Astronomy & Astrophysics

HIGHLIGHTS: this week in A&A

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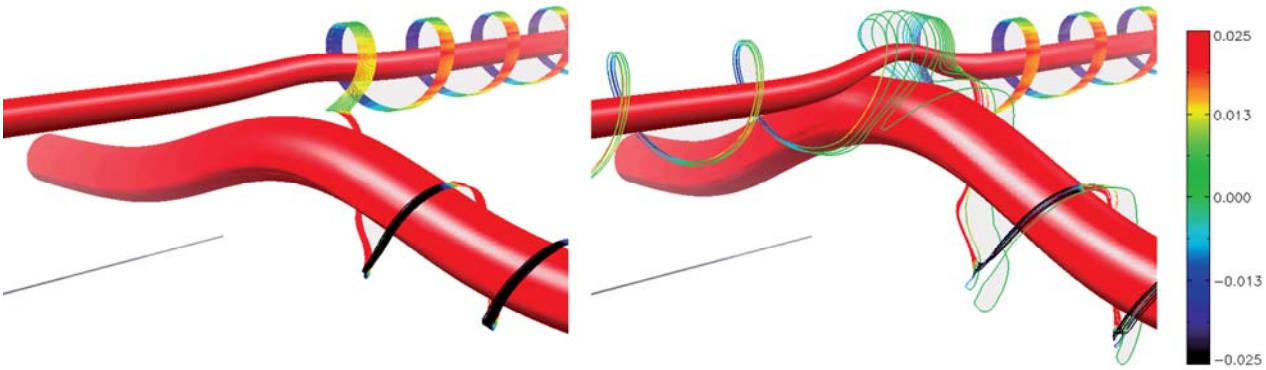
Flux emergence simulations and complex magnetic fields

"Simple emergence structures from complex magnetic fields" by M.J. Murray and A.W. Hood, A&A 470, p. 709

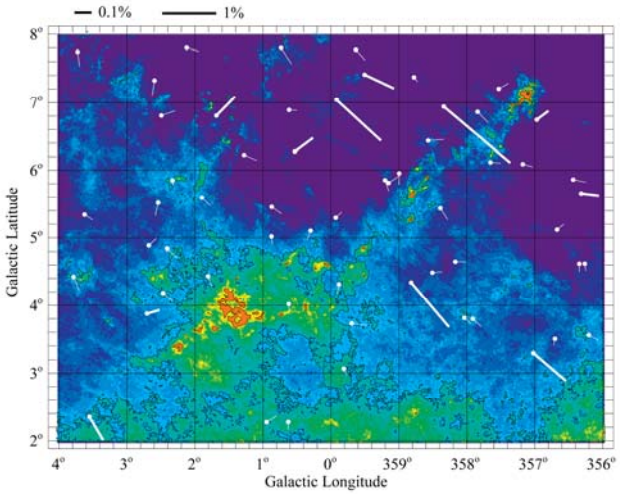
Magnetic flux tubes in the solar interior rise and eventually break through the surface. It is very interesting to understand the relation between the subsurface magnetic field structure and the observable signatures of emerging magnetic flux. Previous models have mostly investigated a simple flux tube emergence, even though the subsurface field structure is much more complex. In this paper, the authors show that the interaction of two flux tubes in the interior leads to a complex subsurface magnetic field. When the complex structure comes close to the surface, it remains quite complex, but the emergence process occurs in a similar manner to what a simpler subsurface field does. This indicates that previous results for flux emergence simulations hold for both simple and complex subsurface field structures.



The distance to the Pipe nebula

"An accurate determination of the distance to the Pipe nebula" by F.O. Alves and G.A.P. Franco, A&A 470, p. 597

This paper presents a new and, so far, the most accurate, determination of the distance to the so-called Pipe nebula, a dark cloud projected against the Galactic bulge. Because of its favourable direction toward a star-rich background, the extinction through this cloud has recently been studied extensively using the JHK multicolour technique. The Pipe nebula is so important for studies related to the initial conditions for star formation (or non-formation) that accurately determining its distance deserves special attention.



In section 7. Stellar structure and evolution

"Origin of the early-type R stars: a binary-merger solution to a century-old problem?" by R. G. Izzard, C.S. Jeffery, and J. Lattanzio, A&A 470, p. 661

The early-R stars are core helium burning giants whose surface is enriched in carbon but not in s-process elements. The fact that they are all single stars makes it plausible that these stars are the result of a stellar merger. This paer shows that the expected number of merger events can match the observed number of early-R stars, and thus concludes that stellar merger are in fact responsible for their formation.

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