On Time within the Field of Universal Matter

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November 19, 2024

1 Preface

Save for love, perhaps the word most often used in our arts, literature, and science is time. When a word is so often used, it may lose definition: We might ask "What is time?" or even, "Does time even exist?"

2 Definition

Let's set out and consider some general types of time:

- Now Time
- Travel Time
- The Flow of Time

2.1 'Now' or Existential Time

It is common to hear people say things like:

- I am hungry.
- I am tired.
- I want to eat.

One could add the word 'now' to end of each of these statements. They speak to our existence; a convenience about our condition - at the moment. The statements do not hold any significance as to measured time: We made statements like these long before there were any clocks and they made just as much sense as they do today. Existential time regards the 'here and now'.

2.2 'Travel' or Relativistic Time

Another use of time is used when we are leaving a place and traveling to some other place. In so doing we might ask:

- Are we there yet?
- When will we get there?
- How long will it take?

All of these sentences suggest that there's a period of time between leaving a place and arriving somewhere else. Travel time is measurable. Albert Einstein referred to this kind of time as 'relativistic time' and we will too.

2.3 The 'Flow' or Arrow of Time

Articles about physics also discuss another concept of time called "The Arrow of Time" (AoT). This concept suggests that time is asymmetric, that is, it seems to flow in only one direction which we think of as 'forward'. We age, we do not get younger. Things break, they do not spontaneously fix themselves. This concept is not about measured time, rather an inflexible flow of time moving in only one direction.

3 Application

The Natural Philosophy of Universal Matter, herein called the Philosophy, does not explicitly define time but does offer some insight into its nature. The insight lies within the relationships of building compositional matter and the resulting by-product of {f} sub-particles.

3.1 {f} Sub-Particles

In the Philosophy we find two basic, defined actions that take place in the lowest level of Universal matter: That is when two particles of {f} (the set of all Universal matter) collide. There are two defined results: One where the two particles find a foothold in either or both of each other and remain connected together; and one where they collide but rebuff one another and go about their separate ways. With either case, the Philosophy defines a possible, separate result from either interaction, that is where small pieces of either or both interacting particles of {f} break off, becoming independent, energetic sub-particles of {f}. It is here, in these interactions and sub-particles, that we find the source of AoT.

Our universe is not permanent and eternal. As particles of {f} interact and compose larger particles, the set of all {f} suffers wear and tear, forming an energetic 'dust' of {f} sub-particles. Sub-particles of {f} do not, and cannot, rejoin particles of {f} or reform into fresh, new particles of {f}: The damage is permanent. We perceive the unavoidable effacement of {f} as the AoT. It is the basis of time. Our universe cannot process the building of compositional particles without wear and tear and our universe cannot heal from the damage.

3.2 Movement and Travel Time

In travel time, or relativistic time, the key idea is the traveling itself. In some form, at some time, travel requires the expenditure of energy. Here potential energy, say of a machine or an animal, is converted to kinetic energy or work. Work requires the interaction of matter and the foundation of all matter is Universal Matter, that is the set of {f}. These interactions invariably produce {f} sub-particles which underlie the AoT. So, yes, travel time is real time however, it is measured across the ages.

3.3 Compositional Distribution of {f}

This brings us to the final category of time, our being in an existential state. Here we must consider this state in nature as we abide on our planet. Let's take a step back and consider our plight as we state as we consider our hunger.

Einstein elegantly demonstrates that space and time are intrinsically bound together into one thing, spacetime. While his formulae demonstrated these phenomena, they did not provide insight into the nature of spacetime. The Philosophy works to fill in the voids of understanding. In his Special and General Relativity papers Einstein speaks of a 'curved' spacetime. This curved spacetime that stands at the heart of relativity and it must be considered when transforming time and space (distance) between inertial frames of reference.

The Philosophy provides the basis of understanding Einstein's 'curved' spacetime in composite particles. In the paper 'On Particle Movement within the Field of Universal Matter'[1] we find the definition of two types of space: Standard and Composite distributions of {f} particles. The later type is of interest here as composite distributions form a dense cloud of composite matter.

Let's take a moment to reflect on the compositional processes discussed in the Philosophy. These processes bring the underlying particles of {f} into ever larger concentrations of {f}. Our planet and our star are examples of this compositional concentrations. These concentrations are an overall set of composite matter which are denser at its core and thinning as one moves outward into the 'regular' space that surrounds these large objects.

How does this relate to existential time? The key idea is movement. As noted in the discussion above regarding travel time, traveling requires energy, which requires the interaction of matter, which produces sub-particles of {f}, which brings us to the AoT. Even just sitting here on our planet there is naught that we can be truly still. Still in space or still in time. It is not possible; for all endeavors we will not and go to a place that is truly still. And so, for us time will always flow in one direction.

[1] Published under the umbrella of the Natural Philosophy of Universal Matter.