

**Gap.9 Satellite Workshop „Material Metaphysics“  
Osnabrück, Sept. 18, 2015**

9:30-10:15	Michael Esfeld	Matter Points and their Dynamics: A Proposal for a Fundamental Ontology
10:30-11:15	Holger Lyre	Structural Realist Views on Elementary Particles: a Critical Assessment
11:30-12:15	Meinard Kuhlmann	Why Structures Collapse into Properties
12:15-13:45	<b>Lunch</b>	
13:45-14:30	Jonathan Schaffer	Monistic Structural Realism
14:45-15:30	Bryan Roberts	Why is there more than one kind of thing?
15:45-16:30	Simon Friederich	The Fine-Tuning Argument for the Multiverse and the Reality of the Constants

Abstracts der Vorträge:

**Michael Esfeld (Lausanne):**

**Matter Points and their Dynamics: A Proposal for a Fundamental Ontology**

In my talk, I seek to combine atomism with structural realism, proposing a fundamental ontology of matter points that are structurally individuated: all there is to them are the spatial relations in which they stand; neither a commitment to intrinsic properties nor to an absolute space is required. The spatial relations change. All that is needed to capture change is a dynamical structure, namely dynamical relations as expressed in terms of the dynamical parameters of a physical theory. I sketch out how this parsimonious ontology is able to match both classical and quantum mechanics, including quantum field theory.

**Holger Lyre (Magdeburg):**

**Structural Realism and Elementary Particles: a Critical Assessment**

What is the structural realist's view on elementary particles? Since structuralists take structure to be fundamental, they must reconstruct or re-conceptualize elementary particles in (more elementary) structural terms. I assess several routes of re-conceptualizing particles from structure such as the much discussed (non-) individuals route and group constitution route, but I also supplement some new routes: the route from mass-energy equivalence, the zero-value properties route and the route from particle oscillations. I shall critically assess and evaluate all of these routes. I will further address questions about ontological priority and shall deal with recent criticisms raised by McKenzie (2014) and Nounou (2015) against my 2004 group constitution argument.

**Meinard Kuhlmann (Mainz):**

**Why Structures Collapse into Properties**

I will show that although there are good reasons for considering the revisionary ontology of structural realism, in the end this position is either untenable or it collapses into a less revisionary ontology in which properties are at centre stage. I will support this claim by considering the role of symmetry arguments in the formation of physical theories: Although

symmetry groups are of paramount importance in the characterization of fundamental physical theories they are best construed not as themselves representing but rather as a means to identify the basic items of reality.

**Jonathan Schaffer (Rutgers, USA):  
Monistic Structural Realism**

Ontic structural realists have claimed that insights from physics require radical revisions to metaphysics, which eliminate or at least downgrade the priority of objects and intrinsic properties, and upgrade the priority of relations. I develop a view—monistic structural realism—which draws on the classical monistic idea that the whole is prior to its parts, and treats intrinsic structural properties of the whole cosmos as fundamental. Monistic structural realism is said to reconcile structuralist insights about physics with a classical perspective in metaphysics.

**Bryan Roberts (London):  
Why is there more than one kind of thing?**

We show a sense in which, if the particle ontology of the world consists in only one kind of thing, then the theory governing those particles is time symmetric. Any evidence that the world fails to be time symmetric thus indicates that there is more than one kind of thing. This provides one answer to the question, 'Why is there more than one kind of particle?' namely, 'Because the motion of fundamental particles distinguishes an arrow of time.'

**Simon Friederich (Groningen):  
The Fine-Tuning Argument for the Multiverse and the Reality of the Constants**

According to the laws of physics as presently known, had the values of some constants of nature been slightly different, life could not have existed. The fine-tuning argument for the multiverse concludes that our universe is just one among vastly many in an encompassing multiverse where the values of the constants differ in the different subuniverses. The present contribution reviews and assesses three objections against this argument: first, that it commits the inverse gambler's fallacy; second that it involves fallacious double-counting; third, that it presupposes an absent physically well-motivated probability distribution over possible values of the constants. I propose novel responses to the first and the second objection and assess the third in the light of the metaphysical distinction between constants of nature and derived computational artefacts.