It is observationally and theoretically well established that a considerable amount of dust is efficiently formed in regions around asymptotic giant branch (AGB) stars. This process is classically considered as the primary source of dust grains in galaxies, and the typical formation timescale in the Milky Way is $\sim 3 \times 10^9$ yr.

In contrast, supernova (SN) explosions in the interstellar medium (ISM) trigger shock waves that are able to quickly process dust grains and are considered the dominant mechanism of dust destruction in the ISM. A recent theoretical work on interstellar dust destruction in shock waves led to an estimated lifetime of $\sim 6 \times 10^7$ yr and $\sim 3 \times 10^8$ yr for carbonaceous and silicate grains in our Galaxy, respectively (Bocchio et al. 2014), which is much shorter than the assumed dust formation timescale from AGB stars. This leads to the conclusion that a large amount of dust must be reaccreted from the gas phase.

Although SNe are believed to be efficient interstellar dust destroyers, there is increasing observational evidence today for the formation of non-negligible quantities of dust grains in the ejecta of SNe. Given the relatively short timescale between the explosion of two SNe, this would lead to an effectively shorter timescale for dust formation. However, all the available measurements of the mass of freshly-formed dust are associated to young SNe, where the passage of the reverse shock has invested only a fraction of the total dust in the ejecta.

In order to estimate the dust mass that is released into the ISM after the passage of the reverse shock, we recently developed a new code (GRASH_Rev, Bocchio et al. 2016), which follows the newly-formed dust evolution throughout the supernova explosion until the merging of the forward shock with the circumstellar ISM. The properties of dust formed in the ejecta are estimated using a recent nucleation model (Marassi et al. 2015) and the processing of dust grains is treated following Bocchio et al. (2014).

We have considered four well studied SNe in the Milky Way and Large Magellanic Cloud: SN1987A, CasA, the Crab Nebula, and N49. For all the simulated models, we find good agreement with observations. However, the largest dust mass destruction is predicted to occur between 10^3 and 10^5 yr after the explosions. Since the oldest SN in the sample has an estimated age of 4800 yr, current observations can only provide an upper limit to the effective dust yields. We find that between 1 and 8% of the observed mass will survive, leading to a SN dust production rate of $(3.9 \pm 3.7) \times 10^{-4}\, M_\odot\, \mathrm{yr}^{-1}$ in the Milky Way.

This value is almost an order of magnitude larger than the observed dust production rate by AGB stars. However, interstellar dust destruction by SNe is observed and modelled to be larger than the dust formation rate by SNe by a factor > 100, therefore requiring dust accretion in the gas phase.