

## Unveiling the cosmic ray acceleration in SNR using the Balmer emission

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The blast wave of young supernova remnant are often associated with Balmer emission produced by the excitation of neutral Hydrogen in the ISM by shocked ions. The resulting Balmer lines contain information on the shock structure, in particular connected to the plasma temperature, speed, ionization fraction and turbulence level. If the same shock accelerate efficiently cosmic rays (CRs), the shock structure is modified affecting also the associated Balmer emission.

The possibility of study Balmer emission with the high spatial resolution provided by the AO technique can help to understand the physics of collisionless shocks as well as the CR acceleration mechanism, especially because non thermal particles are traditionally studied through X-ray and gamma-rays whose angular resolution is by far worse than optical observations and cannot resolve important details of the shock.

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