

Part II Astrophysics Essay 2021

Universe or Multiverse?

Advisor: George Efstathiou, gpe@ast.cam.ac.uk K15

There are a number of arguments that suggest that our observable patch of the Universe is part of a much larger structure. This structure has become known as the 'multiverse'. The essay should review the inflationary model of the early Universe and discuss the conditions required for 'eternal inflation'. The essay should discuss briefly whether it is possible to make theoretical predictions across the multiverse (the so called 'measure problem') and come to a conclusion on whether a multiverse makes physical sense.

Useful references

Eternal inflation:

Vilenkin, A., 1983, Phys Rev D. 27, 12

Guth, A., 2007, J. Phys A., 40, 6811.

Linde, A.D., 1986, Phys. Let. B., 175m, 395.

Measure problem:

Linde, A. and Noorbala, M., 2010, JCAP 9, 008.