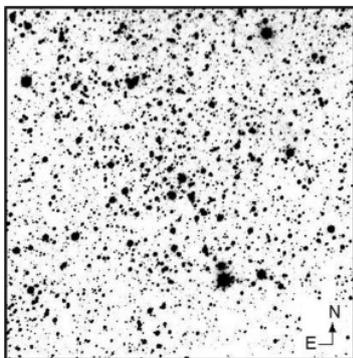


## Topic 2: Crowding simulations of young open clusters

*Supervision: Konstanze Zwintz (Room 08/06)*

**Work focus:** In preparation of a possible future space telescope mission which should observe young open clusters to study the early phases of stellar evolution, you will conduct simulations on how selected young clusters will be seen by a given CCD-instrument combination.

Based on the experience gained with the BRITE-Constellation nanosatellites, we are starting to conduct a concept study for a new satellite project aiming to observe young stellar clusters. One of the aspects we need to work out is how a given instrument – CCD combination would “see” the young clusters, and if all individual objects can be resolved.



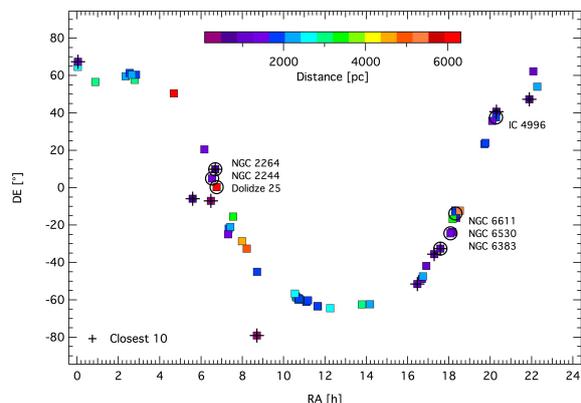
In a cluster, stars are located sometimes very close to each other and it is also possible that they cannot be separated well from each other on the CCD (see Figure on the left as an example).

The crowding and its impact on astrophysical observations from space is a matter of these points:

1. How densely the cluster is populated.
2. How the cluster is projected onto a given CCD.
3. What properties the telescope and camera have.

A few clusters of interest have been already pre-selected (see Figure on the right).

From this initial list, a few clusters will be chosen for your bachelor thesis based on different star densities, different cluster ages, different cluster distances etc.



*In your bachelor thesis you will then simulate the crowding issues assuming a given CCD-instrument configuration (i.e., plate scale) and investigate if (all) stars can be well separated, if and when crowding becomes significant and how precise the pointing of a satellite has to be in order not to lose the necessary information.*

*This work will be done with Konstanze Zwintz as main supervisor and the BRITE-Constellation instrument scientist, Rainer Kuschnig, from the TU Graz as technical advisor.*

*Requirement for this thesis: Excellent programming skills.*

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