The 2022 Winter Meeting will be held as part of the meeting of the Central Division of
the American Philosophical Association. All ASL meeting participants must register for
the APA conference. Registration is at www.apaonline.org/page/2022C_regsitrationinfo.

The Central APA Meeting runs February 23-26, 2022 and includes other talks and
sessions of interest to logicians. The complete program will be available through the
website of the Central Division of the APA.

Thursday February 24, 9:00 AM– 12:00 PM

ASL Plenary Session I
Chair: TBD
9:00 – 9:50 Eileen Nutting (Kansas) Approaches to ordinal abstraction
10:00 – 10:50 Roy Cook (Minnesota) Notes towards a Kripke model of smooth
infinitesimal analysis
11:00 – 11:50 Sean Ebels-Duggan (Northwestern) Vagueness, specificity, and
mathematical structure

Thursday February 24, 7:15 PM– 10:15 PM

ASL Plenary Session II
Chair: TBD
7:15 – 8:05 Sun-Joo Shin (Yale) Peirce’s triadic logic: extension or deviation?
8:15 – 9:05 Michael Titelbaum (Wisconsin) The logical firmament
9:15 – 10:05 Timothy Bays (Notre Dame) Tennenbaum’s theorem, induction, and
the implicit definition of the natural numbers

Abstracts of invited plenary lectures

ROY COOK, Notes towards a Kripke model of smooth infinitesimal analysis.
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Smooth infinitesimal analysis (SIA) is an axiomatization of real analysis which includes
axioms that guarantee the existence of nilsquares: infinitesimals so “small” that,
although they fail to be identical to zero, their squares are identical to zero. These
axioms are inconsistent if one works within classical logic, but SIA has been shown to
be consistent within an intuitionistic setting via category-theoretic constructions. Un-
fortunately, the category-theoretic methods do not provide a good intuitive picture of
what the SIA continuum “looks like”. Thus, in this talk I will construct Kripke models
for SIA (as well as a number of subtheories of full SIA) - models which make apparent
the dynamic character of the SIA domain. The models in question, viewed from the
'classical' metatheory, display both indeterminacy of identity and non-constancy of
domain. Further, I will argue that the "intended" model of SIA (again, as seen from
the classical metatheory), is, in a certain sense, countably infinite.

▶ SEAN EBELS DUGGAN, Vagueness, specificity, and mathematical structure.
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Color predicates, to take a well-worn example, are vague. This patch of blue is more
purple than the second patch, but it is still blue. Keep this up and you’ll call purple
things blue, which they are not. But of course we could add another word, and say that
now we have blue, indigo, and purple. Adding “indigo” is an example of moving to a
language with greater specificity. But of course, the trouble repeats. What is curious is
that when characterizing vagueness, we often resort to further specification in order to
emphasize the vagueness. “Imagine a color which is just a shade darker than our original
sample”, etc. Additionally, in the case of color words, we are lucky, in that we can
move to a language of maximal specificity: the language of real numbers, interpreted
as reflective wavelengths. Something is lost in this move, of course, and it depends
on the very happy accident that colors are determined by reflective wavelengths. This
presentation will address several of the questions that arise in light of these observations.
Is there always a language of greater (or even maximal) specificity available? Does a
language of maximal specificity “disconnect” from the original language, in the way
that the language of real numbers disconnects from the color language? In particular,
we will address whether the structure of a dense linear order can be recovered from
predicates exhibiting the kind of vagueness we observe in color terms.

▶ EILEEN NUTTING, Approaches to ordinal abstraction.
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There are two general approaches to ordinal abstraction. On the first, ordinals are
abstracted from well-orderings. On the second, they are abstracted from elements po-
sitioned within such orderings. On either approach, avoiding the Burali-Forti Paradox
requires setting restrictions on the application of ordinal abstraction. Several such re-
strictions have been proposed. I will offer an alternative that can be applied to ordinal
abstraction on either approach, and I will argue that it is preferable to the restric-
tions in the literature. This alternative relies on Øystein Linnebo’s account of dynamic
abstraction.

▶ SUN-JOO SHIN, Peirce’s triadic logic: extension or deviation?.
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The talk has two goals: (i) to suggest a new way to understand Peirce’s triadic
logic and (ii) to raise the question of whether Peirce’s triadic logic is an extension of
or a deviation from classical logic. I classify Peirce’s six binary connectives, based on
the dominance among three values, V, F, and L. Then, they may be grouped into
three, depending on how the third value L is placed in the dominance hierarchy. (My
visual representation makes the issue clearer.) Where is Peirce’s triadic logic located
in a bigger picture, an extended standard logic or a non-standard logic? Traditionally,
many-valued logic is non-standard, hence, a deviation from classical logic. While
examining passages which seem to support the deviation view of Peirce’s new logic,
I beg you to resist the temptation to rush to that conclusion. Peirce’s discussion on
the third value \( L \) is rather nuanced. He says dyadic logic is defective (which is different from being incorrect) because dyadic logic “takes no heed of the limit between two realms.” Obviously, his new logic aims to cover the limit which traditional logic neglects to represent. Peirce draws our attention to the existence of “an intermediate ground” between both ends, i.e. “positive assertion and positive negation,” and wants to represent that middle area. According to this interpretation, Peirce’s triadic logic is an extension of classical logic, unlike other many-valued logics.

> MICHAEL TITELBAUM, *The logical firmament.*
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Rather than present new logical results, this talk concerns the metaphysics and epistemology of logic. How can we explain logical truths? When someone is ignorant of a logical truth, what specifically might they be ignorant of? Answers to these two questions usually focus on basic logical facts, like the definitions of connectives or simple valid inference patterns. But I identify another kind of fact, which I call a “catenary truth”, that may also figure in the answers. Previous epistemologies of logic ignore catenary truths, often to their detriment. I offer a new epistemology of logic that answers Benacerraf-style questions, avoids invoking intuitive faculties, and highlights an important contrast with other forms of a priori knowledge (such as moral knowledge).