Title: Ontic Structural Realism and Quantum Mechanics

Speakers: James Ladyman

Series: Quantum Foundations

Date: May 28, 2021 - 11:00 AM

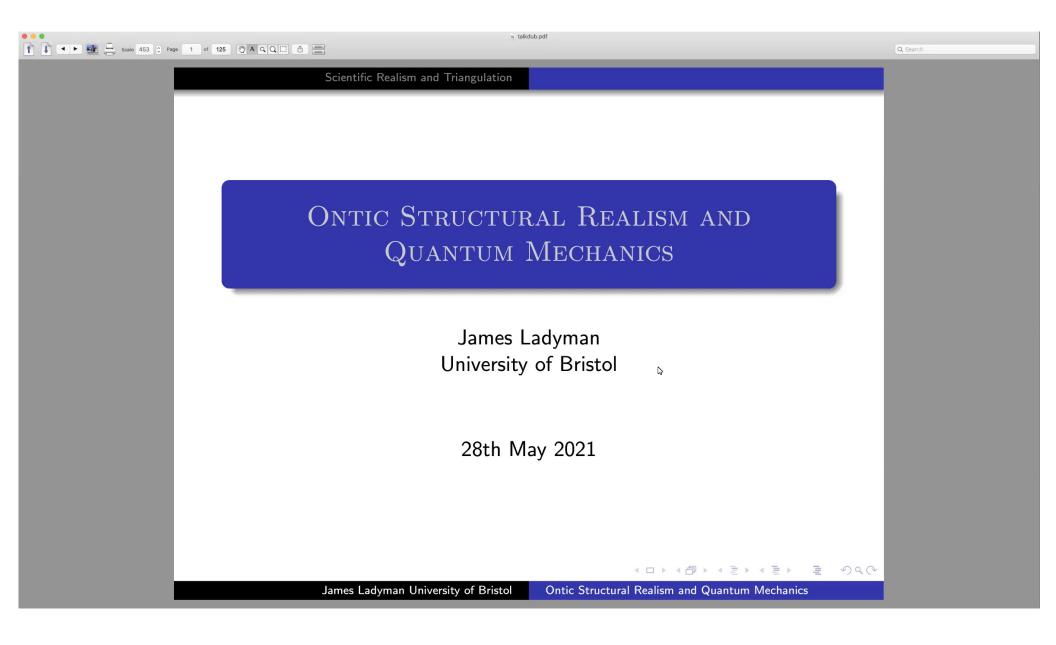
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Abstract: Ontic structural realism is a form of scientific realism based on quantum mechanics in two ways:

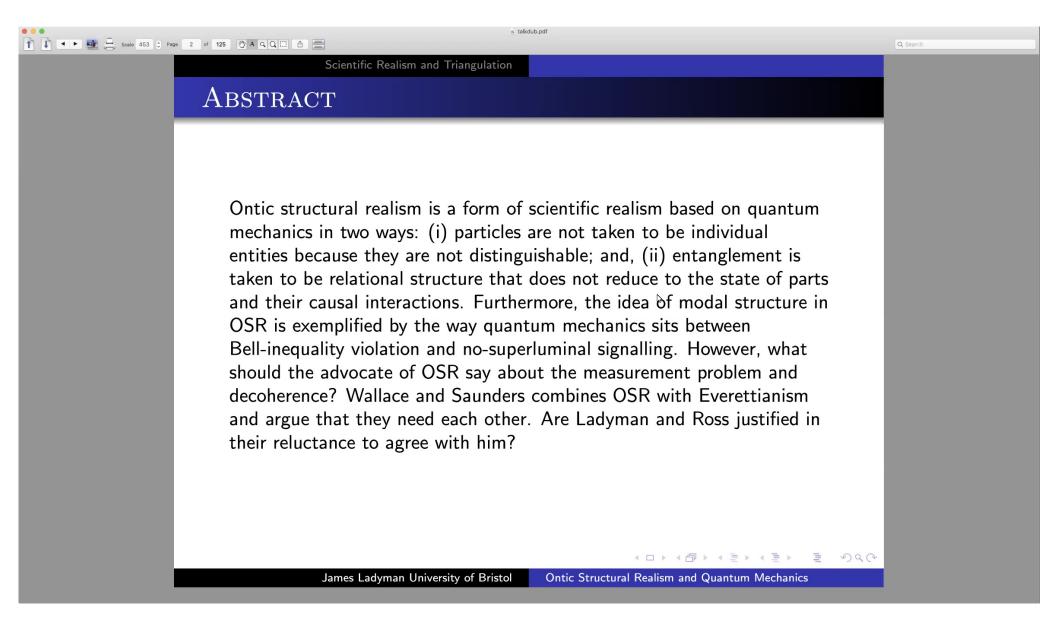
(i) particles are not taken to be individual entities because they are not distinguishable; and, (ii) entanglement is taken to be relational structure that does not reduce to the state of parts and their causal interactions.

Furthermore, the idea of modal structure in OSR is exemplified by the way quantum mechanics sits between Bell-inequality violation and no-superluminal signalling. However, what should the advocate of OSR say about the measurement problem and decoherence? Wallace and Saunders combines OSR with Everettianism and argue that they need each other. Are Ladyman and Ross justified in their reluctance to agree with him?

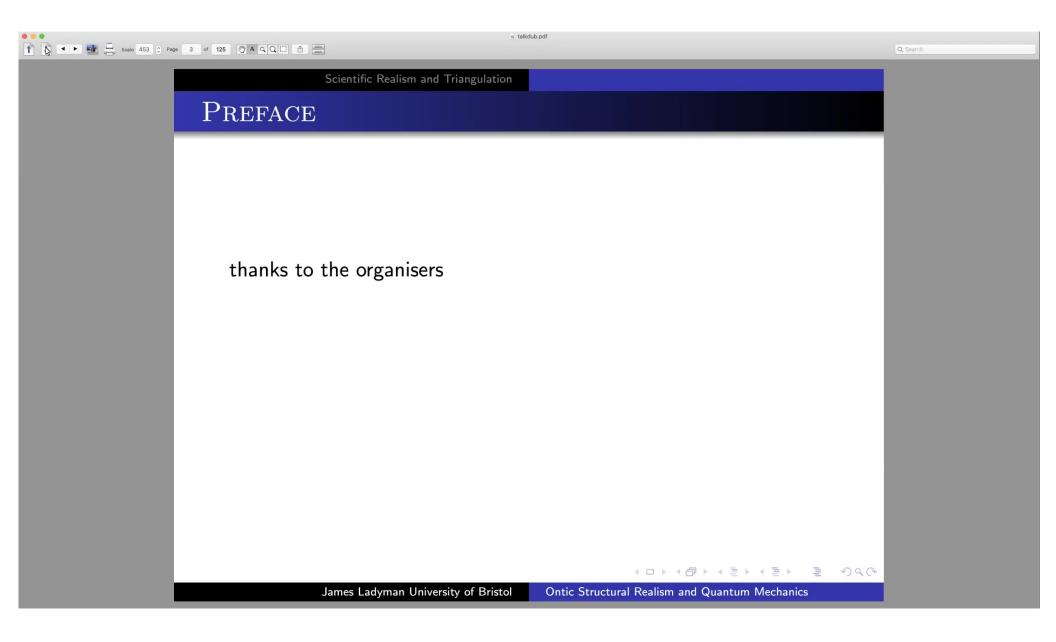
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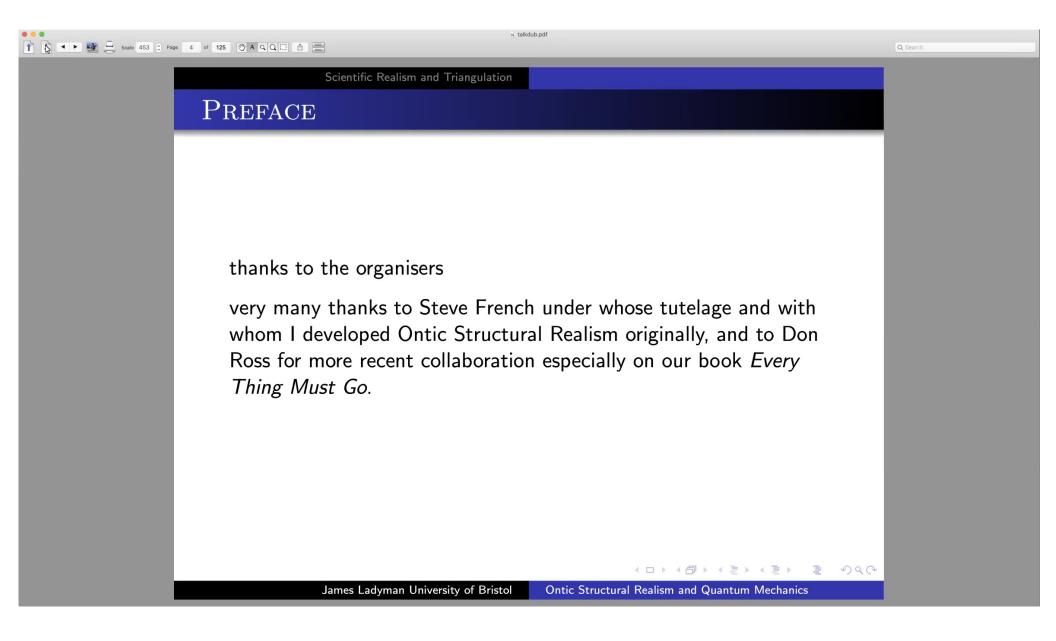
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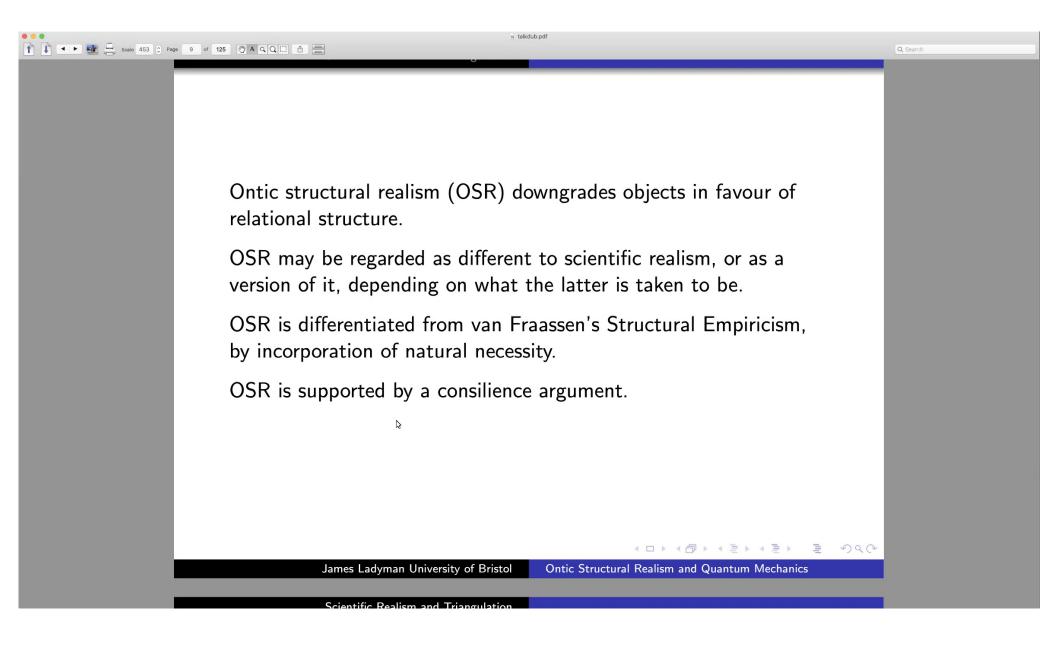
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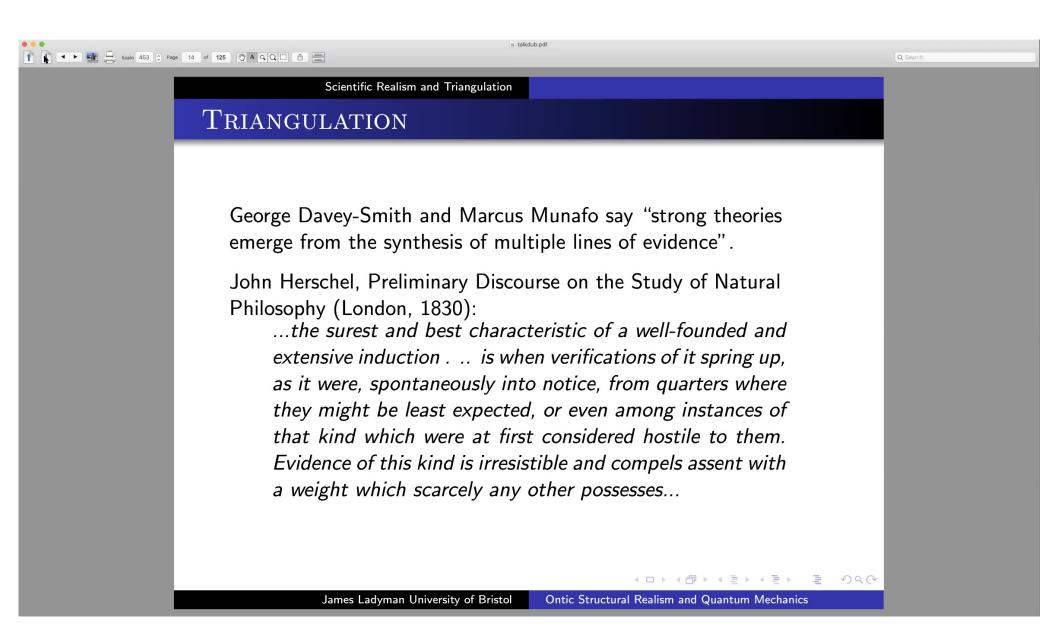
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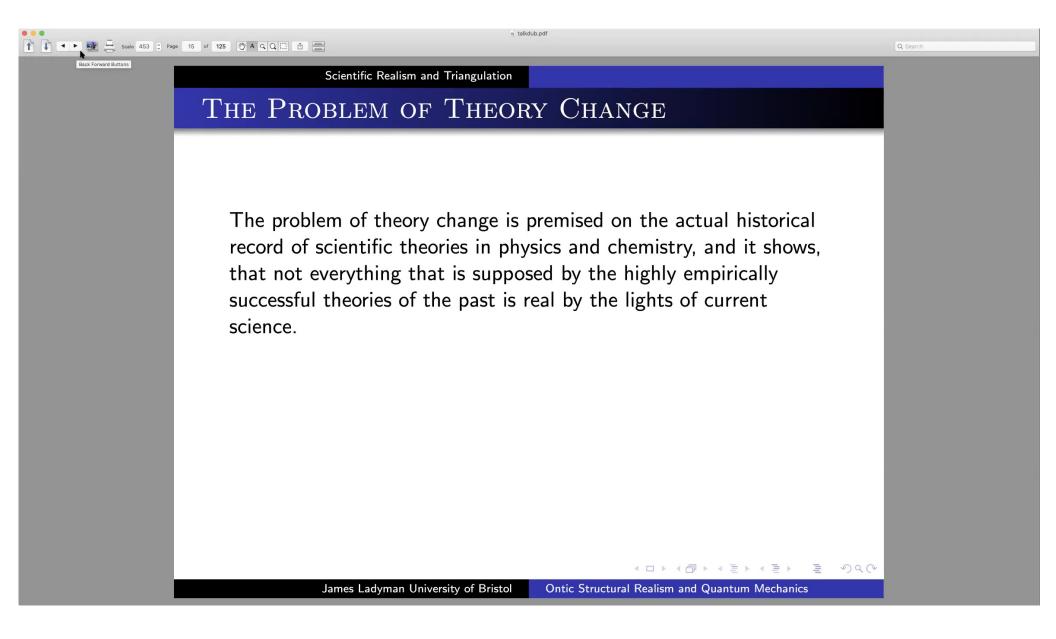
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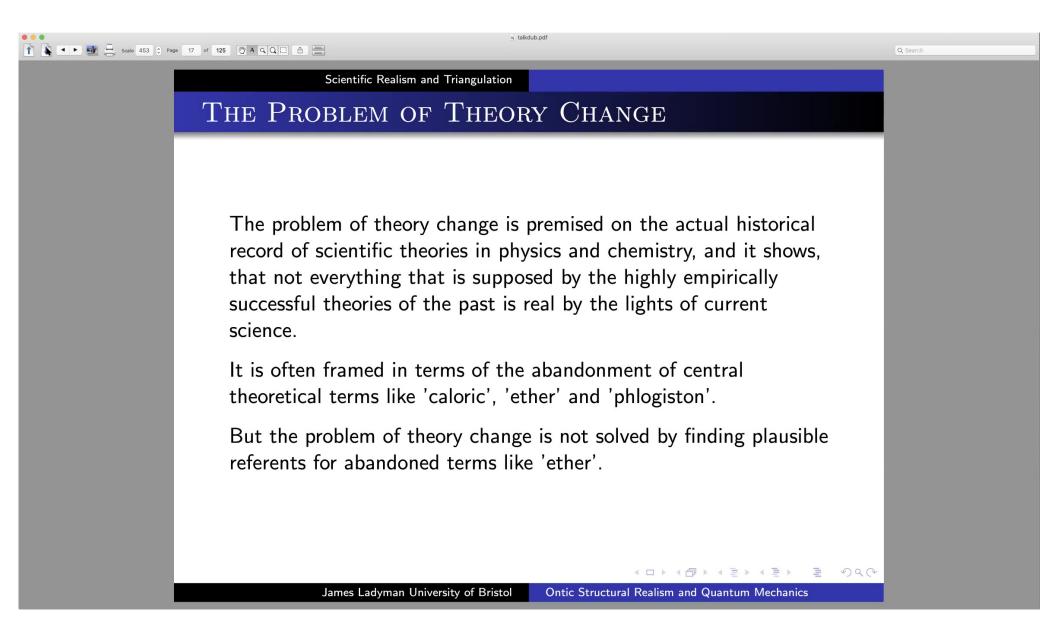
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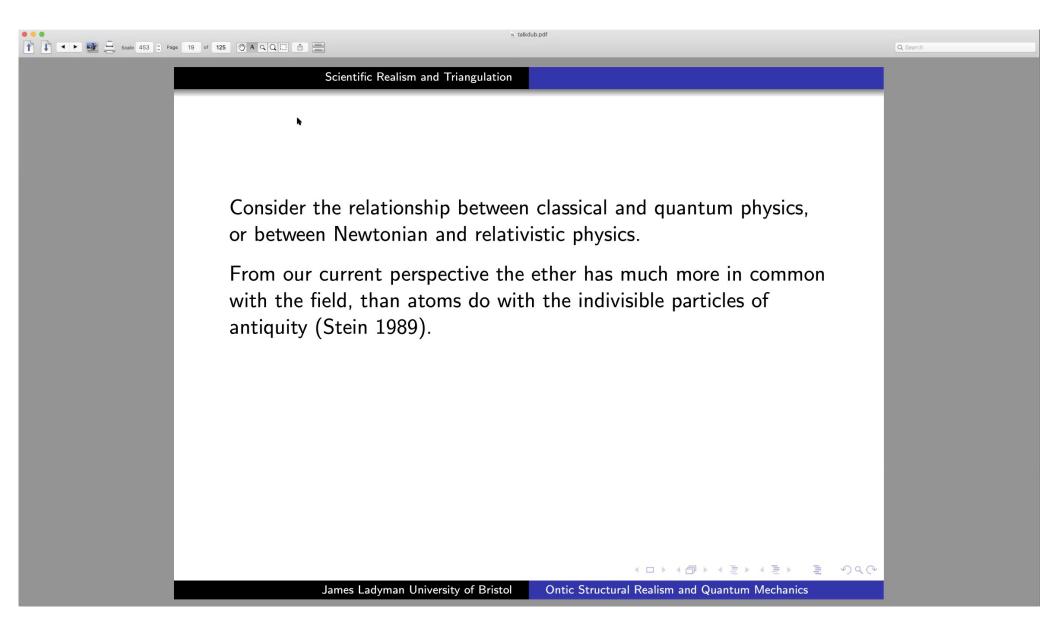
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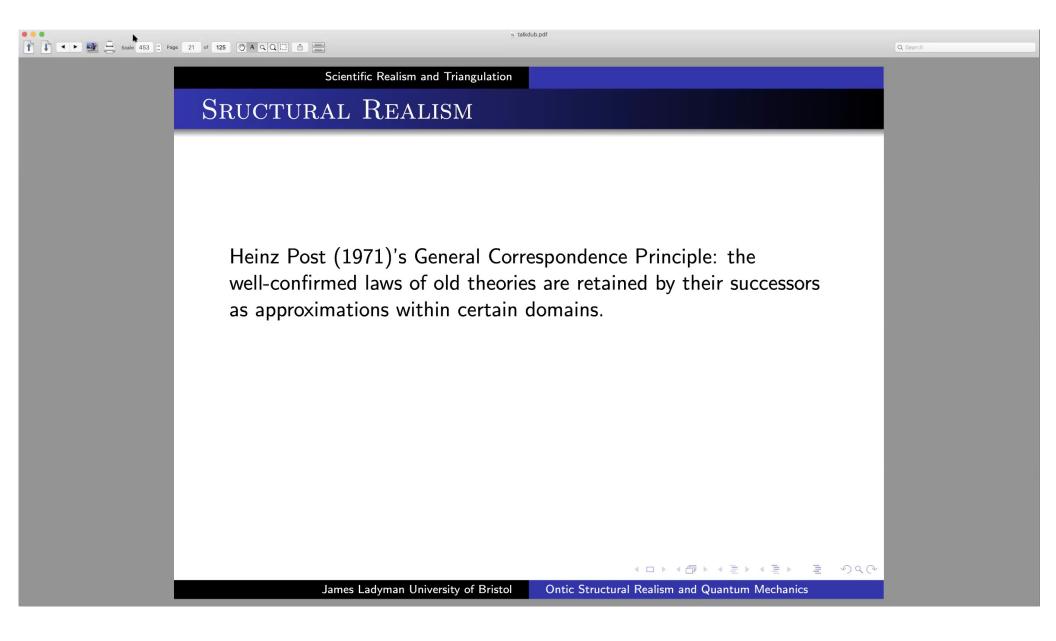
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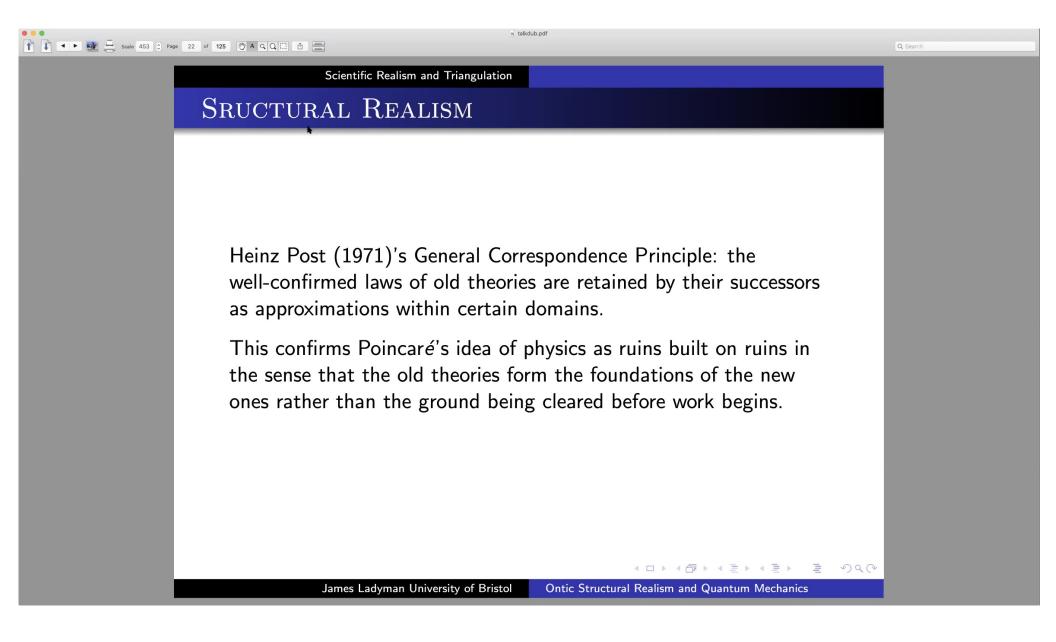
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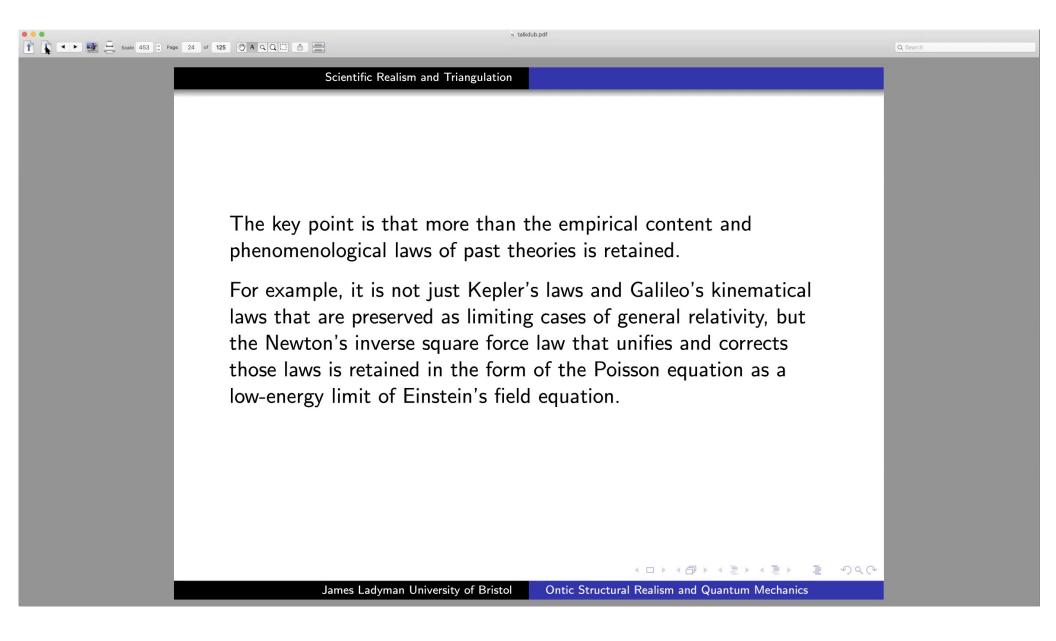
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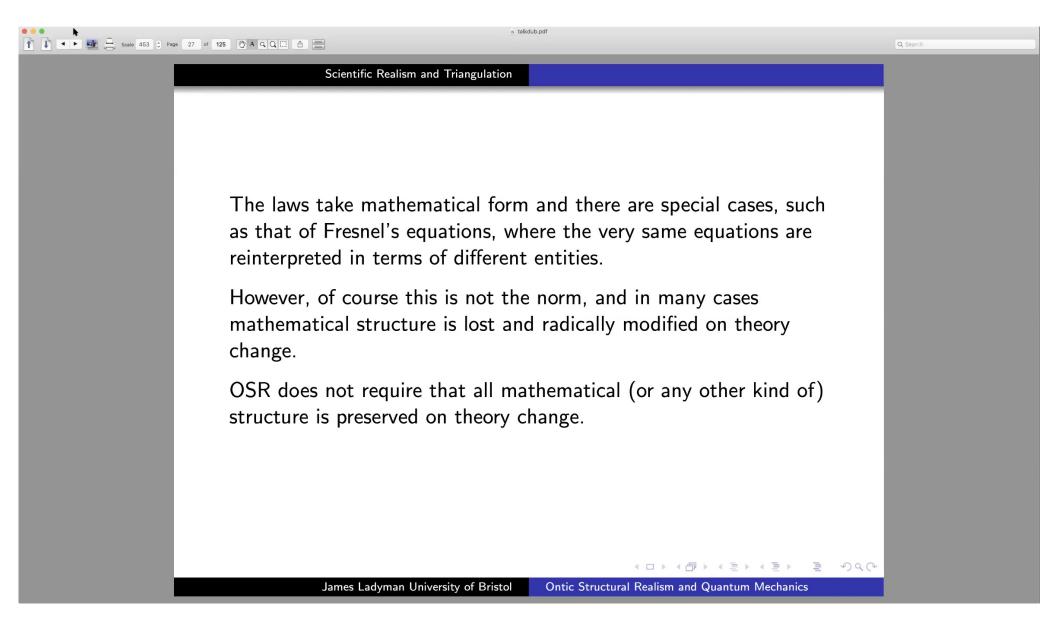
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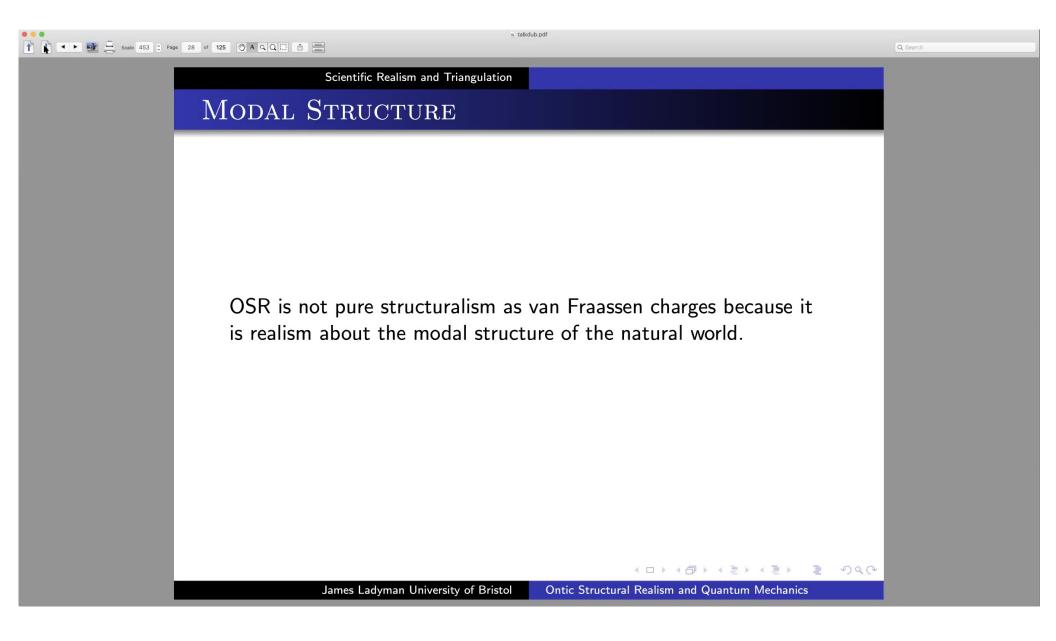
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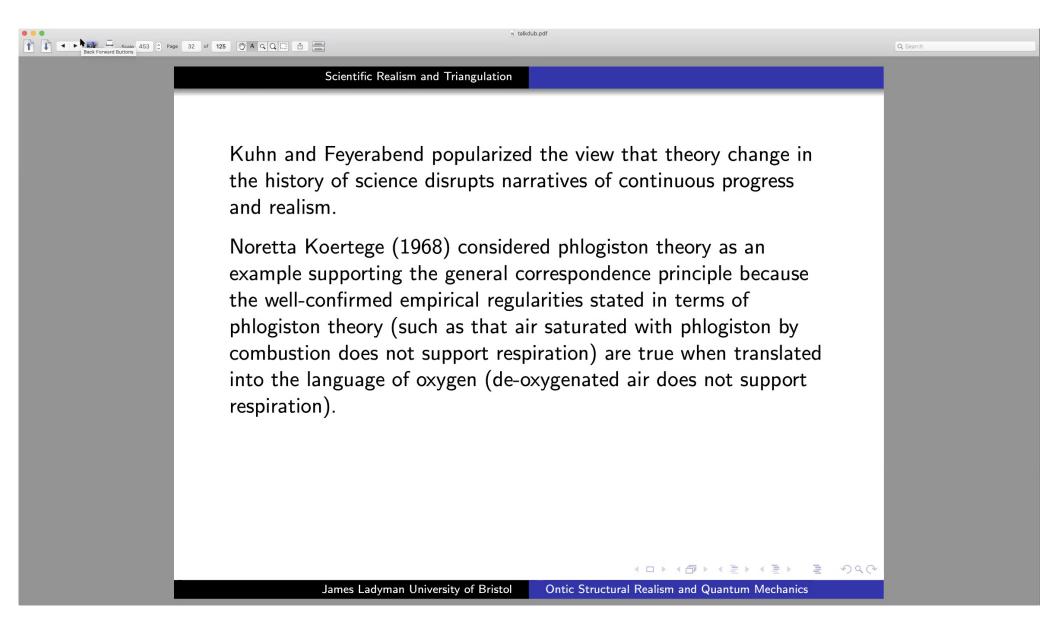
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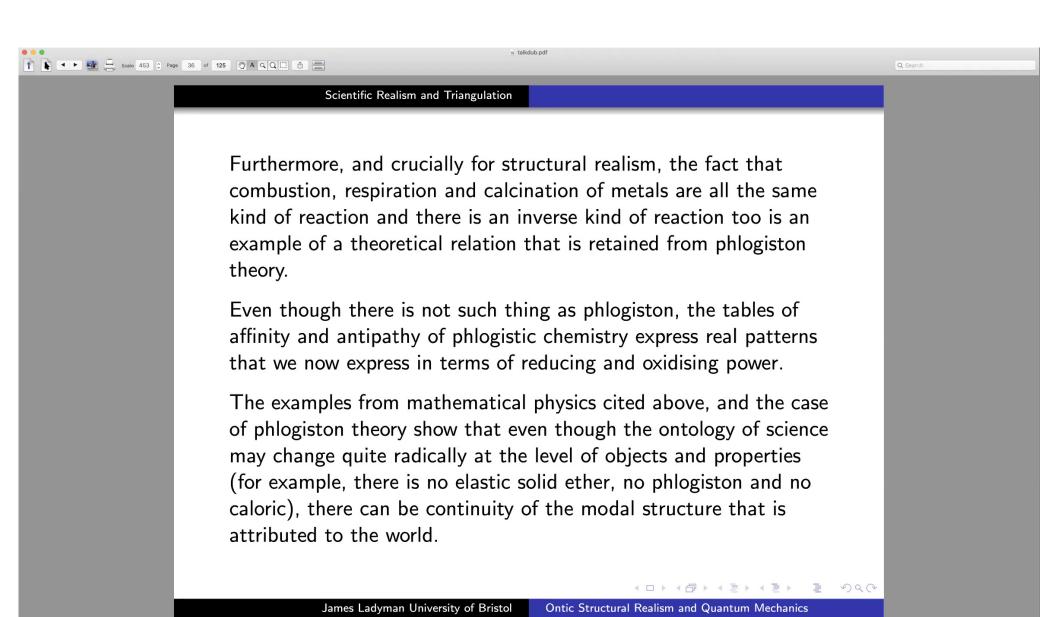
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Scientific Realism and Triangulation

## SELECTIVE REALISM

Stathis Psillos (1999), sought to solve the problem of theory change by what David Papineau dubbed 'selective realism' (1996), which involves analyzing case studies from the history of science to find a formula that restricts the epistemic commitment of scientific realists to parts of theories that will be retained.

The idea is that close examination of the history of science will reveal what it is about abandoned theoretical constituents that distinguishes them from those that are retained, so that a selective commitment to current theories can be then be applied in the confidence that the relevant ontology will not subsequently be abandoned.

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## Scientific Realism and Triangulation

## ONTIC STRUCTURAL REALISM AS TRIANGULATION

Worrall framed structural realism is epistemic terms following Poincaré who said we can only know relations.

Worrall was concerned with the scientific realism debate in general philosophy of science, but French wanted a form of realism that could account for the problems of identity and individuality in quantum physics and spacetime physics.

Physics is highly mathematicised as described by Max Planck.

Quantum mechanics seems to involve relations that do not supervene.

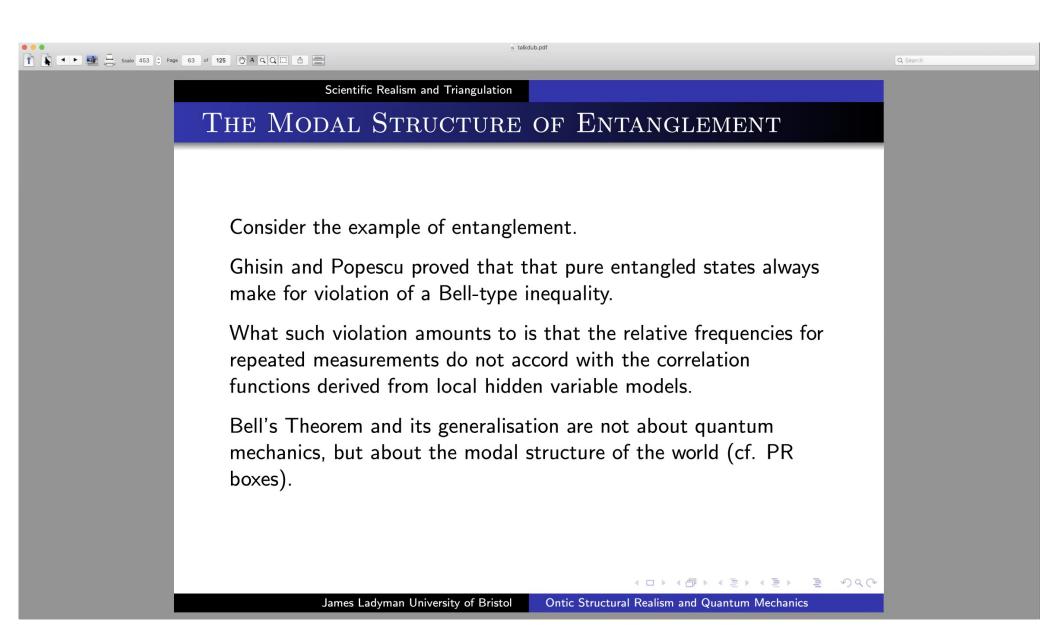
OSR in the philosophy of physics involves inflating the ontological priority of relational structure and can be applied also to spacetime physics or quantum field theory.

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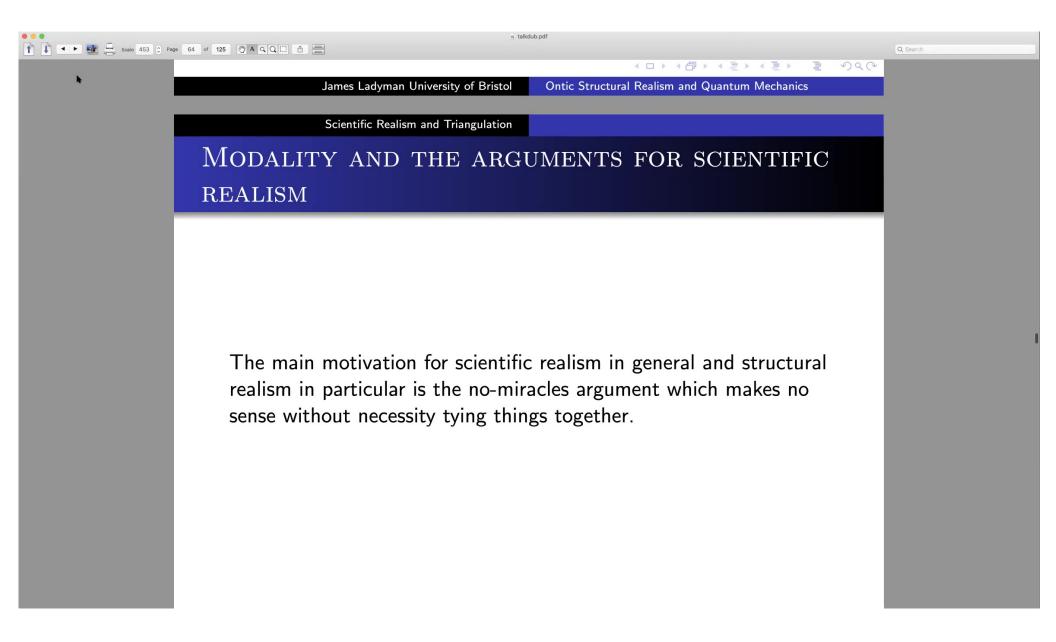
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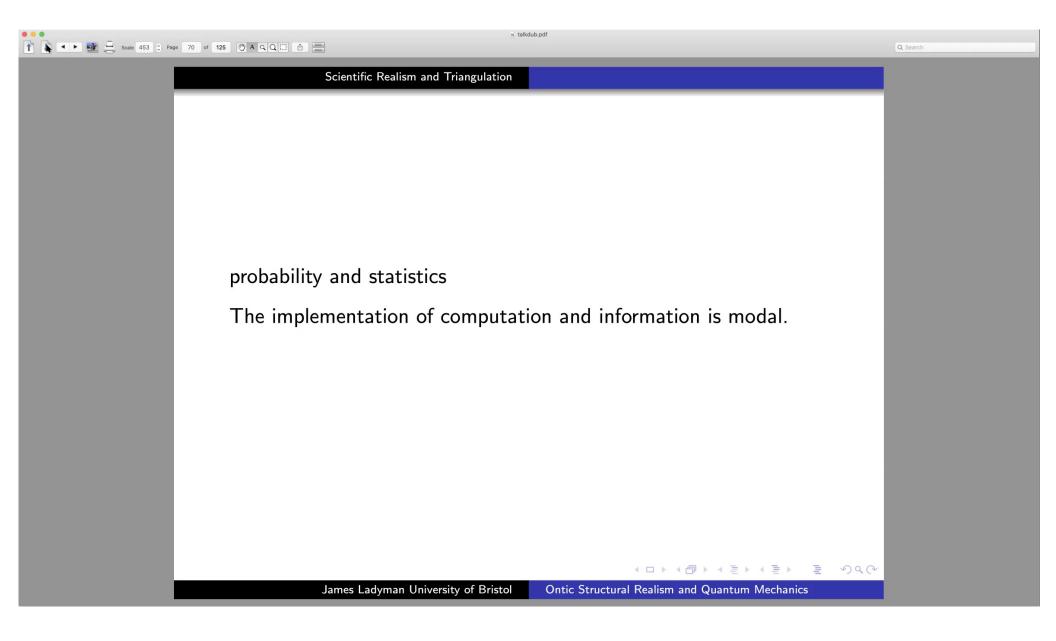
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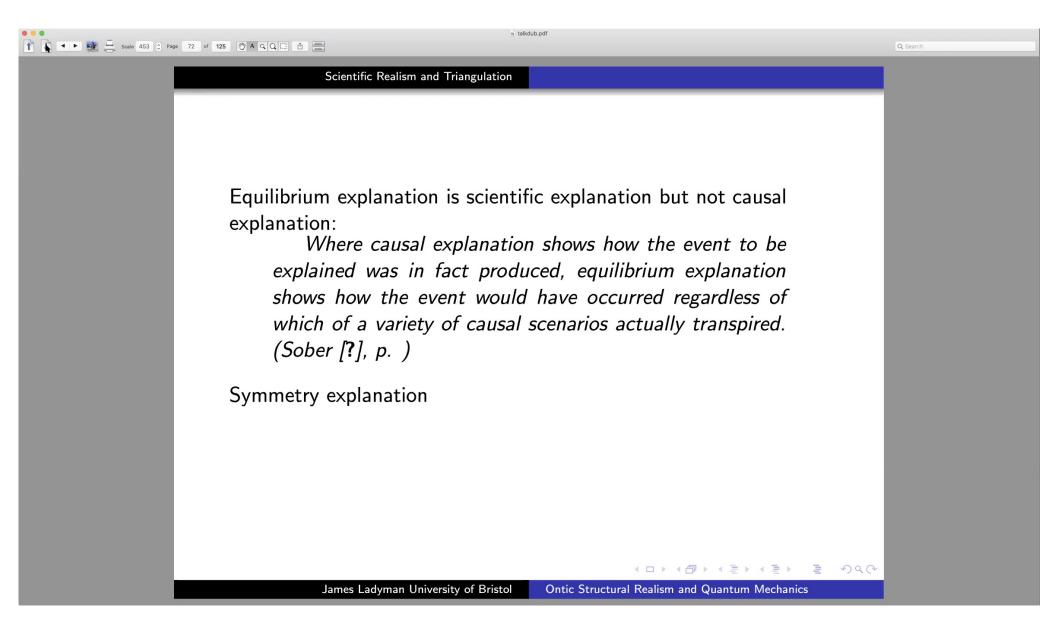
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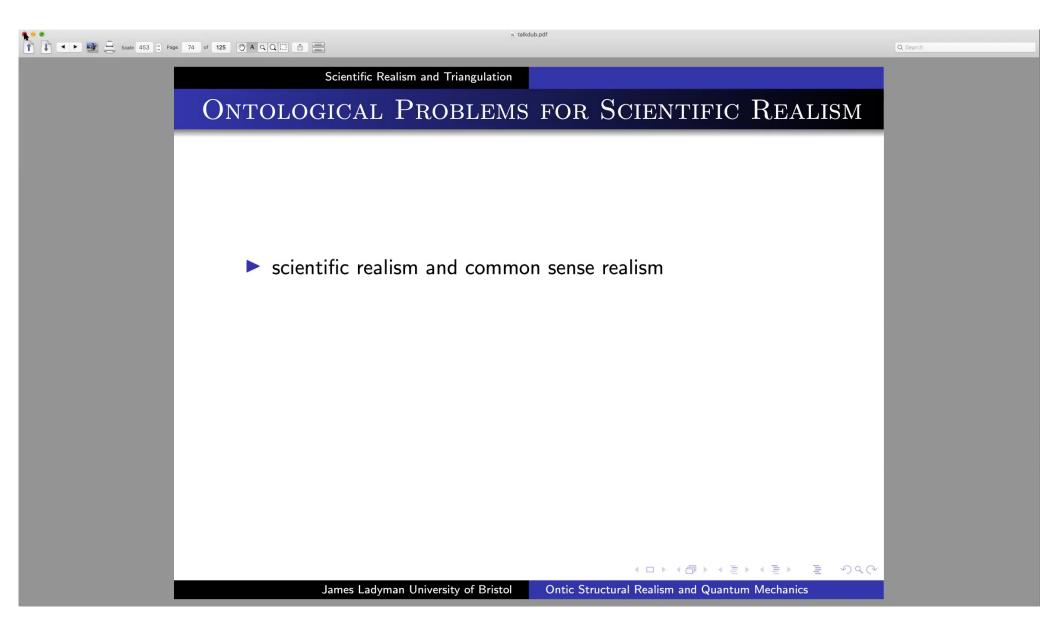
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