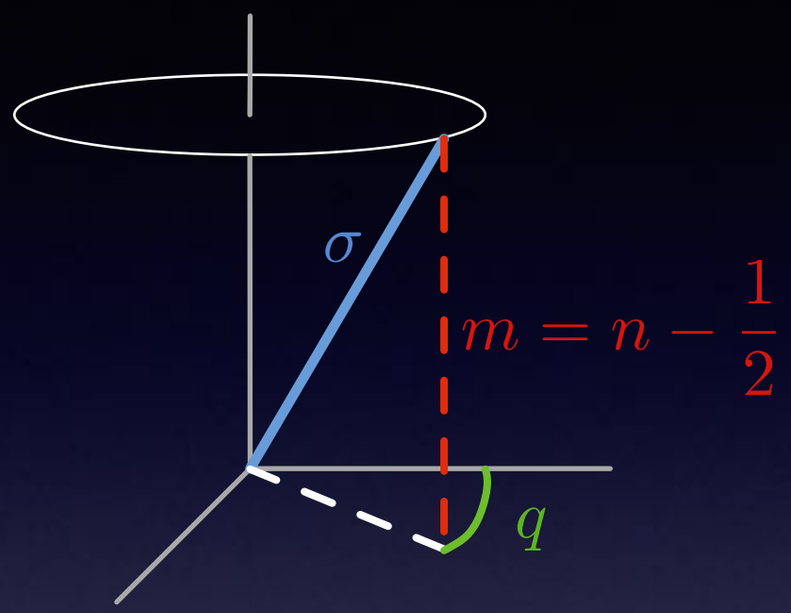
Mapping Procedure

1. Mapping a Single Fermionic State
   - Spin Matrix Mapping: Meyer & Miller (1979)
   - DCMF improvements: DWHS et al. (2011)

2. Extending Mapping to Multiple States
   - Miller & White Fermions (1986)
   - DCMF improvements: DWHS et al. (2011)

Single State Mapping

spin-½ system



$$\mathbf{S}_x/\hbar = \frac{1}{2}\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \mapsto \sqrt{\sigma^2 - \left(n - \frac{1}{2}\right)^2}\,\cos(q)$$

$$\mathbf{S}_y/\hbar = \frac{1}{2}\begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix} \mapsto \sqrt{\sigma^2 - \left(n - \frac{1}{2}\right)^2}\,\sin(q)$$

$$\mathbf{S}_z/\hbar = \frac{1}{2}\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix} \mapsto n - \frac{1}{2}$$