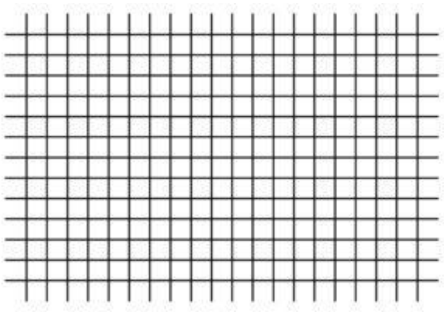
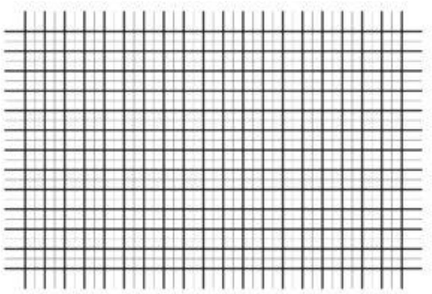
Imagine the following coordinate system with unit distances (square units). **The base distance is equal to 1**. *See below*



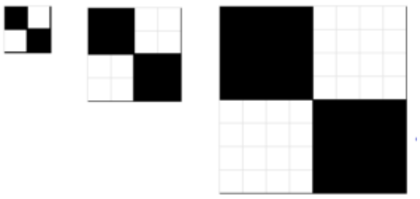
Now, we are stretching this square grid. Let's observe the situation from two points of view – that of an outside observer and an inside observer. The outside observer can clearly see how the distances, which were originally equal, are increasing. The degree of increase is expressed by comparing the stretched square grid with the original (unstretched) one. But the situation is radically different from the perspective of an internal observer—who sees no change. The distances in his square grid, all ratios including his base units, remain the same. **So-called global change.**

Then imagine next coordinate system with unit distances divided in half (unit squares diveded into quarters) - thinly marked. Such coordinate system is inserted into the original one - marked thick. *See below*

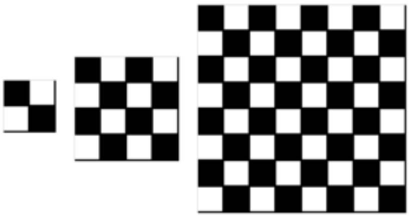


If we stretch the all space, as in the previous case, the situation will be the same. But if we only stretch the (strongly marked) unit square grid, and the halved (thinly marked) square grid remains the same, the proportions for the internal observer will change significantly. The same thing happens when we gradually insert finer square grids into the stretched space. Suddenly, the internal observer sees his space expanding. He can even measure the size of the expansion. So-called Local change. *It's like inflating a balloon, which increases in volume, but the scale of a wooden meter stick, for example, remains the same. If the scale of the meter stick were marked on the surface of the inflating balloon, then the situation would have been very different.*

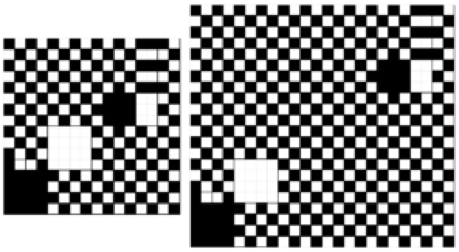
Have a look at the expansion from another point of view. We have very clear structure. *See below*



If we stretch this structure uniformly, from the point of view of an outside observer, the structure will become larger, but the ratio between the size of the black and white squares will remain the same. But from the point of view of the inner observer, who is an integral part of the structure and is therefore subject to the expansion, everything will remain the same for this observer, in short, he will not notice the expansion of his space. The situation will be different in the following case, where both the area and the number of black and white squares will increase, while the squares will remain at their original size - from point of view of an outside observer. *See below*

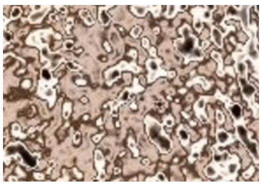


But from the point of view of the inner observer, it looks like its space is expanding (getting bigger) along with the increase of black and white squares. If there are clearly distinguishable shapes in the ocean of fluctuations in the stretched space (change of a black square into a white one and vice versa) again the situation will appear different. *See below*



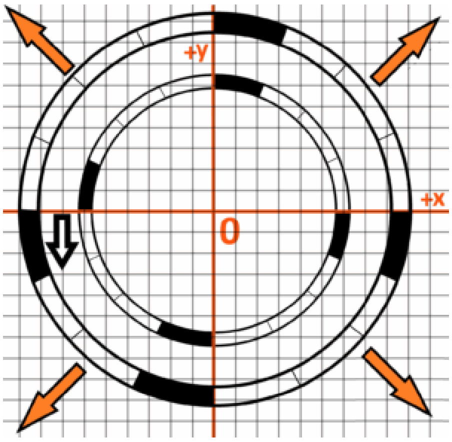
What will be the base unit od measurement? What will it be made of? After all, the entire space is expanding. The basic shapes remain the same size in relation to each other, but the size of the space increases. Local vs. global changes. The universe, or rather the metagalaxies within it, are expanding relative to each other. However, this expansion relative to each other does not occur relative to some external (supra-universal) scale, but rather within the universe itself. The universe does not have a diameter or size relative to an external observer, but only relative to an internal observer. And the internal observer is dependent on internal base units. And here is the question of their stability and how to verify it, or rather, relative to what. So, there are chaotic forms and events. These chaotic forms fill entire space like the field (or the ocean). Such field is the base of "spacetimematter". Inside this field of chaotic forms there are "free" fluctuations (waves) and "bound" fluctuations (like matter in solids and liquids) *See below for better imagination two "balls" which consist of bound fluctuations in the field of free fluctuations*

Such field is stretched. Is only the field with fluctuations being stretched? What about bodies "assembled" from bound fluctuations? Are they not influenced by expansion? And what about free fluctuations themselves? Are they stretched out—and then just get larger—or do new fluctuations arise? Where is the reference point? *See below in detail*



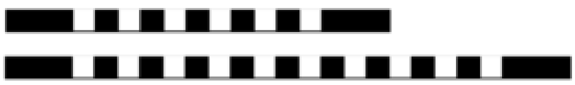
How to verify the upper mentioned questions? By using base units derived from bound fluctuations or from free fluctuations?

We can imagine expanding space as an expanding circle that contains differently structured one-dimensional bodies. *See below*



4 bodies marked in black are expanding together with "the circle". Each body is equally moving away from all of them. The amount of expansion can be evaluated using the **outer** square grid like **external** coordinate system. But really, there is no outer square grid in the expanding circle at all. The situation as viewed from the viewpoints of the bodies. Three bodies don´t recognize any displacement or change. Everything is expanding, including the bodies themselves. But one body (marked with an arrow) is moving to other bodies throughout the expansion. There is a change in its position to other three bodies. *BTW: On the surface of this one moving body, there may be another moving body (car). The car then relates its movement to its support.*

For better illustration - imagin the following example, for simplicity made in 1D space, there are two bodies (rectangles) in expanding 1D space. *See below*



These bodies are moving away to each other. As bodies move away from each other, the distance between them increases. But distance means - the number of squares has been passed - see the top picture. In other words, the number of squares passed - means the distance passed. Then if we divide the number of unit squares by the unit time we get the speed. But this applies to objects moving independently of the reference system - see the movement of the train relative to the ground, resp. to railway sleepers. But imagine movement of the train on stretched railway. The distance between railway sleepers is increased. There is a question if the train is also stretched.

Linear expansion of grouped objects in one dimension of free objects for easy comparison, esp. to the size of a quantum (Planck. const.).

... to be continued