

Efficient cosmic-ray acceleration in the recurrent nova RS Ophiuchi revealed by H.E.S.S.

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Recurrent Novae (RNe) undergo episodic eruptions in the form of thermonuclear explosions, due to the accumulation of material accreted by a white dwarf from a binary companion star.

The well known RN RS Ophiuchi (RS Oph) underwent its latest eruption in August 2021, triggering numerous follow-up observations, including with the High Energy Stereoscopic System (H.E.S.S.).

H.E.S.S. is an array consisting of five Imaging Atmospheric Cherenkov Telescopes (IACTs) situated in Khomas Highland, Namibia, that observes the sky in the very-high-energy (VHE) gamma-ray regime of 100 GeV to a few tens of TeV.

Non-thermal emission was observed coincident with the nova eruption within the first days and up to a month after the initial burst event, establishing novae as Galactic transients reaching TeV energies. Analysis and interpretation of the data identify time-resolved acceleration of cosmic-rays, constraining models of particle energisation. Combining the data taken by H.E.S.S. with concurrent observations taken by the Large Area Telescope (LAT) on board the Fermi Gamma-ray Space Telescope, a consistent temporal and spectral profile is observed, favouring a common origin to the emission. The detection and interpretation of the non-thermal VHE emission from the RN RS Oph by H.E.S.S. will be presented.

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