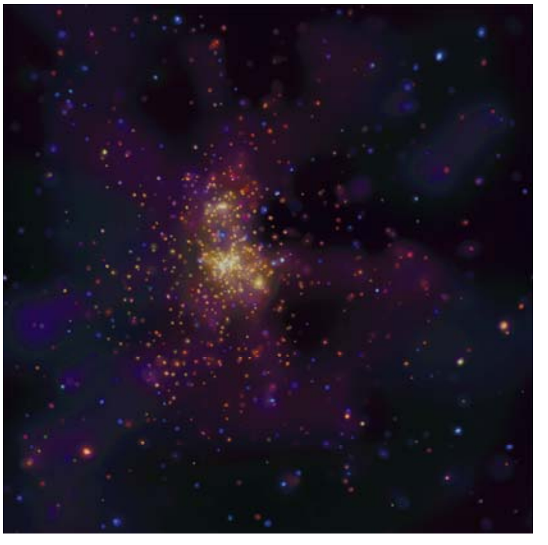
Astronomy & Astrophysics

HIGHLIGHTS: this week in A&A

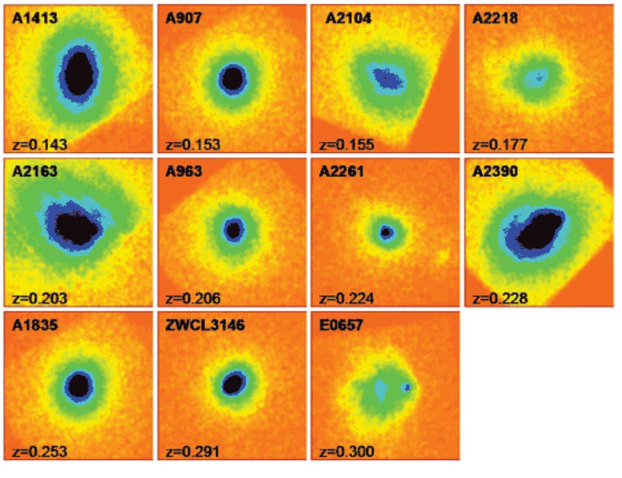
Volume 483-1 (May III 2008)



In section 5. Galactic structure, stellar clusters and populations

"Chandra monitoring of the very massive binary WR20a and the young massive cluster Westerlund2", by Y. Nazé, G. Rauw, and J. Manfroid, A&A 483, p. 171

This paper provides a comprehensive study of a massive, especially young cluster in optical and XR. Comparisons are made with studies in other bands, especially TeV. The cluster is imbedded in a diffuse XR emission region, but the Cherenkov source does not coincide with any feature in the Chandra data. There are several variables in XR, in addition to those already known from the optical, and several WR stars are studied in detail. This cluster is an ideal model for those in the Galactic center and for comparison with extragalactic starburst regions.



In section 3. Cosmology (including clusters of galaxies)

"Searching for cool core clusters at high redshift", by J.S. Santos, P. Rosati, et al., A&A 483, p. 35

The "cooling flow" problem of galaxy clusters has plagued researchers for many years. In brief, although cool gas cores are often detected in clusters, the few detected emission lines are not as strong as expected to justify the predicted cooling rate. The authors revisited the topic using a sample of clusters at redshift z ~ 1 and find that a bimodal population of no-cool-core and cool-core clusters exists at this redshift. This can be interpreted as an evolutionary sequence regulated by the combined action of gas cooling and heat deposition by merger events, as predicted by the theories of the formation of hierarchical structures.

In section 7. Stellar structure and evolution

"Low heat conduction in white dwarf boundary layers?", by F. K. Liu, F. Meyer, E. Meyer-Hofmeister, and V. Burwitz, A&A 483, p. 231

The paper studies dwarf novae in quiescence to determine the thermal conduction properties within the boundary layer that must be present at the inner edge of the accretion disk. The results are, however, far more general in their implications. Using the standard free plasma conductivity, the Spitzer rate, conductive cooling is too efficient with respect to the observations, the low energy portion of the XR spectrum is substantially enhanced, and the high temperature portion is suppressed. Instead, lowering the efficiency by a factor of 100 reproduces the observation remarkably well. This implies a particular magnetic-field geometry in the boundary layer, a large transverse component that inhibits conduction. Similar effects have been suggested in galaxy clusters, where the fields are far more chaotically distributed. Here, the action of a disk dynamo not only may change the structure of the boundary layer but also render the conductivity far less effective relative to radiative losses. The result may extend to virtually all accreting systems, as well as to cosmological flows.