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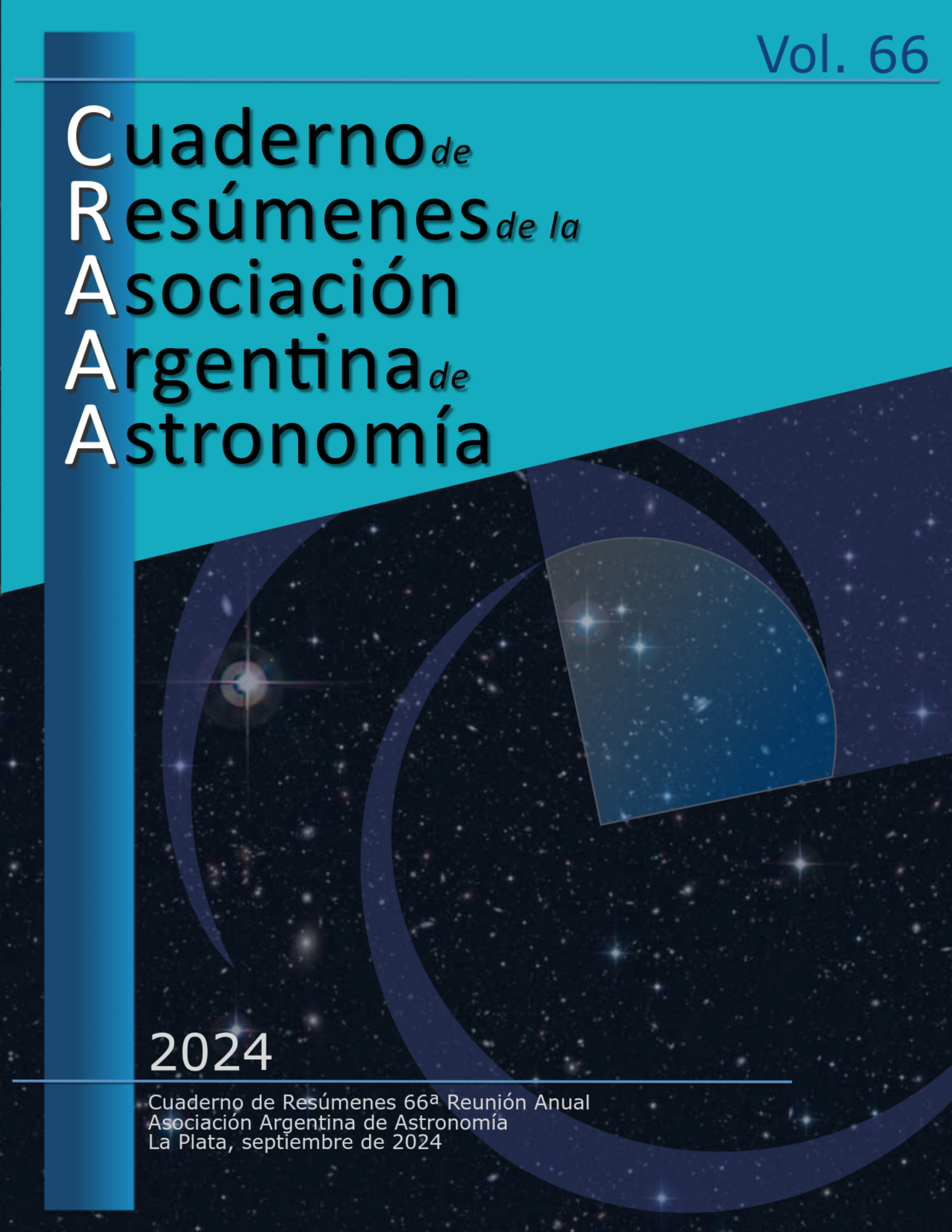

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SN2023ixf: lessons from a nearby supernova

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Abstract / Theoretical supernovae light curves have shown to be sensitive to the physics of the exploding star, its late mass loss history, explosion energetics, and other well established facts, though, constraining parameters is an often challenging endeavor. We have used 1D hydrodynamical simulations to study a rich data set that collects photometric data of one of the nearest Type II supernovae discovered in recent decades: SN2023ixf in Messier 101. Due to its proximity, it has attracted the attention of the entire community and it triggered extensive observations by professional and amateur astronomers alike. Recently we published the calculation of the bolometric luminosity in two separated steps: a model for the first 19 days was depicted using the early light curve and data of the expansion velocities. The interaction between the ejecta and circumstellar material is crucial at these early phases. We then incorporated a total of 100 days of observations and the model did still reproduce the overall shape of the light curve. Including the new information the allowed us to infer the radioactive yield. Here we summarize our main results on this supernova and provide a more general context by comparing our results with other studies.

Keywords / supernovae: general — circumstellar matter — supernovae: individual (SN2023ixf)

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