

# SUPERNOVA DRIVEN TURBULENCE IN MAGNETIC FIELD AND MULTIPHASE STRUCTURE OF THE INTERSTELLAR MEDIUM.

F. A. Gent, Maarit Käpylä, Anvar Shukurov, Graeme Sarson, Andrew Fletcher, Miikka Väisälä, Can Evirgen, James Hollins and Luiz-Felipe Santiago Rodrigues

ReSoLVE, Department of Computer Science, P.O. Box 11000, FI-00076 Aalto University, Espoo, Finland email: frederick.gent@aalto.fi

Using direct numerical simulations of the interstellar medium (ISM) stirred and heated by supernova explosions in rotating disk galaxies, we investigate its thermal structure [2]. The model is the first to invoke a dynamo [3], which includes large scale and small scale dynamo in the ISM, and advances investigation of how the magnetic field is generated in disk galaxies and how the features of the magnetic field interact with the multiphase structure of the ISM [1]. We consider local averaging techniques, as an alternative to horizontal averages, to understand the separation of scales in the magnetic field, velocity field, etc. over arbitrary domains.

<http://fagent.wikidot.com/astro>



- [1] C. C. Evirgen, F. A. Gent, A. Shukurov, A. Fletcher, and P. Bushby. The distribution of mean and fluctuating magnetic fields in the multiphase interstellar medium. *MNRAS*, 464:L105–L109, January 2017.
- [2] F. A. Gent, A. Shukurov, A. Fletcher, G. R. Sarson, and M. J. Mantere. The supernova-regulated ISM - I. The multiphase structure. *MNRAS*, 432:1396–1423, June 2013.
- [3] F. A. Gent, A. Shukurov, G. R. Sarson, A. Fletcher, and M. J. Mantere. The supernova-regulated ISM - II. The mean magnetic field. *MNRAS*, 430:L40–L44, March 2013.