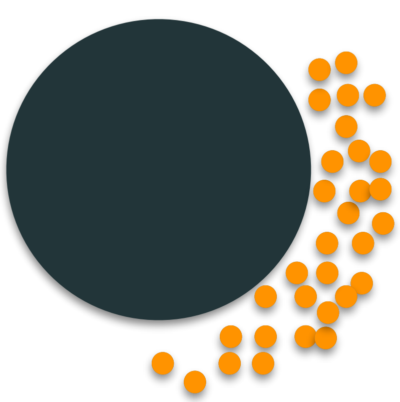
BEHAVIOUR **FLUID - SOLID** IN THE **NANOSCALE**

KAWASAKI-GUNTON PROJECTION OPERATOR + MARKOVIAN APPROXIMATION



$$\partial_t \rho(\mathbf{r}) = -\boldsymbol{\nabla} \cdot \mathbf{g}(\mathbf{r})$$

$$\partial_t \mathbf{g}(\mathbf{r}) = -\boldsymbol{\nabla} \cdot (\mathbf{g}(\mathbf{r})\mathbf{v}(\mathbf{r})) - \rho(\mathbf{r}) \boldsymbol{\nabla} \frac{\delta \mathcal{F}}{\delta \rho(\mathbf{r})}[\rho, \mathbf{R}] + \boldsymbol{\nabla} \cdot \boldsymbol{\Sigma}(\mathbf{r}) + \boldsymbol{\mathcal{S}}(\mathbf{r})$$

$$\dot{\mathbf{R}} = \frac{\mathbf{P}}{M}$$

$$\dot{\mathbf{P}} = -\frac{\partial \mathcal{F}}{\partial \mathbf{R}} - \int d\mathbf{r} \boldsymbol{\mathcal{S}}(\mathbf{r})$$

MORI THEORY

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

MD SIMULATIONS

SLIP BOUNDARY CONDITION