Active ants

- $F = n(\theta_t^i) \cdot \frac{1}{N} \sum_{j \neq i} \nabla K(X_t^i + \tau v(\theta_t^i) - X_t^j)$ on $\mathbb{T}^2$
- Anticipation length τ as a phase transition/bifurcation parameter?

Active ants

$$\begin{cases} \mathrm{d}X_t^i &= \mathrm{Pe} v(\theta_t^i)\mathrm{d}t + \sqrt{2\sigma_x}\mathrm{d}W_t^i \\ \mathrm{d}\theta_t^i &= \chi n(\theta_t^i) \cdot \frac{1}{N}\sum_{j\neq i} \nabla K(X_t^i + \tau v(\theta_t^i) - X_t^j) + \sqrt{2}\mathrm{d}B_t^i \end{cases}$$

- Well-posedness of equations
- SDE system $\Longleftrightarrow$ PDE via mean-field limit
- Long-time behaviour of PDE
- Bifurcation analysis
- Metastability?