HAMILTONIAN MONTE CARLO (HMC) - COMPLETE FLOWCHART

Mathematical Foundation and Algorithmic Structure

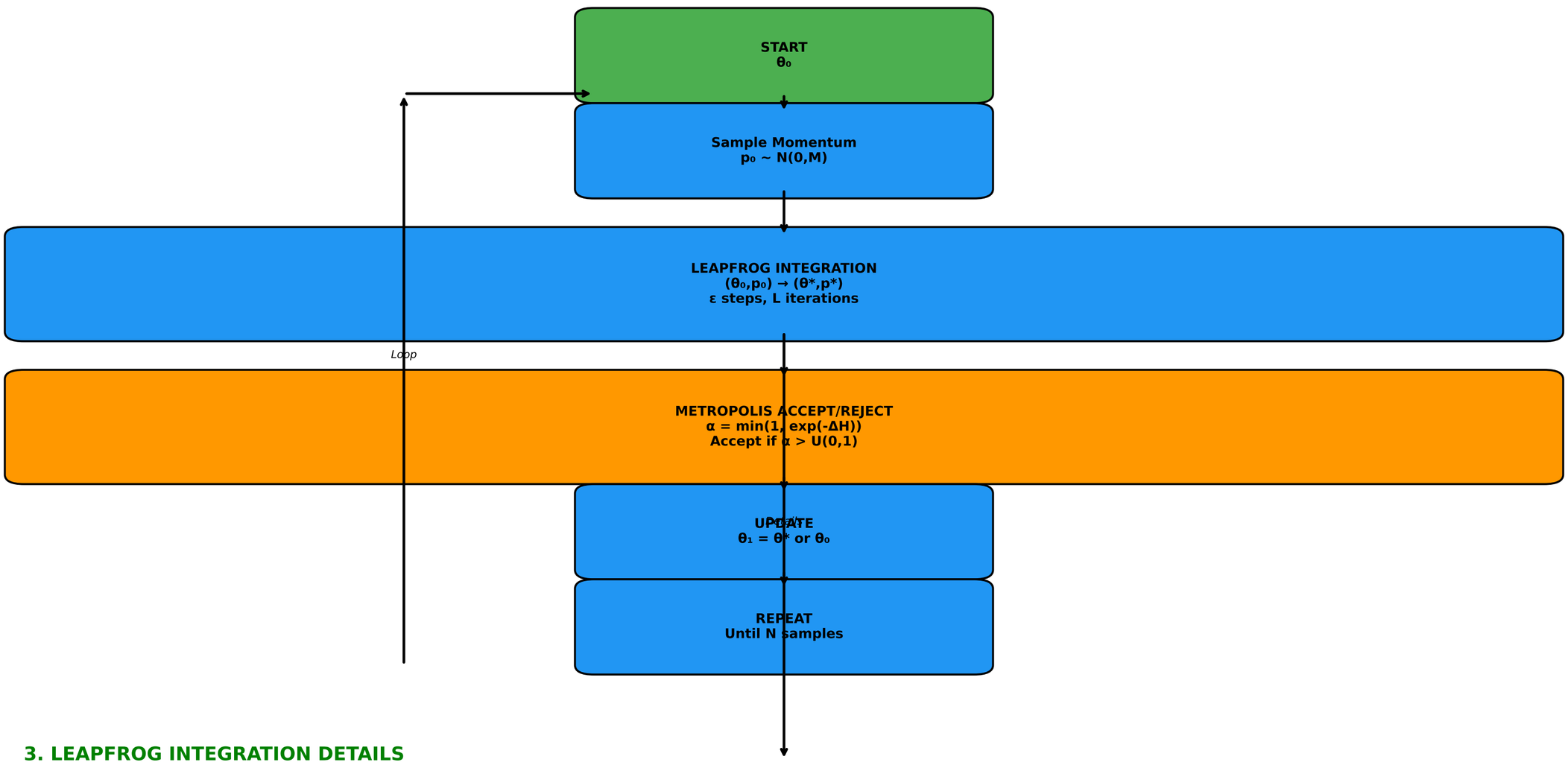
1. MATHEMATICAL FOUNDATION

Target Distribution
$\pi(\theta) \propto \exp(-U(\theta))$

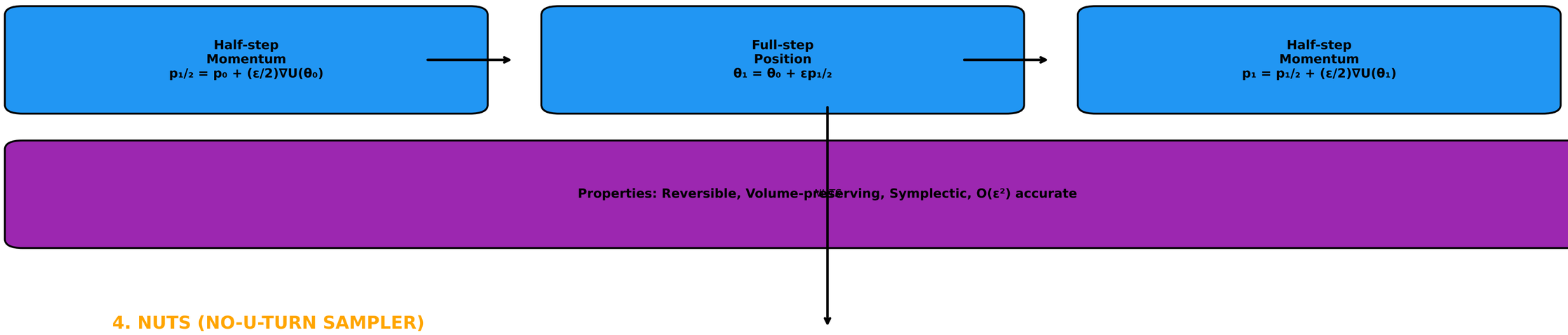
Hamiltonian Function
$H(\theta,p) = U(\theta) + \frac{1}{2}p^T M^{-1} p$

Canonical Equations: $d\theta/dt = M^{-1}p$, $dp/dt = -\nabla U(\theta)$

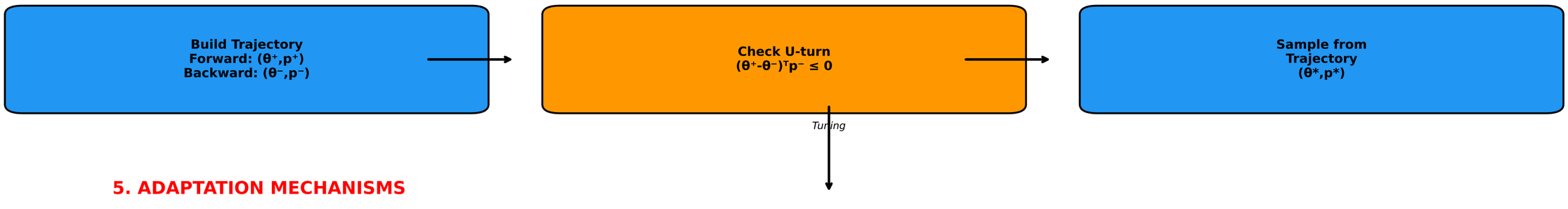
2. MAIN HMC ALGORITHM



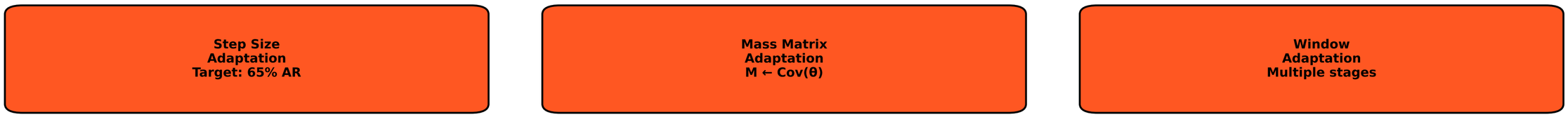
3. LEAPFROG INTEGRATION DETAILS



4. NUTS (NO-U-TURN SAMPLER)



5. ADAPTATION MECHANISMS



6. KEY EQUATIONS