Analysis of Space Time

Human during their evolutionary course and in order to understand the world around them, attended to explain the universe. Two of the biggest mysteries though, about man have always been and remain to be time and space. In order to analyze the "phenomenon" of space and time the effort to give some kind of definitions about those two terms composes a necessity. Describing time, it can be absolute, real and imaginary or global. By the term absolute, time is meant that for each event there is a number called time, and that those numbers have a logic continuance, from that part to the future. Referring now to the real and the imaginary time in the real time case, time, independently from spatial directions, follows and corresponds always an increasing course. In contrast, the imaginary time can increase and decrease adapting a spatial dimension's behavior. Concerning space now a satisfying try to define the term would be to support that space includes everything besides time and matter (even though we all know for sure that it exists). Space and time combined to each other form the known space-time.

Space-time as a term and phenomenon has occupied a serious number of cosmologists. The first report about space-time came with special relativity in 1905. according to the upon theory, space-time is composed by four dimensions, three dimensions of time and one dimension of time. Furthermore in special relativity space-time is "flat" meaning that time as each observes counts it , increases normally in space-time from infinity-past to infinity-future.

The perception about space-time transformed tremendously with a general theory of relativity. Space-time as described by Einstein's particular theory doesn't appear to be flat but distorted. This distortion is owed to the presence of mass and energy in space-time and consequently to gravitational force. As a result, even though particles tend to move up to straight linear, That's the main difference between special and general relativity concerning space-time, the involvement of gravity to space-time's distortion.

Another subject on space-time, that must be discussed is its structure and expansion. If space-time has N points, the function that shows its expansion is 2N - 1. The expansion of time space has a double nature, timelike and spacelike. The steps expansion goes through, shows us the time nature, whereas the growing number of points shows the space nature. At every step, an image of each N points existing at the previous time step is created, along with many new points which represent every possible combination of the N points that already exist. Something else that should be stated is that the distance between the time steps are undefined. The same thing goes for the distance between the points.

Let's call the time increment Dt and the space increment Dx and assume that they are constant. There is a reference frame in which these two quantities are zero. Through the reference frame we can observe both Dx and Dt which are undefined (could be nonzero).

About Dt, just because there is a reference frame, in order for it to be nonzero , the universe must take one time step backwards for every one taken forward. For every time

step it takes either forwards or backwards, it must expand by 2N - 1. Therefore, after the universe completes a couple of steps (backwards + forwards), one direction will always have more points. That direction is called forward in time. What is important to understand is that these "two" universes are coupled but yet separate. It cannot be defined which one takes the time step first.

Referring now to Dx, just because us people are used to continuous time,
We think that we can give coordinates to a point. That is not possible in the early universe. The position of any space-time point is undefined. The reason is that each point, as it has already been mentioned, has new images of itself after every new time step, so it appears to be vibrating. If could be observed this "phenomenon", it would appear like an empty space filling up with points
instantly. This "phenomenon" is called quantum fluctuations of the vacuum.
An alternative way of space to fill up with points, would be that the points would have mass which would increase, but this theory seems to be false because of the point-likeness of the smallest particles which exist.

Another issue that consists a worthwhile report concerning space-time
Is the Big Bang theory. The Big Bang theory is very popular among cosmologists. As it is well known, talks about the beginning of the universe. In the early universe there were very high temperatures. Space-time, is the reason that these high temperatures reduced. As it has been mentioned before, the space-time expands be creating images of the existing N points and also new points. The truth is that these points cannot be defined because for every time step a new image of them is created. So if someone tries to observed a N point, he will see a point vibrating madly. After the Big Bang (with the begging of space time) many points and also images of points were created continuously. These points had a certain space in which they could move spontaneously. As space time expanded, these points became more and more. Due to the exclusion principal these points cannot collide with each other. So, what happened was that the space they could move in, kept on shrinking until a point were the movement was minimum. This decrease in the space that the points could move in, can be translated into a decrease of velocity and finally in a decrease of kinetic energy. So, since the energy of the system reduced, the same thing happen to temperature. So not only did the space-time "drop" the temperature, but it also made it easier to locate an N point because of the minimum space the N points had to move in. Every time step lasted 10-43 seconds and the distance between the points was 10-33 cm.

Concluding it becomes obvious the huge importance of space-time in the exploring of the universe. Space time seems to be a very valuable factor in the solution of many and various problems that occupy scientists. Consequently, space-time will continue to occupy the last ones as long as human curiosity about space exists...