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Quasars.

According to mainstream astrophysics, *quasars* (quasi-stellar radio sources) are very energetic galactic nuclei.
In many instances the radiation power of a quasar is hundreds of times the energy output of our galaxy (the Milky Way).
The source of such enormous radiation power is difficult to understand. Quasars are believed to be powered by accretion of material into super massive black holes in the nuclei of distant galaxies.

Another feature of quasars difficult to understand is their variations of luminosity. Some vary in brightness every few months, weeks, days, or hours. This is interpreted to imply that quasars generate and emit their energy from a very small region, since each part of the quasar would have to be in contact with other parts on such a time scale to coordinate the luminosity variations. As such, a quasar varying on the time scale of a few weeks cannot be larger than a few light-weeks across.
The emission of large amounts of power from a small region requires a source of energy far more efficient than the nuclear fusion which powers stars. The release of gravitational energy by matter falling towards a massive black hole is the only process known that can produce such high power continuously.

(The above features of quasars and many others can be found in an extensive review homed at http://en.wikipedia.org/wiki/Quasar).

Another fact that is difficult to explain is why galaxies hosting such powerful sources of energy (as a quasar is assumed to be) do not appear distorted. (The galaxies hosting a quasar that do appear distorted are those suffering a collision with another galaxy).

According instead to the “EVE model of the aether” it is plausible that:

The galaxies *seen from the Earth as quasars* need not be very different from the normal galaxies and don’t need to have in their nuclei any exotic super powerful source of energy. They are just galaxies that (1) have a high content of hot gas and (2) are very far away from the Earth.
With those two features, the aether model can explain most of the peculiarities of quasars as being *observational* (apparent) instead of intrinsic.

To understand it, it must be recalled that, according to the model, a source of radiation emits its wave-like disturbance in a plurality of aetherino speeds but only that part of the disturbance carried by aetherinos of speed close to c *relative to the detector* manifests itself as light. (Remember that according to the model, the interaction cross section between the aetherinos and the elementary detectors (normally electrons) has its peak at the speed c).
An ordinary Earth detector, when at rest relative to a normal galaxy and *not too far* away from it (from a cosmological point of view) only absorbs the disturbance emitted at the source with aetherino speeds in a narrow interval centered at c because that is also

its speed relative to the detector. But in the case of very distant galaxies with a high content of very hot gas (as a quasar is believed to be according to the model) the conditions are such that "many" wave-like disturbances emitted at various speeds (and not only at those close to c) can be absorbed by distant detectors *if* they all arrive at a speed c (or close to c) relative to the detector. That is so because:

The model assumes that a referential frame can be found in which *all* the aetherinos travel in straight lines at constant speeds. The distances advanced by any given aetherino can be used to define the "time" (i.e. the reference "clock") of such referential frame. Any other referential frame that, with such reference of time, moves at constant velocity relative to the first frame will also observe that the aetherinos move relative to it at constant velocities. Infinite referential frames can therefore be found relative to which all the aetherinos move at constant velocities. These reference frames are called in the model "rectilinear frames". Any observer that uses such "ideal" clocks (with which the rectilinear reference frames exist) is called in the model the Ideal Observer (IO).
The aetherinos maintain a constant velocity (in those reference frames) until they collide with a particle of matter. (The aetherinos that make the aether are not considered "material" particles. The aetherinos do not collide with themselves (their mutual interaction cross section can be considered negligible in all cases)). But when an aetherino collides with a particle of matter (e.g. with an electron) it emerges in general from the collision with a different speed. The collisions of aetherinos with matter can therefore alter the speed distribution of the aetherinos of the aether.

Suppose that the orbiting speed (for any given orbital radius) of all the *bound* material particles of the universe *increases* slowly with time. This slow increase of speed would be consequence of some second order effect of the aetherinical forces between material particles. The oscillation frequency of an harmonic oscillator will also increase at the same rate that the revolution frequency of orbital matter increases with time. (The oscillation frequency of the harmonic oscillator varies with the Hooke force according to the same relation with which the revolution frequency of a material body varies with the centripetal force, namely as $\nu \propto F^{1/2}$).
Notice that the majority of the matter of the universe is bound by some central force and hence is orbiting or oscillating. (Electrons orbit nuclei, planets orbit stars, stars orbit galaxies, galaxies orbit cumuli of galaxies, and so on indefinitely). Note: it is from the point of view of the Ideal Observer that all the bound particles of the universe are continuously increasing their speed.

Suppose that the collisions of the aetherinos with the material particles are such that on the average the aetherinos increase their speed at those collisions. It can be said that the "temperature" of the aether increases. (This "temperature" will be higher near the stars where most of the collisions aetherino-matter occur but it will gradually also affect (increase) the "temperature" of the aether at all places of the universe).
Note: strictly speaking, the average speed of the aetherinos can not be associated with the thermodynamic concept of *temperature* because the individual aetherinos do not have energy (nor mass).

But from the point of view of an official observer (OO) using our normal clocks based on the oscillation period of some matter (e.g. an atomic clock) nothing "local" seems to change because, according to the model:

The laws of Physics only depend on (1) the speed distribution of the aetherinos of the aether (which is assumed to remain unchanged for the Official Observer) and (2) on the speeds of the aetherinos relative to the internal speeds of the fundamental particles of matter with which they collide (i.e. on the OO speeds). Note: the strengths of the forces that govern the physics world depend on the OO speed distribution of the aether that determines the speed *redistribution* emerging from the particles "source" of the force and on the OO speeds of the aetherinos relative to the "target" particles of matter with which they collide.
The Official Observer is nevertheless able to observe some manifestation of the IO's ever increasing speed of particles if he looks at distant celestial objects (seeing them in the remote past when the revolution periods of the bound material particles where noticeably longer than those that he sees now in the matter of its neighborhood). For example Hubble's law is interpreted by the aether model as a manifestation of this increasing speed of matter (and not a manifestation of an expansion of the universe).

Returning now to the analysis of quasars, consider the propagation of those wave-like disturbances (radiation) emitted by the stars of the nucleus of the host galaxy. The aetherinos traveling at speed c (as seen by an Official observer local to the emitter) interact with the clouds of gas surrounding the galactic nucleus and hence the wave-like disturbance carried by such aetherinos is "absorbed". But the disturbances carried by aetherinos of speed very different from c are not absorbed. In particular that of a speed c' >> c is not absorbed. When this "fast" disturbance (of constant velocity c' for the Ideal Observer but not for the local official observers that it encounters in its journey) reaches the Earth, our local clocks will be running faster (from the IO point of view) than were the material clocks local to the emission. Suppose that, referred to our local clocks, the speed of those aetherinos at their arrival to the Earth is c (though always remaining equal to c' for the IO observer). This disturbance emitted at the remote galaxy and not absorbed by its clouds of gas will therefore be detected (e.g. absorbed) by our present Earth detectors.
Furthermore any absorption of radiation phenomenon (like the one that took place by the gas of the emitting galaxy) is accompanied (according to the model) by a reemission of a wave-like disturbance at a plurality of aetherino speeds excluding those of speed c that suffers a destructive interference at the absorber. The disturbance *reemitted* (from the gas) at speed c' will therefore also be detected later at the Earth because it will also have a speed c when referred to our material clocks at the epoch of its arrival.
Furthermore if the gas surrounding the emitting galaxy nucleus is very hot it will not only absorb the disturbance of speed c relative to the emitter but also other disturbances of different speeds relative to the emitters but whose speed is c relative to the pertinent moving atoms of the gas. These other absorptions will also reemit disturbances at speed c' (as seen by IO) that will be detected at the Earth. On the whole, *in the case of a very distant galaxy with plenty of hot gas,* a big amount of the different speed wave-like disturbances emitted by the central stars of the galaxy are collected at the Earth as light.

In what respects the variation of intensity observed in the light coming from the quasars:
- Since the quasar-type radiation reaching the Earth comes in its majority *directly* from the stars (i.e. is not absorbed and reemitted by dust and gas), then, if it is assumed that a significant percentage of those stars are variable (e.g. Cepheid-like stars) it is natural to expect variations of luminosity in the global radiation.
(Note: it can easily be shown that the addition of the radiations of *n* variable sources of

random periodicities, random amplitudes and random phases gives a signal of variable intensity).

- A more plausible guess is that the variations in the apparent luminosity of a quasar are the result of the addition of all the disturbances of speed c’ emitted at different parts of the host galaxy (some emitted at the nucleus stars, others reemitted at the different absorbing gas layers).