

SMS4

Fourth Annual Conference
of the Society for the
Metaphysics of Science

University of Milan
Milan
22-24 August 2018



FOREWORD

MESSAGE FROM THE PRESIDENT OF THE SOCIETY FOR THE METAPHYSICS OF SCIENCE

It's my great pleasure to welcome you to Milan for the 4th Annual Conference of the Society for the Metaphysics of Science, which follows successful previous meetings in Newark, Geneva and New York. The subfield of Metaphysics of Science continues to expand and diversify: our 2018 Program Chair, Christina Conroy, has put together a fabulous program exploring the natures of entities as varied as numbers, genes, spacetimes, causes, temperatures, sounds, laws, species, theoretical models, and foetuses. We're delighted to have Professor Alexander Bird, who has been a key figure in the resurgence of scientific metaphysics and an inspiration to many of us, as our keynote speaker on Thursday evening.

'Metaphysics of Science' means different things to different people depending on their philosophical outlook. Some see it as an enterprise that lays a priori foundations for empirical science and makes it possible; some see it as the sui generis study of the metaphysical implications of particular scientific theories themselves; some see it as indivisible from the philosophies of individual special sciences. Each of these approaches, and no doubt several others, will be represented in Milan and such a diversity of outlooks is a very positive sign for the future of the subfield. I'll offer some reflections of my own on the scope and limits of naturalistic metaphysics on Friday evening.

I'd like to take this opportunity to express appreciation of all those who have been instrumental in organizing the conference: Christina and the whole program committee, Giuliano and the other local organizers, the SMS officers – including especially Ken Aizawa who has done more than anyone to set the Society on a firm footing and who steps down this year after long service as Secretary-Treasurer – and the past Presidents Alyssa Ney and Jessica Wilson. Thank you all!

Alastair Wilson

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PROGRAMME

20–21 August	8
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24 August	13

CPT/FRAMEPHYS WORKSHOP ON TIME AND EXPLANATION

20 AUG	AULA 211
13:00–13:15	Alastair Wilson, <i>Intro</i>
13:15–14:45	David Ingram, <i>Nefarious Metaphysical Explanations</i>
14:45–15:00	Coffee break
15:00–16:30	Alison Fernandes, <i>Three Accounts of Laws and Time</i>
16:45–18:15	Michael Hicks, <i>Space-Time Symmetries and Inductive Discovery</i>
19:30	Dinner
21 AUG	AULA 211
10:00–11:30	Sam Baron, <i>The Metaphysics of Spacetime Emergence</i>
11:30–11:45	Coffee break
11:45–13:15	Christina Conroy and Alastair Wilson, <i>Relationism and the Structure of Time</i>
13:15–15:00	Lunch break
15:00–16:30	Heather Demarest, <i>Flowing Alone</i>
16:45–167:15	General discussion

SOCIETY FOR THE METAPHYSICS OF SCIENCE

22 AUG	AULA 111	AULA 211	AULA 102
8:30–9:00		Coffee and Pastries (Room TBA)	
	Chair: Carl Gillett	Chair: John Carroll	Chair: Giuliano Torrenco
	Session: Pavlov’s Pooch (Psychology and Phil Bio)	Session: Biff (Time and Production in Laws)	Session: $\begin{matrix} P \\ \triangle \\ P \end{matrix}$ (Pythagoras, Probability, aPprehension)
9:00–10:00	Brice Bantegnie <i>The Indistinctness of Psychology and Neuroscience: Prospects and Potential Consequences</i> Com.: Lena Kästner	Tyler Hildebrand <i>Platonic Laws of Nature</i> Com.: Neil Williams	Aaron Segal <i>Pythagoreanism : A Number of Theories</i> Com.: Sam Cowling
10:20–11:20	Lawrence Shapiro <i>Matters of the Flesh: The Role(s) of the Body in Cognition</i> Com.: Alex Miller Tate	Markus Schrenk <i>The Laws’ Necessity</i> Com.: Michael Hicks	Adrian Yee <i>Three Tensions in D’Alembert’s Philosophy of Probability</i> Com.: Neil Dewar
11:40–12:40	Davide Serpico <i>Genetic Causation and Behaviours: Guidelines for Defining Phenotypic Traits</i> Com.: James DiFrisco	Alison Fernandes <i>Does the Temporal Asymmetry of Value Support a Tensed Metaphysics?</i> Com.: Tobias Wilsch	Federica Malfatti <i>Worrall’s Structural Realism, Knowledge and Scientific Understanding</i> Com.: Matthew Slater
12:40–14:10		Lunch break	

22 AUG

AULA 111

Chair: Zee Perry
Session: Tooley's Garden
(Laws)

14:40–15:40

Mathias Frisch
Laws in Physics

Com.: John Carroll

16:00–17:00

Christian Loew and Siegfried Jaag
*Humean Reductionism and
(Iterated) Counterfactuals*

Com.: Christopher Dorst

17:20–18:20

Christopher Dorst
*Why do the Laws
Support Counterfactuals?*

Com.: Alison Fernandes

AULA 211

Chair: Vera Matarese
Session: Schrödinger's Cat
(Quantum Mechanics I)

David Glick and George Darby
*In Defense of the
Metaphysics of Entanglement*

Com.: Alastair Wilson

Fabio Ceravolo
*Insufficiently Specific
Quantum Properties: A
Call for Redesign*

Com.: Christina Conroy

Giuliano Torrenco and Cristian Mariani
*Against Quantum
Mechanics Based Objections to
Metaphysical Supervenience*

Com.: Claudio Calosi

AULA 102

Chair: Markus Schrenk
Session: "Dicey" Metaphysics

Thomas Polger
*Naturalizing the
Metaphysics of Science*

Com.: Tuomas Tahko

Casey McCoy
*The Universe Never
Had a Chance*

Com.: Heather Demarest

23 AUG

AULA 111

AULA 211

AULA 102

8:30–9:00

Coffee and Pastries
(Room TBA)

Chair: Christina Conroy
Session: Disposed to have
Fundamentality
(Fundamentality and Disposition)

Chair: Michael Hicks
Session: The EMERGENCY Room
(Multiple Realization
and Emergence)

Chair: Graham Renz
Session: Boiling Things Down
(Phil of Physics)

9:00–10:00

Cristian Mariani
*Grounding and
Metaphysical Indeterminacy*
Com.: Alexander Skiles

Kenneth Aizawa
*The Duality in the
Multiple Realization Book*
Com.: Brice Bantegnie

Neil Dewar
*Supervenience, Reduction
and Topology*
Com.: Adrian Yee

10:20–11:20

Joaquim Giannotti
Ontological Fundamentality

Alex Carruth
*Formulating Emergentism
and Alexander's Dictum*

Katie Robertson
*Functionalism in Physics: Or,
How to Reduce Thermodynamics
to Statistical Mechanics*
Com.: Alexander Franklin

Com.: Andrea Oldofredi

Com.: Jessica Wilson

12:40–14:00

Lisa Vogt
*Dispositional Essentialism and
the Governance Requirement*
Com.: Matthew Tugby

Niels Martens
*Machian Comparativism
About Mass*
Com.: Zee Perry

11:40–12:40

Lunch break/
SMS BUSINESS MEETING

23 AUG

AULA 111

Chair: Claudio Calosi
Session: Bertlmann's Socks
(Quantum Mechanics II)

14:10–15:10

Joanna Luc
*Is Nonlocality
a Distinctive Feature
of Quantumness?*
Com.: Davide Romano

15:30–16:30

Matthias Egg
*Dissolving the Measurement
Problem Is Not an Option
for the Realist*
Com.: Vera Matarese

17:15–18:45

AULA 211

Chair: Alastair Wilson
Session: Turtles
(Symmetry and Structure)

Michael Hicks
*What Humeans Should
Say About Symmetries*
Com.: Casey McCoy

David Schroeren
Invariance Structuralism
Com.: Vassilis Livanios

KEYNOTE ADDRESS
Alexander Bird
*Fundamental Powers,
Evolved Powers, and
Mental Powers*

AULA 102

Chair: Siegfried Jaag
Session: The Odd Couple
(Phil Bio and Exclusion)

James Difrisko
*Developmental Homology
and the De-coupling of
Levels of Evolution*
Com.: Davide Serpico

John Carroll
*Exclusion, Context
and Possible Worlds*
Com.: Andrea Borghini

24 AUG	AULA 111	AULA 211	AULA 102
8:30–9:00		Coffee and Pastries (Room TBA)	
	Chair: Max Kistler Session: Pondering Propensities (Dispositions)	Chair: Cristian Mariani Session: Puzzle Pieces (Mereology)	Chair: Valerio Buonomo Session : Hide and Seek (Location and Models)
9:00–10:00	Sebastian Murgueitio <i>Defending Nomologically Impossible Dispositions</i> Com.: Markus Schrenk	Helen Zhao <i>The Special Intuition Question</i> Com.: Natalja Deng	Matt Leonard <i>On the Contingency and Vagueness of Where I Am</i> Com.: Robert Michels
10:20–11:20	Mack Sullivan <i>The Counterfactual Analysis of Dispositions – with a Twist</i> Com.: Lorenzo Azzano	Suki Finn <i>The Mereotopology of Pregnancy</i> Com.: Carl Gillett	Carlo Rossi <i>Singular Location, Multi-location, and Immanent Universals</i> Com.: Benjamin Neeser
11:40–12:40	Graham Renz <i>Dispositionality, Truthmaking, and Platonism: A Particularist Alternative</i> Com.: José Tomás Alvarado	Zee Perry <i>Mereology and Metricity</i> Com.: Daniel Berntson	Martin Zach <i>There is no (special) problem of ontology of theoretical models</i> Com.: Michal Hladky
12:40–14:00		Lunch break	

24 AUG

AULA 111

Chair: Suki Finn
Session: Should I Stay or
Should I Go? (Persistence)

14:00–15:00

Błażej Skrzypulec
Auditory Perdurance
Com.: Andrea Roselli

15:05–16:05

María Cerezo and Vanesa Triviño
*3D/4D Metaphysical Equivalence:
Lessons from the Species Debate
for the Metaphysics of
Change and Persistence*
Com.: Valerio Buonomo

17:30–19:00

19:30

AULA 211

Chair: Natalja Deng
Session: Humean Nature
(Humeanism)

Vera Matarese
*Visual Endurance and A Challenge for
Super-Humeanism: The Problem
of Immanent Comparisons*
Com.: Callum Daguid

Dustin Lazarovici
*Super-Humeanism:
A Starving Ontology*

Com.: Niels Martens

PRESIDENTIAL ADDRESS

Alastair Wilson
*Three Grades of
Naturalistic Involvement*

Reception
(Ostello Bello, via Medici 4)

AULA 102

Chair: Ken Aizawa
Session: Suzy and Billy
(Causation)

Vera Hoffman-Kolss
*Three Kinds of
Causal Indeterminacy*
Com.: Max Kistler

Jennifer McDonald
*Proportionality, Exhaustivity,
Exclusivity: Constraints on
Variable Selection in
Modeling Causation*
Com.: Adrian Yee

ABSTRACTS

KEN AIZAWA (RUTGERS UNIVERSITY, NEWARK), “THE DUALITY IN THE MULTIPLE REALIZATION BOOK” Many readers will not fully appreciate what Polger and Shapiro’s accounts of realization and multiple realization are, hence overlook some of the challenges facing them. This paper makes three points. First, Polger and Shapiro think of realization and multiple realization in terms of individual membership in a kind and kind membership in a kind. Second, individual membership in a kind is not, by Polger and Shapiro’s own lights, a realization relation. Third, the individual-membership-in-a-kind view of multiple realization is the one that motivates Polger and Shapiro’s “Official Recipe”, which is then implicitly extrapolated to the kind-membership-in-a-kind view of multiple realization. But, there is reason to think the extrapolation does not work.

BRICE BANTEGNIE (ACADEMY OF SCIENCES OF THE CZECH REPUBLIC), “THE INDISTINCTNESS OF PSYCHOLOGY AND NEUROSCIENCE: PROSPECTS AND POTENTIAL CONSEQUENCES” In a recent paper, Gualtiero Piccinini and Carl Craver argued that psychology is not distinct from neuroscience. I will argue on new grounds that their argument is unsuccessful and show that there are good reasons to think that psychology and neuroscience are distinct. I will determine some of the conditions (both internal and external to the activity of scientists) which,

were they to obtain, would be likely to make the indistinctness thesis true. Though Piccinini and Craver contend that their argument is not an argument against the reduction of psychological theories to neuroscientific theories, they do not explain why this is so and as a consequence do not bring out the full philosophical significance of negating the distinctness thesis. I will try to improve on them on both counts.

SAMUEL BARON (UNIVERSITY OF WESTERN AUSTRALIA): “THE METAPHYSICS OF SPACETIME EMERGENCE” Recent developments in physics suggest that spacetime is not fundamental but arises from a fundamental reality that lacks spatial, temporal and spatiotemporal properties. I argue that standard metaphysical accounts of emergence won’t work for the emergence of spacetime and so a new metaphysics is needed.

JOHN CARROLL (NORTH CAROLINA STATE UNIVERSITY), “EXCLUSION, CONTEXT AND POSSIBLE WORLDS” My goal is to undermine the strength of the exclusion problem as a threat to anti-reductionism about mental states by (i) showing that exclusion does not undermine the truth of many of our ordinary claims of mental-to-physical causation, and by (ii) showing why the exclusion problem is compelling. I also discuss a recent contextualist answer to the exclusion problem from Maslen, Horgan, and Daly (2009). This discussion gives rise to an argu-

ment that shows that a standard possible-world semantics is not suited for a proper treatment of exclusion.

ALEX CARRUTH (DURHAM UNIVERSITY), “FORMULATING EMERGENTISM AND ALEXANDER’S DICTUM” One popular way to characterise strong metaphysical emergence is to hold that emergent entities must possess novel causal powers. Underlying this is a commitment to ‘Alexander’s Dictum’, the claim that to exist is to have causal powers. Alexander’s Dictum, however, does not enjoy universal assent. Nor is it clear exactly how the principle ought to be finessed. This paper examines the role the principle plays in the emergence debate; criticisms which it faces, and responses to these criticisms. It argues that whilst these criticisms might show that Alexander’s Dictum cannot be endorsed as a fully general principle of ontological commitment, nevertheless, the principle can be formulated in manner that makes it suitable for use in the emergence debate.

FABIO CERAVOLO (UNIVERSITY OF LEEDS), “INSUFFICIENTLY SPECIFIC QUANTUM PROPERTIES: A CALL FOR RE-DESIGN” Orthodox quantum mechanics, interpreted realistically, suggests that ascription of a superposed state is ascription of a metaphysically vague property. Metaphysicians largely agree on a succession of models that progressively illuminate what it is to have a vague property in the quantum world, the current peak of this narrative being Wilson’s (2011) and Bokulich’s (2012) view that systems have quantum properties vaguely just in case they instantiate insufficiently specific properties, that is: determinables (eigenstates) without the corresponding determinates (eigenvalues). I argue, however, that segments of the or-

thodox Hilbert-space formalism resist interpretation in terms of insufficient specificity structure, at least if being insufficiently specific is understood along customary lines (Wilson 1999, Funkhouser 2006, 2014). I conclude that at the very least insufficient specificity calls for re-design if it is to sustain a model of superposed state ascription.

MARÍA CEREZO (UNIVERSITY OF MURCIA) AND VANESA TRIVIÑO (UNIVERSITY REY JUAN CARLOS), “3D/4D METAPHYSICAL EQUIVALENCE: LESSONS FROM THE SPECIES DEBATE FOR THE METAPHYSICS OF CHANGE AND PERSISTENCE” In this paper, we address the question whether the persistence of biological species raises any difficulty for the thesis of the metaphysical equivalence between three-dimensionalism (3D) and four-dimensionalism (4D). We argue that, even if one assumes that ‘species’ is a homonymous term and refers to two entities (evolverons or synchronic species and phylons or diachronic ones), 3D/4D metaphysical equivalence still holds. We argue by challenging the strong association between a synchronic view of species and a 3D theory of persistence, and a diachronic view of species and a 4D theory of persistence. We finally show how this debate on persistence of species helps to illustrate some misunderstanding behind contemporary analytic metaphysics of change and persistence.

CHRISTINA CONROY (MOREHEAD STATE UNIVERSITY) AND ALASTAIR WILSON (UNIVERSITY OF BIRMINGHAM & MONASH UNIVERSITY), “RELATIONISM AND THE STRUCTURE OF TIME” We discuss the contingency (or lack thereof) of some widely-discussed views about the structure of time, and defend a necessitarian perspective according to which the structure of time

(in particular, its topological structure) should be regarded as epistemically but not metaphysically contingent. This perspective opens up a new way of defending relationism about time.

HEATHER DEMAREST (UNIVERSITY OF COLORADO, BOULDER), “FLOWING ALONE” Standardly, presentist theories of time accept both a shared, universal present moment as well as flow. But, these two features are notoriously difficult to reconcile with special relativity, according to which there is no absolute, non-conventional simultaneity. I explore a view that I think is worthy of serious consideration. This view rejects a universal, shared present, but accepts temporal flow. I argue that this view can accommodate the time dilation of special relativity, and also, that it can recover the intuitive picture of ourselves as beings who change as time passes.

NEIL DEWAR (MUNICH CENTER FOR MATHEMATICAL PHILOSOPHY), “SUPERVENIENCE, REDUCTION, AND TRANSLATION” This paper considers the following question: what is the relationship between supervenience and reduction? I investigate this formally, first by introducing a recent argument by Christian List to the effect that one can have supervenience without reduction; then by considering how the notion of Nagelian reduction can be related to the formal apparatus of definability and translation theory; then by showing how, in the context of propositional theories, topological constraints on supervenience serve to enforce reducibility; and finally, how constraints derived from the theory of ultraproducts can enforce reducibility in the context of first-order theories.

JAMES DiFRISCO (KONRAD LORENZ INSTITUTE & KU LEUVEN), “DEVELOPMENTAL HOMOLOGY AND THE DE-COUPLING OF LEVELS OF EVOLUTION” Recently, several theorists have argued against the prevailing phylogenetic conception of homology in favor of a novel developmental view. They argue that homologues must be tied to their developmental causes in order to be individuated and to be explained. In this paper I show that this is not the case. Developmental views also face empirical and conceptual difficulties in light of indications from recent evolutionary biology that molecular and morphological evolution are de-coupled to a significant degree. I argue that although development often explains homology, it should not be construed as providing a distinct definition of homology, and thus pluralism about homology concepts is unmotivated.

CHRISTOPHER DORST (WASHINGTON UNIVERSITY IN ST. LOUIS), “WHY DO THE LAWS SUPPORT COUNTERFACTUALS?” When we engage in counterfactual reasoning, we tend to hold fixed the actual laws of nature. This paper aims to explain why. I begin by highlighting some salient features of counterfactual reasoning: in addition to being “nomically guided”, it is also “conservative” and uses “hindsight”. I then present a rationale for our engagement in counterfactual reasoning that aims to make sense of these features. In particular, I argue that counterfactual reasoning helps us evaluate the evidential relations between unanticipated pieces of evidence and various hypotheses of interest. Given this goal, it makes a great deal of sense that counterfactual reasoning would have the aforementioned features.

MATTHIAS EGG (UNIVERSITY OF BERN), “DIS-SOLVING THE MEASUREMENT PROBLEM IS NOT AN OPTION FOR THE REALIST” This paper critically assesses the proposal that scientific realists do not need to search for a solution of the measurement problem in quantum mechanics, but should instead dismiss the problem as ill-posed. James Ladyman and Don Ross have sought to support this proposal with arguments drawn from ontic structural realism and from a Bohr-inspired approach to quantum mechanics. I show that the first class of arguments is unsuccessful, because formulating the measurement problem does not depend on the metaphysical commitments which are undermined by ontic structural realism. The second class of arguments is problematic due to its refusal to provide an analysis of the term “measurement”. It turns out that the proposed dissolution of the measurement problem is in conflict not only with traditional forms of scientific realism, but even with the rather minimal realism that Ladyman and Ross themselves defend.

ALISON FERNANDES (UNIVERSITY OF WARWICK & TRINITY COLLEGE, DUBLIN): “THREE ACCOUNTS OF LAWS AND TIME” Loewer distinguishes two approaches to the metaphysics of science: Humean accounts that deny primitive modality and explain temporal asymmetries in scientific terms, and anti-Humean accounts that take temporal asymmetry and modality as primitives. I’ll argue that Loewer neglects an important third approach: explain temporal asymmetries as well as the function of modal notions in scientific terms. This kind of pragmatist approach provides a clear ontology to fundamental science, and doesn’t replace scientific explanation with metaphysics.

ALISON FERNANDES (UNIVERSITY OF WARWICK & TRINITY COLLEGE, DUBLIN), “DOES THE TEMPORAL ASYMMETRY OF VALUE SUPPORT A TENSED METAPHYSICS?” There are temporal asymmetries in our attitudes towards the past and future. For example, we judge a given amount of work to be worth twice as much compensation if it is described as taking place in the future, compared to the past (Caruso et al 2008). Does this temporal value asymmetry support a tensed metaphysics? By getting clear on the asymmetry’s features, I’ll argue that it doesn’t. To support a tensed metaphysics, the value asymmetry would need to a) be absolute, b) apply equally to events concerning oneself and others, and c) be both rational and judged to be so. But the value asymmetry is not absolute, is partially first personal, and is judged irrational even by subjects whose judgements display the asymmetry. The asymmetry’s features suggest instead that it arises as an emotion-driven overgeneralisation from a temporal bias concerning our future actions. This explanation points towards mechanisms that can play a role in explaining other cases where we overgeneralise about the past and future, and why we’re tempted towards metaphysical pictures of time in the first place.

SUKI FINN (UNIVERSITY OF SOUTHAMPTON), “THE MEREOTOPOLOGY OF PREGNANCY” Consider the following two philosophical questions about pregnancy: When does a new organism start to exist? and; What is the metaphysical relationship between the mother and foetus? These questions have great relevance with regard to our personal identity and they impact significantly on bioethical issues regarding reproduction. Despite their importance, answers to these questions have been at worst

under-explored in metaphysics, and at best conflated or presupposed elsewhere in philosophy. The aims of this paper are to clarify, distinguish, and connect these questions about pregnancy, to then outline rival models of pregnancy that result from the various combinations of answers to such questions. Therefore, it is hoped that such an elucidation of these questions, answers, and models will provide a foundation for better understanding the metaphysics of pregnancy.

MATHIAS FRISCH (LEIBNIZ UNIVERSITÄT HANNOVER), “LAWS IN PHYSICS” In this paper I discuss several features of the role of ‘law-ish’ principles in theorizing in physics. These features are, first, that laws are more adequately represented within what Richard Feynman has dubbed a “Babylonian conception” of physics – a non-hierarchical conception of theories as providing connected and over-connected physical principles, rather than a hierarchically organized fully axiomatized structure, and, second, that the distinction between dynamics and kinematics is to some extent contextual. I examine what consequences these features have for both Humean and non-Humean philosophical accounts of laws.

JOAQUIM GIANNOTTI (UNIVERSITY OF GLASGOW), “ONTOLOGICAL FUNDAMENTALITY” The notion of fundamentality is supposed to play an important role in philosophical inquiry and scientific theorising. Yet there is no consensus on how to formulate it in precise terms. According to a promising view, fundamentality is a form of ontological independence. This view has the merit of capturing a natural connection between fundamentality and ontological dependence. However, it has been recently

argued that it is possible that there are fundamental and yet ontologically dependent entities; therefore, we should not characterize the fundamental in terms of ontological independence. My aim is to show that such a possibility does not threaten a conception of fundamentality as ontological independence. I illustrate this claim by providing a definition of equifundamentality and showing that fundamental and yet ontologically dependent entities can be treated as equifundamental.

DAVID GLICK (ITHACA COLLEGE) AND GEORGE DARBY (DURHAM UNIVERSITY): “IN DEFENSE OF THE METAPHYSICS OF ENTANGLEMENT” Quantum entanglement has long been thought to have deep metaphysical consequences. For example, it has been claimed to show that Humean supervenience is false; or to involve a novel form of ontological holism. One way to avoid confronting the metaphysical consequences is to adopt some form of antirealism. In this paper we discuss two prominent strands in recent literature – wavefunction realism and “Bohumeanism” – that appear quite different, but, as we see it, are instances of a more general strategy. In effect, what these attempt to do is to diffuse the puzzle of entanglement by eliminating it. These interpretative movements are advertised as equally realist, but, we claim, fail to take an appropriately realist attitude towards entanglement. What we advocate instead is a genuine metaphysics of entanglement: instead of eliminating entanglement, develop a metaphysics that accounts for and explains it.

MICHAEL HICKS (UNIVERSITY OF COLOGNE), “SPACE-TIME SYMMETRIES AND INDUCTIVE DISCOVERY” Recently, a number of authors (Jaag and Loew, Dorst) have argued that pragmatic

considerations motivate the idea that the laws of physics should be invariant under certain symmetry transformations. These arguments follow Wigner (1967) in noting that laws which are not invariant under, for example, the Poincaré symmetry group will deliver behavior that varies in different experimental contexts. Since our only access to laws is through their application to a wide variety of isolated systems, the argument goes, we would be unable to inductively discover such laws. Some Humeans have gone further: they've argued that this constraint on inductive practice allows us to give a pragmatic explanation of this feature of laws. Here, I'll argue that this argument goes too far: laws could fail to be invariant under any of these symmetries and still be discoverable and applicable – provided their divergence from perfectly respecting these symmetries is not too great. So, rather than requiring laws to be strictly invariant under these symmetry transformations, we should require something weaker, for example, invariance in a low-energy limit. I conclude by arguing that, given that the induction requires less than full invariance under these transformations, the Humean pragmatic explanation of symmetry invariances does not go through.

MICHAEL HICKS (UNIVERSITY OF COLOGNE), "WHAT HUMEANS SHOULD SAY ABOUT SYMMETRIES" The laws of physics have an interesting internal explanatory structure. Some principles explain others; some constraints fall out of the dynamic equations, and others help determine them. This leads to interesting, and non-trivial, questions for metaphysicians of laws. What sort of explanation is this? Which principles are explananda, and which explanandum?

In a recent and insightful series of papers,

Marc Lange (2007, 2009, 2011a, 2011b) has discussed these questions in detail, with a focus on the explanatory priority of symmetry principles and their associated conservation laws. Lange argues that symmetry principles are meta-laws: laws governing the laws. The symmetry principles explain the conservation laws by governing them, just as first-order laws explain first-order facts by governing them. He then claims that his metaphysical view of laws can neatly accommodate metalaws but his competitors, namely Humeans and dispositional essentialists, cannot (2009, 2011b).

While I agree with Lange that symmetry principles explain conservation laws, I hold that he is wrong on all other counts. Symmetry principles are not meta-laws: they are first-order generalizations. The explanation of conservation laws from symmetry principles is not a covering-law explanation: it has more in common with reductive explanations of higher-order laws from more fundamental principles. And these facts put him at a loss relative to his primary competitor, the Humean view: this correct account of the explanatory power of symmetry principles falls neatly out of Humeanism, but must be added in post hoc to Lange's view.

TYLER HILDEBRAND (DALHOUSIE UNIVERSITY), "PLATONIC LAWS OF NATURE" David Armstrong accepted the following three theses: universals are immanent; laws are relations between universals; and laws explain natural regularities. In this paper, I argue that they're incompatible. The basic idea is that each thesis makes an explanatory claim, but the three claims can be shown to run in a problematic circle. I conclude with a reflection on which thesis we ought to reject, and suggest some general lessons for the

metaphysics of laws.

VERA HOFFMANN-KOLSS (UNIVERSITY OF COLOGNE), “THREE KINDS OF CAUSAL INDETERMINACY” It is commonly assumed that causation is a determinate relation. If c and e and all the relevant background conditions are sufficiently specified, then the claim that c caused e will either be determinately true or determinately false. In this paper, I present three kinds of cases in which the question whether c caused e does not have a determinate answer: (1) cases of absence causation recently discussed by Bernstein and by Swanson, (2) cases that lead to Sorites paradoxes for causation and (3) cases in which causal claims are indeterminate if they occur in indeterministic contexts. This is evidence that causal indeterminacy is not just a very specific phenomenon occurring in a single case only, but should be considered a general characteristic of the causal relation.

DAVID INGRAM (UNIVERSITY OF YORK), “NEFARIOUS METAPHYSICAL EXPLANATIONS” I extend and develop some recent ideas about ‘nefarious’ responses to the truth-maker problem facing presentism (see ‘Nefarious Presentism’, *Philosophical Quarterly*, vol. 65; ‘Truth and Dependence’, *Ergo*, vol. 5). I argue that the success of this project of ‘nefarious metaphysical explanation’ may prove decisive in the debate between presentism and non-presentism.

SIEGFRIED JAAG (HEINRICH HEINE UNIVERSITÄT DÜSSELDORF) AND CHRISTIAN LOEW (UNIVERSITÉ DU LUXEMBOURG), “HUMEAN REDUCTIONISM AND (ITERATED) COUNTERFACTUALS” Humean reductionism about laws of nature is the view that the laws reduce to the total distribution of non-modal or categorical prop-

erties in spacetime. However, there is a worry that Humean reductionism cannot account for the characteristic modal resilience of laws under counterfactual suppositions and thus generates wrong verdicts about certain iterated counterfactuals. In this paper, we defend Humean reductionism by providing an account of the counterfactual resilience of Humean laws that gets iterated counterfactuals right.

DUSTIN LAZAROVICI (UNIVERSITÉ DE LAUSANNE), “SUPER-HUMEANISM: A STARVING ONTOLOGY” The paper provides a critical discussion of the Super-Humean view of spacetime (Huggett’s regularity account) and the “minimalist ontology” in terms of Leibnizian relations and primitive matter points, recently developed by Esfeld et al. It investigates, in particular, the empirical adequacy of the proposed metaphysics, arguing that Super-Humeanism cannot provide a plausible account of space and time without committing to bona fide geometric structure in the fundamental relations. Against this backdrop, I propose a moderate version of Super-Humeanism and discuss its possible application to Euclidean space and General Relativity.

MATT LEONARD (UNIVERSITY OF SOUTHERN CALIFORNIA), “ON THE CONTINGENCY AND VAGUENESS OF WHERE I AM” A number of philosophers have recently defended the view that material objects are just regions of spacetime. Sider, Skow, Schaffer, Nolan, and Eagle, for instance. Implicit in this view is a particular theory of location—the identity theory of location—where to be located at a region just is to be identical to that region. Two challenges for the identity theory have to do with the apparent contingency and vagueness of location.

Although it is natural to suppose that the challenges are perfectly analogous, there are structurally very important, but unfortunately neglected differences between them. One of the purposes of this paper is to correct this situation. I highlight two important differences between modality and vagueness: one concerns the necessity and definiteness of location, and one concerns the necessity and definiteness of distinctness. I argue that when properly understood, the challenges from contingent and vague location are in fact insurmountable.

JOANNA LUC (JAGIELLONIAN UNIVERSITY), “IS NONLOCALITY A DISTINCTIVE FEATURE OF QUANTUMNESS?” Physicists often say that some effects are specifically quantum, in contrast to classical ones, but if we ask about the precise meaning of this difference, it turns out that the literature provides many suggestions but no simple or at least systematised answer to this question. If we refer to these suggestions as ‘candidates for distinctive feature of quantumness’, the problem may be framed as a question: What are the bearers of these features (e.g. states, observables), and which candidates are good candidates in the sense that they are characteristic for all quantum mechanical bearers (not only for some of them) and only for quantum mechanical bearers (i.e. they are absent in all analogous classical cases)? In my talk I would like to examine whether so called quantum nonlocality can be regarded as a good candidate. I claim that under the most straightforward understanding this is not the case, but in some more refined sense it is. This more refined sense is relational and dispositional, so these considerations shed light on the metaphysical characteristics of quantumness.

FEDERICA MALFATTI (LEOPOLD FRANZENS UNIVERSITY OF INNSBRUCK), “WORRALL’S STRUCTURAL REALISM, KNOWLEDGE AND SCIENTIFIC UNDERSTANDING” Worrall’s structural realism is usually read as a view telling us about an epistemic failure: our knowledge is limited or constrained. There is something about reality that lies beyond our grasp, that cannot be an object of our (theoretically mediated) knowledge. Take our best scientific theories: at best, they will tell us something about the structure of reality, and about the way things interact, but they won’t tell us anything about the way things are independently from any interaction. This I call the “negative stance” of Worrall’s structural realism. In this paper, I argue that this “negative stance” has a positive side: by placing a constraint to our theoretically mediated knowledge, Worrall’s position might tell us something relevant about the nature and conditions of our scientific understanding of the world, and about what is it that makes a false theory not just empirically successful, but also epistemically valuable.

CRISTIAN MARIANI (UNIVERSITY OF MILAN), “GROUNDING AND METAPHYSICAL INDETERMINACY” Proponents of Grounding maintain that the world is metaphysically structured into more and less fundamental entities, with the latter being grounded on the former. The notion of Grounding is spelled out in many different ways, yet almost everyone agrees that grounding is a very intimate relation, slightly weaker than identity, but stronger than mere necessitation. According to proponents of metaphysical indeterminacy, the world itself is sometimes irreducibly indeterminate. If the fundamental facts ground the derivative facts, and if we assume that there are genuine cases of metaphysical in-

determinacy, then at least one of the following has to be true: (i) the world is indeterminate at the fundamental level, (ii) the world is indeterminate at the derivative level, (iii) the link between what is fundamental and what is derivative is itself indeterminate. In what follows, I will argue that all options have to be rejected. To do that, I will show that certain basic assumptions on what Grounding is, are strictly incompatible with the possibility of genuine cases of metaphysical indeterminacy.

NIELS MARTENS (RWTH AACHEN UNIVERSITY), “MACHIAN COMPARATIVISM ABOUT MASS” Absolutism claims that mass ratios obtain in virtue of absolute masses. Comparativism denies this. Defenders of comparativism promise to recover all the empirical and theoretical virtues of absolutism, but at a lower ‘metaphysical cost’. This paper develops a Machian form of comparativism about mass in Newtonian Gravity, obtained by replacing Newton’s constant by another constant divided by the sum over all masses. Although this form of comparativism is indeed empirically equivalent to absolutism – thereby meeting the challenge posed by the comparativist’s bucket argument – it is argued that the explanatory power and metaphysical parsimony of comparativism (and especially its Machian form) are highly questionable.

VERA MATARESE (ACADEMY OF SCIENCES OF THE CZECH REPUBLIC), “A CHALLENGE FOR SUPER-HUMEANISM: THE PROBLEM OF IMMANENT COMPARISONS” According to the doctrine of Super-Humeanism (Esfeld 2017), the world’s mosaic consists only of permanent matter points and changing spatial relations, while all the other entities and features figuring in physical theories are nomological parameters,

whose role is merely to build the best law system. In this paper, I develop an argument against Super-Humeanism by pointing out that it is vulnerable to and does not have the resources to solve the well-known problem of immanent comparisons. Firstly, I show that it cannot endorse a fundamentalist solution la Lewis, since its two pillars – a minimalist ontology and a best system account of lawhood – would generate, together, a tedious problem of internal coherence. Secondly, I consider anti-fundamentalist strategies, proposed within Humeanism, and find them inapplicable to the Super-Humean doctrine. The concern is that, since it is impossible to choose the best law system within Super-Humeanism, this doctrine may be charged with incoherence.

CASEY MCCOY (UNIVERSITY OF EDINBURGH), “THE UNIVERSE NEVER HAD A CHANCE” Demarest asserts that we have good evidence for the existence and nature of an initial chance event for the universe. I claim that we have no such evidence and no knowledge of its supposed nature. Against relevant comparison classes her initial chance account is no better, and in some ways worse, than its alternatives.

JENNIFER McDONALD (CITY UNIVERSITY OF NEW YORK), “PROPORTIONALITY, EXHAUSTIVITY, EXCLUSIVITY: CONSTRAINTS ON VARIABLE SELECTION IN MODELING CAUSATION” This paper defends strong proportionality against what I take to be its principal objection: that proportionality fails to preserve common sense causal intuitions – by articulating independently plausible constraints on representing causal situations. I first assume the interventionist formulation of proportionality, following James Woodward. This views proportional-

ity as a relational constraint on variable selection in causal modeling that requires that changes in the cause variable line up with those in the effect variable. I then argue that the principal objection derives from a failure to recognize two constraints on variables presupposed by interventionism: exhaustivity and exclusivity. Exhaustivity holds that a variable must take at least one of its values. Exclusivity holds that a variable must take at most one of its values. Both constraints are guided by, and thereby help to make explicit, the modal assumptions implicit in causal inquiry.

SEBASTIAN MURGUEITIO (UNIVERSITY OF NOTRE DAME), “DEFENDING NOMOLOGICALLY IMPOSSIBLE DISPOSITIONS” In this paper I examine Jenkins and Nolan’s arguments according to which objects can be, in a non trivial way, disposed to do things in nomologically impossible circumstances. I offer two cases from the history of physics that support their claim that there are nomologically impossible dispositions. I then examine and reply to some ways of objecting to their argument. I start by showing why Barbara Vetter’s objections to the existence of impossible dispositions in general (not only nomologically ones) are unsatisfactory. I explain that one of the premises of her argument undermines the other premise, and I point out that her argument only addresses a very particular type of impossible dispositions (i.e., one involving names). On the other hand, I argue that her arguments in the book *Potentiality* do not work because they assume a problematic interpretation of the disposition in question. Finally, I show how scientific practice allows us to reject a strategy to paraphrase away the talk of impossible dispositions. The general upshot of the paper is that the best evidence for the the-

sis that objects have nomologically impossible dispositions comes from scientific practice, and that we have yet to see good philosophical reasons to distrust scientific practice in these cases.

ZEE PERRY (RUTGERS UNIVERSITY, NEW BRUNSWICK), “MEREOLGY AND METRICITY” This article motivates and develops a reductive account of the fundamental structure of certain physical quantities in terms of mereology (the formal relationship between parts and wholes). In it, I argue that quantitative relations like “longer than” or “3.6-times the volume of” can be analyzed in terms of necessary constraints those quantities put on the mereological structure of their instances. The resulting account, I argue, is able to capture the intuition that these quantitative relations are intrinsic to the physical systems they’re called upon to describe and explain.

THOMAS POLGER (UNIVERSITY OF CINCINNATI), “NATURALIZING THE METAPHYSICS OF SCIENCE” Most practitioners of the metaphysics of science agree that it should be a naturalized metaphysics. But, just as in other areas of philosophy, there is no consensus on what constitutes naturalism. Here I will focus on just one aspect, viz., the idea that the metaphysics of science should be epistemically naturalized. In the first section I will characterize the kind of epistemic naturalism relevant to the metaphysics of science. The main idea is that metaphysical inquiry is to be conducted and metaphysical claims justified in the very same way that scientific inquiry is conducted and scientific claims are justified. I then examine two prominent examples of metaphysicians of science proposing to “naturalize” the metaphysics of science, and argue that they fail to be epistemically natural.

Considering their failures shows us a way forward for naturalized metaphysics of science that is both more metaphysical and more scientific.

GRAHAM RENZ (WASHINGTON UNIVERSITY IN ST. LOUIS), “DISPOSITIONALITY, TRUTHMAKING, AND PLATONISM: A PARTICULARIST ALTERNATIVE” Matthew Tugby has argued in a series of papers that Dispositionism is the view that irreducibly dispositional properties exist best served by a Platonic theory of universals. This is for two reasons. First, an ontology of uninstantiated universals is uniquely qualified to explain the nature of dispositionality. A disposition is a property for or directed at some manifestation. This directedness is understood most straightforwardly as a relation between disposition and manifestation, but neither an Aristotelian nor trope theory of properties can adequately accommodate this. Second, Platonism can ground truths about dispositions and their manifestations in important cases other ontologies purportedly cannot, like, say, cases where a disposition will never in fact be activated. My goal is to show that an ontology of particulars – of substances and tropes – has the resources to adequately support Dispositionism in these two regards. The hope is that Tugby’s Platonism is shown to be metaphysical over-kill.

KATIE ROBERTSON (UNIVERSITY OF CAMBRIDGE), “FUNCTIONALISM IN PHYSICS: OR, HOW TO REDUCE THERMODYNAMICS TO STATISTICAL MECHANICS” In the wider philosophical literature, the relationship between thermodynamics and statistical mechanics is taken to be the paradigmatic case of reduction. Furthermore, the identification of temperature with mean kinetic energy is one of the archety-

pal examples of theoretical identification. Indeed, ‘temperature’ is often used as the contrast class of the philosophically troubling property ‘pain’. In contrast, the consensus in philosophy of physics is sceptical about this reduction.

In this talk, I argue that neither consensus is correct. Temperature is not proportional to mean kinetic energy; instead temperature has different microphysical correlates in different systems and so, in this respect, is akin to pain. But I also argue that the consensus in philosophy of physics is too pessimistic. By considering functionalism, the scepticism of philosophers of physics can be overcome and reduction had.

CARLO ROSSI (UNIVERSITY OF CAMBRIDGE), “SINGULAR LOCATION, MULTI-LOCATION AND IMMANENT UNIVERSALS” Immanent properties are those properties that exist in the spatiotemporal entities that instantiate them and not outside or independently of them. Any account of properties that accepts the existence of immanent properties ought to offer an explanation of the relation between them, the entities in which they exist and their locations. The general aim of this paper is to develop an account of the location of immanent properties that relies on the notion of exact location and the relation of multi-location. It will be argued that there is no conflict at all in accepting this idea together with holding plausible principles that, to some extent or other, link the mereological, geometrical, and topological structure of regions of space (or spacetime) with the entities that occupy them. It will also be shown that the aforementioned account fares better than its competitors when it comes to deal with the objections commonly raised against accounts of immanent properties. Particular attention will be

paid here to Effingham's theory (2015), which does not contest the idea of applying the notion of exact location to the location of immanent properties, but objects to the application of the relation of multi-location. Among other things, I will show that my account offers a better prospect for dealing with the objections raised against the coherency of the distinction between immanent and transcendent properties (Jones 2017).

MARKUS SCHRENK (HEINRICH-HEINE-UNIVERSITY DÜSSELDORF), "THE LAWS' NECESSITY" Roughly, at least two things can be meant by the laws' necessity: (I) The (actual) laws of nature are necessarily what they are, there's no (metaphysically) possible world in which they are different. (II) What the laws say must happen, the laws govern/enforce their instances. This paper has two aims: first, to specify and disambiguate (I) and (II). The map of possible interpretations of the laws' necessity that is thereby drawn includes signposts whether and how Humean and non-Humean theories commit to the specified "necessities". Finally, it will be highlighted how non-Humeans can ground nomological necessity in production (aka necessitation or bringing about) The paper is also a critical appreciation of Schaffer's (2016) "It is the Business of Laws to Govern".

DAVID SCHROEREN (PRINCETON UNIVERSITY), "INVARIANCE ESSENTIALISM" One of the striking features of fundamental physics is that certain important properties of elementary particle systems are defined as invariants under specific groups of symmetry transformations of these systems. For example, rest mass and relativistic spin are said to be defined as invariants

under the Poincaré group of relativistic boosts, translations, and rotations. The goal of this paper is to provide a metaphysically perspicuous account of this sort of definition, and to evaluate the extent to which the resulting definitions satisfy broadly structuralist desiderata.

AARON SEGAL (THE HEBREW UNIVERSITY OF JERUSALEM), "PYTHAGOREANISM: A NUMBER OF THEORIES" Pythagoreanism is the very surprising view that "all is number". Could Pythagoreanism possibly be true? And why in the world would anyone believe it? Before addressing those good questions, I try to get clear on what the view is. As it turns out, there are actually several views that are all reasonable ways to precisify the basic Pythagorean idea. Then I turn to the good questions. I examine the best extant argument for Pythagoreanism and find it wanting, but then offer a more promising argument. I then consider the most compelling objections to Pythagoreanism of which I am aware. As it turns out, the argument I give for Pythagoreanism doesn't conflict with the most compelling objections to Pythagoreanism: the argument supports versions to which the compelling objections don't apply. Given that fact, it seems to me that Pythagoreanism deserves to be taken more seriously than it is at present.

DAVIDE SERPICO (UNIVERSITY OF GENOA & UNIVERSITY OF LEEDS), "GENETIC CAUSATION AND BEHAVIOURS: GUIDELINES FOR DEFINING PHENOTYPIC TRAITS" A major issue in the study of the genetic bases of human behaviour consists in how hard it is to provide reliable definitions of behaviours themselves. Characteristics such as intelligence and mental disorders are often poorly defined and display much complexity as well as fuzzy boundaries. Never-

theless, behavioural geneticists consider complex behaviours as phenotypic traits and assume they can be analysed by means of methodologies generally adopted for the study of simpler biological characteristics (e.g., stature and pigmentation). For instance, heritability and genome-wide association studies have been widely adopted in the analysis of human behaviour. However, the relationship between genes and behaviour is still unclear and important theoretical controversies afflict behavioural genetics. In this paper, I address these controversies by focusing on genetic causation: indeed, the definition of phenotypic trait can be grounded on the specificity of the causal relationship between genotype and phenotype.

LAWRENCE SHAPIRO (UNIVERSITY OF WISCONSIN, MADISON), "MATTERS OF THE FLESH: THE ROLE(S) OF BODY IN COGNITION" What role does the body play in cognition? Andy Clark distinguishes two possibilities. According to the Larger Mechanism Story, the body serves as a partial realizer of some cognitive capacities. In contrast, the Special Contribution Story assigns to the body a more profound role in cognition, such that we should expect differently embodied organisms to differ as well in their psychologies. Clark favors the first story, whereas I have defended the second. In this paper I argue that the Larger Mechanism Story is in fact not an account of psychological processing at all, but instead an account of mere implementation. If embodied cognition is indeed a psychological theory, it must pursue the Special Contribution Story that Clark rejects.

BLAŻEJ SKRZYPULEC (POLISH ACADEMY OF SCIENCES), "VISUAL ENDURANCE AND AUDITORY PERDURANCE" Philosophers often state that

the persistence of objects in vision is experienced differently than the persistence of sounds in audition. This difference is expressed by using metaphors from the metaphysical endurantism/perdurantism debate. For instance, it is claimed that only sounds are perceived as "temporally extended". I investigate, by referring to conceptual framework of contemporary psychology, whether it is justified to characterize visually experienced objects and auditorily experienced sounds as different types of entities: endurants and perdurants respectively. This issue is analyzed from the perspective of the major specification of the endurance/perdurance distinction connected with the notion of temporal parts. I argue that it is unjustified to characterize visually experienced objects and auditorily experienced sounds as different types of entities in respect of how they persist. Instead, the apparent distinction in the way of persisting can be explained by the presence of contingent differences between typical visual and auditory experiences.

MACK SULLIVAN (NORTHERN ILLINOIS UNIVERSITY), "THE COUNTERFACTUAL ANALYSIS OF DISPOSITIONS – WITH A TWIST" In this paper I suggest a novel form of counterfactual analysis of the behavior of dispositions' bearers. After discussing the basic idea of the project (1), in 2 I discuss some hyperintensional metaphysics (non-trivial counterpossibles and a special definition of being alone), analyze a small subset of dispositions' bearers' behavior in terms of them, and sketch an in-principle argument that such an analysis does not face ordinary counterexamples. In 3 I extend that analysis to another kind of dispositions' bearers, consider a number of more sophisticated sorts of counterexamples, and extend the in-principle argument to

more sorts of counterexamples. And in 4 I consider whether our analysis of dispositions' bearers' behavior lets us offer an analysis of dispositions themselves, and suggest an argument from Scientific Mooreanism that it cannot.

GIULIANO TORRENTO (UNIVERSITY OF MILAN) AND CRISTIAN MARIANI (UNIVERSITY OF MILAN): "AGAINST QUANTUM MECHANICS BASED OBJECTIONS TO METAPHYSICAL SUPERVALUATIONISM" Metaphysical indeterminacy has recently received a great deal of philosophical interest. According to one of the most influential theories, metaphysical supervenience, metaphysical indeterminacy occurs when reality is unsettled between different options, although each option is itself fully determinate. Many authors have argued against this view by claiming that according to quantum mechanics, reality cannot be made fully precise, and thus metaphysical supervenience should be ruled out as a valid option. In what follows I argue against this claim. My strategy is twofold. First, I show that the above objection relies on two assumptions that can easily be rejected. Second, I argue that, even if those assumptions are accepted metaphysical supervenience has many ways out.

LISA VOGT (UNIVERSITY OF BARCELONA), "DISPOSITIONAL ESSENTIALISM AND THE GOVERNANCE REQUIREMENT" Dispositional essentialism consists in the claim that the fundamental properties possess their causal-nomological roles essentially. On this view, dispositional essences are the sources of the natural modalities and govern non-modal facts. The aim of my talk is to explore what this governance would look like in more detail. I shall propose understanding governance in terms of produc-

tive determination, and discuss different forms of determination that might initially look like promising candidates: causation, grounding, and a novel kind of essentialist determination. Surprisingly, however, none of these options can be made to work. The only remaining option is a form of second-order rather than first-order determination – dispositional essences might play a governing role insofar as they determine determination between other facts.

ADRIAN YEE (UNIVERSITY OF TORONTO), "THREE TENSIONS IN D'ALEMBERT'S PHILOSOPHY OF PROBABILITY" This paper expounds and assesses the philosophical merits and deficits of the 18th century French natural philosopher Jean le Rond d'Alembert's philosophy of probability. While his theory of probability has been well studied by historians of science, it has not been discussed in the philosophical literature. I argue that d'Alembert's philosophy of probability commits him to denying the truth of at least three mainstream philosophical assumptions implicit in the contemporary mathematics of probability in the Kolmogorovian tradition: The Principle of Indifference, Independence, and an assumption I call Simultaneity. I further argue that despite these tensions, d'Alembert's philosophy of probability nonetheless retains internal coherence. That is, his view is best seen as a criticism of the mainstream views of probability of not only fellow Enlightenment thinkers of his time but even contemporary philosophers of probability.

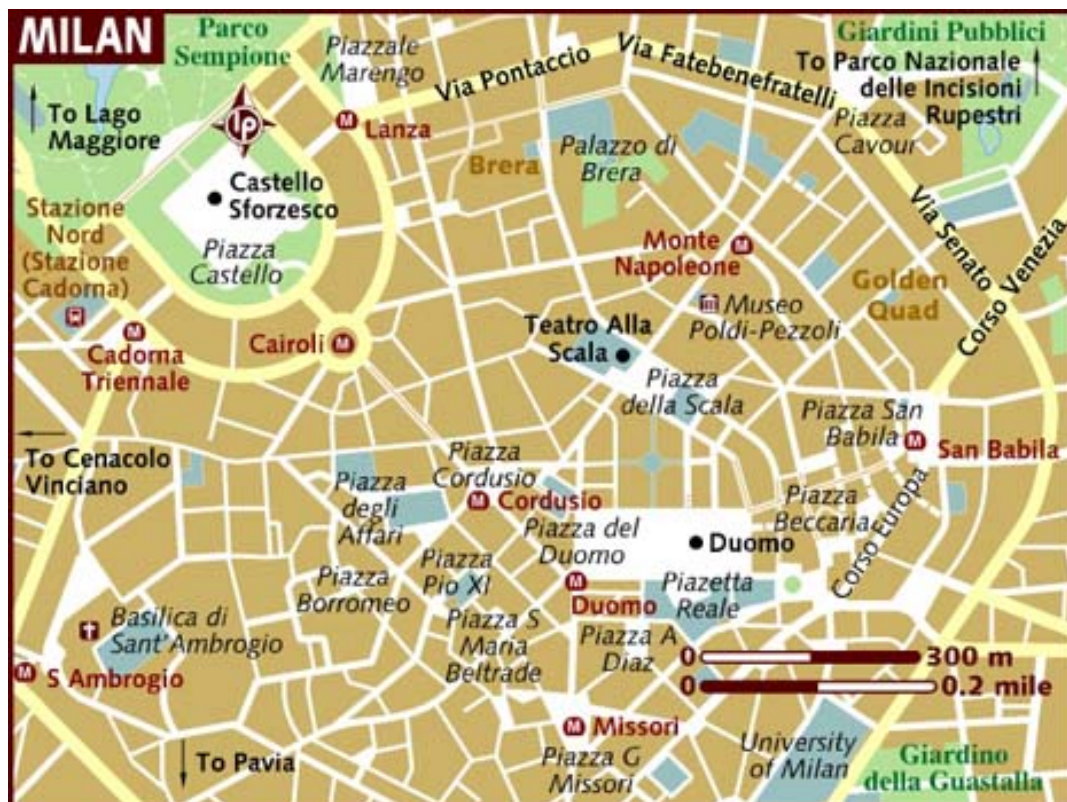
MARTIN ZACH (CHARLES UNIVERSITY & UNIVERSITY OF HELSINKI), "THERE IS NO (SPECIAL) PROBLEM OF ONTOLOGY OF THEORETICAL MODELS" What is the nature of theoretical models? This question has led to a variety of

ontological accounts. After reviewing some of the major views I argue for a naturalistic approach to (dis)solving the issue at hand. Such a naturalistic approach boils down to construing theoretical models as mental models, or so I argue. It is, however, desirable to keep the various accounts in the pocket rather than throwing them away. For one thing, these accounts have successfully identified number of important features of scientific practice. At the same time, they have to be stripped off of their more metaphysically robust ambitions because taking these metaphysical commitments too seriously leads to insurmountable problems. Furthermore, it is best to focus on those features that the various accounts have highlighted instead of building elaborate metaphysical constructs.

HELEN ZHAO (COLUMBIA UNIVERSITY),
"THE SPECIAL INTUITION QUESTION" A
scientifically-informed metaphysics must get

clear on the evidential status of scientific claims in metaphysics. My aim is to make small strides in that direction. In this paper, I propose a connection between the mereologist's warrant to use her intuitions as evidence and the explanatory project undertaken by her. I argue that objections to mereological universalism based on intuitions about the existence of hypothesized mereological composites, henceforth 'compositional intuitions', presuppose an answer to what I dub the 'Special Intuition Question' (SIQ): under what conditions are mereologists warranted to use compositional intuitions as evidence? Here I canvass four possible answers to the SIQ: compositional intuitions are warranted as evidence just when (a) they are 'common sense', (b) supported by scientific theory and practice, (c) always, and (d) never. By rough analogy with scientific investigation, I propose a decision-principle relating one's choice of an answer to the SIQ to what one in general aims for compositional theories to explain.

PRACTICALITIES



LOCATION

SMS4 takes place in the main building of the University of Milan, which is located in [Via Festa del Perdono, 3-7](#). The easiest way to access Room 111, Room 211, Room 102 is from the entrance in [via Festa del Perdono, 3](#).

TRAVEL

The University of Milan is easily accessible by *subway* and *car*. Subway: Red line (M1), stop

at 'Duomo' or at 'San Babila'; Yellow line (M3), stop at 'Duomo' or at 'Missori'. Car: we recommend the 'Car Central Parking' ([via Chiaravalle, 12](#)), which is three minutes on foot from the conference venue.

PARALLEL SESSIONS

Each slot in the parallel sessions will be so organized: presentations will be 30 minutes, with a 10 minutes comment, a 5 minutes reply, and 15

minutes for Q&A. Speakers and commentators are advised to bring a computer to plug into the university projection system, if they wish to use Powerpoint, etc. It would be easiest for speakers and commentators in the same slot to agree beforehand to use a single computer wherein both sets of Powerpoint slides, if they are to be used, can be loaded. This will save time on set up and enable more time for philosophy.

FOOD

Some suggestions for a quick lunch nearby the university: Spontini, Luini, Pizza AM.

RECEPTION

The reception (Friday 24th, 19:30) takes place at

Ostello Bello in [via Medici 4](#), which is 15 minutes walk from the conference venue.

LODGING

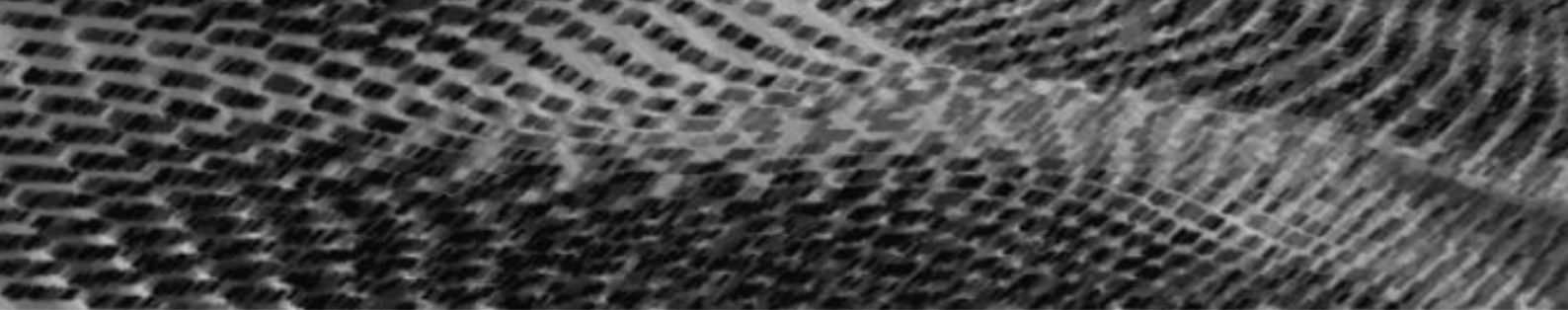
The hosts at the University of Milan suggest the Hotel Canada ([via Santa Sofia, 16](#)), that is a very good hotel and also close to the venue. Other good options include: Uptown Palace ([via Santa Sofia, 10](#)), and Hotel Ascot ([via Lentasio, 3](#)). However, it is very likely that in this period there will be many Airbnb's, so it's worth looking at them first.

CITY GUIDE

[Here](#) is a nice city guide, constantly updated, and full of information about cultural events, or places worth visiting.

ACKNOWLEDGEMENTS

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