Introduction

Since at least the time of the ancient Assyro-Babilonians in 1000 BC ESA, humankind has been keeping detailed records of the motion of planets beyond our own. At first this may have only served a utilitarian purpose: track planetary and star motion and you can track time itself. This would aid in agriculture, religious rituals and even navigation. Seven hundred years passed before Greek astronomers attempted to use this information to determine cosmic scales, and heliocentricity was proposed by Aristarchus of Samos in the third century BC wiki. With the fall of the Greek empire and the decay of the library of Alexandria, astronomy continued to flourish predominantly in Asia and in the Islamic world until the European region woke up from the Dark Ages. With the invention of the telescope in the Netherlands in 1608, fundamental discoveries were made possible: evidence was found to support Copernicus's heliocentric theory and with Galileo's observations and Kepler's laws of planetary motion, Newton was inspired to write his general theory of gravity. Colonial powers, like the French and English empires, were motivated to create precise sky-maps for navigation and established two great institutes (at Paris and Greenwich respectively). It was here that mounting evidence presented itself to support the fact that astronomical distances are enormous- Cassini's estimate of the distance to Mars allowed an estimate of the entire Solar System- and that Halley compared these sky catalogues to ancient Greek ones to show that stars are not fixed, but move through space. As more precise measurements became reality, wilder theories became testable and the limits of human imagination and ingenuity slowly crumbled. One can speculate that since the beginning, humans have pondered questions bigger than them: where do we come from? where did everything appear? how will it all end? For the first time in our long history, we have a real chance of answering these questions. What started out as a utilitarian stride has given us one of the most fascinating and awe-inducing branches of modern-day science: cosmology.

Cosmology has its lexical roots in the greek words *kósmos = world* and *logos = knowledge*; so the study of the world as a whole: the Universe. When trying to untangle the mysteries of the Universe we live in, we assume that our place in it is not special: no matter at what point in the Universe you are, you should see the same when looking outward (homogeneity). Additionally, the picture has to be the same in all directions no matter where you are looking from (isotropy). On scales large enough, the universe is therefore **homogeneous** and **isotropic**. We call this the ***Cosmological Principle***. It is a powerful assumption that can reveal properties of the space we inhabit; for instance, that only 3 types of Universes are possible: flat, hyperbolic and spherical. On smaller scales, however, the density of matter that the Universe contains is very much **not** homogeneous: there is structure that resembles a spider web, made of objects called *voids*, *filaments*, *walls* and *nodes* which make up ***the Cosmic Web***. These objects are not stationary: they evolve, with the elements Being transported from one type of structure to another.