Simulator (physics-based)

$\boldsymbol{\theta} \sim p(\boldsymbol{\theta}), \ \mathbf{x} \sim p(\mathbf{x} \mid \boldsymbol{\theta})$

$\mathbf{x}$

Summary extractor (NN)

$T_\phi(\mathbf{x})$ (optional)

$\boldsymbol{\theta}$

$\nabla_\phi \mathcal{L}$

Inference head (NN)

e.g., posterior, likelihood, ratio, score

e.g., $q_\phi(\boldsymbol{\theta} \mid \mathbf{x})$

$\nabla_\phi \mathcal{L}$

Inference loss $\mathcal{L}$

e.g., cross-entropy, score matching
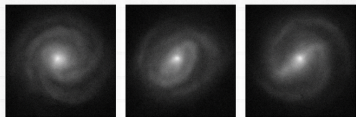
$$\begin{bmatrix} 1.27 \\ -0.83 \\ 0.41 \end{bmatrix}, \quad \begin{bmatrix} -0.15 \\ 2.34 \\ 0.79 \end{bmatrix}, \quad \begin{bmatrix} 0.66 \\ 1.02 \\ -1.48 \end{bmatrix}$$