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The Origin of Galactic Cosmic Rays as Revealed by their Composition

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Galactic cosmic-rays (GCRs) are thought to be accelerated in strong shocks induced by massive star winds and supernova explosions sweeping across the interstellar medium. But the phase of the interstellar medium from which the CRs are extracted has remained elusive up to now. We have studied in detail the GCR source composition deduced from recent measurements by the AMS-02, Voyager 1 and SuperTIGER experiments to obtain information on the composition, ionisation state and dust content of the GCR source reservoirs. The results of this data analysis suggest that the GCRs are mainly accelerated in superbubbles energised by the activity of massive star winds and supernova explosions. The resulting model explains well the measured abundances of all primary and mostly primary CRs from H to Zr, including the overabundance of ^{22}Ne .

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