Sunday, December 29, 2019

Thermal radiation Distance to transmission and reception Spectral light efficiency As ongoing glam.

The Orion nebula, also known under the serial number of M42 or NGC 1976, is a diffuse cloud that shines in emission and reflection at the heart of the constellation of the same name.

It is the most intense nebula visible to the naked eye from the northern hemisphere, at night and in the absence of light pollution.

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Its structure occupies a patch of sky of 66 × 60 minutes of arc, four times larger than the full moon. Its size is approximately 33 light-years in size.

This object corresponds to the main part of a much larger gas and dust cloud, the Orion cloud, which spans almost half of the constellation.

In 2007, the new measurements available, thanks in particular to the large intercontinental radio telescopes, Very Long Baseline Array, made it possible to reduce the distance of the nebula from 1,500 light years, as previously believed, to approximately 1,350 years.

Light from Earth.

Or a virtual approximation of around 10%.

The Orion nebula contains an open cluster containing many very young and very hot stars (theta, Trapeze), born recently and whose radiation now ionizes the surrounding hydrogen.

The Orion nebula shelters within it a huge gas bubble, very tenuous, with a temperature of 2 million degrees Celsius, discovered by an international team led by Swiss researchers and the Grenoble Astrophysics Laboratory (CNRS / Joseph-Fourier University, Observatory of Sciences of the Universe of Grenoble) thanks to the European satellite XMM-Newton.

This temperature is so high that the gas emits not in the visible range, but in that of X-rays, the area of investigation of the XMM satellite, launched by the European Space Agency in 1999.

These results are published online on November 30 2007 on Science Express

M42 is one of the easiest celestial objects to observe. It is located in the harness of the constellation Orion, just below its belt which, formed of three very tight and aligned stars, is easily identified.

The harness looks like a tear falling towards the horizon

Electromagnetic radiation generated by the thermal agitation of particles in the matter ..

Any matter emits thermal radiation. The term is often used for a spectral range from infrared to ultraviolet although the mechanisms involved can generate photons of lower or higher energy.

If an object emitting thermal radiation conforms to the physical characteristics of a black body, then this radiation is called black body radiation.

Planck's law describes the spectrum of the luminance of this radiation, which depends solely on the temperature of the object.

In particular, this radiation is independent of the direction of propagation: it is isotropic The thermodynamics of a medium containing photons and considered as a photon gas shows that it is also independent of the nature of the source that creates it.

The law of the displacement of Wien determines the wavelength of the maximum value of the emitted spectrum.

The Stefan-Boltzmann law gives the exitance (thermal radiative flux) emitted by a surface limiting an opaque black body.

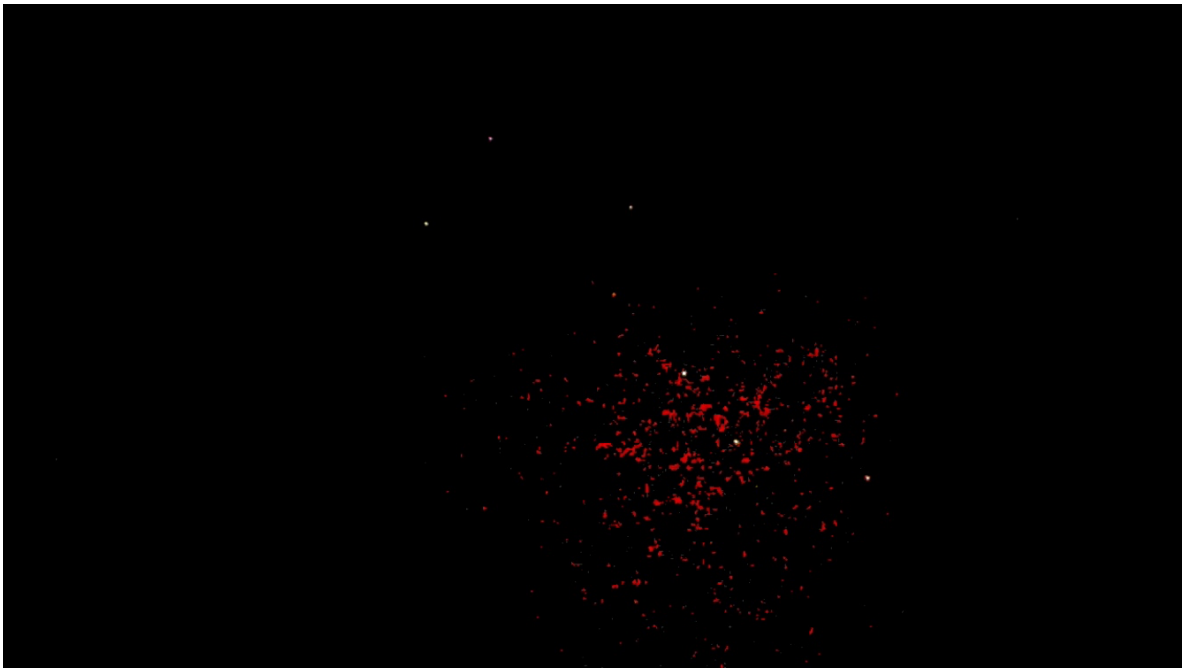
Spectral light efficiency is a function which expresses, for a given wavelength, the relationship between the energy flux of the electromagnetic radiation received and the perception of light flux that this flux induces for human vision.

It characterizes the sensitivity of the human visual system to different wavelengths.

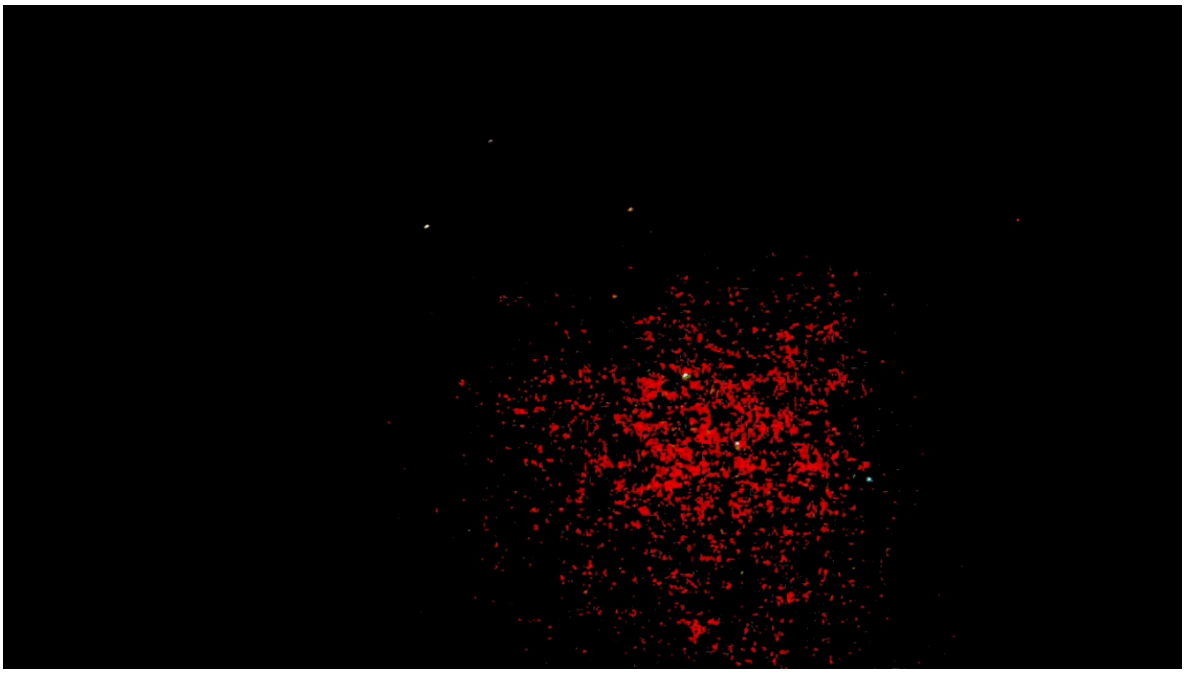
It is expressed in the International system of units in lumens per watt (lm-W)

The spectral light efficiency links photometric quantities to radiometric quantities.

Energy illumination: research with the Little Dipper galaxy



Sunday 29 December 2.26 am



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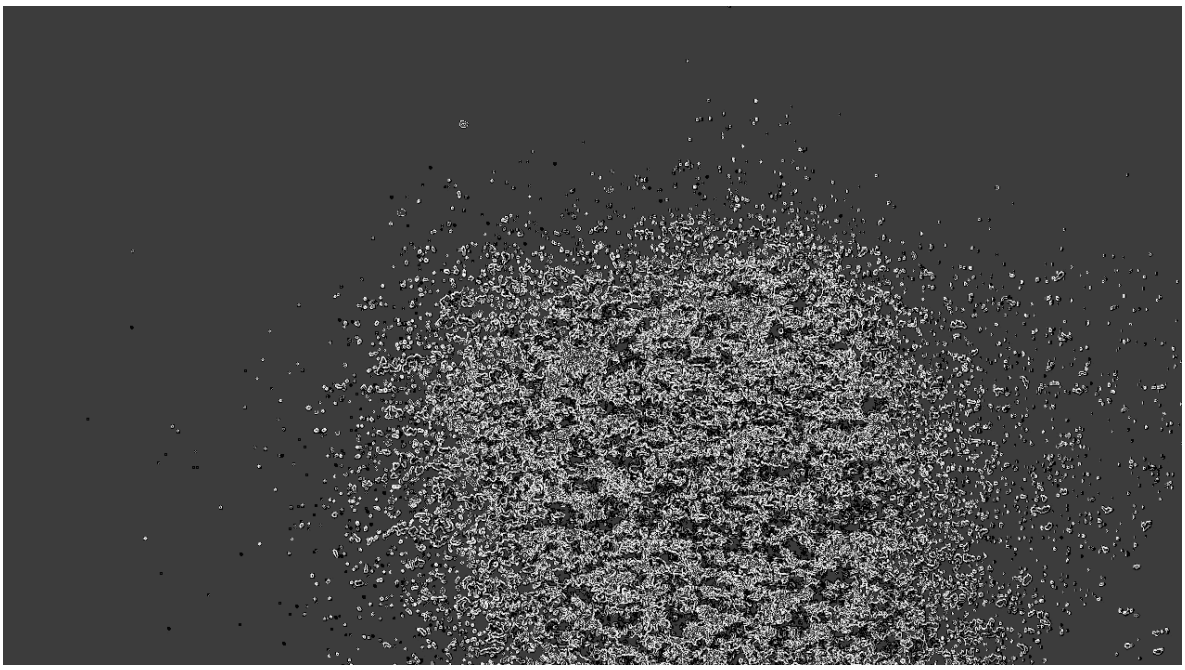
Kinematics and structure of the Little Dipper galaxy.

It has a radial speed estimated at -247.4 ± 1.0 km / s by measuring the individual speed of 94 bright stars.
The same study reveals a speed dispersion estimated at 10.4 ± 0.9 km-s or 8.8 ± 0.8 km-s depending on the stars used in the measurement.

Whatever the value chosen, this dispersion attests to a total mass of the galaxy much greater than its visible mass.

Its mass-luminosity ratio is thus evaluated at 77 ± 13 in solar units (higher but compatible with older measurements, sign of a significant presence of dark matter in this galaxy in the same way as for the dwarf Galaxy of the Dragon, a conclusion reinforced by the fact that the dispersion of velocities does not seem to decrease with the distance to the center of the galaxy, as expected in the presence of a halo of dark matter more extensive than the distribution of visible stars, conversely, a profile decreasing with distance would be more characteristic of a King model found in globular clusters.

Video stills



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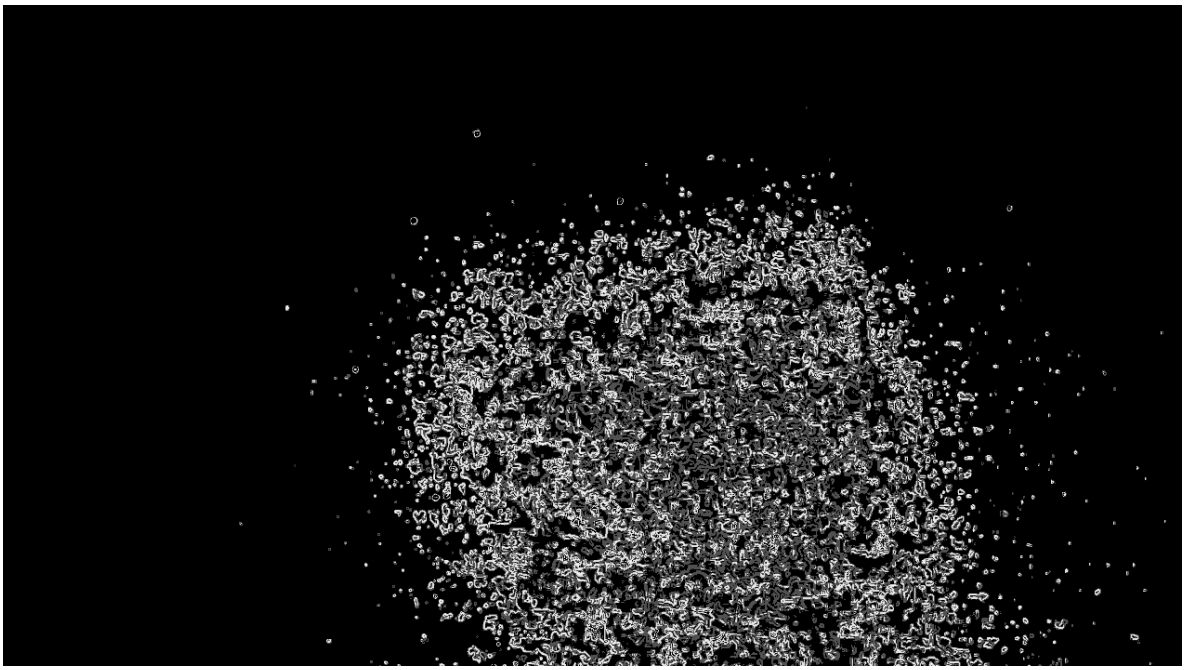

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Whether the galaxy has its own rotation or not is difficult to determine with current data.

A value of 3 km / sa been proposed, but the asymmetry of the galaxy suggests that this possible rotation results in fact from tidal effects or from the fact that the system is not relaxed.

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Distant 205,000 light years from the solar system, the Little Dipper galaxy is like almost all nearby dwarf galaxies, made up of ancient stars and little interstellar matter.

GLAM/Case studies Universe sample

Posted by Veronica IN DREAM at 2:53 PM