

Ontology of Physics – Dates and Literature

08.10. Introduction

15.10. The beginning of natural philosophy: from the Presocratics to Newton

22.10. The notion of a primitive ontology

- V. Allori. Primitive ontology and the structure of fundamental physical theories. In A. Ney and D. Z. Albert, editors, *The Wave Function – Essays on the Metaphysics of Quantum Mechanics*, pages 58–75. Oxford University Press, 2013.

29.10. Laws of nature: Humeanism

- N. Hall (2009): "Humean reductionism about laws of nature". (Unpublished)

06.11. Laws of nature: modal realism (primitivism, dispositionalism)

- M. Esfeld: "Die Metaphysik dispositionaler Eigenschaften", *Zeitschrift für philosophische Forschung* 62 (2008), pp. 323-342.
- M. Esfeld: "Wozu Dispositionen?", in Carl Friedrich Gethmann (ed.): *Lebenswelt und Wissenschaft. Deutsches Jahrbuch Philosophie* 2. Hamburg: Meiner 2011, pp. 433–439.

13.11. Newtonian mechanics: particles and forces

- H. Stein. On the notion of field in Newton, Maxwell, and beyond. In R. H. Stuewer, editor, *Historical and Philosophical Perspectives in Science*. Minneapolis: University of Minnesota Press, 1970.
- I. Newton. *Mathematical Principles of Natural Philosophy*. Translated by Andrew Motte. Berkeley: University of California Press, 1729, pp. 1-14.

20.11. Classical fields: are they real?

- B. Mundy. Distant action in classical electromagnetic theory. *The British Journal for the Philosophy of Science*, 40:39–68, 1989.
- D. Lazarovici. *Relativistic Interactions and the Structure of Time*. P. 1-12.

27.11. Space and time in classical physics: absolutism vs. relationalism

- T. Maudlin. *Philosophy of Physics: Space and Time*. Princeton, New Jersey: Princeton University Press, 2012, chap. 1&2.

03.12. QM: primitive ontology & wave-function

- D. Albert. Wave-Function Realism. In A. Ney and D. Albert, editors, *The Wave Function: Essays on the Metaphysics of Quantum Mechanics*. New York: Oxford University Press, 2013.
- S. Goldstein. Reality and the Role of the Wave-Function in Quantum Theory. In A. Ney and D. Albert, editors, *The Wave Function: Essays on the Metaphysics of Quantum Mechanics*. New York: Oxford University Press, 2013.
- T. Maudlin. Completeness, supervenience and ontology. *Journal of Physics A: Mathematical and Theoretical*, 40(12):3151–3171, 2007.

10.12. BM

- M. Esfeld, D. Lazarovici, M. Hubert, and D. Dürr. The ontology of Bohmian mechanics. *The British Journal for the Philosophy of Science*, 2013. doi: 10.1093/bjps/axt019.
- D. Dürr and S. Teufel. *Bohmian Mechanics. The physics and metaphysics of quantum theory*. Springer, 2009. Chapter 4: Chance.

17.12. Identity-based BM

- M. Esfeld, V. Lam, D. Lazarovici, M. Hubert. *Physics and Metaphysics of Primitive Stuff*, 2014.

07.01. QFT: no go theorems for particles

- D.B. Malament. In Defense of Dogma : Why There Cannot be a Relativistic Quantum Mechanics of (Localizable) Particles. *Perspectives on Quantum Reality* 57, 1996.
- R. Tumulka - Physical Meaning of Malament's Theorem on the Position Operators in Relativistic Quantum Theory (Unpublished Draft)

14.01. QFT: Bell-type

- J. Bell. *Beables for Quantum Field Theory*. Chap. 19.
- W. Struyve. *Pilot-wave approaches to quantum field theory*.

21.01. QFT: Dirac sea

- P. Dirac. Quantised Singularities in the Electromagnetic Field. *Proc. R. Soc. Lond. A*, 133, 1931.

28.01. Nonlocality and relativity

- T. Maudlin. Non-local correlations in quantum theory: how the trick might be done. In W. L. Craig and Q. Smith, editors, *Einstein, Relativity and Absolute Simultaneity*, pages 156–179. Abingdon: Routledge, 2008.
- J. Bell. *La Nouvelle Cuisine*.
- M. Esfeld and N. Gisin. "The GRW flash theory: a relativistic quantum ontology of matter in space-time" *Philosophy of Science* 81 (2014), pp. 248-264.