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SU(N) Baryon formation in the large N limit and Dark Matter

I discuss baryon formation in the early Universe in a confining SU(N) gauge theory containing quarks with masses well below the confinement scale and transforming in the fundamental representation of the gauge group. Assuming Casimir scaling of the confining potential between static SU(N) charges, I show that baryon formation is hindered by a Casimir bottleneck: for small quark clusters, which constitute the initial stages of N-quark baryon assembly, destruction processes greatly outweigh formation processes. Due to the large suppression in their relic number density, cosmologically stable SU(N) baryons can provide dark matter candidates with masses substantially larger than conventionally assumed.

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