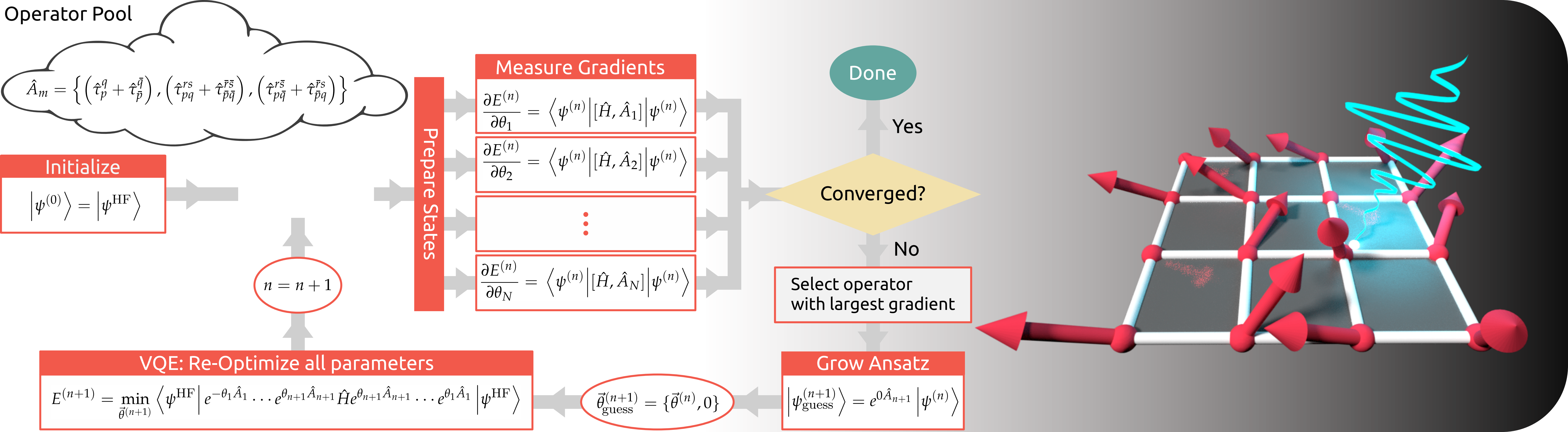

Operator Pool
$\hat{A}_m = \left\{ \left(\hat{\tau}_p^q + \hat{\tau}_{\bar{p}}^{\bar{q}}\right), \left(\hat{\tau}_{pq}^{rs} + \hat{\tau}_{\bar{p}\bar{q}}^{\bar{r}\bar{s}}\right), \left(\hat{\tau}_{p\bar{q}}^{r\bar{s}} + \hat{\tau}_{\bar{p}q}^{\bar{r}s}\right) \right\}$
Initialize
$\left|\psi^{(0)}\right\rangle = \left|\psi^{\mathrm{HF}}\right\rangle$
Prepare States
Measure Gradients
$\frac{\partial E^{(n)}}{\partial \theta_1} = \left\langle \psi^{(n)} \middle| [\hat{H}, \hat{A}_1] \middle| \psi^{(n)} \right\rangle$
$\frac{\partial E^{(n)}}{\partial \theta_2} = \left\langle \psi^{(n)} \middle| [\hat{H}, \hat{A}_2] \middle| \psi^{(n)} \right\rangle$
$\vdots$
$\frac{\partial E^{(n)}}{\partial \theta_N} = \left\langle \psi^{(n)} \middle| [\hat{H}, \hat{A}_N] \middle| \psi^{(n)} \right\rangle$
Done
Yes
Converged?
No
Select operator with largest gradient
Grow Ansatz
$\left|\psi^{(n+1)}_{\mathrm{guess}}\right\rangle = e^{0\hat{A}_{n+1}} \left|\psi^{(n)}\right\rangle$
$\vec{\theta}^{(n+1)}_{\mathrm{guess}} = \{\vec{\theta}^{(n)}, 0\}$
VQE: Re-Optimize all parameters
$E^{(n+1)} = \min_{\vec{\theta}^{(n+1)}} \left\langle \psi^{\mathrm{HF}} \middle| e^{-\theta_1 \hat{A}_1} \ldots e^{\theta_{n+1}\hat{A}_{n+1}} \hat{H} e^{\theta_{n+1}\hat{A}_{n+1}} \ldots e^{\theta_1 \hat{A}_1} \middle| \psi^{\mathrm{HF}} \right\rangle$
$n = n + 1$