

A radical breach with Aristotle

The European Research Council (ERC) is funding research into contradictory logics with two million euros.

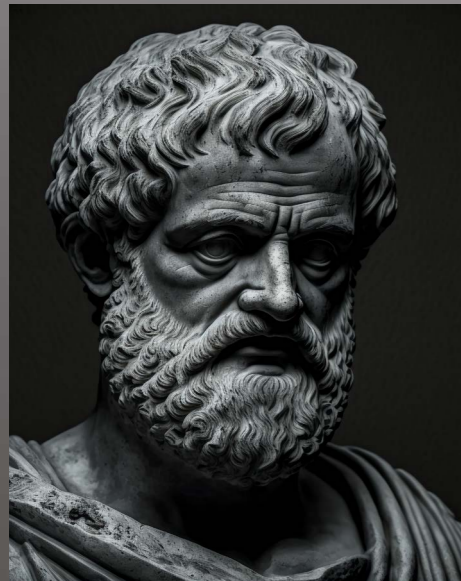


Figure 1: Adobe Stock: Aristotle © Worldillustrator. Generated with AI.

For Aristotle, it was the most certain of all principles and needed no further justification: no declarative sentence (or proposition or statement) is both true and false. If the negation of a proposition expresses its falsity, and the proof of a proposition guarantees its truth, then it should be impossible for proposition *A* and its negation, $\sim A$, both to be provable.

An international team of researchers led by Professor Heinrich Wansing at the Ruhr University Bochum (Germany) is radically breaking with Aristotle and researching logical systems that contain provable contradictions. The project 'Contradictory Logics: A Radical Challenge to Logical Orthodoxy' (ConLog), cordis.europa.eu/project/id/101018280, is funded by the ERC with a two million euro ERC Advanced Grant. The ERC's mission is to fund "high-risk/high-gain research". The benefit of a project is expected to be so high that it is worth the considerable risk taken in carrying it out. The risk for the ConLog project appears to be very high indeed, and its goals are ambitious. As Nicholas Rescher and Robert Brandom (*The Logic of Inconsistency*, Basil Blackwell, Oxford, 1980) remarked:

“

Since Aristotle's days, virtually all logicians and logically concerned philosophers in the mainstream of the Western tradition have had a phobia of inconsistency. They have been near to unanimous in proscribing it from the precincts of their logical and ontological theorising, holding that toleration of inconsistencies would inevitably bring cognitive disaster in its wake.”

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Professor Graham Priest,
City University of New York and International
Research Fellow at Ruhr University Bochum:
There are true contradictions.

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.

Professor Wansing's research team is trying to gain a deeper understanding of these provable contradictions. The logics investigated are not *ad hoc* and have not been fabricated artificially just in order to obtain examples of non-trivial contradictory logics. Rather, it turns out that it is possible to arrive at non-trivially contradictory, so-called 'negation inconsistent' logics in a completely natural way. A key to understanding certain such logics is what the Mexican philosopher Luis Estrada-González has called *The Bochum Plan*, alluding to the investigations at the Ruhr University Bochum. Unconventional, but by no means unnatural, conceptions

of the falsification of sentences of a certain type can lead almost immediately to provable contradictions.


It is largely uncontroversial to derive the conjuncts A and B from a conjunction A and B ($A \ \& \ B$). Accordingly, both A and $\sim A$ can be derived from a contradiction $A \ \& \ \sim A$, and thus the statements *If* ($A \ \& \ \sim A$), *then* A (abbreviated as $(A \ \& \ \sim A) \rightarrow A$) and *If* ($A \ \& \ \sim A$) *then* $\sim A$ ($(A \ \& \ \sim A) \rightarrow \sim A$) are provable. If it is now assumed, in deviation from classical logic, that an implication *If* A , *then* B is falsified just in case *If* A , *then* $\sim B$ is verified, then the negation $\sim((A \ \& \ \sim A) \rightarrow A)$ of $(A \ \& \ \sim A) \rightarrow A$ says as much as $(A \ \& \ \sim A) \rightarrow \sim A$ and the two contradictory statements $(A \ \& \ \sim A) \rightarrow A$ and $\sim((A \ \& \ \sim A) \rightarrow A)$ are both provable.

To make sense of the provability of contradictions, it seems necessary to develop a fundamentally new understanding of logic. For the founder of modern formal logic, Gottlob Frege, logic investigates “the most general laws of being true”, and with the Aristotelian banishment of contradictions, it is then

fundamentally misguided to work with logical systems that contain provable and hence logically valid contradictions. Frege’s metaphysical understanding of logic as a discipline that investigates the laws of being true is contrasted by the ConLog researchers with a view according to which logic is a discipline that investigates the laws of information flow. If contradictions are provable, then certain contradictory information is inescapably given. While Priest advocates a metaphysical theory of so-called ‘dialetheism’, according to which there are true contradictions, Wansing advocates ‘dimathematism’, according to which it is theoretically rational to assume that certain contradictory information is unavoidable. Both approaches propagate paraconsistency: it is by no means the case that arbitrary statements follow from contradictory assumptions, and the banishment of all contradictions for fear of trivialisation is therefore unfounded. However, the view that logic is dedicated to the study of the flow of information avoids a metaphysical commitment to the existence of *true* contradictions.

6th - 8th of December 2023

1st Workshop on Contradictory Logics
Ruhr Universität Bochum






Speakers

- Marta Bilková [Czech Academy of Sciences, Prague]
- Amnon Avron [Tel Aviv University] (online)
- Norihiro Kamide [Teikyo University]
- George Metcalfe [University of Bern] (online)
- Hitoshi Omori [Tohoku University]
- Graham Priest [CUNY, University of Melbourne, RUB]
- Yaroslav Shramko [Kryvyi Rih State Pedagogical University]
- Jan Sprenger [University of Turin] (online)

Website: <https://sites.google.com/view/1stworkshoponcontradictorylogi/home> Email: sara.ayhan@rub.de

The workshop is organized by the ERC Advanced Grant Project ConLog: Contradictory Logics - A Radical Challenge to Logical Orthodoxy : Heinrich Wansing, Sara Ayhan, Caitlin Canonica, Satoru Niki, Grigory Olkhovikov, Daniel Skurt


Professor Heinrich Wansing,
Ruhr University Bochum:
There are provable contradictions.

PROJECT NAME

Contradictory Logics:
A Radical Challenge to
Logical Orthodoxy
(ConLog)

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 is.

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*.



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