Google translation from French :

# Simple physics of the observable universe.

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The observable universe is one whose telescopes provide images. The images are those of the stars which are all the more visible as they are hot and near us. Physics decrypts the complexity of the universe, with its laws that eliminate uncertainty, when laws exist. Over time, during the last centuries, the laws of physics have sorted out the measurements made on the materials of the observable universe, and only kept what is certain. As the precision of the measurements is becoming greater, the laws have evolved towards a greater constraint on the precision of the laws, prohibiting the inaccuracies of the replaced laws. The laws of physics that have evolved to explain the observable universe are mainly the laws of optics, thermics, relativity, gravity, and celestial mechanics. Physics explains that the so-called dark matter is actually ordinary cold matter, visible through the diffuse background located around the Sun.

The rest of this text is at the end of high school level. With superior knowledge, see also in French http://jean.moretbailly.free.fr/PhyUni.pdf

Physics, with its local laws, controlling uncertainties well, is the most capable of providing the data necessary for simulations in the nuclear and observable universe. Physics decrypts the complexity of the universe as in nuclear. Measurements are difficult to carry out there, because the universe is not homogeneous. In practice, the only calculation method that can be used is the numerical computer simulation calculation of the portion of space whose geometry and its evolution have been described.

The geometry of the observable universe is provided by our eyes and telescopes. Black holes are small invisible massive stars which do not radiate. They are observed indirectly by their gravitation which attracts visible matter. The hot stars are large massive spheres radiating thermally. They are observable when they are not too far away and are not hidden by obstacles. Obstacles to the rays are material: stars, various materials, more or less large clouds or dust. Cold materials radiate little and are less visible than hot ones. Hot stars radiate more thermal energy than cold materials. The cold matters are dispersed between the stars, in the almost empty. They are not very visible, but they are, according to simulations, 8.4 times more massive, on average, than hot materials.

The visible hot stars exceed the ordinary temperature of the thermometer on Earth. The Sun has a surface that radiates thermally at 6000 kelvins, largely in the light visible to us, but also in the ultraviolet and infrared. The Earth radiates thermally in the infrared that we do not see. It takes lighting from the Sun or a lamp to see with our eyes. Low temperatures are those of large spaces with little dispersed matter and far from hot stars. The temperature loses its thermal definition, when the material has an insufficient density. Not very dense, it does not radiate thermally, but there are rays created non thermally to which physics attributes a non thermal definition, in particular in the vicinity of absolute zero 0 kelvin, but also electrically and magnetically. Radars simulate thermal with narrower directional beams than those of thermal emissions. The response of a target is thermal, widely dispersed in a very wide beam.

The stars move on trajectories passing in a complex way between the other stars. In the solar system, relativistic celestial mechanics respect the laws of physics. When relativity was not yet known, celestial mechanics used gravitation and mass inertia as a first approximation to explain the complicated movements of the stars between the other stars. These movements are also subject to relativity, which adds small modifications to the trajectories of the stars of the solar system, especially known for Mercury. Satellites, used by GPS to precisely position themselves on Earth, have very precise atomic clocks that require general relativity to use local physical laws of gravitation to measure positions with little uncertainty. By using general relativity in physics, the physical laws of the gravitation of the solar system generalize to the entire observable universe. The relativistic celestial mechanics of the solar system apply to movements, visible stars, galaxies, and clusters. Relativistic celestial mechanics is now universal in the observable universe. It explains very well its gravitational functioning.

All the materials of the observable universe have an identical thermal behavior. Ordinary temperature does not exist in vacuum and almost vacuum, because the thermal agitation is there or zero or negligible. The accumulation of heat by matter is zero. Thermal agitation is possible when the density of the material is higher. Then, the material accumulates heat or loses it by changing temperature. A thermometer measures the temperature inside this dense material. If dense matter is dispersed in near vacuum, there are areas of matter with temperature and areas without temperature. Zones without temperature can be crossed by thermal rays. They transport heat from one area of dense material to another, in both directions. If the confinement of dense matter is sufficient, the temperatures of the areas of dense matter are gradually equalized by reverse heat returns. The temperature can be measured remotely with a thermometer or a radiation telescope, adapted to the temperature, by targeting the surfaces of materials which are always opaque, absorbent and emitting at their temperature, like the glass of an opaque infrared greenhouse with the Earth temperatures. Glass is transparent, but it stops infrared thermal rays, absorbs them, and radiates at its temperature.

The solar system contains a thick spherical shell of dispersed matter centered on the Sun, similar to the glass of a greenhouse, between Saturn and Uranus. It encompasses us and diffuses towards us at its temperature 2.728 kelvins. The shell thermally filters the rays coming from the stars towards us. It absorbs the rays of thermal temperatures, emits at 2.728 kelvins and lets through transparency which is not thermal. The shell is seen by us from the inside between the stars. It diffuses a uniform background at a single temperature of 2.728 kelvins in the band emptied of other temperatures by thermal temperature confinement resonance. This resonance is that which creates the temperature of the ordinary thermometer at a very confined point enclosed inside the dense matter. This diffuse background at uniform temperature has been observed since 1964 by telescopes using thermal waves from radars.

The 2.728 kelvins temperature is that of the actual shell material. This material has a real mass which has the gravitational properties of real materials. The thermalization of the shell is accompanied by the weak radiant thermalization by the materials dispersed in and out of the shell. But the mass of these materials is not negligible. It is distributed near the Sun and between the neighboring stars of the Sun. It is evaluated by simulations at 8.4 times the mass of visible matter in hot stars. The significant gravitational effect of these real materials is manifested by the attraction on the visible hot stars passing nearby. They were sought in the form of dark matter which is obviously only found in real ordinary form. The physical triumphs by giving the explanation by real matter. It eliminates all those by particles, elastic mathematical spaces or modifications of physics.

**Conclusion.** By respecting the laws of physics updated with its progress in a century, the observable universe is much simpler than what is still taught today. The greenhouse effect of the solar system has been ignored by imagining an unreal cold matter. Without updating, the theory of dark matter is false, because it supposes the homogeneous universe. Physical reality is satisfactory because the laws of physics have been able to evolve towards less uncertainty.