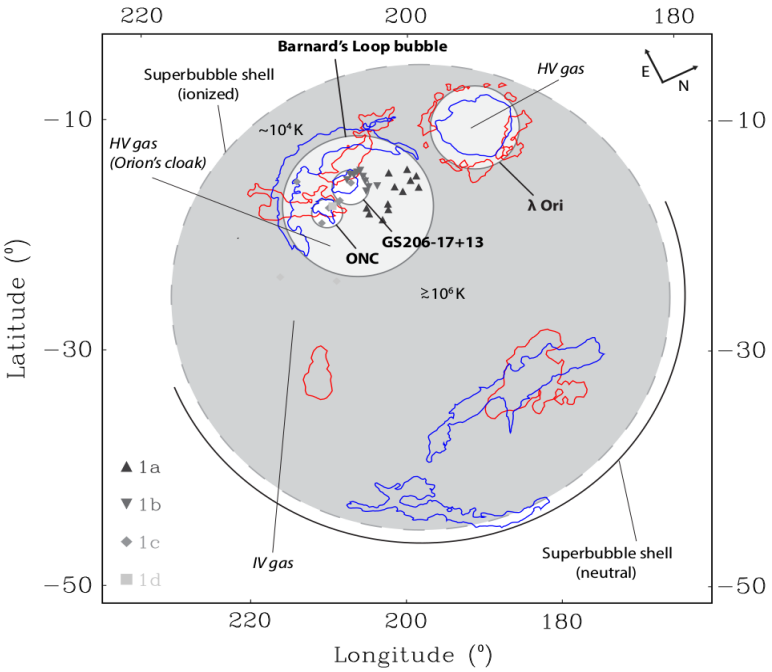
Second Goal

$\rightarrow$ Determination of the ages of the populations in Orion.

Structure of the ISM surrounding Orion

Ochsendorf et al. (2015): the gas in the Orion region is organized in shells nested in space and time.



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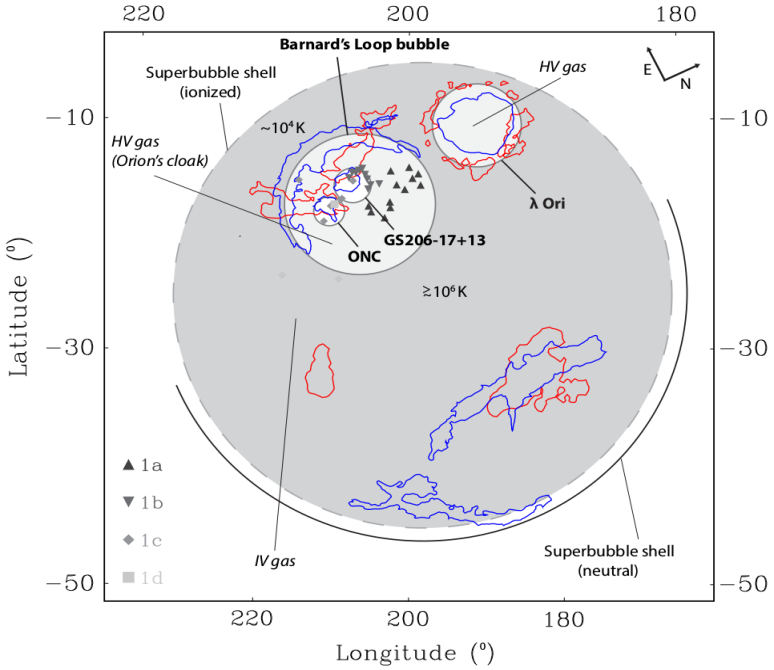

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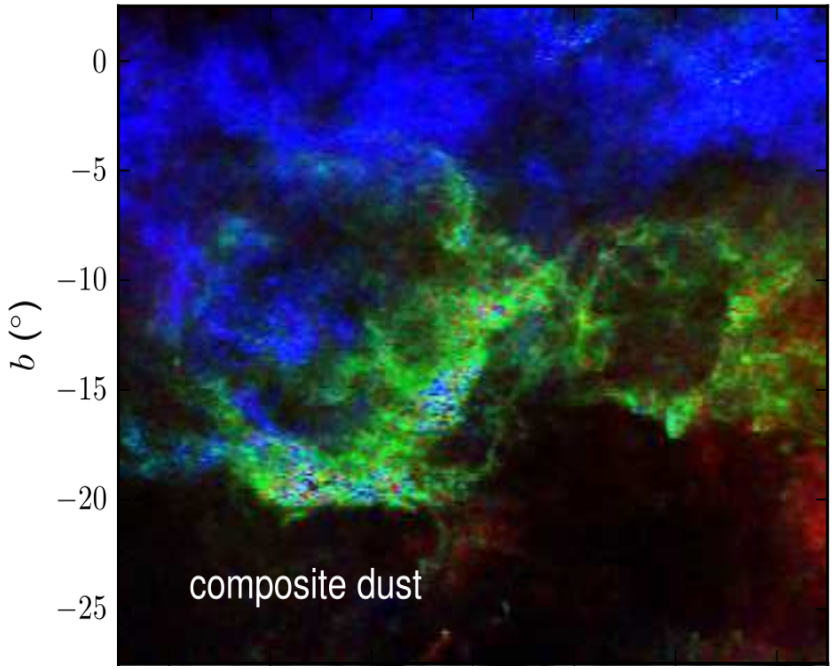

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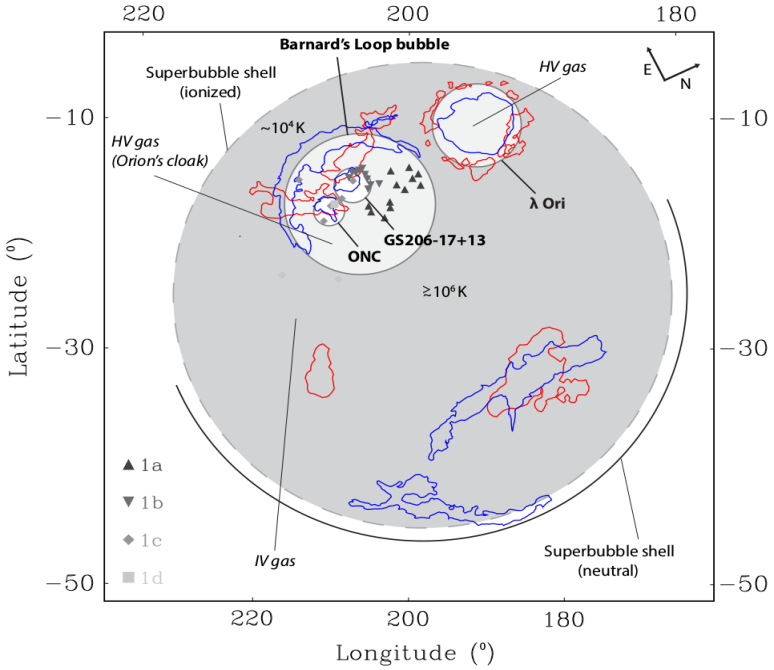

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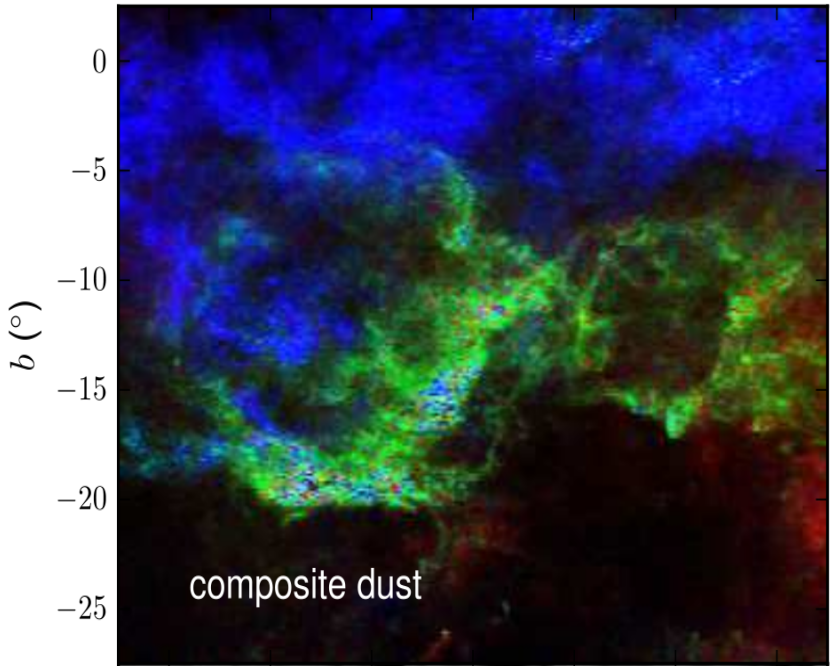
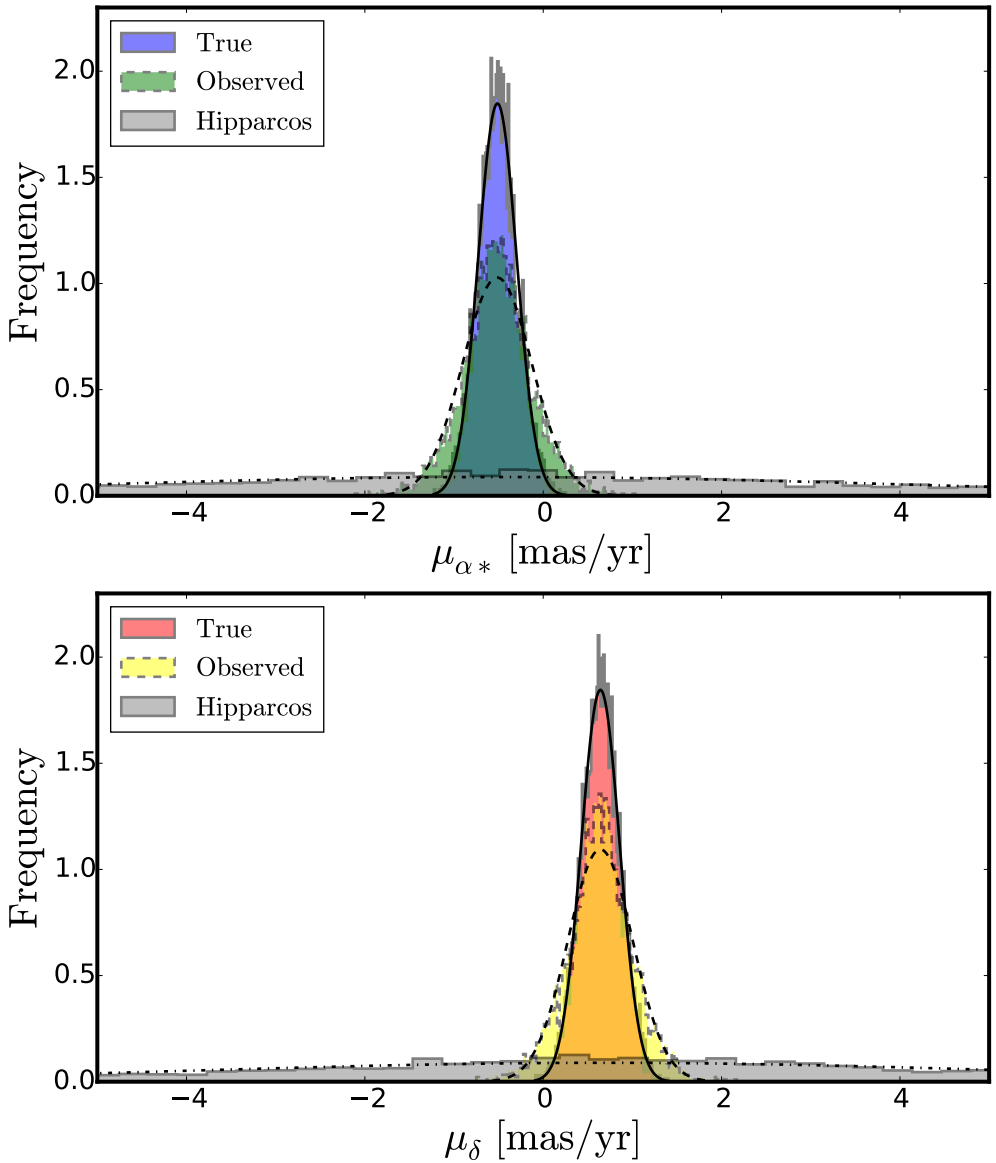


Third Goal

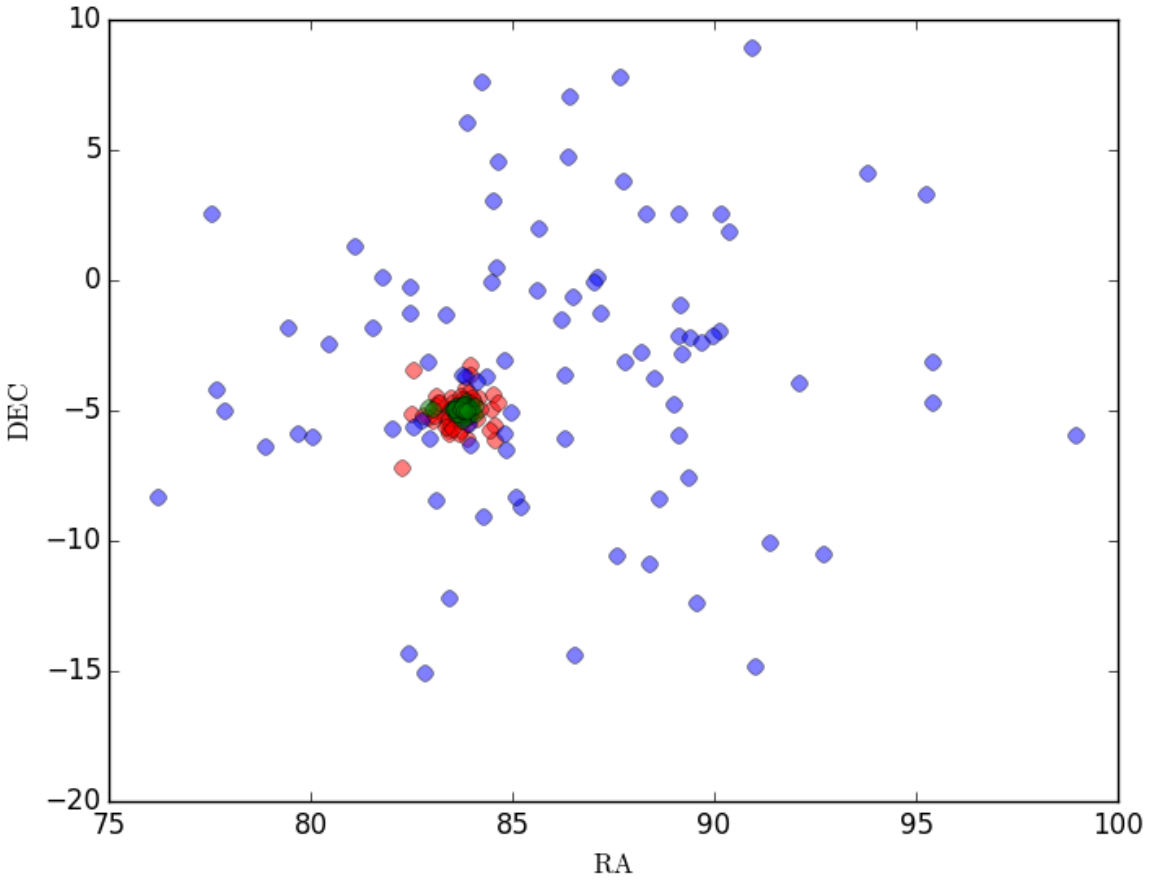
Determination of the effects of ionizing radiation, stellar winds and supernovae on the ISM surrounding Orion.


Rogelio Bernal Andreo
DeepSkyColors.com
Thank you!

Current work 1: Velocity structure of a cluster



Current work 2: Kinematic age determination



- Blue dots: positions of the cluster members at 10 Myr;
- Red dots: observed positions of the cluster members obtained after tracing back the proper motions;
- Green dots: initial positions of the cluster members.

→ Observed age: 10 Myr!