In The Name of Most Passionate, Merciful

Dark Matter in the Universe

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Astrophysical Dynamics, December 2009
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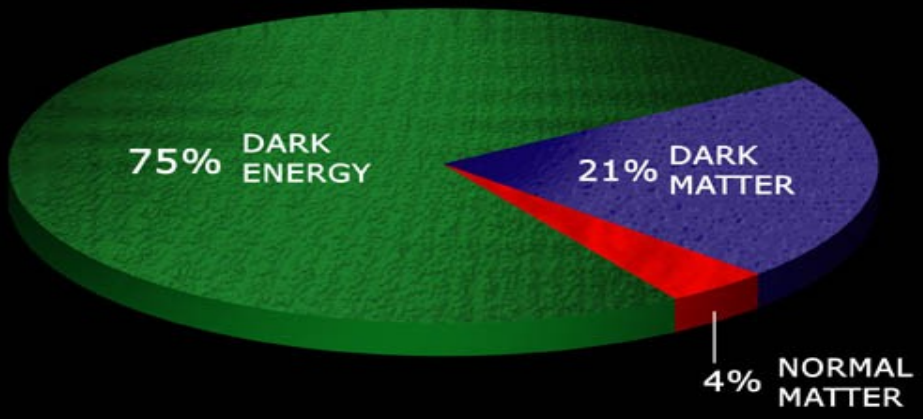
Main Components of the Universe

1. Normal Matter (4%) – Matter composed of the quarks and electrons that are part of the Standard Model of Particle Physics.
2. Dark Matter (21%) – A new kind of matter that can't be seen directly.
3. Dark Energy (75%) – The unknown exotic substance that is fueling the accelerated expansion of the Universe.

Main Components of the Universe



Dark Matter: Definition

A kind of matter that does not or weakly interacts with light, hence it is invisible and even undetectable.
Dark Matter could be either of the following cases:

1. Uncharged particles
2. Baryonic matter, whose interaction with light is too weak to be visible on earth.

Dark Matter: Evidences

By considering Gravitational Force which acts between all objects with non-zero mass, we observe two cases:

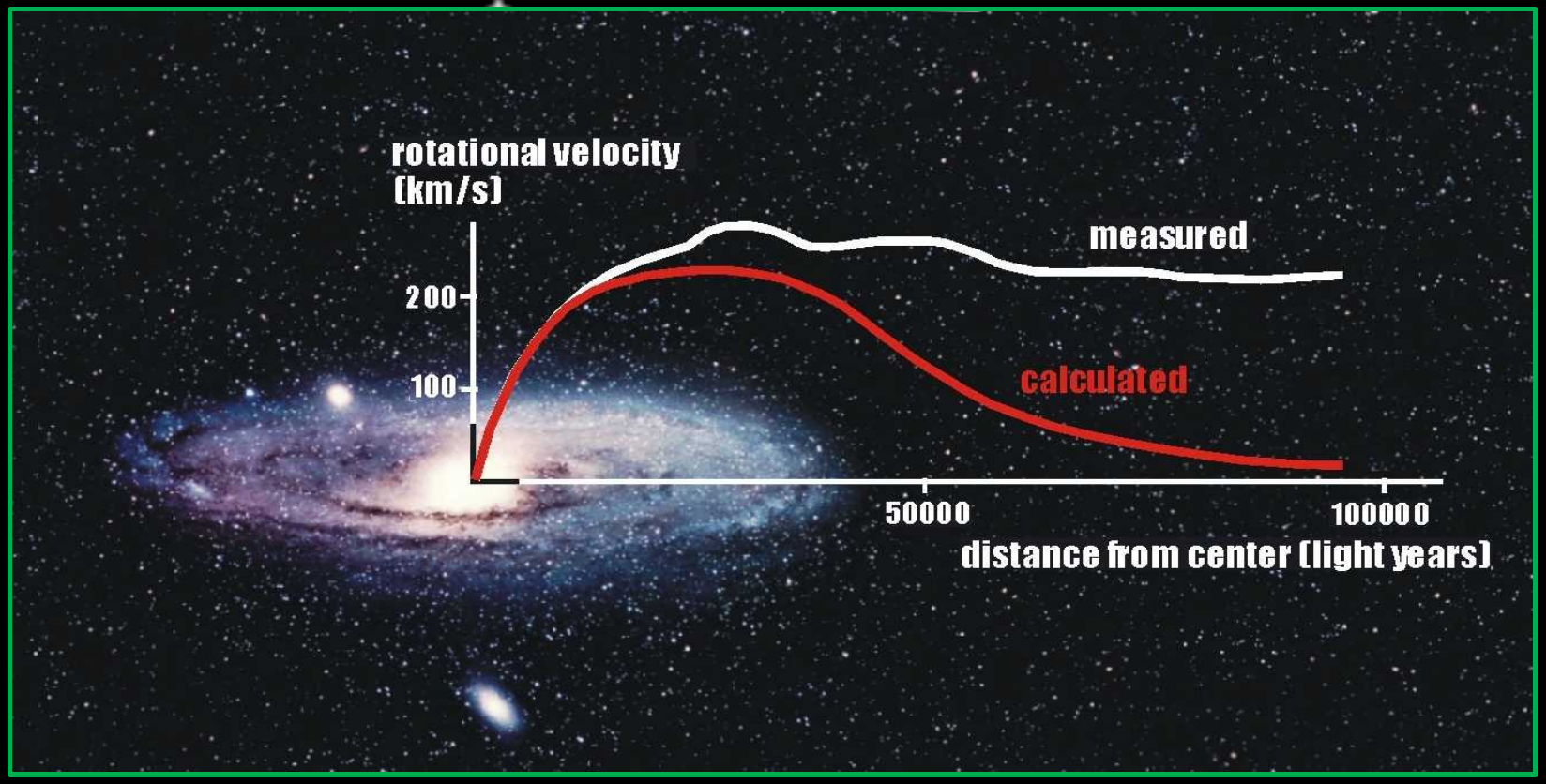
1. Cluster of galaxies
2. Rotation curves of galaxies

Dark Matter: Evidence 1

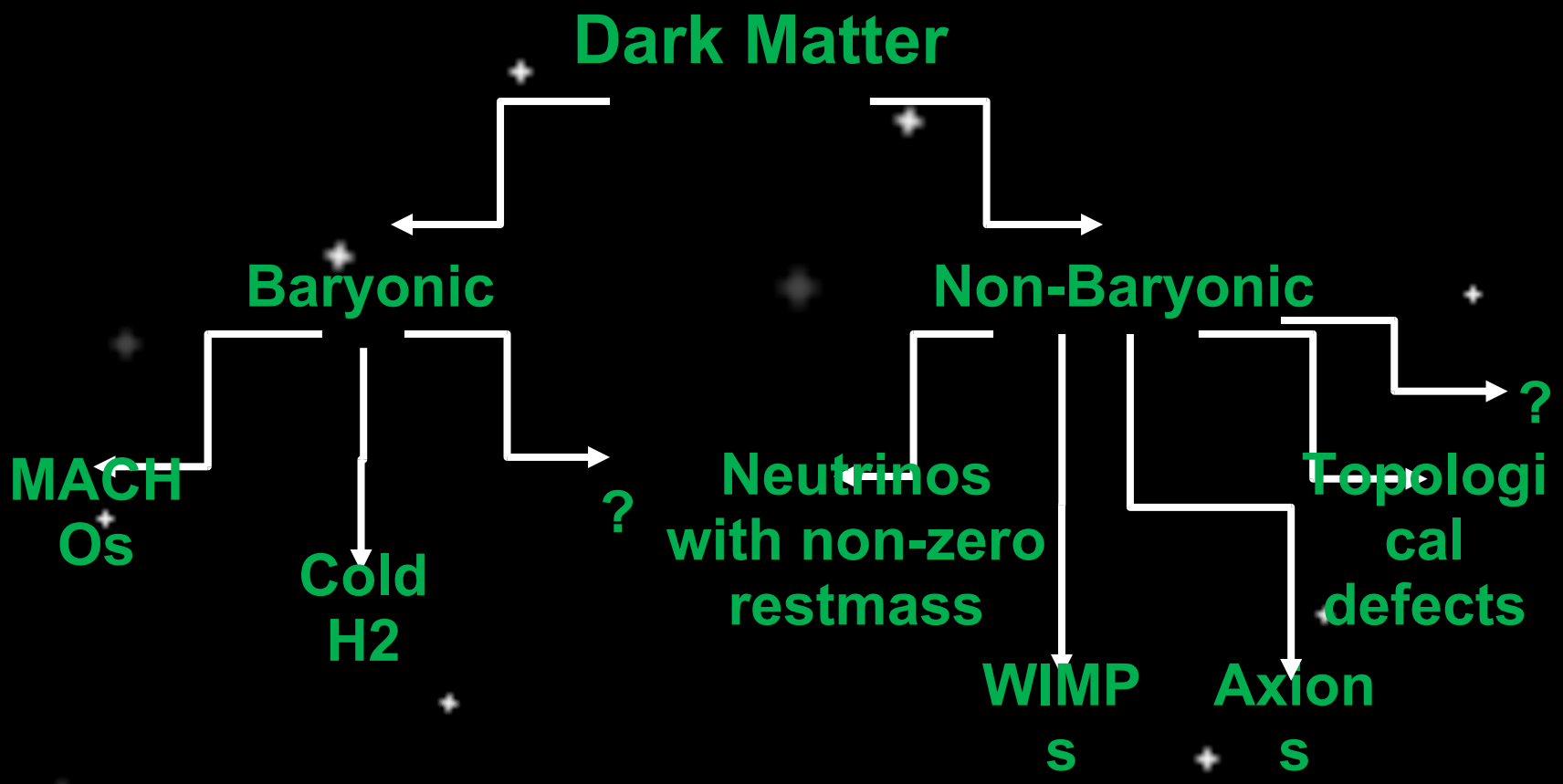
Cluster of Galaxies

Dark Matter: Evidence 2

Rotation Curves of Galaxies



Dark Matter Candidates



References

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2. “Dark Matter in the Universe and Alternatives”, Farhad Aslani, Göteborg University, 2004.
3. “Einsteins’s Telescope,The Hunt For Dark Matter and Dark Energy in the Universe”, Evalyn Gates, 2009.


Q & A