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Pulsar wind nebula beyond reverberation

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Reverberation starts when the PWN is reached by the reverse shock of the supernova remnant. Depending on the internal to the outer pressure balance, it might induce a compression of the PWN. This period has a large (even huge) effect on the subsequent dynamical and spectral evolution.

In this talk, we shall present numerical evidence for that the shell accumulated at the PWN boundary is far from being ideally thin, and that maintaining this approximation through the whole evolution may lead to incorrect estimates of the dynamical, and consequently spectral, properties of PWNe. Moreover, we shall show that thin-shell-based models are forced to assume a simplified, and rather arbitrary, structure for the supernova remnant. But this, especially the pressure profile, is a fundamental ingredient for the interaction between the PWN and the SNR, and a rough model is source of artificial modifications of the compression. We shall introduce a brand new solution to this problem that puts together the strengths of all past approaches: a numerical model that couples radiative one-zone and lagrangian treatments, able to correctly reproduce the PWN interaction with the SNR during reverberation and to consistently evolve the particle spectrum beyond.

Primary authors: Prof. OLMI, Barbara (INAF); TORRES, Diego F. (ICREA & Institute of Space Sciences (ICE, CSIC)); Prof. BUCCIANTINI, Niccolo (INAF); Prof. BANDIERA, Rino (INAF)

Presenter: TORRES, Diego F. (ICREA & Institute of Space Sciences (ICE, CSIC))

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