Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Anomalous sound absorption in the Voronoi liquid** JEAN FARAGO, CLINE RUSCHER, ALEXANDR SEMENOV, JOERG BASCHNAGEL, Universit de Strasbourg, Institut Charles Sadron, CNRS — The physics of simple fluids in the hydrodynamic limit, and notably the connection between the proper microscopic scales and the macroscopic hydrodynamical description are nowadays well understood. In particular, the three peak shape of the dynamical structure factor $S(k,\omega)$ is a universal feature, as well as the $k$-dependence of the peak position ($\propto k$), and width $\propto k^2$, the latter accounting for the sound attenuation rate. In this talk, I will present a theoretical model of monodisperse fluid, whose interactions are defined via the Voronoi tessellations of the configurations (called the Voronoi liquid and first studied in C. Ruscher et al., *Europhys. Lett.*, **112**, 66003 (2015) ), which displays at low temperatures a marked violation of the universal features of $S(k,\omega)$ with sound attenuation rate only $\propto k$. This anomalous behaviour, which apparently violates the basic symmetries of the liquid state, is traced back to the existence of a timescale which is both (1) short enough for the viscoelastic features of the liquid to impact the relaxational dynamics and (2) long enough for the momentum diffusion to be substantially slower than the sound propagation on that characteristic time.

Jean Farago
Universit de Strasbourg, Institut Charles Sadron, CNRS

Date submitted: 09 Nov 2016 Electronic form version 1.4