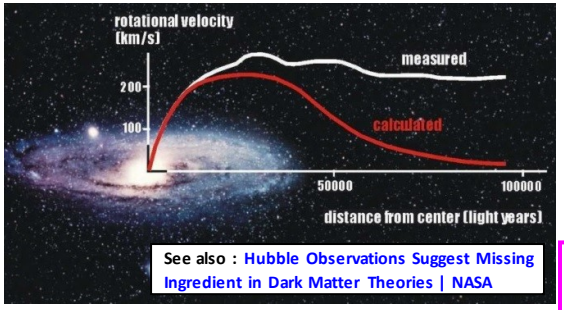
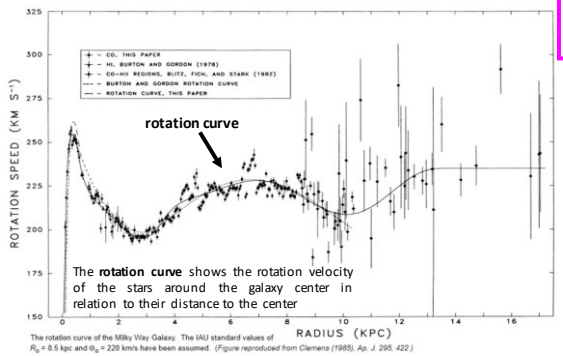
A new hypothesis to Dark Matter : Interstellar -Asteroids & -Comets caused by Galaxy-Collisons are the invisible matter ! – Harry K. Hahn/ 11.1.2021

Dark Matter is exactly what the definition says ! : It's dark matter with low albedo ! I am talking about Asteroids & Comets which are nearly invisible when they are far away from the sun There is indication coming from different directions which shows us that we are totally underestimating the amount of asteroi ds- and comet-like objects which move through interstellar space ! In 2017 the first **Interstellar Asteroid** "**Oumuamua**" was discovered. In 2019 the first **Interstellar Comet** **2I/Borisov** was discovered. These small dark objects are very hard to detect !, because they move very fast. Old elliptical galaxies don't seem to have dark matter (**see : Study**). All younger spiral galaxies seem to be the result of collisions and fusions of two or more galaxies, which have produced gigantic tidal debris streams that were distributed along the spiral arms, and in the long term along the galactic planes. Collision simulations show that the spiral structures are caused by collisions ! (**see : Study2**) And there is indication that all bipolar planetary nebulaes are the result of direct star-collisions (**Study3, Study4**)

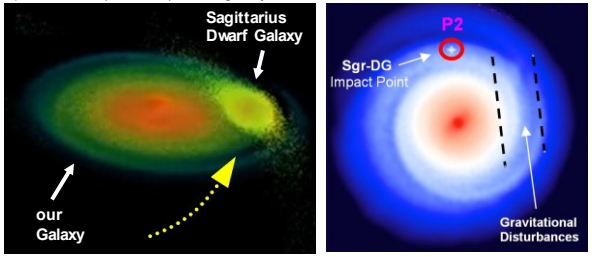


See also : Hubble Observations Suggest Missing Ingredient in Dark Matter Theories | NASA

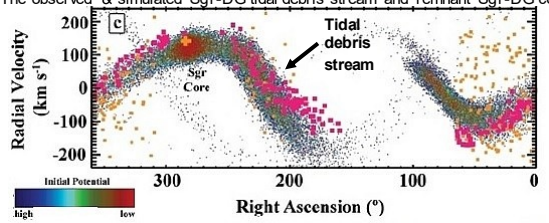


The curve shows the total rotation curve. It has contributions from the spherical *galactic bulge* and the *disk*, but these contributions do not make up the entire curve, so another contribution called the *corona* must exist. The corona is not evident in anything we can see, so-called *luminous matter*, so it must be due to some form of *dark matter*

The collision of the **Sagittarius Dwarf Galaxy** with our own galaxy caused debris streams **>10^{10}** sun-masses and gravitational disturbances, which enhanced the spiral modes (structure) of our galaxy. **see animation** → Movie_Dynamic Analysis



W eblink to study which analyses the collision : http://arxiv.org/abs/1109.2918
The observed & simulated Sgr-DG tidal debris stream and remnant Sgr-DG core



The curve on the left shows the Measured Rotation Curve (white) and the Calculated Rotation Curve (red) of stars in a typical spiral galaxy. It shows the rotation velocity of the stars around the galaxy center in relation to their distance to the center. In regards to the visible (luminous) matter which we can see, the rotation speed of stars further away from the center should drop rapidly (red curve). But it doesn't !! That's why astro-physicists developed the idea of dark (invisible) matter that must be distributed between the stars further away from the center (in the socalled galaxy corona) in order to explain the much to high measured rotation speed of stars here.

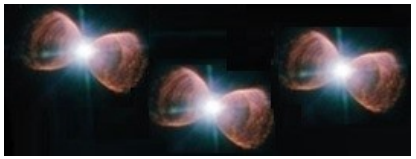
In my opinion this "Dark Matter" can simply be explained by dark matter that consists of „dark debris (asteroids & comets)" caused by galaxy collision. Spiral-Galaxies are the result of collisions & fusions of two or more galaxies ! Old Elliptical- (not collided) Galaxies don't seem to contain dark matter ! → **see Study :** https://arxiv.org/abs/1303.6896

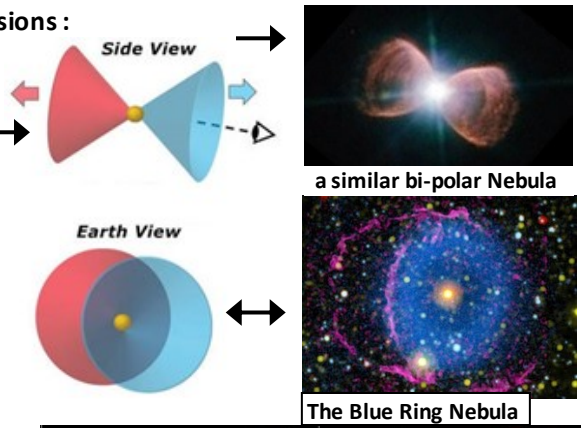
Old Elliptical Galaxies are not the result of many collisions like spiral galaxies ! A simulation of collisions of our own Galaxy with the Sagittarius Dwarf Galaxy (Sgr-DG) shows that gigantic tidal debris streams move through the areas, during collisions, where dark matter is expected. If we consider this tidal debris mass streams to be mainly asteroid- & comet-streams caused by billions of star-collisons then we can explain the mysterious dark matter (see images below left). A proof for this hypothesis may be bi-polar planetary nebulas located in the galactic plane of our galaxy which are aligned with the same 'collision vector'

Bi-polar Nebulas are caused by collisions :

The **Blue Ring Nebula** is a cloud in space composed of debris & gas from two stars that collided and merged into one star. → **see images** (**see: Study**) This Nebula represents the bi-polar planetary nebula type ! Another study to bi-polar planetary nebulas In our galaxy's central bulge showed that they have their long axes mostly aligned along the disk-plane of our galaxy !! This is a first proof for my hypothesis that bi-polar Planetary Nebulas are the result of star-collisions !! **Because stars mainly move ≈parallel to the galactic-plane their collision-vectors will have a similar direction !**

see weblink : Aligned Nebulae (ESO)
https://www.eso.org/public/news/eso1338/



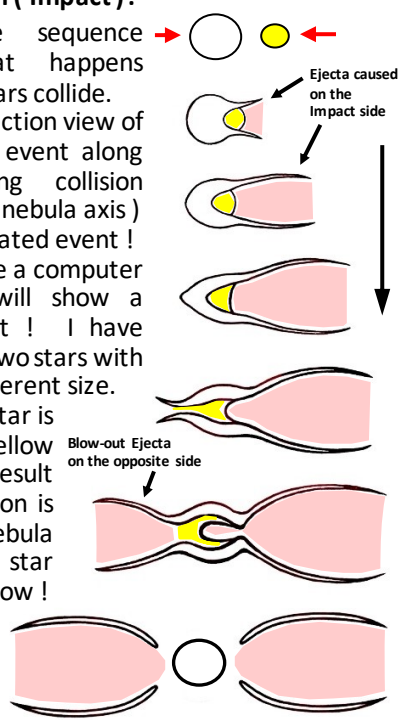


a similar bi-polar Nebula

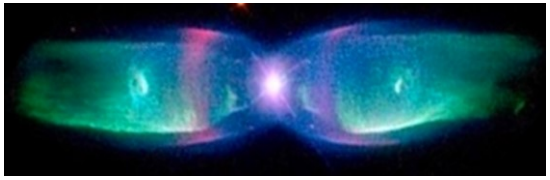
The Blue Ring Nebula

Star-Collision (-Impact) :

This image sequence shows what happens when two stars collide.
It shows a section view of the collision event along the resulting collision vector (long nebula axis)
It is an estimated event !
But I am sure a computer simulation will show a similar result ! I have considered two stars with slightly differerent size.
The smaller star is marked in yellow color. The result of the collision is a bi-polar nebula and a fused star as shown below !



The resulting nebula looks like two rocket-nozzles !



The images below show some bi-polar Nebulas