

Displacement at
$$t = t_k$$

$$\underline{\mathbf{x}}(t_{k+1}) = \underline{\mathbf{x}}(t_k) - \nabla V(\underline{\mathbf{x}}(t_k))\Delta t + \underline{\mathbf{u}}^*(t_k)\Delta t + \sqrt{2D}\underline{\boldsymbol{\xi}}(t_k)\Delta t$$