# Nuclear structure with Bayesian analysis – résumé

First Bayesian analyses reproducing a large set of isoscalar and isovector data with HF/qRPA start to be available => nuclear structure might be used as a complementary source of data to produce a multi-dimensional EoS inference (**joint E0-K-J-L-m*n-m*p-Gs-Gv posteriors**) to be

1. Added to the same analyses using HI and/or astro (more sensitive to K-Ksym-Q-Qsym) for a complete inference using all info
2. Used for unified NS modelling including a microscopically controlled crust

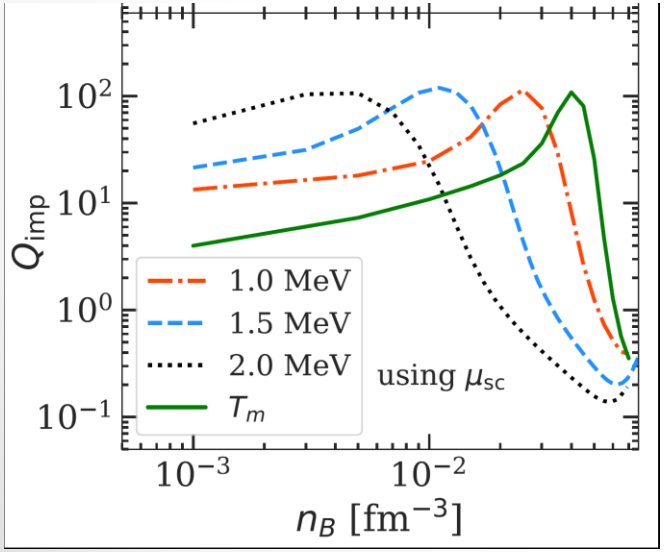
**A possible collaborative strategy**

- Bayesian protocol (different groups working independently):
  - BCS-HF&qRPA
  - Different functional forms by different groups: (Ext)Skyrme, KIDS, RMF, Fayans
  - Same observable set: BE+R, GMR,GDR,APV,alpha_D for spherical (magic and open shells)
  - Same many body method => same theoretical precision asked
  - Systematically check for possible outliers
  - Use single likelihoods for masses
- Defining the systematic error due to the functional form (common shared work)
  - Compare the posteriors in terms of (i) observable reproduction and (ii) posterior NMP distribution
  - Bayesian model mixing for a comprehensive posterior

# Clustering in the (proto)NS

## Impurities in the solid phase

- Stress tensor $\frac{\partial \delta f_i}{\partial x_j}$ =>
  microscopic shear modulus => i-modes?
- Interplay with the EoS?




## Light clusters in the liquid phase

$$m^*_{AZ} \approx m^{vac}_{AZ} - A\boldsymbol{x_s}(n,T)g_s(n)\langle\sigma\rangle$$

- Disentangle scalar and vector contributions => more theo and exp benchmarks?
- Applications in HI transport?