Definitions:

1. shell: the space between two concentrical spheres with an infinitesimally small Δr;
2. ball: a shell plus all concentric shells inside it;
3. llab: a shell plus all concentric shells outside it (i.e. the complement of a ball);
4. ring: the space between two concentrical circles with an infinitesimally small Δr;
5. disk: a ring plus all concentric rings inside it;
6. ksid: a ring plus all concentric rings outside it (i.e. the complement of a disk).

All are presumed to be of homogeneous *density*, i.e. to contain an evenly distributed *mass*.

The shell theorem:

a) for an object outside a shell or ball, the latter gravitationally behaves as if all its *mass* is concentrated in its geometrical centre, so for calculating orbits around it, it can be treated as a *mass* point located at its very centre;
b) for an object inside a shell or llab, *gravitation* cancels out anywhere, so any shell or llab outside the object's orbit can be discarded when calculating orbits.

See https://en.wikipedia.org/wiki/Shell_theorem.

The ring theorem (as I call it):

c) for an object outside a ring or disk, the latter does not gravitationally behave as if all its *mass* is concentrated in its geometrical centre, so for calculating orbits around it, it can certainly not be treated as a *mass* point located at its very centre;
d) for an object inside a ring or ksid, *gravitation* does not cancel out anywhere except at the geometrical centre. At the centre exists an unstable equilibrium with zero *gravitation*; anywhere else a *mass* experiences centrifugal *gravity*, so any outer ring or ksid cannot be discarded when calculating orbits.

See http://henk-reints.nl/astro/HR-Galaxy-Rotation-and-Dark-Matter-20190206T0858Z.pdf.

Kepler's laws can for a two-body system be derived using Newtonian mechanics. They apply however only to a single body orbiting a single ball or *mass* point, be it inside a larger llab or in further empty space. These laws do definitely not apply to stars in spiral galaxies. Such systems are far more homogeneous than for example the solar system (scaled to the same *size*), and those stars are orbiting a *mass* that is far more like a disk than like a ball, and they do so inside a ksid and not in a llab or in further empty space (well, the outermost stars do).

Therefore it is absolutely certainly definitely totally completely hopelessly utterly terribly wrong to presume so called *Keplerian decline* for the rotation curves of spiral galaxies and then excogitate mysterious dark matter and WIMPs when nature appears not to follow this flaw.

Or pick modified gravity from thin air. Good old Isaac is turning around in his grave, but smiling at his dear friend Albert, who without fabricating anything found the higher-order terms of *gravitation*. Read Newton's Regulæ Philoſophandi at the start of Liber Tertius of his Philoſophiæ Naturalis Principia Mathematica (ed. 3, 1726), as well as the second last paragraph of the Scholium Generale at the end of the same, where he says: hypotheſes non fingo, which I interpret as: *I do not fabricate excogitations*.

And then there was Fritz Zwicky. Yes, he used the same term, but he meant nothing special by it. In 1933 he wrote: "dark (cold) matter" and in 1937: "We must know how much dark matter is incorporated in nebulae in the form of cool and cold stars, macroscopic and microscopic solid bodies, and gases.", indicating normal baryonic matter that is not very luminous. Nothing mysterous.

Zwicky applied the virial theorem to the Coma cluster, and he found it to have insufficient *mass* to be stable. The virial theorem is however only valid for stable systems and if any premise yields its own falsification it cannot be true. Instead of then concluding the Coma cluster just is unstable, Zwicky excogitated a *mass* shortage. Observation-based logic however says that it must be that the Coma cluster simply cannot and does not keep itself together by *gravitation*.

Sic.