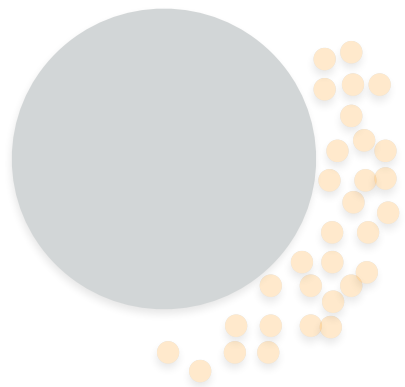


# BEHAVIOUR FLUID - SOLID IN THE NANOSCALE

KAWASAKI-GUNTON  
PROJECTION OPERATOR

+

MARKOVIAN  
APPROXIMATION



$$\begin{aligned}\partial_t \rho(\mathbf{r}) &= -\nabla \cdot \mathbf{g}(\mathbf{r}) \\ \partial_t \mathbf{g}(\mathbf{r}) &= -\nabla \cdot (\mathbf{g}(\mathbf{r}) \mathbf{v}(\mathbf{r})) - \rho(\mathbf{r}) \nabla \frac{\delta \mathcal{F}}{\delta \rho(\mathbf{r})} [\rho, \mathbf{R}] \\ &\quad + \nabla \cdot \boldsymbol{\Sigma}(\mathbf{r}) + \mathcal{S}(\mathbf{r}) \\ \dot{\mathbf{R}} &= \frac{\mathbf{P}}{M} \\ \dot{\mathbf{P}} &= -\frac{\partial \mathcal{F}}{\partial \mathbf{R}} - \int d\mathbf{r} \mathcal{S}(\mathbf{r})\end{aligned}$$

MORI THEORY

$$C(t) = \exp\{-\Lambda^* t\} \cdot C(0)$$

MD SIMULATIONS

SLIP BOUNDARY  
CONDITION

