AGPhil 10: General Topics I

Time: Friday 11:00–13:00 Location: H-HS III

AGPhil 10.1 Fri 11:00 H-HS III

Are we living in a bidirectional big bang / big crunch universe? — •Fritz Wilhelm Bopp — Universität Siegen, Walter-Flex-Str. 3, 57068 Siegen

The interrelation of macroscopic classical and usually microscopic quantum physics is considered. Arguments for fixed two state vector quantum mechanics are outlined in a somewhat pedagogic way. A heuristic concept is developed how something like classical physics could emerge in an early epoch of a finite universe with a compact initial state and an extremely extended final one. The concept contains no intrinsic paradoxes.

However it can not incorporate free agents which are somehow essential. To allow for free agents the fixed final state is replaced by a matching state of maximum extend between an expanding and a contracting universe. How a bidirectional macroscopic world with possible free agents could emerge in such a big bang / big crunch universe is the central object of the paper.

AGPhil 10.2 Fri 11:30 H-HS III

Experimentally proven: An argument used to justify mythological concepts and entities in theoretical physics. — •Osvaldo Domann — Stephanstr. 42, 85077 Manching, Germany

Theoretical physics concentrates on building models that allow obtaining calculated data that match with experimental data, independent of the physical world. That explains the existence of fictitious particles like gluons, gravitons, dark matter, energy, etc. and fictitious variables like time dilation and length contraction. Once these fictitious entities are integrated in the standard model they lose their character of *transitory makeshift solutions* and become the starting point of new physical and philosophical models magnifying the mythology. The argument used to justify the fictitious entities is, that they are experimentally proven, not realizing that the apparent prove of their existence is a fallacy. The argument avoids that new models build on well proven physical interaction laws are pursued, models which can explain experimental data without fictitious entities. This shows the necessity to recognise when the argument 'Experimentally Proven' is a real justification or simply a fallacy to justify mythological concepts. More at: www.odomann.com

AGPhil 10.3 Fri 12:00 H-HS III

On Leibniz's contribution to the concept of absolute space — •Dieter Suisky — Berlin

For having now available almost all writings of Leibniz and Newton, it becomes obvious that there are two versions of absolute theory of space and time and it is not exclusively Newton who represents the absolute side. The Leibnitian version is even the earlier one (1669-71). The later developments, however, manifested the roles of Newton and Leibniz in the relational/absolute debate (Barbour, Smolin). Leibniz himself contributed a lot to the later interpretation for he tried to enforce the impact of his criticism by the substantial turn in the end of 1670s. His arguments for and against absolute space are:

"If space is a certain thing consisting in a supposed pure extension, whilst the nature of matter is to fill space, and motion is change of space, then motion will be something absolute; and so when two bodies are approaching one another, it will be possible to tell which of them is in motion and which at rest; (...). And from this will follow those conclusions which I once showed in the *Theory of Motion Abstractly Considered*. But in reality (...) motion is not something absolute, but consists in relation." (Leibniz (Early 1677))

It will be demonstrated that Leibniz mainly developed his absolute theory as a response to Huygens' *Rules of collision* in a writing entitled *On the causes of motion* whereas Newton's analysis in *On Gravitation* basically concerns Descartes' theory. The former debates will be related to the currently discussed question of background dependence.

AGPhil 10.4 Fri 12:30 H-HS III

Reduktionismus in der modernen Physik — •Albrecht Giese — Taxusweg 15, 22605 Hamburg

Die moderne westliche Naturwissenschaft basiert generell auf dem reduktionistischen Ansatz. Simple Systeme bilden in ihrem Zusammenspiel komplexere bis hinauf zu den Systemen, aus denen unsere sichtbare Umgebung besteht und unsere menschliche Existenz selbst. Aufgabe der Wissenschaft ist es deshalb, die komplexen Systeme unserer Umgebung und unserer Wahrnehmung auf ihre einfacheren Grundlagen zurück zu verfolgen.

Die Physik hat seit der Zeit Newtons mit diesem Ansatz große Fortschritte erzielt, und vom theoretischen Ansatz her besteht Einigkeit über das Vorgehen. In der moderneren Physik allerdings wurde diese Linie zu einem gewissen Grade verlassen, besonders in den Gebieten, die als die Krone bisheriger Forschung gelten, nämlich in der Relativitätstheorie Einsteins und in der Quantenmechanik nach Bohr und Heisenberg.

Wir werden an einigen Beispielen aus der Zeitenwende um Newton und dann aus der Entstehungszeit von Relativität und QM zeigen, in welchem Maße dieser Ansatz aufgeweicht wurde. Und wir werden auf offene Problem der heutigen Physik hinweisen, die man als Folge dieses veränderten Paradigmas ansehen kann.

Zur Einführung: www.ag-physics.org