DWARF GALAXIES

Small yet packing a punch

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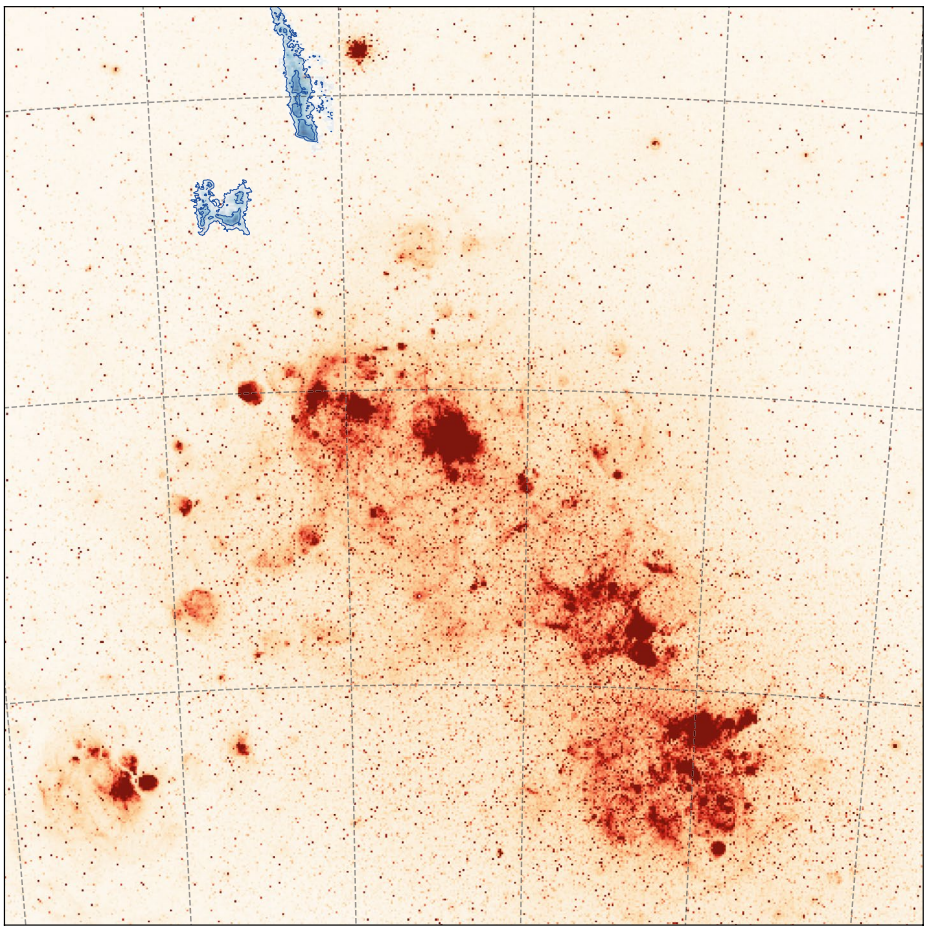

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Dwarf galaxies are some of the most intriguing objects in the cosmos. They are thought by many to be local examples of primordial galaxies, while others may be tidally disrupted galaxies or even over-inflated stellar clusters. Enrico Di Teodoro and collaborators report observations of molecular gas outflowing from the Small Magellanic Cloud (SMC), the closest dwarf galaxy to us.

It was previously found that the SMC (pictured in red) shows a massive outflow in H I (pictured in blue contours), containing tens of millions of solar masses of atomic gas. The authors use the Atacama Pathfinder Experiment (APEX) to look for CO molecules in this outflow, in order to quantify the total mass expelled from the galaxy. They find molecular gas outflow rates of up to two solar masses per year, implying that at this rate the SMC will expel its whole molecular gas reservoir in up to a few billion years.

The results of Di Teodoro et al. are consistent with supernovae winds driving massive outflows of atomic gas that in turn entrain clumps of molecular gas in their wake. Given the shallow gravitational potential of dwarf galaxies, these outflows can be very efficient in drying a galaxy up and leading to its transformation to a passive galaxy while at the same time enriching the intergalactic medium with molecular gas and metals. These results, however, call into question the idea that dwarf galaxies are pristine laboratories of primordial cosmic conditions.

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