

# 46th Annual Meeting of the Society for Exact Philosophy

University of Connecticut · Storrs, CT · Laurel Hall · May 18–20, 2018



## Titles & Abstracts

### Keynote Speakers

**Elaine Landry**

*Mathematics is not Metaphysics*

I will use a structuralist account of mathematics to critically examine the claim, typically made against structural realists, that one cannot speak of structures without objects as structured relata, because relata are prior to relations. I will argue that such priority claims result from a general conflation of mathematics with metaphysics. Specifically, I will show that many of these priority arguments arise from the many attempts to provide a metaphysical framework for mathematical structuralism. If, however, one shifts to providing a linguistic framework, and views mathematical structuralism as a methodological stance, then one can focus on the fact that mathematical structuralism does indeed show us that it is conceptually possible to speak of structures without objects, and so relations without relata. But too, against the many pronouncements of ontic structural realists, one must be careful not to conflate what is conceptually possible with what is metaphysically possible. Because, again, mathematics is not metaphysics.

**Joan Moschovakis**

*A Logical Look at Kripke's Idea of Free Choice Sequences*

L. E. J. Brouwer accepted free choice sequences (of natural or rational numbers) as legitimate mathematical objects in the process of construction. He used them to justify intuitionistic theorems apparently incompatible with classical analysis, such as "Every total function [on the unit continuum] is uniformly continuous." Now Kripke has suggested a temporal motivation for a Brouwerian theory of free choice sequences extending classical mathematics. Addressing the temporal aspect indirectly via a single axiom, I show that Kripke's idea is logically feasible: there is a three-sorted axiomatic system IC extending Kleene's system I of intuitionistic analysis, containing a faithful translation of classical analysis C, and asserting the impossibility of constructing a free choice sequence guaranteed not to mimic any classical sequence. Classical sequences may be copied by choice sequences, but IC is neutral on the question whether every free choice sequence mimics some classical sequence. Logical conflicts are avoided by judicious use of negative versions of classical disjunction and existential quantification. Any omega-model of C guarantees the classical consistency of IC plus a weak version of Kripke's Schema for sentences, via a corresponding realizability interpretation.

**Craige Roberts**

*The Character of Epistemic Modals in Natural Language: Evidential Indexicals*

I argue that *must* and other epistemic modals in English are indexically anchored to an agent-at-a-time whose doxastic state is currently under discussion in the context of utterance. I modify the evidential semantics proposed by von Stechow & Gillies (2010) so that *must* and *may* are merely evidential instead of truly epistemic, hence not "strong" in their sense. Realized in a Kratzerian semantics, the assumed body of evidence restricts the domain of the modal operator (effectively yielding the intended modal accessibility relation), playing a crucial role in the resulting truth conditions. The indexical anchoring (a) correctly predicts the contextually limited range of candidates for the anchoring agent of such a modal, as attested in the literature, (b) thereby constrains what body of evidence is understood to be relevant (that of the anchor), and (c) explains the modal's apparent scope in a given context—a presuppositional pseudo-scope effect rather than a reflection of syntactic scope at LF (*pace* Hacquard 2013). The account sheds light on several puzzles, including (d) Yalcin's (2007) version of Moore's paradox for embedded epistemic modals, and (e) purported arguments for modal relativism (Egan,

Hawthorne & Weatherston 2005). It is consistent with recent theoretical and experimental work which argues that *must* is relatively weak (Lassiter 2016, Del Pinel & Waldon 2018), and that its domain is tightly constrained by local context (Mandelkern 2018). Moreover, though the two central features of this account—anchoring to the evidential perspective of a contextually given doxastic agent, and weakening from a strong (knowledge-based) to a weaker (doxastic-like) semantics—are *prima facie* independent, recent work by Kneer (2017) suggests they may be related: he offers sophisticated experimental evidence that belief attributions do manifest a perspective effect, though knowledge attributions do not.

## Submitted Talks

**Guram Bezhaniashvili** (ASL SESSION)

*Modal logics arising from metric spaces*

Topological semantics is one of the oldest semantics for modal logic. If we interpret modal box as interior, and hence modal diamond as closure, then the modal principles valid under such interpretation are exactly the theorems of the well-known modal system S4. Adding stronger modal principles to S4 define interesting classes of topological spaces. For example, S4.2 defines the class of extremally disconnected spaces, while S4.3 the class of hereditarily extremally disconnected spaces. On the other hand, some well-known topological properties, such as compactness and connectedness, are not definable in the basic modal language. It is a celebrated theorem of McKinsey and Tarski that S4 is sound and complete with respect to any crowded metric space. We will outline the main ideas behind the McKinsey-Tarski theorem, as well as show how to use the theorem to axiomatize the modal logic of any metric space. This last result is joint work with David Gabelaia and Joel Lucero-Bryan.

**Max Bialek**

*Comparing Systems without Single Language Privileging*

Most extant versions of the Best System Analysis of laws of nature (BSA) involve some form of single language privileging, according to which all systems competing to be the titular ‘best’ must be expressed using the privileged language. It is argued that such language privileging is problematic for the BSA because (1) it breaks the parallel between the BSA and scientific practice by preventing laws and the basic/natural/fundamental kinds of the world from being identified (in the BSA) or discovered (in scientific practice) at the same time, and (2) needing to say which language is privileged fuels the objection to the BSA that it is insufficiently objective. One of the main reasons for adopting single language privileging is the idea that there are no measures of ‘best’ for the BSA that allow systems expressed in different languages to be compared. It is shown that this problem is overstated, but not entirely without merit, and may be resolved with privileging language classes. Since what class should be privileged depends on the measure of ‘best’ employed, the whole matter of language privileging is reducible to the more familiar problem for the BSA of privileging a measure of ‘best’.

**Adam Bjorndahl, Aybuke Ozgun** (ASL SESSION)

*Logic and topology for knowledge, knowability, and belief*

In recent work, Stalnaker proposes a logical framework in which belief is realized as a weakened form of knowledge [3]. Building on Stalnaker’s core insights, and using frameworks developed in [2] and [1], we employ *topological* tools to refine and, we argue, improve on this analysis. The structure of topological subset spaces allows for a natural distinction between what is *known* and (roughly speaking) what is *knowable*; we argue that the foundational axioms of Stalnaker’s system rely intuitively on *both* of these notions. More precisely, we argue that the plausibility of the principles Stalnaker proposes relating knowledge and belief relies on a subtle equivocation between an “evidence-in-hand” conception of knowledge and a weaker “evidence-out-there” notion of what *could come to be known*. Our analysis leads to a trimodal logic of knowledge, knowability, and belief interpreted in topological subset spaces in which belief is definable in terms of *knowledge and knowability*. We provide a sound and complete axiomatization for this logic as well as its uni-modal belief fragment. We then consider weaker logics that preserve suitable translations of Stalnaker’s postulates, yet do not allow for any reduction of belief. We propose novel topological semantics for these irreducible notions of belief, generalizing our previous semantics, and provide sound and complete axiomatizations for the corresponding logics.

## **Christopher Blake-Turner**

### *Deflationism about Logic*

Deflationism about logic rails against the orthodoxy that construes logical consequence as a metalinguistic relation that holds between (sets of) sentences. Instead, the deflationist takes attributions of logical truth and consequence to amount to universal generalizations over absolutely everything. Ole Hjortland has recently criticized Timothy Williamson's influential presentation of deflationism. In this paper, I agree with Hjortland that deflationism is problematic, but not for the reasons he supposes. After explaining Williamson's deflationism in more detail I consider Hjortland's objections to the view. They turn on the claim that deflationism fails to distinguish between different logics because it isn't sensitive to meta-argumentative differences. I argue that Hjortland's particular case of classical and supervaluationism rests on an equivocation. Then I show that, in a sense to be made precise, if two logics are equivalent by the deflationist's lights, then they are meta-argumentatively equivalent. Finally, I argue that the real problem with deflationism is that there's no reason to think that the logical properties of a sentence have anything to do with the obtaining of its universal generalization. I preempt the most promising response to this objection by showing that it is exceptionalist, and thereby goes against the anti-exceptionalist motivation of deflationism.

## **Ethan Brauer**

### *Mathematical Knowledge and Indefinite Extensibility*

Many authors have argued that when one accepts a mathematical theory, one is also thereby committed to its consistency and hence to the consistency sentence expressed in the language of that theory. From this claim I argue that mathematical knowledge is indefinitely extensible, drawing on an account of indefinite extensibility due to Shapiro and Wright.

## **Samara Burns**

### *Relational Hypersequents and the Proof Theory of Modal Logics*

Gerhard Gentzen's (1935) proof systems – natural deduction and the sequent calculus – have had much success in relation to classical logic. They are widely used, have interesting proof-theoretic properties, and have applications in fields outside of philosophy. Despite the success of these systems, applying them to modal logics has not been straightforward. Many of the desirable properties of the sequent calculus are lost in relation to modal logic, and Gentzen-style natural deduction systems for modal logics are underdeveloped. In this talk I will introduce Gentzen's systems and some of the problems that arise when applying them to modal logic. I will then discuss a recently developed extension of the sequent calculus called relational hypersequents, and present some proof-theoretic results that suggest that the relational hypersequent framework might be able to fill the gaps in the proof theory of modal logics.

## **Steven Dalglish**

### *Defaulting on Paradox*

Can we solve the (semantic) paradoxes by accepting that our ordinary principles of reasoning admit of exceptions and that the semantic paradoxes are such exceptions? This paper clarifies some proposals in the literature that purport to solve semantic paradoxes by treating them as exceptions to our ordinary principles of reasoning. This clarification proceeds by investigating the extent to which certain nonmonotonic logics, particularly default logic, may be used to formalize the relevant proposals. I show that the views discussed walk a fine line between providing and failing to provide the guidance required of a solution to paradox. Additionally, what emerges from this investigation seems to be a fruitful area for further research, and so I conclude with questions for further study.

## **Michael De**

### *Knot much like tonk*

Connectives such as Tonk have posed a significant challenge to the inferentialist. Recently, Tim Button has argued that the classical semanticist faces an analogous problem due to the definability of connectives under non-standard interpretations of the classical propositional vocabulary. In this paper, we defend the classical semanticist from Button's argument, and extend that defense to both expanded (e.g. modal) and non-classical languages.

**Ralph DiFranco, Andrew Morgan**

*Slurs, Speech Acts, and Derogatory Soliloquies*

Few theorists would deny that slurs are expressive of derogatory attitudes and emotions, yet, perhaps surprisingly, they have had little to say about what derogation is. One constraint on a satisfactory theory of derogation is that it provide an explanation of the derogatory character of slurring when it occurs silently in the privacy of a speaker's thoughts. This feature of slurs has been acknowledged, but never tackled head on. To explain it, we distinguish two ways in which utterances of slurs can be said to derogate their targets: (1) by producing psychological effects, or (2) by constituting the expression of evaluative attitudes and negative emotions such as contempt, hatred, and disgust. We explain how expressive derogation of type (2) occurs across contexts, whether a speaker uses a slur in the presence of non-bigots, in the presence of fellow bigots, or while alone (in an instance of private or inner speech). Finally, we address the moral implications of using slurs. Accounts of derogation that focus solely on psychological effects on bystanders predict that no derogation results from private and internal uses. Our account of expressive derogation explains what is wrong with public, private, and internal uses of slurs in a more unified way.

**Ravit Dotan**

*Resistance to Evidence*

Being sensitive to evidence is very important for the success of epistemic endeavors. However, I argue that resistance to evidence is also important. Sometimes we bite the bullet on inconvenient evidence, and it is difficult to imagine how one could make headway without occasionally doing so. This raises a question: when ought one be resistant rather than sensitive to evidence? I explore solutions utilizing formal approaches to the Quine-Duhem problem. I conclude that, even after all the formal work, resistance comes down to judgment calls, which may be influenced by factors that are irrelevant to the truth of the propositions at hand, such as biases, values, and personal preferences. Allowing such factors to influence decisions on how to respond to evidence is epistemically dangerous. The reason is that whether or not the theories supported by evidence chosen on irrelevant grounds are true is a matter of luck. In the conclusion part of the paper, I sketch some suggestions on how to proceed. My own tendency is to accept that resistance to evidence makes irrelevant considerations an inherent part of evaluation of evidence and hypotheses and utilize a Kuhnian evolutionary view of scientific progress.

**Kathy Fazekas**

*The Experience of the Passage of Time*

A-theorists often accuse B-theorists of being unable to explain our temporal experience, especially the experience of the passage of time. This paper provides a B-theoretic explanation of the experience of passage, which consists of having one experience after another and of there being a seamless transition or "flow" within and between successive experiences. The objective temporal succession of events explains how we have one experience after another and it explains the temporal direction or order that is part of the experience of passage. The representation of succession and change in the specious present and the way that successive specious presents are connected via overlapping contents are responsible for the "dynamic," "flowing" character of the experience of passage and for the feeling that we are always moving forward in time. Our experience of passage is veridical insofar as it represents temporal succession.

**David Fisher**

*A regress for the ground-theoretic explication of antirealism*

Way back in 2001 Kit Fine offered an explication of the antirealist attitude in his 'The Question of Realism'. On that view, as I understand it, a necessary condition for antirealism about some Fs is that the F-facts all be grounded in something else. I show how any successful form of antirealism in this sense would set off a regress. This regress generalizes of the one identified by Karen Bennett in 'By Our Bootstraps'. I try to show how the more general regress lends a new perspective on other work that has grown out of trying "stop" Bennett's regress.

**Greg Front-Arnold, James R. Beebe**

*Multiply-Signifying Names in Ordinary Language*

Multiply-signifying names signify more than one entity. Carnap (1957) maintained that any putative name that is associated with more than one object in a relevant universe of discourse fails to be a genuine name. Although many philosophers have agreed with Carnap, they have not always agreed among themselves about whether atomic sentences containing such terms should be deemed false or neither true nor false. After outlining various semantic theories for multiply-signifying names, we report the results of a study designed to investigate which of these accounts best accords with the truth-value judgments of ordinary language users about sentences containing these terms. We found that naive participants view multiply-signifying names as capable of successfully referring to one or more objects. Thus, semantic theories that judge them to involve reference failure do not comport well with patterns of ordinary usage.

**Giacomo Giannini**

*Resemblance, Representation, and Counterparts*

In this paper I argue that Counterpart Theory can provide truth-conditions for *de re* sentences avoiding Kripke's famous objection only by assuming three further theses: the adoption of the neutral notion of 'true at', the interpretation of such notion in terms of representation, and the idea that counterpart relations are, or entail, representation relations. I argue that we have no reason to grant this third thesis, because counterparthood is a special case of resemblance, and resemblance in general does not entail representation. I show how the distinguishing features of counterparthood fail to bridge this gap, and indeed give us no reason to think that counterparts represents one another. I then examine three possible way to re-establish the link between counterparts and representation: a different notion of representation, the adoption of an implicit convention or rule, and a weakening of the formulation of the the initial assumption. I show how each of these is problematic and unappealing, and conclude that Counterpart Theory is ill-suited to account for *de re* modality.

**Patrick Grafton-Cardwell**

*Platonism about Stories: Creativity without Creation*

In this paper, I take up a question about the metaphysics of fiction, specifically about stories and whether they are created or not. In the first section I frame my Main Question, which is whether stories are discovered or created. In §2 I articulate my preferred answer to the Main Question. The view I espouse is that stories are discovered, not created. I spend some time in that section saying just what sort of ontological categories I take discovered stories to fall under. In §3 I offer four arguments for my view of stories. The arguments provide a cumulative case for my view over and against the view that stories are created. In the final section I respond to a pair of anticipated objections.

**Cosmo Grant**

*When will people play a Nash equilibrium?*

An epistemic characterization of a solution concept shows under what epistemic conditions (for example, what the players believe about each other's actions, rationality and beliefs) the players behave as the solution concept describes. Giving an epistemic characterization of a solution concept which involves mixed strategies, such as Nash equilibrium, is problematic: on the classical interpretation, mixed strategies represent randomizations, and randomizing doesn't fit easily into epistemic game theory. A standard workaround is to reinterpret mixed strategies. On the classical interpretation, a mixed strategy for player *i* represents player *i*'s randomization, and equilibria are *strategic* equilibria. On the new interpretation, a mixed strategy for player *i* represents the other players' beliefs about *i*'s action, and equilibria are *doxastic* equilibria. Doxastic equilibria fit easily into epistemic game theory and epistemic characterizations of doxastic equilibria have been given—notably, by Aumann & Brandenburger (1995). I argue: (1) Strategic equilibria and doxastic equilibria are apples and oranges: they are not two ways of looking at the same thing; an epistemic characterization of one does not shed light on the other. This hasn't been appreciated in the literature; as a result, people have drawn unwarranted conclusions about when people will play a Nash equilibrium. (2) Doxastic equilibrium is not an interesting concept and doesn't deserve the attention it has received. (3) If players can randomize, then game models should represent randomizations. If they can't, then we gain little if we insist on

interpreting the classical formalism in the epistemic theory. Nash equilibrium is a fundamental concept in game theory. Theorists often claim that people will or ought to play a Nash equilibrium. Under what conditions are their predictions accurate or their prescriptions apt? An epistemic characterization can tell us. But we have to interpret the characterization correctly: if we slip between strategic and doxastic equilibrium, as people have done, we will misunderstand the scope of our predictions and prescriptions.

### **Norbert Gratzl**

*Classical Logic as Single Conclusion*

Classical Logic is one of the 20<sup>th</sup>-century success stories. Having said this there is no lack of criticism since classical logic has been scathed for many different reasons. The talk is on developing single conclusion classical logic where proof theoretic desiderata are given and used as a measure of success. The first part addresses two proposed solutions; both build on extensions of intuitionistic logic in sequent setting. Some pros and cons are discussed. The last part of the talk centers on a new solution that is possibly more in accordance with the desiderata of proof theoretic semantics.

### **Eric Guindon**

*Arbitrary reference is pluri-reference*

In reasoning to a universal conclusion or from an existential premise, it is common to deploy names introduced into the reasoning via stipulations. For instance, one might say ‘Let  $n$  be an (arbitrary) real number’, or ‘Let  $f$  be some continuous function’. Breckenridge and Magidor (2012) defend the arbitrary reference (AR) view, according to which instantial names refer to particular, albeit arbitrarily selected, individuals. I begin by highlighting two problems for (AR). I then sketch an alternative view that avoids them. On my preferred view, instantial names have universal pluri-reference: they refer to each and every object in the domain. Sentences that contain pluri-referring names express multiple propositions, each of which results from composing a referent for each pluri-referring name with the semantic values of other constituents of the sentence. I then show how to account for inference using such sentences, and how this results in the agent who engages in valid instantial reasoning simultaneously running through a multiplicity of valid arguments.

### **Madiha Hamdi**

*The Predicativist Dilemma:  $\lambda$ -abstraction or UI?*

One response to the Russell Paradox is to restrict Comprehension by excluding formulas containing bound second-order variables. This is called Predicative Comprehension. It is well known that Comprehension is equivalent to the combination of  $\lambda$ -abstraction and Universal Instantiation. The Predicativist solution requires a restriction on either principle. In this paper, we examine the options and suggest a restriction on UI.

### **Jussi Haukioja, Mons Andreas Nyquist, Jussi Jylkka**

*Reports from Twin Earth*

In this paper, we present results from two experiments that were conducted on ordinary speakers’ usage of natural kind terms, using cases closely modeled after Putnam’s classic Twin Earth case. Although our results confirm the standard externalist judgments concerning Twin Earth (for “water”, as well as for other natural kind terms), they are at the same time problematic for mainstream externalist views: the subjects were found consistently to take *both* sharing of underlying structure and similarity of appearance with standard samples of a kind to be necessary for belonging to the extension of the relevant natural kind term.

### **Allen Hazen, Jeff Pelletier**

*K3, L3, LP, RM3, A3, FDE, M: How to Make Many-Valued Logics Work for You*

We investigate some well-known (and a few not-so-well-known) many-valued logics that have a small number (3 or 4) of truth values. For some of them we complain that they do not have any *logical* use (despite their perhaps having some intuitive semantic interest) and we look at ways to add features so as to make them useful, while retaining their intuitive appeal. At the end, we show some surprising results in the system FDE, and its relationships with features of other logics. We close with some new examples of “synonymous logics.” An Appendix contains a natural deduction system for our augmented FDE, and proofs of soundness and completeness.

**Jared Henderson**

*True is a Gradable Adjective*

This talk investigates the semantics of the truth predicate. I argue that true is a gradable adjective. As such, it does not ascribe an all-or-nothing property to truth-bearers, nor does it serve a merely expressive role in English. True denotes a property that comes in degrees.

**Rachel Keith**

*The Hard Question of Feminism and the 'Hard' Sciences*

There is a large body of research done on feminist critiques of biological and social sciences. Little has been done, however, on how feminist concerns relate to the physical sciences, namely, physics and chemistry. In this paper, I examine how sexism historically has and likely still does affect theories in the physical sciences in order to describe why and how feminism is important for these disciplines. A large portion of this paper will be devoted to showing that sexism can infect theories that do not (at least explicitly) deal with gender. I do so by drawing upon historical examples that I believe demonstrate sexist influences on theories in the physical sciences. I then examine contemporary theories and how they may be similarly affected. I specifically address how the non-empirical values scientists use to judge competing theories (e.g., that they should be aesthetically pleasing, or "beautiful") are likely related to modern society's misogynistic history as well as the scientific community's tendency to exclude women and other minorities. Finally, I identify potential objections to my position, and address them accordingly. Ultimately, with this paper I hope to demonstrate the value of a feminist philosophy of the physical sciences and outline questions that warrant examination in our contemporary scientific community.

**David Kinney**

*Curie's Principle and Causal Graphs*

In this article, I consider Curie's Principle from the point of view of graphical causal models, and demonstrate that the usual adequacy conditions for causal graphs – i.e., the Causal Markov Condition and Minimality – do not require anything like Curie's Principle to be true. In light of this finding, I conclude that Curie's Principle is, at best, a useful heuristic for discovering causal structure, rather than a deep truth about the causal structure of nature itself.

**Teresa Kouri Kissel**

*Metalinguistic Negotiation and Logical Pluralism*

Logical pluralism, the view that there is more than one right logic, has become more and more popular as of late. A particular version of the view, what I will call Carnapian logical pluralism, has it that the right logic and connectives depend somehow on the domain of use, or context of use, or the linguistic framework. This type of view has a problem with cross-framework communication, though: it seems that all such communication turns into merely verbal disputes. If two people approach the same topic from different domains/contexts, then they may be using different logics and connectives, and hence talking past each other. In this situation, if we think we are having a conversation about " $\neg A$ ", but are using different " $\neg$ "s, then we are not really talk about the same thing. The communication problem prevents legitimate disagreements about logic, which is a bad result. In this paper I articulate a possible solution to this problem, which requires adopting a notion of metalinguistic negotiation, and allows people to communicate and disagree across domains/contexts/frameworks.

**Aleks Knoks**

*Higher-order evidence by way of deontic logic*

One good reason for the recent interest in higher-order evidence is the fact that it gives rise to a puzzle about rationality. If we think that such evidence can mislead and accept two plausible rationality requirements, we'd seem to have to conclude that there are rational dilemmas. This paper approaches the puzzle formally, via deontic logic. It presents a language that allows us to formalize the reasoning that leads to the disconcerting result. Then, drawing on work on normative conflicts, it puts forth a new solution to the puzzle that allows us to retain all of its three components—the two requirements and the possibility of misleading higher-order evidence. The solution denies the common assumption that conflicts between requirements imply a commitment to rational dilemmas. It also induces an unorthodox perspective on rationality requirements, suggesting that they are defeasible.

**Philip Kremer** (ASL SESSION)*Quantified logic in topological semantics*

Kripke's possible world semantics for modal and intuitionistic logic is the "standard" semantics. But it is predated by the *topological* semantics, given for propositional logics by McKinsey and Tarski in 1944 and extended to quantified logics by Mostowski in 1948 and Rasiowa in 1951: in this semantics, formulas are interpreted as subsets of topological spaces rather than as subsets of Kripke frames. McKinsey and Tarski proved that the intuitionistic logic H [the modal logic S4] is the propositional intuitionistic [modal] logic of all topological spaces. They also proved H [S4] is the logic of each of a large class of particular spaces, including the real line, the rational line, and the irrational line. If we add to H [S4] standard rules for the quantifiers we get QH [QS4]: Rasiowa proved that QH [QS4] is the quantified intuitionistic [modal] logic of all topological spaces. As for particular topological spaces, there have been, until recently, few results: in 1979, Dragalin proved that QH is the quantified intuitionistic logic of the irrational line; and in 2014, I proved that QS4 is the quantified modal logic of the rational line. But in forthcoming work, I prove that QH is the logic of each of a large class of particular spaces, including the rational and irrational lines, but many others. This is a quantified intuitionistic analogue of the McKinsey-Tarski result. It remains open whether there is a similar result for quantified modal logic. In this talk, I will begin with the Kripke and topological semantics for propositional logics and then move onto quantified logics. I will outline some of the techniques for proving completeness, and indicate why, when we add quantifiers, things are especially difficult in the modal case.

**Fabio Lampert***Modal logic should (still) say more than it does*

This talk investigates modal logics with propositional quantifiers and an actuality operator. It is shown that propositionally quantified modal languages enriched with an actuality operator are strictly more expressive than their actuality-free counterparts despite the underlying notion of validity. Complete axiomatizations are provided, as well as prefixed tableaux. Decidability is established by an effective embedding into monadic second-order logic with a distinguished constant. Finally, a characterization theorem for the modal logics of actuality is proven via a detour through hybrid logics.

**Tamar Lando***Logic of Pointless Spaces*

For a long time, logicians have wondered whether our ways of representing space are in some sense too idealized. Euclidean space is made up of *points*: dimension-less, indivisible regions. These are the smallest parts of space—the atoms beyond which we can divide no further. But such spatial atoms do not seem to correspond to anything in our ordinary experience of the world. On an alternative, region-based approach to space, extended regions together with some mereological and topological relations are taken as primitive; points are constructed as mathematical abstractions from regions. In recent years, simple formal logics for region-based theories of space were developed in Balbiani et al. [2007]. Much like modal logics, these logics have both a relational and topological semantics. In the relational semantics, the logics are interpreted in reflexive, symmetric Kripke frames, or pairs  $F = (W, R)$ , where  $W$  is a non-empty set and  $R$  is a reflexive and symmetric relation on  $W$ . In the topological semantics, they are interpreted in the algebra of regular closed subsets  $RC(X)$  of a topological space  $X$ . The present paper explores some new completeness results in the topological semantics for these logics.

**Noa Latham***Maudlin on the Passage of Time*

In this paper I present Tim Maudlin's minimal conception of the passage of time, contrasting it with the stronger conception that has come to be associated with McTaggart's A-series. I focus on an objection, forcefully presented by Huw Price, that can be made against even the most minimal conception of passing time. It suggests that the passage of time is explanatorily irrelevant, a kind of fifth wheel, because if time did pass we would lack epistemic access to the direction in which it passes. I examine Maudlin's view that the passage of time and nonHumean fundamental dynamic laws are primitive independent postulates and contrast it with what I call the generative conception of fundamental laws in which the passage of time is built in. I argue that on the generative view, but not Maudlin's original view, we would have good reason to believe that time passes in one direction rather than its opposite under certain empirical conditions that likely hold of our universe, and that this direction coincides with that presented to us by our subjective sense of passing time.

## Greg Lauro

*Decision Dependence and Causal Decision Theory: A Critical Response to Hare and Hedden*

Caspar Hare and Brian Hedden's (2015) recent attack on causal decision theory is targeted toward decision dependence, the principle that "in some cases what you subjectively ought to do at a certain time depends on what you believe you will do at that time" (p. 604). Decision dependence is best understood in the context of rational deliberation, where an agent uses all available information, including her inclinations toward her own actions, to think about the act she will choose according to some evaluative standard. In this note we demonstrate that Hare and Hedden's overall argument against causal decision theory is fallacious, involving either illegitimate applications of weak dominance reasoning or inconsistent assumptions in their overall argument. Furthermore, we present models of rational deliberation that are not based on those assumptions and in which Hare and Hedden's central claim about causal decision theory turns out to be false; in fact, causal decision theory provides us with the correct answer. The upshot is that Hare and Hedden's case against causal decision theory is unconvincing and that causal decision theory continues to stand as the correct normative account of decision making.

## Joanna Lawson

*The Metaphysical Structure of the De Se: Constructing a Functional Account of the Self*

In this paper, I examine the metaphysical structure of a subject of experience, or what I call a *de se* center. First, I explain what I take a *de se* center to be: it is a unified subjective perspective from which the world is apprehended. I situate my metaphysical project against the background of existing epistemological and linguistic approaches to the *de se*. Then, I individuate three ways that humans gain perspectival information, which I call *de se* modalities. It is from these *de se* modalities that we learn not only about the world, but about the *de se* center. The first *de se* modality is the sensory perspective: I have unique access to how things look from my eyes, how things feel to my fingers, how things sound to my ears. The second is cognitive perspective: I have unique access to my own thoughts. The third is agential perspective: I have unique access to control over my mind and body. This way of characterizing *de se* information, however, leads to a problem, however. Given that there are various *de se* modalities, how is it the case that there is only a *single de se* center? It seems that what now seems to be a single *de se* center would have been in fact three separate (though perhaps interdependent, or even cooperating centers): a perceptual center, a cognitive center, and an agential center. I propose a functional account of self, which solves the problem of *de se* unity. I explain how the self resolves conflicts between and integrates the various *de se* modalities and unifies the incoming information into a single unified stream.

## Jeonggyu Lee

*Against Predicativism about Names*

According to predicativism about names, names which occur in argument positions have the same type of semantic contents as predicates. In this paper, I shall argue that these bare singular names are not predicates. I first introduce predicativists' being-named condition of names, and present three objections against it: the modal, the epistemic, and the translation objections. Then I consider Fara's "the"-predicativism and Bach's nominal description theory as possible responses and show why they fail.

## Hanti Lin

*Modes of Convergence to the Truth: Steps Toward a Better Epistemology of Induction*

Those who engage in normative or evaluative studies of induction, such as formal epistemologists, statisticians, and computer scientists, have provided many positive results for justifying (to a certain extent) various kinds of inductive inferences. But they all have said little about a very familiar kind of induction. I call it *full* enumerative induction, of which an instance is this: "We've seen this many ravens and they all are black, so all ravens are black" – without a stronger premise such as IID or a weaker conclusion such as "all the ravens observed in the future will be black". I explain why those theorists of induction all say little about full enumerative induction. To remedy this, I propose that Bayesians be *learning-theoretic* and learning-theorists be *truly* learning-theoretic – in three steps. (i) Understand certain modes of convergence to the truth as *epistemic ideals* for an inquirer to achieve where possible. (ii) Require the norm that an inquirer ought to achieve the highest achievable epistemic ideal. (iii) See whether full enumerative induction can be justified as – that is, proved to be – a necessary means for achieving the highest epistemic ideal achievable for tackling the problem of whether all

ravens are black. The answer is positive, thanks to a new theorem whose Bayesian version is proved as well. The technical breakthrough consists in introducing a mode of convergence slightly weaker than Gold's (1965) and Putnam's (1965) identification in the limit; I call it *almost everywhere* convergence to the truth, where the conception of "almost everywhere" is borrowed from geometry and topology. The result is also applied to justify a form of Ockham's razor.

### **Jonathan Livengood**

*Counting Experiments*

In this paper, I clarify the argument from intentions for the Likelihood Principle, and I show how the key premiss in my formulation of the argument may be resisted by maintaining that creative intentions sometimes independently matter to what experiments exist.

### **Shay Logan**

*The Alpha Calculus: Syntax and Semantics*

This paper is the first part in a larger project in which I will produce a system for formal reasoning about arbitrary objects. I call this system the *alpha calculus* in analogy to Hilbert's *epsilon calculus*, to which it bears a more-than-passing familiarity. The language of the alpha calculus contains a variable-binding and term-forming operator  $\alpha$  with the intended interpretation of  $\alpha x\phi$  being 'an arbitrary  $x$  such that  $\phi$ '. This paper presents the syntax and semantics of the alpha calculus.

### **Marija Jankovic, Kirk Ludwig**

*Conventions and Status Functions*

Conventions and status functions are central features of social life. How are they related? In this paper, we argue that (a) there is a variety of convention that has not been adequately identified in the literature, (b) status functions constitutively involve this variety of convention, and (c) what is special about it explains the central feature of status functions, namely, that objects with status functions can perform their functions only insofar as they have been collectively accepted as having them.

### **P.D. Magnus**

*Science, Values, and the Priority of Evidence*

It is now commonly held that values play a role in scientific judgement, but many arguments for that conclusion are limited in two respects. First, many arguments concern scientific theories and concepts which have obvious practical consequences, thus suggesting or at least leaving open the possibility that abstruse sciences without such a connection could be value-free. Second, many arguments concern the role values play in inferring from evidence, thus taking evidence as given. This paper argues that these limitations do not hold in general. There are values involved in every scientific judgement. This holds as much for exotic as for practical sciences and as much for the observation as for explicit inference.

### **Colin McCullough-Benner**

*Representing the World with Inconsistent Mathematics*

According to standard accounts of mathematical representations of physical phenomena, positing structure-preserving mappings between a physical target system and the structure(s) picked out by a mathematical theory is essential to such representations. In this paper, I argue that these accounts fail to give a satisfactory explanation of scientific representations that make use of inconsistent mathematical theories and present an alternative, robustly inferential account of mathematical representation that provides not just a better explanation of applications of inconsistent mathematics, but also a compelling explanation of mathematical representations of physical phenomena in general.

### **David McElhoses**

*A Problem for Fundamental Ontology*

This paper argues against the popular idea that the distinction between fundamentality and non-fundamentality is to be understood in terms of 'by virtue of', or "grounding." To advance this argument, I invent a view called *Fundamental Fundamentality* which consists in the following three claims: (1) truths exclusively about fundamental things are fundamental truths; (2) fundamental truths are exclusively about fundamental things; and (3) there are non-fundamental things (e.g., truths): those

things which are by virtue of other (e.g., fundamental) things. After showing that these three claims lead to an inconsistency given a popular principle of deduction (viz. C.S. Pierce's principle of non-ampliativity), I investigate which of the three claims is to be rejected. After arguing that rejecting either of the first two claims also requires rejecting the third, I am left to conclude that fundamentality is not to be understood in terms of 'by virtue of'.

### **Paul McNamara**

*Monadic & Dyadic Agency & Ability Logics: A Fundamental Theorem for Canonical Models & Correspondence Proofs*

In the following, I prove a fundamental theorem for canonical models for logical frameworks developed for representations of agency and ability broadly in the tradition of Kanger, Porn, Elgesem, and others. Special interest is given to *dyadic* agency (and in an extension of this paper, to monadic and dyadic ability), in both pure forms as well as mixed forms (e.g. monadic agency logics, dyadic agency logics and monadic-dyadic agency logics). I use minimal models, but with an extra parameter to facilitate strong completeness proofs for some formulae where strong completeness would otherwise appear to stall (see appendix of paper for preview). I cast things with an eye toward generalization to classical modal logics and especially to various conditional logics (broadly conceived) for the dyadic systems.

### **Christopher Meacham**

*Deference and Uniqueness*

*Deference principles* are principles that describe when it's rational to defer to others. Recently, some authors have used such principles to argue for *Evidential Uniqueness*, the claim that every batch of evidence determines a unique permissible doxastic state. This paper has two aims. The first aim is to assess these deference-based arguments for Evidential Uniqueness. I'll show that these arguments only work given a particular kind of deference principle, and I'll argue that we should reject these kinds of principles. The second aim of this paper is to spell out what a plausible generalized deference principle looks like. I'll start by offering a principled rationale for taking deference to constrain rational belief. Then I'll flesh out the kind of deference principle suggested by this rationale. Finally, I'll show that this principle is both more plausible and more general than the principles used in the deference-based arguments for Evidential Uniqueness.

### **Ruth Millikan**

*Biosemantics and Words that Don't Represent*

One of the virtues of the biosemantic view of language is the clarity and simplicity of its description of the nature of nonrepresentational linguistic constructions as such. It doesn't follow, however, that it is obvious how any of these functions should be described individually. After an explanation of the biosemantic approach, initial suggestions are made for analyses of a variety of nonrepresentational constructions that have traditionally been considered problematic. Included are "not," "is" (of identity), "exists," "means," "but," "if...then," "possibly," evaluative terms, and "true." The relation of speech act analysis to analysis by reference to stabilizing functions is then discussed.

### **Leo Carton Mollica**

*How Not to Argue for Conditional Excluded Middle*

By far the most prominent argument for conditional excluded middle (CEM) is the *argument from linguistic indiscriminability*. The argument comes in various forms, but all argue that the validity of CEM explains the inability of natural language speakers to distinguish between sentences that should, given the invalidity of CEM, come apart in truth conditions. In this paper, I argue that this strategy is misguided, or at least in need of serious support. The inability of natural language speakers to discriminate in these cases is equally well explained, I argue, as a manifestation of the well-documented linguistic phenomenon of *neg raising*, which does not require CEM to be valid. I argue that this hypothesis accurately predicts the felicity of certain discourses, and that it is consistent with a well-respected semantic-pragmatic account of neg raisers due to Laurence Horn. Defenders of CEM therefore need to either take an entirely different tack in arguing for the principle or explain why the hypothesis of CEM is more plausible than the neg raising hypothesis as an explanation of the relevant linguistic data.

### **Devin Morse**

*More Cats than Dogs: Comparing Quantities in 'Steps Towards a Constructive Nominalism'*

In “Steps Towards a Constructive Nominalism” Goodman and Quine present some methods of nominalistic translation for various sentences. I consider the method of translation they propose for “there are more cats than dogs” and other comparisons of quantity. I consider some challenges to this method presented by cases of mereological overlap, including fatal challenges that arise given atomism.

### **Thomas Mulligan**

*The Epistemology of Disagreement: Condorcetian Lessons and Bayesian Prospects*

Disagreement is a ubiquitous feature of human life, and philosophers have dutifully attended to it. One important context of disagreement is that of *collective decision-making*, in which members of a group share a goal but disagree about how to pursue that goal. Another important context is that considered by the *epistemology of disagreement*, in which the important theoretical question is how a person should revise her beliefs, if at all, in light of disagreement from others. In this essay I do two things. First, I show that the central theoretical insights of these two contexts are incompatible, and that this demonstrates that none of the current norms in the epistemology of disagreement – steadfast or conciliatory – can be correct. Second, I suggest a new, Bayesian approach to disagreement which resolves these puzzles and provides for more accurate, and more general, belief revision.

### **Ioan Muntean**

*Fictions, maps, and structures in forecast models*

The main aim of this paper is to discuss some epistemic aspects of forecast models, especially in the context of “model fictionalism,” promoted and discussed by P. Godfrey-Smith, M. Suarez, and especially R. Frigg. Forecast models are designed to predict the future states of a system from what we know about its past and present states, and from our knowledge of laws of nature, causation, mechanisms, symmetries, etc. This paper argues that the very process of building forecast models implies ultimately the insertion into the model of several types of fictional entities. We discuss here especially fictional structures, as opposed to fictional objects, and on their role in this type of models. The main epistemological question is whether we can produce knowledge about the future by employing these fictional structures. The paper has also a metaphysical component, as it engages the ontological status of future objects, the distribution of properties over populations of models, and the ontology of fictions and their representational role. The epistemology of forecast models, as a second component envisaged here, is also peculiar, in respect of epistemic access we have to the target space. Models in general represent a target system, which is real. Future objects have a different status: they are real, but not known and not accessible by direct observation (unlike the target system of most of our scientific models) Are forecast models completely target-less? What means to have a representational target (partially or totally) in the future? In relation to the variability (or lack thereof) of laws of nature, the paper argues that fictions in forecast models are non-mimetic, but nevertheless nomic possibilities. The paper emphasizes the difference between representing future states of a system and representing its past states. Mapping the future states of a system depends on assumptions which the modeler needs to make explicit. The paper does not discount therefore the difference in epistemic access between past, present, and future when it comes to models. The conclusion of this paper is that forecast fictional structures, with properties distributed over populations of models, enable the modeler to represent a target system in the future. Fictional structures serve a better role in forecast models than hypotheses, which are typically expressed in first order language.

### **Jordan Ochs**

*Knowledgeability of Inner Speech Episodes: A Problem for the Practical Self-knowledge Approach*

It is thought that inner speech episodes (ISEs) are implicated in knowledge of occurrent mental states, or basic self-knowledge. A successful account of the epistemic role of ISEs should be able to distinguish ISEs that are knowledgeable from those that are not, since it seems clear that not all ISEs are self-knowledge apt. Consider, for example, ISEs constitutive of Auditory Verbal Hallucinations – symptoms of schizophrenia. Any satisfying account of the role of inner speech in basic self-knowledge will be able to explain why AVHs (at the very least) are not among the class of knowledgeable ISEs. Here, I canvass Johannes Roessler’s practical-knowledge explanation of the role of ISEs in basic self-knowledge of thoughts and identify the agentive/passive distinction as a way of differentiating knowledgeable from non-knowledgeable ISEs that is entailed by his account. I show that this method of distinction leads to a dilemma which should lead us to ultimately reject not only Roessler’s account, but the practical knowledge explanation of the role of ISEs in basic self-knowledge altogether.

**Andrew Parisi***Neutral Proof Theory*

Neutral free logic is like other free logics in that it has no existential assumptions, but it differs from other logics in that atomic sentences featuring a non-denoting term have a third truth value. While cut free calculi have been developed for negative free logic (see Gratzl (2010)), there is not yet one for neutral free logic. In this paper, we develop a framework for developing cut free calculi for neutral free logics. There are several choices to be made about how quantification and identity works. For the most part our work follows Lehmann (2002) on how to best handle these issues, while we note that there are other approaches available.

**Jonathan Payton***Proportionality and Omissions Reconsidered*

It seems that omissions can be causes. For instance, it seems that my failure to water my plants causes them to die. But it seems that if an event is caused by one omission, it is caused by many. For instance, my plants would not have died if Donald Trump had watered them, and so Trump's omission seems to be as causally efficacious as mine. This is the Problem of Profligate Causation. A solution to this problem must single out, for any event, at most one omission as cause, to the exclusion of all others. I propose and defend a solution that appeals to Stephen Yablo's proportionality constraint on causation:  $C$  causes  $E$  only if an explanation of  $E$  in terms of  $C$  contains the right amount of causally relevant detail, no more and no less.

**Alexandru Radulescu***Token-Reflexivity and Repetition*

The classical rule of Repetition says that if you take any sentence as a premise, and repeat it as a conclusion, you have a valid argument. It's a very basic rule of logic, and many other rules depend on the guarantee that repeating a sentence, or really, any expression, guarantees sameness of referent, or semantic value. However, Repetition fails for token-reflexive expressions. In this paper, I offer three ways that one might replace Repetition, and still keep an interesting notion of validity. Each is a fine way to go for certain purposes, but I argue that one in particular is to be preferred by the semanticist who thinks that there are token-reflexive expressions in natural languages.

**Diana Raffman***How to Deal with Borderline Cases*

In the philosophical literature, possession of (actual or possible) borderline cases is widely taken to be definitive of the vagueness of vague terms. It is also, according to many, the feature of vague terms that necessitates use of a non-classical logic and/or semantics. Specifically, borderline cases for a vague predicate ' $F$ ' are defined as being *neither definitely  $F$  nor definitely not- $F$* , and the sentence ' $x$  is  $F$ ' is supposed to be neither true nor false in a borderline case. Not surprisingly, a variety of non-classical devices (e.g. supervaluations, truth-value gaps, and degrees of truth) have been introduced to express the logic and semantics of vague terms. In this paper I argue that, on largely intuitive grounds, the standard definition of borderline cases cannot be correct. At the end I briefly consider an alternative, "classical" definition, but I leave that question open here. The goal of the present paper is primarily negative.

**Elisángela Ramírez-Cámara***Knot is not that nasty*

Knot is a unary connective introduced by Button in (2016) and it is supposed to cause trouble to the advocates of model-theoretic semantics on the Tonk debate. Button argues that Knot is a nasty connective because it violates almost a third of the classical principles even though it merely induces a congruence relation on classical logic. We will show here that the logic generated by Knot need not be as weak as Button supposes. Adopting a more liberal, non-transitive notion of logical consequence, one could get all classical theorems and almost all the classical principles demanded by Button, with the only exception of Cut and  $\rightarrow L$ , which is no big surprise once one goes non-transitive, and for which there are arguments for their rejection independent of the Tonk debate.

**Gurpreet Rattan***Relativism and Austere Nonsense*

I argue that relativism is a view about the possibility of a certain kind of limit rational engagement between thinkers – relativistic engagement – in which thinkers treat nonsense like sense. Arguing for this requires getting clear on notions of relativism, sense, nonsense, and treating nonsense like sense. Donald Davidson glimpses the connection between relativism and nonsense but does not locate the role of nonsense at the right level, at the level of the rational significance of the thoughts about other minds involved in relativistic engagement. Bernard Williams and Carol Rovane recognize that relativism is a matter of the rational significance of the thoughts about other minds involved in relativistic engagement, but they do not pause to consider the underlying theory of thought in terms of which such thoughts are to be explained. Frege’s sense/reference framework supplies such a theory of thought, but Williams’s and Rovane’s views about the thoughts about other minds involved in relativistic engagement are incoherent on the Fregean theory of thought. A better account runs in terms of the attribution of nonsensical thinking, with the relevant notion of nonsensical thinking adapted, with one significant correction, from the austere conception of nonsense that figures in Cora Diamond’s reading of Ludwig Wittgenstein’s claim that the propositions of his *Tractatus* are nonsensical. I close by arguing that the temptation to treat nonsense like sense in relativistic engagement is fuelled by a confusion between intersubjective and objective perspectives on other minds.

**Greg Ray***Recursive Semantics Without a Net*

In this talk, I show how to directly give a recursive meaning theory at the level of thought—using classical logic and without resort to a metalanguage. This is a direct meaning theory in the sense that it issues in means-that theorems for each sentence of a target language. It does not go by way of truth theory, but satisfies Davidson’s three key desiderata, reflects linguistic competence, and does not quantify over meanings. This extends the work of (Ray, 2014) in a way that entirely moots the recent criticisms of (Hoeltje, 2016) and (Kirk-Giannini & Lepore, 2016).

**Gerard Rothfus***Evidence, Causality, and Sequential Choice*

Causal decision theory has recently been criticized by Arif Ahmed on the grounds that the agents it describes fall prey to dynamic inconsistency in certain sequential choice problems. Ahmed suggests that this result supports the competing evidential approach to decision theory. I argue, however, that evidential decision theory faces dynamic consistency worries of its own. Thus, if Ahmed’s criticism of causal decision theory succeeds, evidential decision theory is undercut as well.

**Rachel Rudolph***Appearance Reports and the Acquaintance Inference*

Some assertions give rise to what Dilip Ninan calls the “acquaintance inference”: the inference that the speaker is acquainted with some individual. Discussion of the acquaintance inference has previously focused on assertions about aesthetics and personal taste (e.g. “The eclipse was sublime”), but it also arises with appearance reports (e.g. “Tom seems like he’s cooking”). Appearance reports give rise to variable acquaintance behavior, with no analog in the previously-discussed domains. I present experimental evidence that the acquaintance inference with appearance reports depends on the semantics of the clause embedded under the appearance verb “seem”; and I explain why this behavior makes sense given the evidential role of appearance reports. I also show how this result is relevant for extant proposals about the semantics of appearance reports.

**Michael J. Shaffer**

*Disjunction, Modality, and Uncertainty: A Solution to the Miners Paradox*

This paper presents a case for the claim that the Miners Paradox is not a paradox. This contention is based on some important observations about the nature of ignorance with respect to both disjunctions and conditional obligations.

**Nader Shoaibi**

*Logic and the Aim of Truth*

The idea that logic is in some sense normative for belief or reasoning is well-entrenched in philosophical tradition. According to a standard account, going back to Frege, while logic is to be understood independently from belief and reasoning (as essentially the study of truth preservation), it nevertheless has normative implications for belief in much the same way that any other science does: insofar as truth is the aim of belief, logic can tell us what we should and shouldn't believe. In this talk, I will attempt to get clear on exactly what this line of thought amounts to. My question is: Can we vindicate logic as having normative implications by appeal to facts about truth or falsity of our doxastic states? My conclusion is skeptical, but it is meant in a positive spirit, pointing the way to a more viable alternative.

**Paul Silva**

*A Bayesian Explanation of the Irrationality of Sexist and Racist Beliefs Involving Generic Content*

Various sexist and racist beliefs ascribe certain negative qualities to people of a given sex or race. Epistemic allies are people who think that in normal circumstances rationality requires the rejection of such sexist and racist beliefs upon learning of many counter-instances, i.e. members of these groups who lack the target negative quality. Accordingly, epistemic allies think that those who give up their sexist or racist beliefs in such circumstances are rationally responding to their evidence, while those who do not are irrational in failing to respond to their evidence by giving up their belief. This is a common view among philosophers and non-philosophers. But epistemic allies face three problems. First, sexist and racist beliefs often involve generic propositions. These sorts of propositions are notoriously resilient in the face of counter-instances. Second, background beliefs can enable one to explain away counter-instances to one's beliefs, thus making it rational to retain one's beliefs in generics in the face of many counter-instances. The final problem is that the kinds of judgements epistemic allies want to make about the irrationality of sexist and racist beliefs upon encountering many counter-instances is at odds with the judgements that we are inclined to make in seemingly parallel cases about the rationality of non-sexist and non-racist generic beliefs. Thus epistemic allies may end up having to give up on plausible normative supervenience principles. All together, these problems pose a significant *prima facie* challenge to epistemic allies. In what follows I explain how a Bayesian approach to the relation between evidence and belief can neatly untie these knots. The basic story is one of defeat: Bayesianism explains when one is required to become increasingly confident in chance propositions, and confidence in chance propositions can make belief in corresponding generics.

**Daniel Skibra**

*Propositions and the Content of Desire*

While philosophers disagree about whether or not intentional attitudes can have non-propositional content, even those philosophers who countenance non-propositional content for certain attitudes tend to think that desire contents are propositional. I challenge this consensus by pointing out an asymmetry between belief contents and desire contents. First of all, intuitions about belief contents tend towards eternalist contents, as arguments by Richard (1981) make clear, and fit in with a traditional, temporally absolute conception of propositions more broadly. By contrast, parallel arguments show desire contents to be temporally neutral. Secondly, the role of contents as specifying the satisfaction conditions of desires gives us further reason to suppose that desire contents are temporally neutral. Temporal absoluteness would prevent these contents from specifying their satisfaction conditions. I take these arguments to suggest that beliefs and desires differ systematically with respect to their content. If we are tempted by the traditional picture of propositions as temporally absolute, it would require us to think of desire contents as non- or sub-propositional.

**Rory Smead**

*Learning to Spite*

Spiteful behavior presents an evolutionary puzzle. Why would individuals incur costs to inflict harm on others? Thus far, evolutionary explanations have pointed toward relative advantages in certain small or structured populations. I present an alternative explanation: spite is a product of learning in strategic settings. To articulate this possibility, I first identify what kinds of learning will reliably lead to spiteful behavior in game theoretic contexts and argue that there is reason to believe that humans show learning tendencies consistent with these models. Finally, I present a model which suggests that such learning rules can be evolutionarily advantageous despite leading to detrimental behaviors such as spite.

**Andrew Smith**

*Re-visiting Quine on Truth by Convention*

In this paper, I critically evaluate two recent analyses of Quine's "Truth by Convention." In doing so, I aim to clarify Quine's views on both explicit and implicit linguistic convention. I first criticize Edward Becker's claim that the main point of Quine's famous regress argument is that explicit conventionalism about logic is circular. I argue instead that Quine's main point is that an explicit conventionalist must explicitly and consciously understand why every logical truth presupposed by a logical inference is true. I then criticize Jared Warren's claim in "Revisiting Quine on Truth by Convention" that Quine's argument against implicit conventionalism about logic fails. I argue Warren's argument is incomplete, since he at most establishes that syntactical rules of inference are implicit linguistic rules but does not explain why such implicit rules are linguistic conventions.

**Eric Snyder**

*How Not to Count 2 ½ Oranges*

If I begin with three oranges, cut one in half, discard one of the halves, and leave the remaining half on the table, how many oranges are on the table? Two and a half, right? But a half orange isn't an orange, so how can there be anything other than two or three oranges on the table. Nathan Salmon and others have used this puzzle – the Counting Oranges Puzzle – to motivate the contention that standard analyses of cardinality expressions within philosophy and linguistic semantics are fundamentally flawed: we do not count individuated objects, but rather measure quantities of stuff relative to some contextually-determined property. Though Salmon's puzzle does not actually show this, it is possible to construct a very similar puzzle – what I call the Measuring Oranges Puzzle – which purports to succeed where Salmon's puzzle fails. Ultimately, I argue this new version of the Puzzle undermines standard analyses only if a problematic analysis of 'many' is assumed, and so neither version of the Puzzle actually succeeds at its intended task.

**Erik Stei**

*How can more than one logic be correct?*

Whether or not logical pluralism – the view that there is more than one correct logic – is a controversial view depends, at least in part, on what is meant by the correctness of a logic. This talk explores how different notions of correctness relate to some core commitments of pluralism like (i) the plurality of logics and (ii) the potential for rivalry between those logics. I propose the following hypothesis: the more substantive the rivalry allowed by a given notion of correctness, the more controversial (and also the more interesting) the resulting pluralist position.

**Andrew Tedder**

*A Multi-Modal Interpretation of Descartes' Creation Doctrine*

Descartes' doctrine of the creation of eternal truths (the creation doctrine) seems to claim that there is a class of necessary truths which are, nevertheless, possibly false. In short, these are truths concerning the essences of created things, and so are necessary, and yet God, having full voluntary control over the creation of said essences as part of his voluntary control over creation in general, could have failed to create some essences or created them otherwise than he did. In this talk, I develop an interpretation according to which Descartes countenances two distinct modalities, one constrained by the actual essences God creates (inner modalities), and the other not so constrained (outer modalities). I present

textual evidence to support this reading and develop a model theory capturing the logical behaviour of the modalities. The upshot is that the creation doctrine is consistent, and that the consequence relation, restricted to the portion of the language not including the outer modalities, is that of S5 – so Descartes' modal metaphysics is not especially bizarre.

### **Rafael Ventura**

*Ambiguous Signals, Partial Beliefs, and Propositional Content*

Propositions are usually taken to help explain the behavior of rational agents. However, a closer look at signaling games suggests otherwise: rational agents often acquire partial beliefs, and many of their signals are ambiguous. Signaling games also suggest that it is rational for agents to mix their behavior in response to partial beliefs and ambiguous signals. But as I show in this paper, propositions cannot help explain the mixing behavior of rational agents. My suggestion is that we should abandon propositions in explanations of rational behavior and adopt instead a probabilistic notion of content.

### **Bruno Whittle**

*Truth and Generalized Quantification*

Kripke [1975] gives a formal theory of truth based on Kleene's strong evaluation scheme. It is probably the most important and influential that has yet been given – at least since Tarski. However, it has been argued that this theory has a problem with generalized quantifiers such as  $All(F, G)$ , i.e. all  $F$ s are  $G$ , or  $Most(F, G)$ . Specifically, it has been argued that such quantifiers preclude the existence of just the sort of language that Kripke aims to deliver, that is, one that contains its own truth predicate. In this paper I solve the problem: by showing how Kleene's strong scheme, and Kripke's theory that is based on it, can in a natural way be extended to accommodate the full range of generalized quantifiers.

### **Isaac Wilhelm**

*Comparative Structure*

The subset approach, a popular method for comparing the structures of mathematical objects, says that  $X$  has more structure than  $Y$  just in case  $X$ 's automorphisms form a proper subset of  $Y$ 's automorphisms. Though this approach gets some cases right, it gets many other cases wrong, some of which are relevant for comparing spacetime structure. The problem is that the subset approach compares automorphisms via the subset relation. So as I argue, a different approach is needed. Automorphisms should be compared via the 'isomorphic subgroup' relation.

### **Evan T. Woods**

*Many But ~~Almost~~ One*

The problem of the many threatens to show that, in general, there are far more ordinary objects than you might have thought. I present and motivate a solution to this problem using *many-one identity*. This paper accomplishes two tasks. First, it makes an initial case that an overlooked solution to the problem of the many is the best solution, or at least a solution that deserves additional attention. Second, it shows the versatility of many-one identity by showing how it can solve a problem it has not yet been applied to.