Re: Dark matter hides, physicists seek (Forwarded)

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- *Date*: Wed, 14 Feb 2007 15:12:58 GMT

"Joseph Lazio" <jlazio@xxxxxxxxxxxxxxxxx> schreef in bericht
news:ypzabzluc1s.fsf@xxxxxxxxxxxxxxxxxxxx

"NV" ==
Nicolaas
Vroom
<nicolaas.vroom@xxxxxxxxxx>
writes:

NV> "Nicolaas Vroom" <nicolaas.vroom@xxxxxxxxxx> schreef in bericht
NV> news:Thuvh.316448$HS2.6325285@xxxxxxxxxxxxxxxxxxxxxxxx

NV> In the book Galactic Dynamics by James Binney and Scott Tremaine
NV> at page 23 we can read: "It is a remarkable fact that the circular
NV> speed curves still remain flat even at radii well beyond the outer
NV> edge of the visible galaxy, thus implying the presence of
NV> invisible or dark mass in the outer parts of the galaxy (...)"
NV> What this quote implies that dark matter is the sole and only
NV> explanation beyond a certain distance.

Strictly, there are at least two possibilities: Either there is unseen matter or the gravitational force changes on these large scales. Most astronomers and physicists prefer the former, because it is easier to explain all of the data with this explanation.

If fact with dark matter you have an open ended explanation
because you can make the total galaxy as massive as you like.

The Hernquist model is one solution, but there are an infity number
more.

NV> This may be true in principle, the problem is that stil more
NV> visible matter is discovered at larger distances, making this
NV> assumption a less strict requirement. At solar scale the same can
NV> be said about the kuiper belt objects which make our solar system

NV> larger and larger with at galaxy type scales invisible objects.

Correct, but if you look at the mass of the KBOs, it's tiny compared to, say, Jupiter, to say nothing of the Sun. Similarly, in the outskirts of galaxies, one would have to look at the ratio of dark to light matter. I don't remember the numbers off the top of my head, but I'm certain that the ratio is substantial. In other words, a substantial amount of unseen matter, relative to the matter that's detected, is required. It's not clear how to make the unseen matter out of anything with which we are familiar. If it were stars, we'd see it. If it were hydrogen gas, we'd see it.

See at the bottom for Pluto type objects.

NV> In Astronomy of November 1992 at page 45 in the article "The grand
NV> Illusion. What we see in the night sky is a widly misleading
NV> representation of the universe" by Ken Croswell He makes the point
NV> that "often" the brightest objects have the smallest mass and the
NV> dimmest objects have the heighest mass, which implies how
NV> difficult it is to estimate mass as a function of luminosity.

You must be misreading this or Croswell is writing about something slightly different than to what you're trying to apply it. Take the case of stars. The most massive stars are the brightest. A star 10 times the mass of the Sun can have a luminosity 1000 times that of the Sun; conversely, a star 10 times less massive than the Sun can have a luminosity 100 times less than that of the Sun.

May be I should have written:
He makes the point that "often" the total of the brightest objects have the smallest mass and the total of the dimmest objects have the heighest mass, which implies how difficult it is to estimate mass as a function of luminosity.

This is more in line with Croswell his writing:
"Actually, and incredibly, the dark interarm regions harbor nearly as many stars as the bright spiral arms do. The spiral arms appear bright because they contain extremely luminous stars etc."
He also makes the point that 95% of all the stars in our Galaxy are cool K dwarfs, red dwarfs and hot small white dwarfs.

NV> For me it is difficult to understand why the scientific community
NV> assumes dark matter in a sperical distribution as a tool to
NV> explain galaxy rotation curves and not visible/baryonic matter in
NV> the disc. In my opinion the first step should be to explain a
NV> galaxy rotation curve by only assuming baryonic matter in the
NV> bulge and the disc

> You might try re−reading Binney & Tremaine. First, there's just no way to stuff enough visible matter into a typical spiral disk in order to explain a typical rotation curve.

I think this is easy.
The mean distance of planet pluto is 40 AU = 6E12 km
Mass pluto 0.002 Earth mass
Take a sphere A of 5 pc around the sun.
Within this sphere A there are rougly 60 stars
with a total mass of 25 sun masses.
Take a sphere B of 40 AU around pluto.
You can place 1,7E13 of those spheres (pluto size "invisible "objects)
within sphere A.
Total mass 100000 sun masses.
That is much too much to explain flat rotation curve.

http://www.nineplanets.org/kboc.html

> Second, there's an issue with
> the stability of spiral disks if they are not surrounded by a large
> halo of mass, which is again not seen.

Why can not you have a disc without dark matter ?
What are the limits that dark matter is required ?
What is exactly this influence of darkmatter on the behaviour
of the disc ?

As part of my similations I have written a program to simulate
galaxies: http://users.pandora.be/nicvroom/progrm14.htm

This program consists of two parts.
In the first part the mass distribution of the stars is calculated
based on a flat rotation curve.
In the second part this configuration is simulated.

The star configuration is based on a number of rings with in each ring
the same number of stars.
For example you can take 10 rings with each 50 stars.
ie a total of 500 massif stars.
Part 1 shows that the total mass of each ring and the density in order to
get a flat rotation curve.

What the simulation shows is that the calculated configuration is stable.

What is the reason to believe that this simulation, based on Newton's
Law, is not in accordance with reality ?
Is that because the total number of stars is too small ?

Is that because the stars are situated in rings (equally spaced) ?

> NV> The second step should be define the stars that make up this mass
> NV> based on a distribution as explained at page 48 of the above
> NV> mentioned document. Step three should be to calculate the
> NV> luminosity of this galaxy assuming that many stars are hided by
> NV> other stars in the foreground. The fourth step should be to
> NV> compare this luminosity which what is observed.
>
> Alternately, if you think that hundreds (thousands?) of people who have done this kind of work already were wrong, why don't you do it to prove them wrong?

I try to understand.

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http://users.pandora.be/nicvroom/

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