6TH WORKSHOP ON PHILOSOPHY OF SCIENCE:

MODELS AND MODALITY

13 enero 2026
09.50 – 19.00 hrs.
Auditorio del Centro de Estudios Árabes Eugenio Chahuán
Primer Piso
Facultad de Filosofía y Humanidades
Universidad de Chile

Organiza:
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El Grupo de Estudios de Filosofía de las Ciencias de la Universidad de Chile invita al **6th Workshop on Philosophy of Science (WPS): Models and Modality**. Los modelos juegan un rol clave en la distintas prácticas científicas, facilitando labores asociadas a la explicación, predicción y representación de diversos fenómenos. La filosofía de las ciencias ha llevado a cabo esfuerzos sostenidos por entender, entre otras cosas, las maneras en las cuales los modelos pueden representar sus fenómenos. Más recientemente, se ha prestado particular atención al hecho de que muchos modelos incorporan elementos tales como idealizaciones y abstracciones que los tornan inevitablemente falsos si se los quiere leer literalmente como representaciones de sus dominios de ionterés. Poco a poco se ha llegado a reconocer que los modelos exitosos no necesariamente llevan a cabo labores representacionales, sino de otro tipo – lo cual tiene que ser determinado caso a caso. El presente workshop pretende ir más allá, explorando el hecho peculiar de que algunos modelos son modalmente informativos. Esto quiere decir que algunos modelos, incluso si no representan directamente sus dominios, ofrecen información acerca de posibilidades, imposibilidades o necesidades relevantes en sus dominios respectivos. Algunas de las preguntas filosóficas que emergen ante ello son las siguientes: ¿pueden los modelos, aún si no son representaciones, ofrecer información modal acerca de sus dominios de interés? Y si ese es el caso, ¿es la modalidad en cuestión meramente epistémica u ontológica? En el primer caso, la modalidad se predica acerca de (usualmente probabilidades subjetivas) de estados de creencias; en el segundo caso, en cambio, la modalidad se predica acerca de la constitución del dominio de interés. La estrategia del modelamiento modal lleva solo unos pocos años siendo desarrollada e invita a plantear varios problemas no siempre abordados por el debate estándar sobre modelos y representación científica.

La asistencia al Workshop es gratuita y abierta al público, pero se sugiere solicitar inscripción.

Expositoras/es:

- **JONAS ARENHART**, Universidad Federal de Santa Catarina, Brazil
- **MARIBEL BARROSO**, Universidad Alberto Hurtado, Chile
- **BRUNO BORGE**, CONICET / Universidad de Buenos Aires, Argentina
- **OTÁVIO BUENO**, University of Miami, EE.UU / Tohoku University, Japón
- **MARIO CABRERA**, Investigador Doctoral, Universidad de Chile, Chile
- **ALEJANDRO CASSINI**, CONICET / Universidad de Buenos Aires, Argentina
- **ROMAN FRIGG**, London School of Economics, Inglaterra
- **JORGE IGNACIO FUENTES**, Pontificia Universidad Católica de Chile, Chile
- **JUAN REDMOND**, Universidad de Valparaíso, Chile

Programa

9.45-10.00	Cristián Soto *Palabras de bienvenida*
10.00-10.45	Juan Redmond *Robustness and the collapse of the notion of representation*
10.45-11.30	Alejandro Cassini *Deidealized models and holistic representation*
11.30-12.00	Break
12.00-12.45	Mario Cabrera *Actual Possibility and Social Modeling:* *Essentialist and Dispositionalist Foundations*
12.45-13.30	Jonas Arenhart *The Semantic approach: back to Suppes*
13.30-15.00	Lunch
15.00-15.45	Otávio Bueno *Data as Evidence for Phenomena: Inference and Modality*
15.45-16.30	Bruno Borge *Empiricist Modalism and Instrumental Observation: A Dilemma about Perception*
16.30-17.00	Break
17.00-17.45	Maribel Barroso & Jorge Ignacio Fuentes *There are no "inconsistent models"*
17.45-18.30	Roman Frigg *Robustness and the collapse of the notion of representation*

Resúmenes

The Semantic approach: back to Suppes

Jonas Arenhart

Abstract. The idea behind the label 'semantic approach' is that models are the appropriate tool to characterize and study scientific theories. Clearly, that characterization admits of many distinct versions, depending on how one understands the key term 'model' and how one fixes other details. The view was supposed to overcome difficulties that plagued the so-called 'syntactical view'. In this talk, I shall argue that the dialectics between the semantic and the syntactic view introduced elements that not only are strange to the goals that Patrick Suppes set for the semantic view in his original formulation of it, but which are also responsible for most of the difficulties attributed to it. In particular, the related claims that the semantic view is closer to the actual practice of science and that it is language-free will be discussed. We shall argue that these features are not part of the Suppesian approach, which can somehow avoid the burden of objections related to the failure in being actually language-free and really close to the practice of science. That is, once some features of the Suppesian approach are recognized, we avoid some of the trouble the semantic view faces today.

There are no "inconsistent models"

Maribel Barroso & Jorge Ignacio Fuentes

Abstract. Some state that addressing "inconsistent models" is necessary because they can threaten scientific rationality. The reason is that, using classical logic, every well-formed sentence of a theory follows from a contradiction. Thus, they propose solutions such as the introduction of paraconsistent logic (Priest 2002; Brown 2006), chunk-and-permeate approaches (Brown & Priest 2015), dialetheism (Priest, Routley, & Norman 1989), partial structures (Da Costa & French 2002), and perspectivism (Giere 2006), among others. We refer to this as the standard view and claim that it rests on a lumping together of the syntactical and semantic dimensions of scientific knowledge. We argue that there are no "inconsistent scientific models." For starters, formally speaking, inconsistencies belong to theories, not models. There are three types of theory inconsistency. A theory is syntactically inconsistent if two or more contradictory sentences can be derived from it. A theory is semantically inconsistent if it has no models that make its sentences true. Two theories are mutually inconsistent if their conjunction is syntactically or semantically inconsistent. Syntactically, theories have few principles and are intended to explain a large range of phenomena or target systems, hence being more global. Models are local in that they account for specific phenomena or target systems. Models can belong to theories if they satisfy their principles; yet some models do not satisfy any theory's principles but have heuristic value for theory construction (e.g., Hartmann 1995). Defenders of the standard view do not offer a clear definition of inconsistent models. By analyzing the examples provided, we infer that they assume the theories used as a heuristic means to obtain some of the model's parts (e.g., equations, descriptions, diagrams, etc.) are to be included in the model. For instance, under such a view, classical electrodynamics would be part of Bohr's model (Brown & Priest 2015; Rice 2020; Martínez-Ordaz 2021). Yet we maintain that in this case, classical electrodynamics is used as a heuristic, and the adequacy of the conclusion extracted from it is settled empirically (not deductively) (cf. Smith

1988). Hence, this theory does not belong to the model; it could be the other way around, but as is usually noticed, this is not the case for this particular model. Thus, drawing on the material account of induction (e.g., Norton 2024, 2021, 2003), we show that the intended historical cases of inconsistent models, e.g. Bohr's model of the hydrogen atom, are only so if we insist that the theories, from which every equation or description in the model was derived, are completely contained within the model. But, as said, theories cannot belong to models. Furthermore, the material restrictions of reasoning with models generally constrain the kinds of inferences that can be extracted from them, placing pragmatic constraints grounded in local facts (Norton 2003).

References

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Empiricist Modalism and Instrumental Observation: A Dilemma about Perception

Bruno Borge

Abstract. This paper explores a tension between empiricist modalism and an empiricist account of observation based on instrumentally mediated perception. Building on Bueno's modalism, which treats modality as primitive while striving to minimise metaphysical commitments, I focus on his account of observation that characterises 'thick' epistemic access in terms of robustness, refinement, and spatiotemporal tracking. I argue that no inferential theory of perception can secure these conditions for microscope-based images without implicitly presupposing a form of direct realism about the perceptual link to the world. Once instrumentally mediated experience is required to meet these robustness constraints, the empiricist is pushed toward a dogmatic commitment to direct realism that conflicts with the anti-dogmatic core of the empiricist stance. The resulting dilemma is that empiricist modalism can either retain its critical, anti-metaphysical aspirations or preserve its expanded notion of observation, but not both. I suggest that recognising this tension clarifies the real epistemic cost of integrating modalism within an empiricist framework.

Data as Evidence for Phenomena: Inference and Modality

Otávio Bueno

Abstract. Data are often taken to provide evidence for phenomena. But how is it possible for data to provide reliable evidence for phenomena if what counts as relevant data depends on whether it can offer evidence for the phenomena in question? It seems that a circularity is involved in this process. Michela Massimi highlights the significance of this evidential inference problem and provides a solution that takes "phenomena to be modally robust" (Massimi [2022], p. 192). After all, "they pack as much modal information as is needed to allow scientists to make inferences from the data to warranted conclusions about what may be the case. Phenomena are the outcome of perspectival modelling that helps us to physically conceive something so as to carve out the space of what is possible in nature" (Massimi [2022], p. 192). In this paper, I contrast Massimi's perspectival realist solution with a modalist empiricist stance that acknowledges the significance of modality, without reification, in the relevant inferences, but resists the underlying realism (Bueno and French [2018], and Bueno [2021]).

References

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Actual Possibility and Social Modeling: Essentialist and Dispositionalist Foundations

Mario Cabrera

Abstract. In modal modeling, local possibilities allow us to understand which outcomes are possible in the actual world, a notion Teller (2025) refers to as *actual possibility*. This does not imply that any state of affairs is possible, but only some. In the case of the social sciences, the notion of actual possibility may help ground social tendencies that may occur in the future. According to Vetter (2011), whereas classical actualists treat modality as a primitive, new actualists assert that the truthmakers of modal truths are found in the actual world. Specifically, the latter proposes three alternatives: object essentialism, property essentialism, and dispositionalism. This presentation aims to introduce these proposals, contrast them with models in the social sciences, and examine how such notions should be re-evaluated when providing a metaphysical foundation for the social.

Deidealized models and holistic representation

Alejandro Cassini

Abstract. Some philosophers of science, such as Knuuttila, Morgan, and Rice, have argued in recent works against the possibility of deidealizing scientific models. The core of their position is that scientific models holistically represent their respective targets. More precisely, idealizations are introduced all at once when a model is constructed, and it is not possible to separate them and, therefore, eliminate or replace them one by one. Since the way in which models represent is always global, they have argued, it is not even possible to distinguish which parts or elements of a model accurately represent the properties or behavior of the target and which introduce distortions. Against this position, I maintain that there are numerous examples in the history and practice of science of successful de-idealizations of models, as is the case with the different models of the pendulum (ideal, physical, and dampened). Deidealization, however, depends on the modeler´s interests and purposes, so it can sometimes be counterproductive. In other cases, we may not know how to carry it out. Nevertheless, it does not follow from the above that deidealizing every scientific model is impossible in principle.

Models and Modals - As Close as Their Words?

Roman Frigg

Abstract. The recent literature on models has seen a number of claims to the effect the models provide modal information. I analyse these claims, distinguishing different notions of modality. I then ask to what extent claims that models provide modal information hold up to scrutiny.

Robustness and the collapse of the notion of representation

Juan Redmond

Abstract. The notion of robustness has gained various forms and applications in different areas of science in our day. In this article, we propose to reclaim the original meaning with which this notion was born in Levins' work (1966) and which, in our view, points to the epistemic collapse

of the notion of representation. We believe it is important to return to this point, as we understand that this is the situation faced by most modeling practices and it is therefore necessary to explore its limits.