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# The supernova driven interstellar medium on local and global scales

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## Abstract content

During the last two decades due to the increase of computing power and software developments, such as adaptive mesh refinement, substantial progress has been made in numerical modeling of the interstellar medium (ISM). It has been found that the bulk of kinetic and thermal energy input stems from supernovae and to a lesser extent from stellar winds. Our group has shown that on mesoscales (1 kpc x 1 kpc x 15 kpc in the disk and perpendicular to it, respectively) subparsec scale resolution can be achieved, so that major physical processes can be described correctly, although the end of the turbulent cascade is still out of range. An important result is that radiative cooling and the ionisation structure of the plasma are non-linearly coupled so that the often used assumption of collisional ionisation equilibrium in a dynamical plasma might give erroneous results, both in temperature derivation from spectral lines and in the dynamics of the plasma itself. On a local scale, we show that it is possible to derive supernova explosion sites and times near Earth from modeling the fluence of the radioisotope 60Fe, generated in explosive nucleosynthesis and found in the ferromanganese crust and sediments on deep sea ocean floors.

**Primary author(s) :** BREITSCHWERDT, Dieter (Technische Universität Berlin)

**Presenter(s) :** BREITSCHWERDT, Dieter (Technische Universität Berlin)

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