Astronomy & Astrophysics

HIGHLIGHTS: this week in A&A

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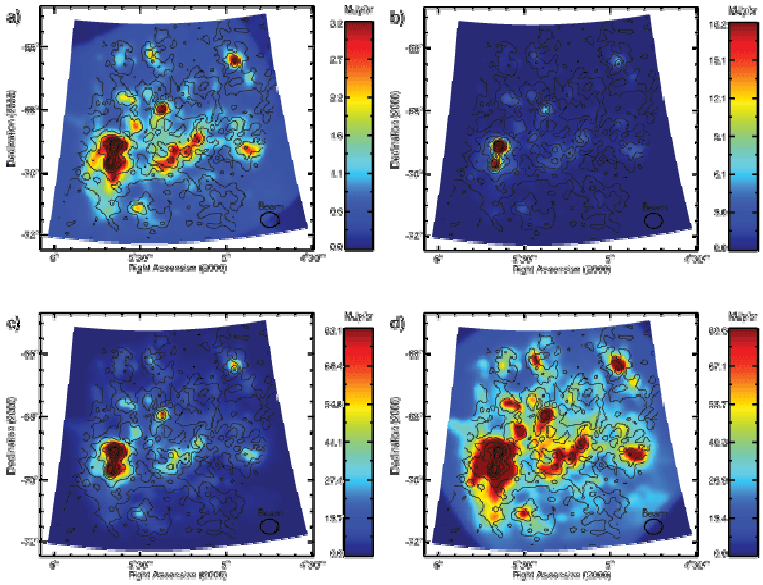

In section 6. Interstellar and circumstellar matter

"A spatially resolved study of photoelectric heating and [C II] cooling in the LMC. Comparison with dust emission as seen by SAGE", by D. Rubin, S. Hony, S. C. Madden et al., A&A 494, p. 647

The Large Magellanic Cloud (LMC) is an obvious site for studying the properties of the interstellar medium in a galaxy with lower metallicity than the Milky Way. In this paper, Rubin et al. measure the photoelectric efficiency (or heating efficiency) of LMC grains combining the Mochizuki et al. [CII] 157 µm observations with the recent Meixner et al. SAGE FIR survey using the SPITZER telescope. They find a good correlation between the two, suggesting that PAH photoelectron emission is the dominant heating process.

In section 1. Letters to the Editor. Sub-section 4. Extragalactic astronomy

"The metallicity of the most distant quasars", by Y. Juarez, R. Maiolino, R. Mujica et al., A&A 494, p. L25

The authors study the metallicity of the broad line region (BLR) of a sample of 30 quasars in the redshift range $4<z<6.4$ and find that the metallicity of the BLR is very high, even in QSOs at $z\sim6$. The data suggest the lack of evolution with redshift of the carbon abundance. This is puzzling, since the minimum enrichment timescale of carbon is about 1 Gyr, i.e. longer than the age of the universe at $z\sim6$.

In section 4. Extragalactic astronomy

"The physical properties of Ly alpha emitting galaxies: not just primeval galaxies?", by L. Pentericci, A. Grazian, A. Fontana et al, A&A 494, p. 553

Pushing the search for the most distant galaxies is now a central challenge for present-day cosmology. These elusive and very faint objects located at the border of the visible universe are difficult to find and extensive observational campaigns using the most advanced ground-based and space-borne telescopes are required. This paper uses data from one of the largest international coordinated efforts (GOODS) to shed light on the origin, properties, and relationship of the two most common high-redshift galaxy populations, the so-called Lyman Alpha emitters and the Lyman break galaxies. Somewhat surprisingly, although not completely unexpected, the authors show that at least some of these remote objects are not young, but instead contain traces of stellar populations older than one billion years, thus pushing the epoch of first star formation even farther back in time. In addition, evidence is reported for the most massive among these objects to be dust-enriched, demonstrating that dust grains formed quite rapidly during cosmic evolution.