On Gravity within the Field of Universal Matter

Richard D. Pohl

September 1, 2025

1 Prerequisites

The Reader should be familiar with the ideas presented in the following:

- "The Natural Philosophy of Universal Matter": Herein the Philosophy (and main hypothesis for all papers in this repository)
- "On Particle Movement within the Field of Universal Matter": Herein Movement

The Philosophy Describes processes where particle members in the set of Universal Matter, labeled {f}, interact with other particles of the set {f} building ever more complex particles. This compositional process builds all 'things' in our universe.

Movement Discusses characteristics of particle movement within Standard and Composite Particle Distributions of field {f} matter: A significant characteristic of composite distribution is its effect on the particle's path through the field[1]. The root of the effect on a particle's path is the energy wave movement within the field.

2 Composite Distribution of Field Matter

2.1 Curved Space

Einstein posited that space and time are unified and, as such, curves around massive objects such as planets and stars. However, at least in his prose, he never presents definitions for 'spacetime' or 'curved spacetime[2]'. The presents found here, and in the Philosophy and Movement, should not change or contradict his theories, rather they should serve to offer a deeper understanding of them.

2.2 Curvature of Spacetime and Composite Distributions

In the terms of the Philosophy and Movement, Einstein's curved spacetime is represented herein as a composite distribution of {f} field matter. As presented in Movement, the density of a composite distribution, that is a massive object, increases from high to low as one moves away from the center of a massive object into its surrounding ambient space.

Moving energy wave-particles interact with the composite field, as presented in Movement, such that they are influenced by the graduated distances between particles of the field {f} within the composite distribution field. Momentum, velocity, and acceleration may mitigate the influence of graduated field particles on the energy wave-particles.

It must be stated clearly that the composite distribution of matter is not caused by the massive object, rather it is the massive object. It should be clear to an observer that a planet or star is indeed massive, but it may not be clear that the composite distribution is not only within the massive object, but extends far away from it and reaches out into surrounding space in a graduated manner.

2.3 Graduated Density Affects a Particle's Path

As detailed in Movement, particles interact with both standard and composite distributions of {f} field matter. However, of note in this discussion, is that energy wave-particle interaction within a composite field may alter the course of the energy wave-particle due to it interaction with the graduated differences in distances between the graduated field particles. We generally refer to these graduated differences as a 'field of gravity'.

[1] However a particle's path will remain unchanged in standard distributions of field matter

[2] It is possible that such definitions may be found within the formulae of his Theories on Special and General Relativity.

In Movement, we see that the path, or main direction of movement, of an energy wave-particle is affected by certain factors (momentum, velocity, and acceleration) and may cause acceleration movement towards the center of a massive object. Each direction of movement is independent of each other but the sum of their effect on the energy wave-particle will determine its path in the field.

2.4 All is in Motion

The composite distribution of {f} matter affects energy wave-particles as they move through the field. Movement, then, relates energy wave-particles to a composite field in an effect that we know as gravity.

We should note that here, in our star system, there is nothing that we can know but movement: Our planet rotates on its axis and orbits the sun, our sun and its planetary system rotates about itself, and this system rotates with our galaxy. Also, our galaxy is part of a cluster of galaxies that appear to be moving towards the Great Attractor. All the things in our star system are moving in a composite distribution of {f} field matter.

So, even when an object, say a small rock, is stationary on the ground, it is in motion within the composite field of our planet. This is, of course, also true for us. Even sitting or standing on our planet, we are in motion, in a composite field, and subject to the same effect of that motion as any other energy wave-particle.

That rock on the ground, or any other object, and their motion through our planet's composite field is not one of a single object, rather it is a composition of a myriad of smaller particles, each one individually in motion through the field. Each energy wave-particle is affected by its movement within the composite field and as a sum of said particles represented by the rock or other object.

3 Gravity

3.1 Graduated Density and Orientation

In Movement, an energy wave-particle's motion through a composite distribution of field matter was described in terms of its (lateral) interface. The directional effect of the diverging motion on the wave-particle was inward towards the massive object's center. In that discussion, as we considered an energy wave-particle out in space coming near a massive object, it may have been convenient to see this directional effect as to the right or to the left. Certainly, this can be true, however in order to further discuss gravity we need to reorient this perspective. When considering an object subject to Earthly gravity, we need to shift the perspective from right-to-left (or vice-versa) to up (or outwards from, down, or inwards to) the planet's center.

Of note, in Movement, was the detailed discussion around the energy wave-particle's interface and the field of {f}. Here we saw that the interface lost energy but gained rotational velocity on the side of the interface facing the massive object. The increase of speed continues as an energy wave-particle moving through the field, slowly deviating its course towards the massive object.

3.2 Gravitational Movement

In Movement, we discussed how an energy wave moves through the field of {f} as a series of rotations of field matter. The velocity of the energy wave, and the number of rotations, their size, and rotational velocity, are directly proportional to the amount of energy it carries through the field.

The strength of a massive object's field of gravity is directly proportional to:

- The amount of field particles in the composite distribution of field particles that make up the massive object; and
- The relative smoothness or suddenness of graduation of field particles in the composite distribution of the massive object.

Everything in, on, and around a massive object, as a sub-group of smaller particles, moves in an arc shaped path. Note the energy wave-particle in **??**. It is moving in direction D around the composite distribution of field matter of massive object M. As the sub-group[3] moves in this arc-path, the particles exhibit the energetic rotations of field matter as they move in direction D. As the particles move, they experience acceleration towards the center of the massive object M, noted as direction G. Without the effects of gravity, the wave-particle would move in direction 'NG'. This movement, or acceleration, inwards is also expressed in terms of energy wave-particle rotations of field matter.

[3]Simplified to just one illustrated particle

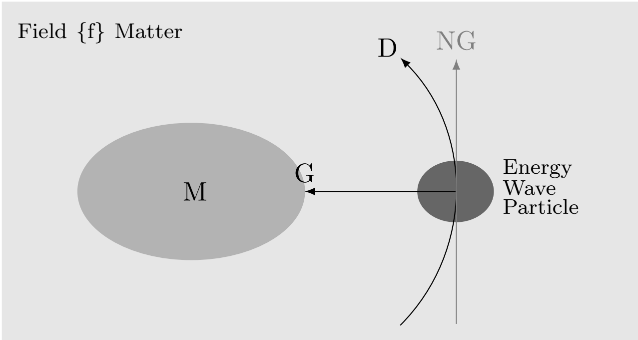

Figure 1: Lateral Movement

Figure 1 well illustrates the lateral movement of an object around a massive object. If the object remains in a constant position on the surface of the massive object, it is still in motion in the composite field. Now the object's acceleration, expressed as a mass of sub-particles, is inwards toward the center of M and is perceived as mass (weight). The balance sheet for a static object is neutral: The energy/acceleration added by gravity is used by the object to remain in its current position.

Figure 2 shows that for any object in, on, or around a massive object, in addition to any independent direction of movement (D) an object may exhibit, there is always a direction of acceleration (G) towards the center of the massive object. The object is a group of sub-particles and, as such, the same amount of acceleration is applied to each sub-particle separately. The acceleration is not additive, so the number of sub-particles in the object do not matter and does not affect the total amount of inward acceleration.

Figure 3 illustrates motion outwards away from a massive object. This requires the expenditure of energy in two ways:

- One amount is needed to counteract the acceleration of gravity (G); and
- The second amount is needed to accelerate the object in direction D as shown in Figure 3.

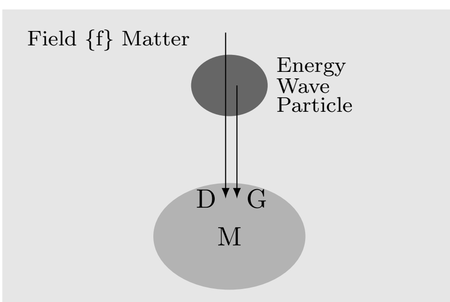

Figure 2: Inward Movement

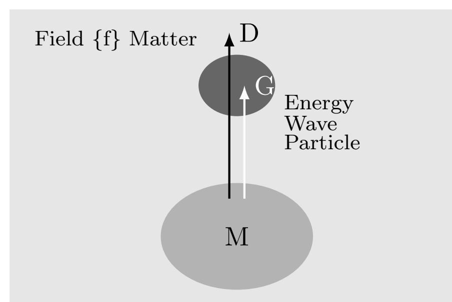

Figure 3: Outward Movement