The ERC Advanced Grant project ConLog is nearing successful completion

The ERC-funded project **Contradictory Logics: A Radical Challenge to Logical Orthodoxy (ConLog)** has been running since October 2021 and has obtained numerous results, achieving considerable insight into logical systems with provable contradictions. To give an impression of the project, here are the titles and abstracts of some representative research papers.

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2nd Workshop on Contradictory Logics

September 12-13, 2025

RUB RUHR UNIVERSITÄT BOCHUM

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Image: Group photo from 2nd Workshop on Contradictory Logics 2025.

What is a contradiction?

A contradiction is often understood to be the conjunction of a proposition and its negation, which shifts much of the discussion of provable contradictions to the notion of negation.

What is negation?

The answer to the question is controversial, but the logical systems considered in the ConLog project make use of established notions of negation, so that indeed provable contradictions are under consideration.

Inferring from negated conditionals connexively; an experimental investigation of a Boethian inference

Edoardo Canonica[†]

Abstract. In his sixth-century commentary on Cicero's Topics, Boethius presents four examples of what he takes to be valid inferences involving a negated conditional, the form of which we generalise informally as "if $\sim(A \rightarrow B)$ and A, then $\sim B$". We argue that Boethius' endorsement of these inferences provides evidence of his likely endorsement of reversed variants of Boethius' Thesis, e.g. $\sim(A \rightarrow B) \rightarrow (A \rightarrow \sim B)$, a principle which is validated by some connexive logics, however, it is classically invalid. It has furthermore been claimed that connexively valid principles are not only highly intuitive, but that human reasoning can plausibly be characterised as connexive in virtue of this. We investigate the first part of this claim via an experiment in which participants infer outcomes of a simulated game. We conclude that there is good evidence for the intuitiveness of inferences along the lines of reversed variants of Boethius' Thesis.

Canonica, E. (forthcoming) 'Inferring from negated conditionals connexively; an experimental investigation of a Boethian inference', *Synthese*.

On the provable contradictions of the connexive logics C and C3

Satoru Niki and Heinrich Wansing

Abstract. Despite the tendency to be otherwise, some non-classical logics are known to validate formulas that are invalid in classical logic. A subclass of such systems even possesses pairs of a formula and its negation as theorems, without becoming trivial. How should these provable contradictions be understood? The present paper aims to shed light on aspects of this phenomenon by taking

the constructive connexive logic **C** and its non-constructive extension **C3** as samples. The topics covered in this paper include: how new contradictions are found from provable contradictions; how to find constructive provable contradictions in C3; how contradictions can be seen from the viewpoint of strong implication; and generating provable contradictions in C3.

Niki, S. and Wansing, H. (2023) 'On the provable contradictions of the connexive logics **C** and **C3**', *Journal of Philosophical Logic*, 52 (2023), pp. 1355–1383. doi: 10.1007/s10992-023-09709-4.

Varieties of negation and contra-classicality in view of Dunn semantics

Hitoshi Omori and Heinrich Wansing

Abstract. In this paper, we discuss J. Michael Dunn's foundational work on the semantics for first-degree entailment logic (**FDE**), also known as Belnap-Dunn logic (or Sanjaya-Belnap-Smiley-Dunn Four-valued Logic, as suggested by Dunn himself). More specifically, by building on the framework due to Dunn, we sketch a broad picture towards a systematic understanding of *contra-classicality*. Our focus will be on a simple propositional language with negation, conjunction, and disjunction, and we will systematically explore variants of **FDE**, **K3** and **LP** by tweaking the falsity condition for negation.

Omori, H. and Wansing, H. (2022) 'Varieties of negation and contra-classicality in view of Dunn semantics', in: Katalin Bimbó (ed.), *Relevance Logics and other Tools for Reasoning. Essays in Honour of Michael Dunn*, College Publications, London, pp. 309–337. doi: 10.13154/294-10519.

On the completeness of some first-order extensions of C

Grigory K. Olkhovikov

Abstract. We show the completeness of several Hilbert-style systems resulting from extending the propositional connexive logics **C** and **C3** by the set of Nelsonian quantifiers, both in the

varying domain and in the constant domain setting. In doing so, we focus on countable signatures and proceed by variations of Henkin construction. In addition, we consider possible extensions of C and C3 with a non-Nelsonian universal quantifier preserving a specific rapport between the interpretation of conditionals and the interpretation of the universal quantification, which is visible in both intuitionistic logic and Nelson's logic but is lost if one adds the Nelsonian quantifiers on top of the propositional basis provided by C and C3. We briefly explore the completeness systems resulting from adding this non-Nelsonian quantifier either together with the Nelsonian ones or separately to the two propositional connexive logics.

Olkhovikov, G.K. (2023) 'On the completeness of some first-order extensions of C', *Journal of Applied Logics - IfCoLog Journal*, 10(1), pp. 57–114. doi: 10.13154/294-9815.

Logical multilateralism

Heinrich Wansing and Sara Ayhan

Abstract. In this paper, we will consider the existing notions of bilateralism in the context of proof-theoretic semantics and propose, based on our understanding of bilateralism, an extension to logical multilateralism. This approach differs from what has been proposed under this name before in that we do not consider multiple speech acts as the core of such a theory, but rather multiple consequence relations. We will argue that for this aim, the most beneficial proof-theoretical realisation is to use sequent calculi with multiple sequent arrows satisfying some specific conditions, which we will lay out in this paper. We will unfold our ideas with the help of a case study in logical tetralateralism and present an extension of Almukdad and Nelson's propositional constructive four-valued logic by unary operations of meaningfulness and nonsensicality. We will argue that in sequent calculi with multiple sequent arrows, it is possible to maintain certain features that are desirable if we assume an understanding of the meaning of connectives in the spirit of proof-theoretic semantics. The use of multiple sequent arrows will be justified by the presence of congruentiality-breaking unary connectives.

Wansing, H. and Ayhan, S. (2023) 'Logical multilateralism', *Journal of Philosophical Logic*, 52, pp. 1603–1636. doi: 10.1007/s10992-023-09720-9.

Double negation as minimal negation

Satoru Niki

Abstract. N. Kamide introduced a pair of classical and constructive logics, each with a peculiar type of negation: its double negation behaves as classical and intuitionistic negation, respectively. A consequence of this is that the systems prove contradictions but are non-trivial. The present paper aims at giving insights into this phenomenon by investigating subsystems of Kamide's logics, with a focus on a system in which the double negation behaves as the negation of minimal logic. We establish the negation inconsistency of the system and embeddability of contradictions from other systems. In addition, we attempt at an informational interpretation of the negation using the dimathematical framework of H. Wansing.

Niki, S. (2023) 'Double negation as minimal negation', *Journal of Logic, Language and Information*, 32(5), pp. 861–886. doi: 10.1007/s10849-023-09413-1.

Bi-connexive logic, bilateralism, and negation inconsistency

Heinrich Wansing, Satoru Niki and Sergey Drobyshevich

Abstract. In this paper, we study logical bilateralism understood as a theory of two primitive derivability relations, namely provability and refutability, in a language devoid of a primitive toggling negation and without a falsum constant, ⊥, and a verum constant, ⊤. There is thus no negation that toggles between provability and refutability, and there are no primitive constants that are used to define an "implies falsity" negation and a "co-implies truth" co-negation. This reduction of expressive power notwithstanding, there remains some interaction between provability and refutability due to the presence of (*i*) a conditional and the refutability condition of conditionals and (*ii*) a co-implication and the provability condition of co-implications. Moreover, assuming a hyperconnexive understanding of refuting conditionals and a dual understanding of proving co-implications, neither non-trivial negation inconsistency nor hyperconnexivity is lost for unary negation connectives definable by means of certain surrogates of falsum and verum. While a critical attitude towards ⊥ and ⊤ can be justified by problematic aspects of the Brouwer-Heyting-Kolmogorov interpretation of the logical operations for these constants, the aim is to reduce the availability of a toggling negation and observations on undefinability may also give further reasons to abandon ⊥ and ⊤.

Wansing, H., Niki, S. and Drobyshevich, S. (2025) 'Bi-connexive logic, bilateralism, and negation inconsistency', *Review of Symbolic Logic*, published online 12 March 2025. doi: 10.1017/S1755020324000248.
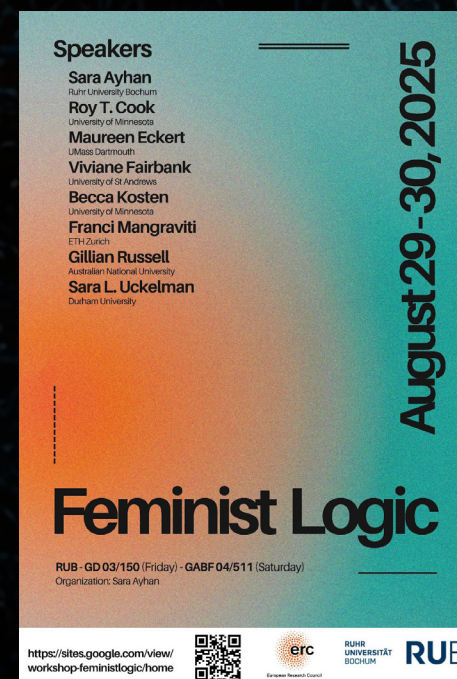
Abelian logic on the Bochum Plan (and the American Plan as well)

Satoru Niki and Heinrich Wansing

Abstract. In this paper, we introduce two new semantic presentations of Abelian logic: the non-trivial negation inconsistent logic of Abelian lattice-ordered groups, which was independently developed by Ettore Casari and by Robert Meyer and John Slaney. Abelian logic is presented through a methodology that combines elements of what is sometimes referred to as the "Bochum Plan" and the "American Plan." While the Bochum Plan is an approach to defining contra-classical logics, the American Plan– developed by Nuel Belnap and Michael Dunn–in particular offers a conception of negation that invites an application of the Bochum Plan. The first semantics is a ternary frame Kripke semantics, and the second is based on ideas from Edwin Mares' work. Thereby emerges a condition for the falsity of Abelian implication to be supported, which we analyse further in the separate context of the first-degree entailment logic. The perspectives are united in the end to provide a defence against the scepticism concerning the status of the Abelian negation as a negation.

Niki, S. and Wansing, H. (2025) 'Abelian logic on the Bochum Plan (and the American Plan as well)', *Studia Logica*, published online 13 September 2025. doi: 10.1007/s11225-025-10208-7.

Speakers

Sara Ayhan — Ruhr University Bochum
Roy T. Cook — University of Minnesota
Maureen Eckert — UMass Dartmouth
Viviane Fairbank — University of St Andrews
Becca Kosten — University of Minnesota
Franci Mangraviti — ETH Zurich
Gillian Russell — Australian National University
Sara L. Uckelman — Durham University

Feminist Logic

August 29-30, 2025

RUB · GD 03/150 (Friday) · GABF 04/511 (Saturday)
Organization: Sara Ayhan

https://sites.google.com/view/workshop-feminist-logic/home

Feminist logic

An unexpected turn the project took within the subproject focusing on the philosophical aspects of contradictory logics was the development of an approach related to feminist logic. Broadly speaking, feminist logic sheds light on sexist (and other) biases in the area of logic. More specifically, this can mean to use logical tools for feminist ends, e.g. to uncover biases in arguments or to model social hierarchies to make patriarchal structures explicit; to look at the history of logic from a feminist perspective, e.g. by revealing so far disregarded contributions by female logicians and exposing exclusionary practices that led to their invisibility; or to consider teaching practices in logic and how those disadvantage certain underrepresented groups.

One specific approach concentrates on analysing logical systems with respect to structural features that may perpetuate sexism and oppression or, on the other hand, features that may be helpful for resisting and opposing these social phenomena. Upon this assumption, we started to investigate possible applications of queer feminist views on (philosophy of) logic with respect to contradictory logics. Our aim is to show that, on the one hand, the formal set-up of contradictory logics makes them well-suited from the perspectives of feminist logic and, on the other hand, that queer feminist theories provide a relevant, and so far undeveloped, conceptual motivation for contradictory logics. On a large scale, non-trivial negation inconsistent logics have still received little recognition. Applying well-motivated contradictory logics to reasoning about queer feminist issues may prove fruitful both as a 'real-life' motivation for these logical systems and as a formal basis for a philosophical field that is still characterised by a distrust of formalism.

A first publication is: Ayhan, S. (2025): Queer feminist logic and contradictions: Or how logic and feminism can be relevant to each other, *Synthese* 206, doi: 10.1007/s11229-025-05220-2.

Find out more about ConLog

https://sites.google.com/view/contradictory-logics/

https://cordis.europa.eu/project/id/101018280

ConLog
Contradictory Logics: A Radical Challenge to Logical Orthodoxy

PROJECT SUMMARY

ConLog investigates non-trivial logical systems in which certain contradictions are provable. The aim is to develop a clear comprehension of the contradictoriness of these logics and to study the consequences of this understanding within the philosophy of logic. Thereby, the project will yield a paradigm shift in our conception of what a respectable logical system and an acceptable scientific theory are.

PROJECT LEAD PROFILE

Heinrich Wansing is a professor of Logic and Epistemology at the Ruhr University Bochum. Before that, he was a professor at TU Dresden (1999–2010). He is the (co-)author of five monographs and numerous articles on topics from philosophical logic. Moreover, he is the editor-in-chief of the book series *Trends in Logic* (Springer) and a managing editor of the journal *Studia Logica*.

FUNDING