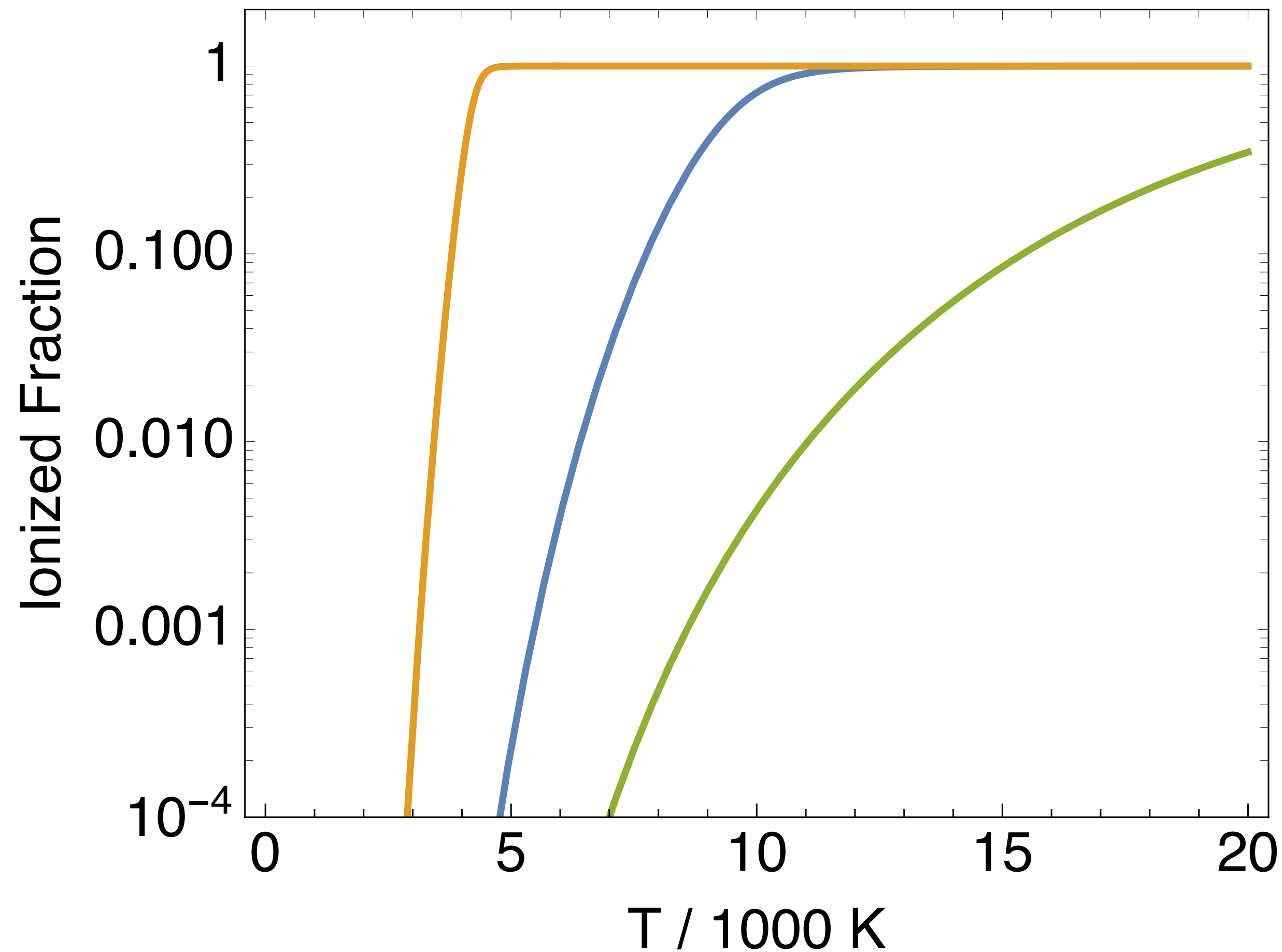


The Saha Equation



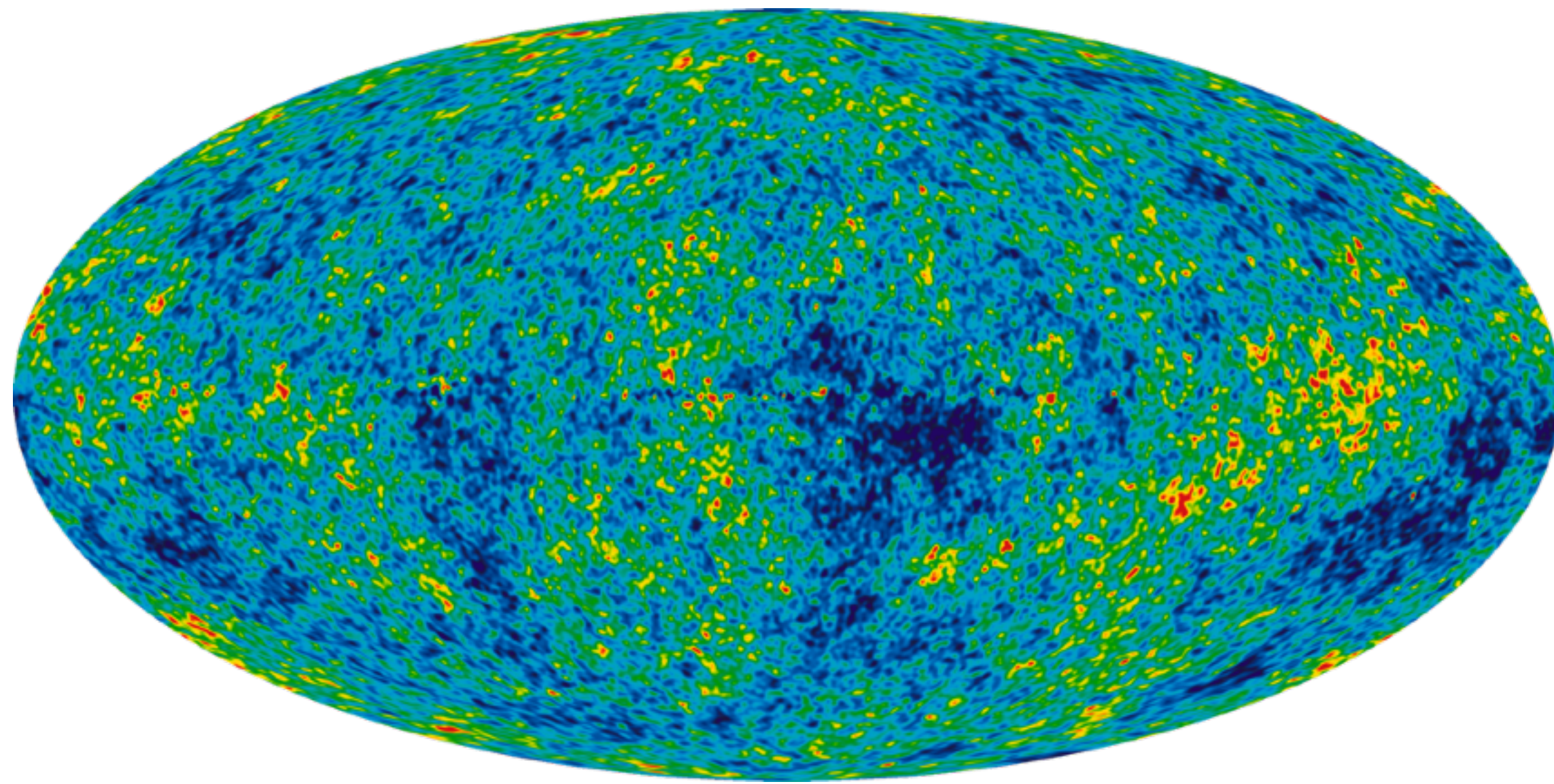
$$n_p + n_H \simeq 10^{20} \text{ m}^{-3}$$

The ionized fraction is

$$\frac{n_p}{n_p + n_H}$$

Cosmological Story:

Spectrum of cosmological light,
reflecting a temperature of 10,000
Kelvin many years ago



13.6 Billion Years ago the universe
was approximately 10,000 Kelvin

Then at this time the electrons and
protons recombined, making neutral
hydrogen. Since then, the light has
been traveling freely, but becoming
redshifted, to a lower effective
temperature. We measure light at
temperature of 2.7°K everywhere in
the sky, reflecting $10,000^{\circ}\text{K}$ from
13.6 billion years ago.