Mem. S.A.It. Vol. 75, 402

Memorie della

Star Formation History of Omega Centauri

Takuji Tusujimoto[1] and Toshikazu Shigeyama[2]

[1] National Astronomical Observatory, Mitaka-shi, Tokyo 181-8588, Japan
[2] Research Center for the Early Universe, Graduate School of Science, University of Tokyo, Bunkyo-ku, Tokyo 113-0033, Japan

Abstract. The star formation history of the globular cluster Omega Centauri is investigated in the context of an inhomogeneous chemical evolution model in which supernovae induce star formation. The proposed model explains recent observations for Omega Cen stars and divides star formation into three epochs. The formation of Omega Cen is also discussed in the framework of globular cluster formation triggered by cloud-cloud collisions. In this scenario the relative velocity of clouds in the collision determines the later chemical evolution in the clusters. A head-on collision of proto-cluster clouds with a low relative velocity would have converted less than 1% of gas into stars and promoted the subsequent chemical evolution by supernova-driven star formation. This is consistent with present observed form of Omega Cen. In contrast the other Galactic globular clusters are expected to have formed from more intense head-on collisions and the resultant clouds would have been too thin for supernovae to accumulate enough gas to form the next generation of stars. This explains the absence of chemical evolution in these other globular clusters.