Fixing the Past; Changing the Future
Fixed Deceleration Epoch

- CMB determination of matter density controls all determinations in the deceleration (matter dominated) epoch

- Current status: $\Omega_m h^2 = 0.14 \pm 0.01 \rightarrow 7\%$

- Distance to recombination $D_*$ determined to $\frac{1}{4}7\% \approx 2\%$

- Expansion rate during any redshift in the deceleration epoch determined to 7\%

- Distance to any redshift in the deceleration epoch determined as

$$D(z) = D_\ast - \int_z^{z\ast} \frac{dz}{H(z)}$$

- Volumes determined by a combination $dV = D_A^2 d\Omega dz / H(z)$

- Structure also determined by growth of fluctuations from $z_\ast$

- $\Omega_m h^2$ can be determined to $\sim 1\%$ in the future.