Equations of Stellar Structure

$$\frac{dP}{dr} = -\frac{GM(r)\rho}{r^2} \qquad P, M, \rho$$

$$\frac{dM}{dr} = 4\pi r^2 \rho \qquad M, \rho$$

$$\frac{dL}{dr} = 4\pi r^2 \rho\,(\epsilon - \epsilon_\nu) \qquad L, \rho$$

$$\frac{dT}{dr} = -\frac{3\kappa L \rho}{16\pi a c\, r^2\, T^3} \qquad \mathrm{T}, L, \rho$$

equation of state: $P(\rho, T, X, Y)$