

Title: 13/14 PSI - Foundations of Quantum Mechanics - Lecture 5

Date: Jan 13, 2014 04:00 PM

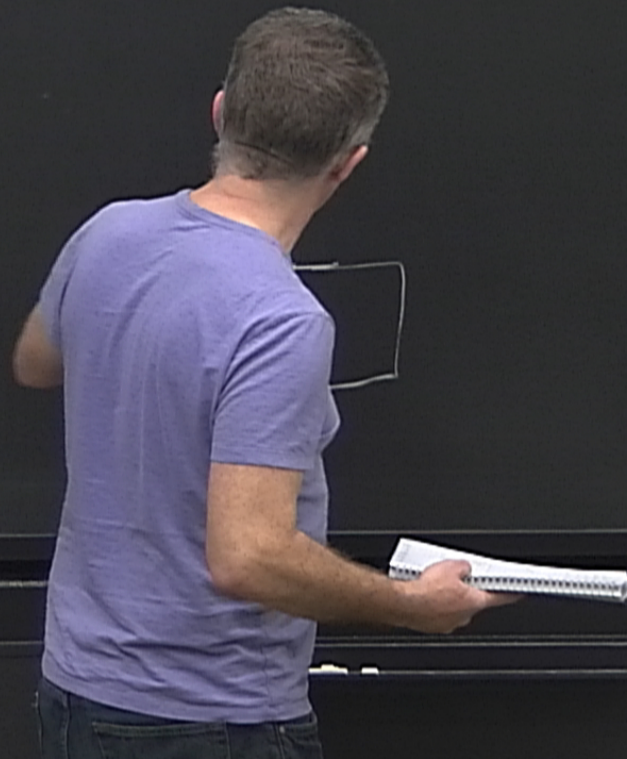
URL: <http://pirsa.org/14010050>

Abstract:

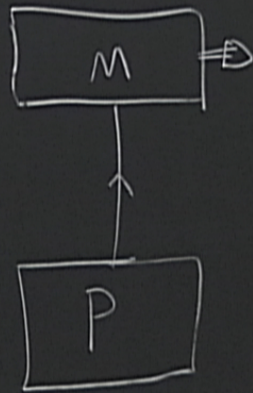


The Harrigan Spekken, classification

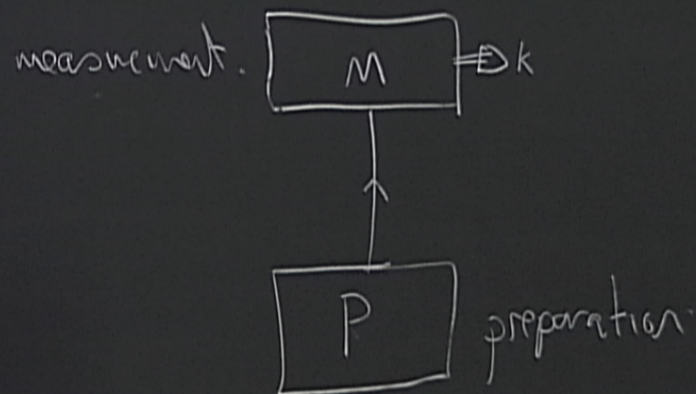
The Harrigen Spekten, classification scheme
for ontological models.



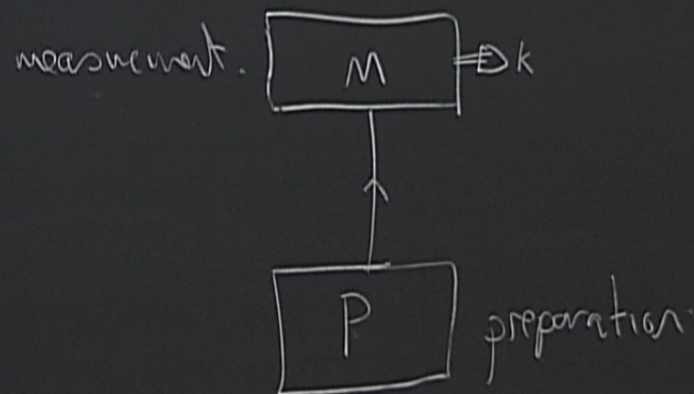
The Harrigen Spekten, classification scheme
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The Harrigan Spekkens classification scheme
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The Harrigan Spekkens classification scheme for ontological models.



this is operational

... going to use it to gain some insight into ontological matter.

an, classification scheme
al models.

ontic
state

$$\lambda \in \Lambda$$

this is
operational

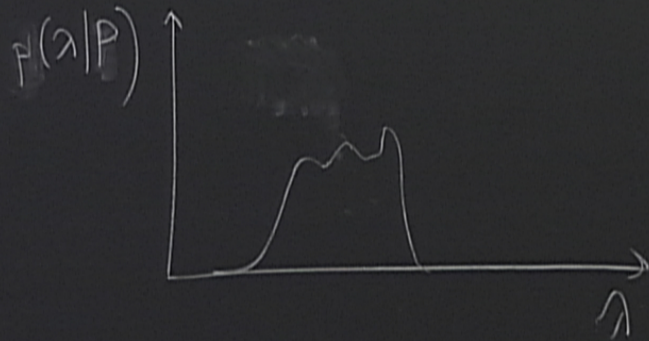
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preparation

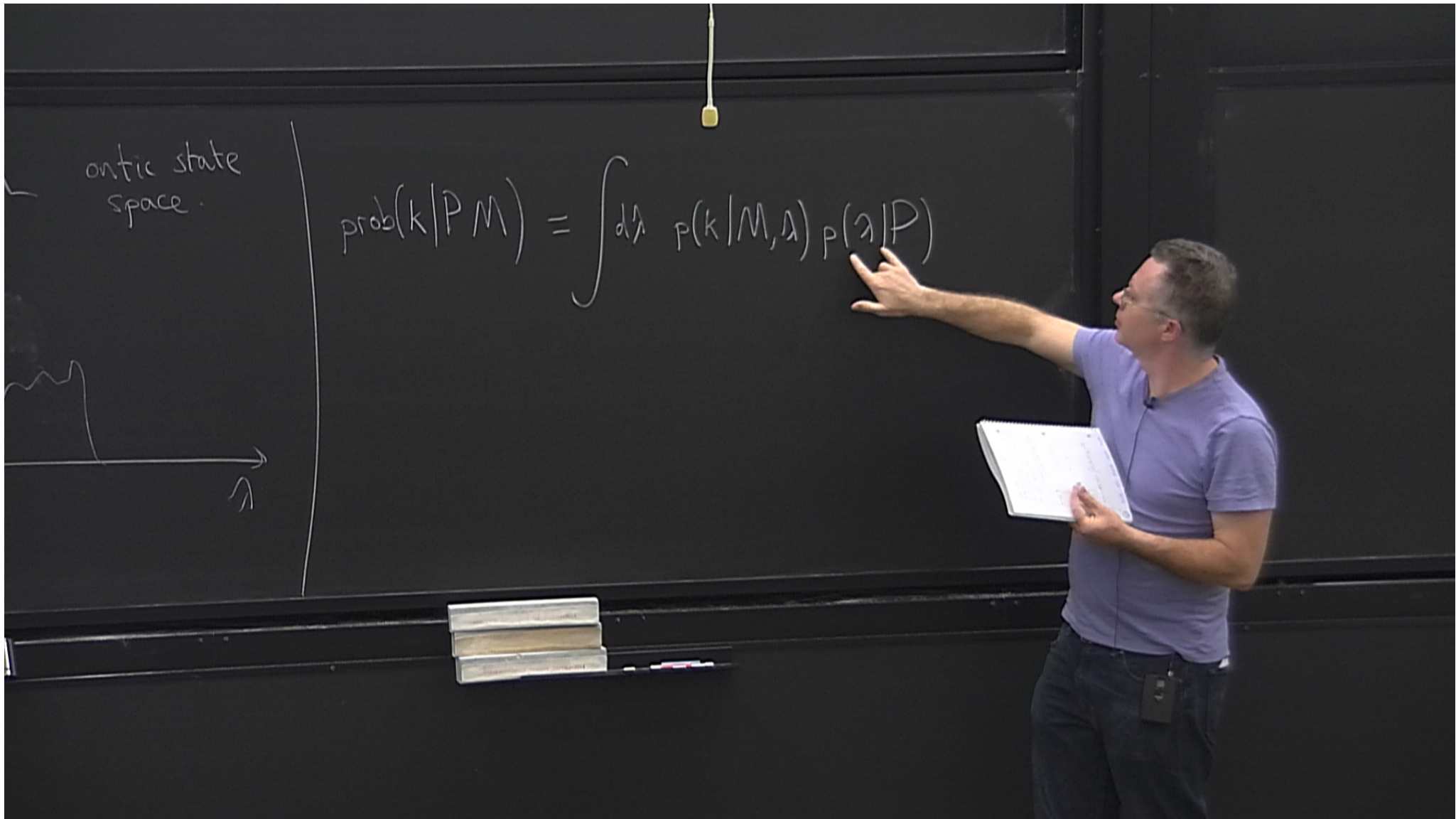
ontic
state

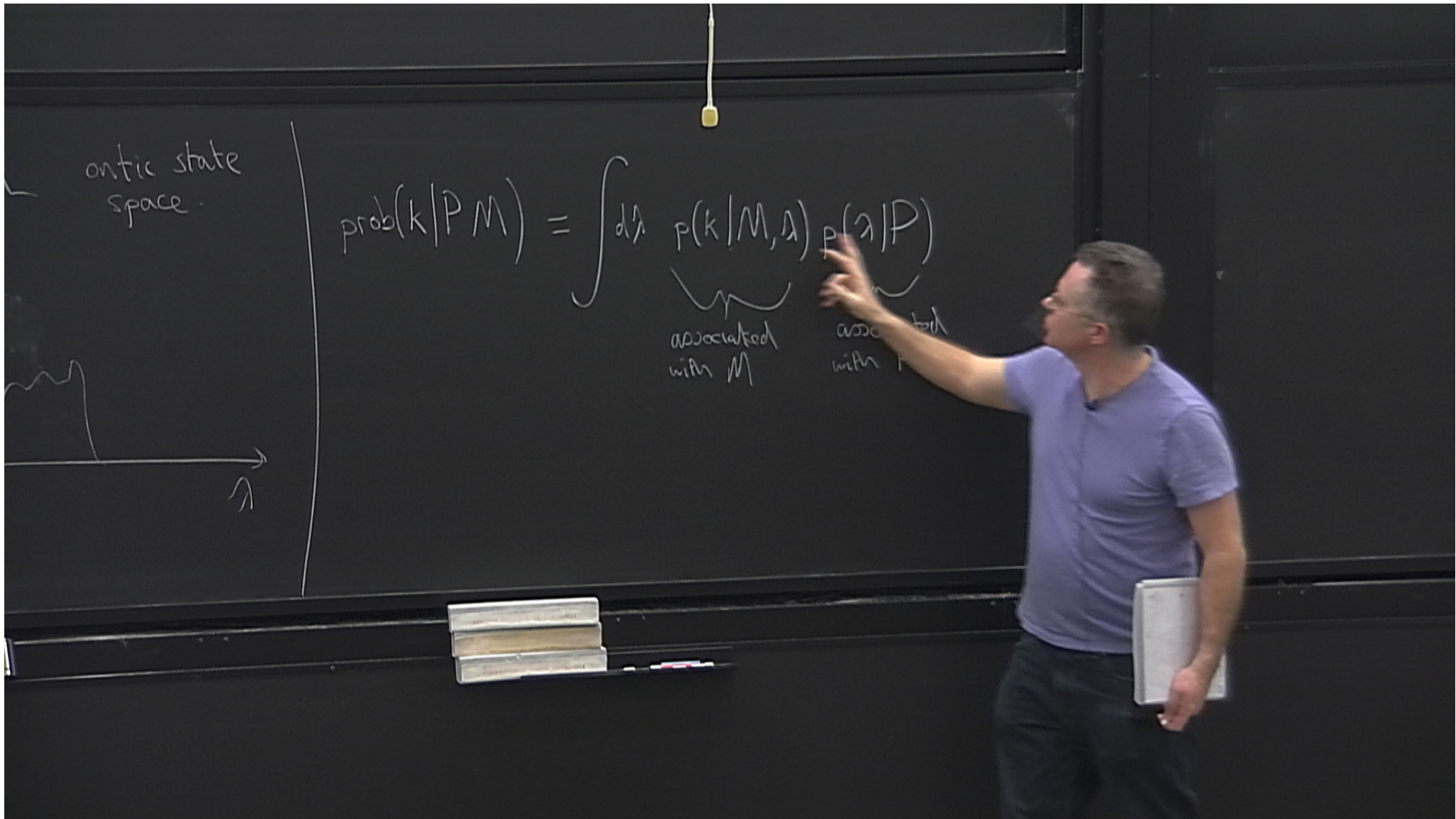
$\lambda \in \Lambda$

ontic state
space.



$$\text{prob}(k|PM) = \int d\lambda \, p(k|M, \lambda) p(\lambda|P)$$





ontic state
space

$$\text{prob}(k|PM) = \int d\lambda \underbrace{p(k|M,\lambda)}_{\text{associated with } M} \underbrace{p(\lambda|P)}_{\text{associated with } P}$$

On ontological model for QT then

$$\int d\lambda p(k|M,\lambda) p(\lambda|P) = \text{tr}(\hat{E}_k^M \hat{\rho}^P)$$

Detⁿ ψ -complete. An ontological model for QT

is

Det^N ψ -complete. An ontological model for QT
 is ψ -complete if Λ is isomorphic to the
 space of projection operators, $|\psi\rangle\langle\psi|$, acting on

Defⁿ ψ -complete. An ontological model for QT is ψ -complete if Λ is isomorphic to the space of projection operators, $|\psi\rangle\langle\psi|$, acting on the Hilbert space, $\mathcal{H}$ associated with the given system.

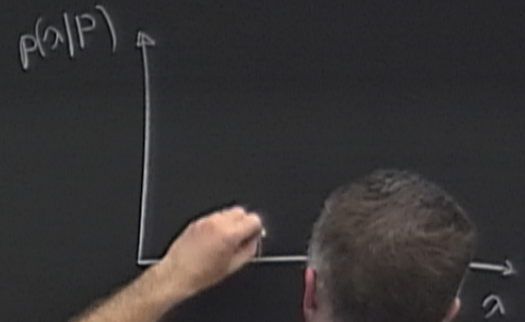
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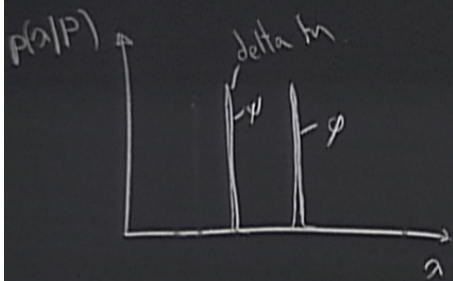
This means that $p(\lambda/P_\psi) = \delta(\lambda -$

Defⁿ

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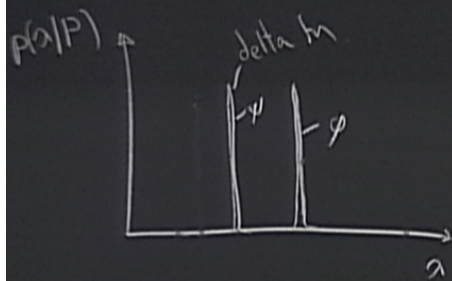
This means that $p(\lambda/P_\psi) = \delta(\lambda - \lambda_\psi)$





ψ -incomplete means

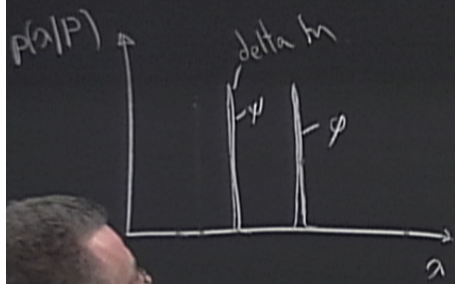
$\lambda_\psi)$



$\lambda_\psi)$

$\text{Det}^n \psi$ -incomplete means not ψ -complete.

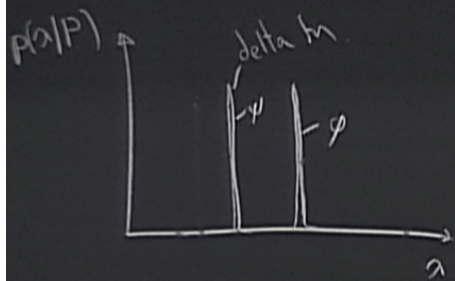
$\text{Det}^n \psi$ -ontic



ρ -complete.

Det^n ψ -incomplete means not ψ -complete.

Det^n ψ -ontic. An

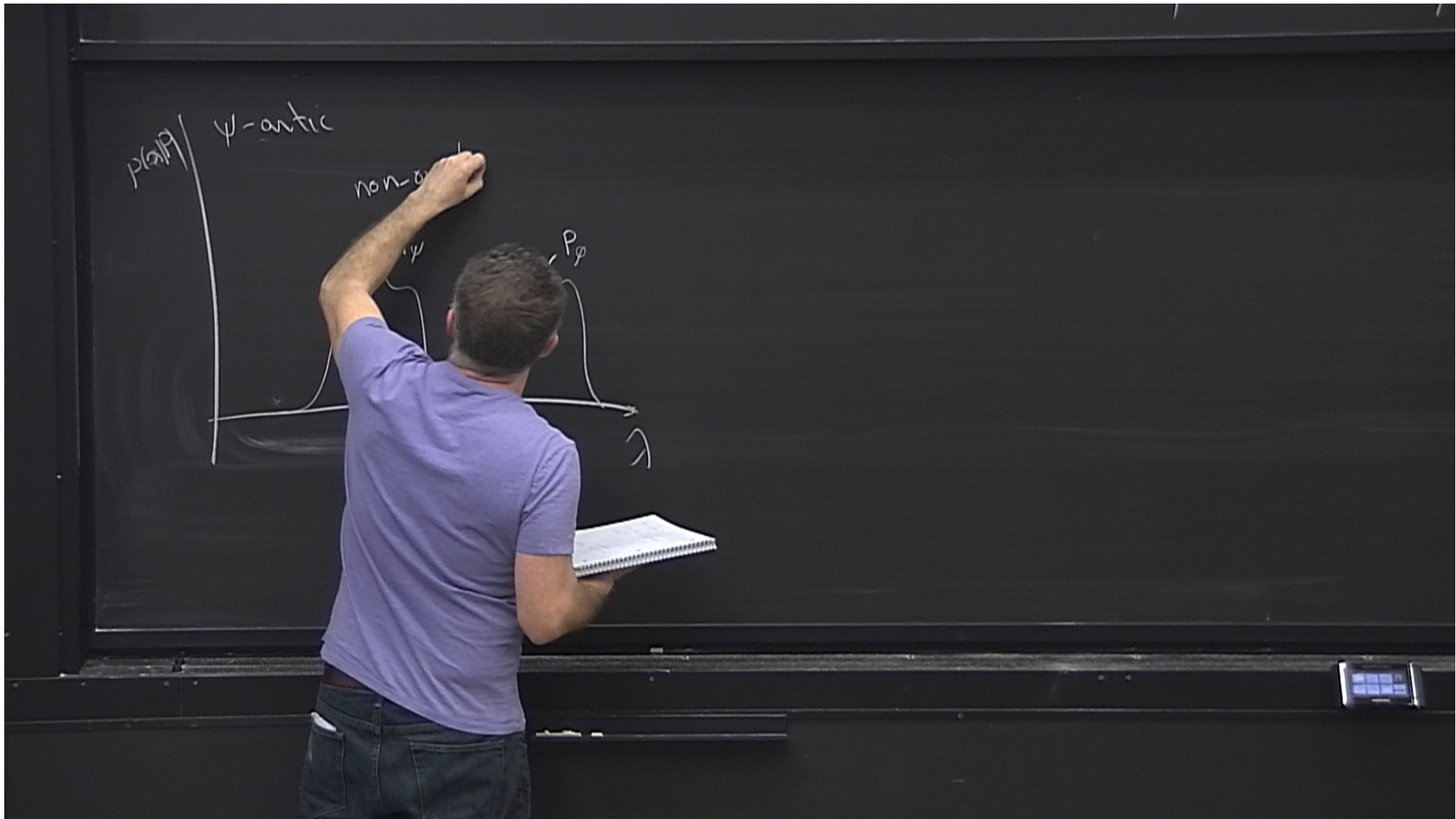


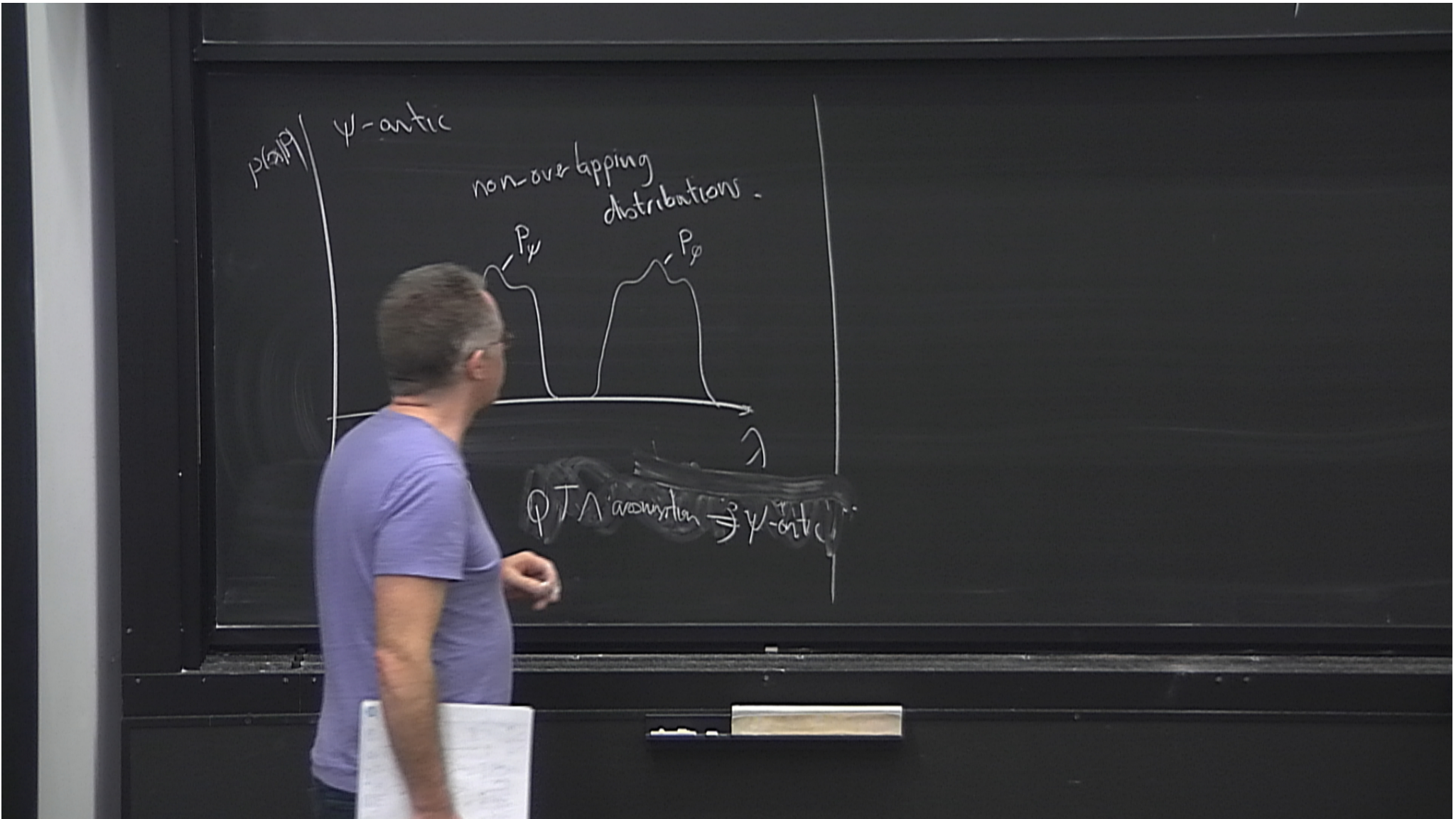
ρ -complete

λ_ψ

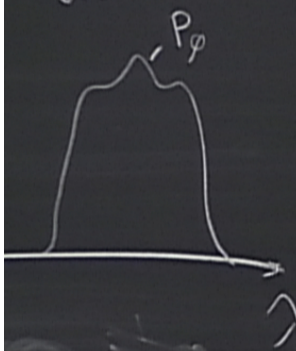
Defⁿ ψ -incomplete means not ψ -complete.

Defⁿ ψ -ontic. An ontological model is ψ -ontic if, for any pair of preparations, P_ψ and P_ϕ , associated with distinct pure quantum states we have $p(\lambda|P_\psi)p(\lambda|P_\phi) = 0 \quad \forall \lambda$



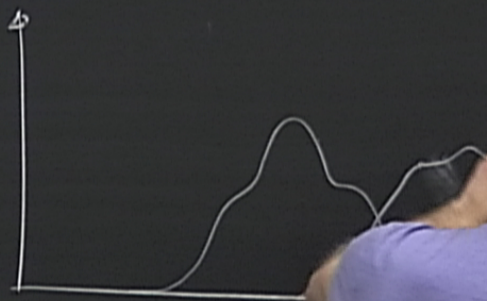


lapping
distributions -

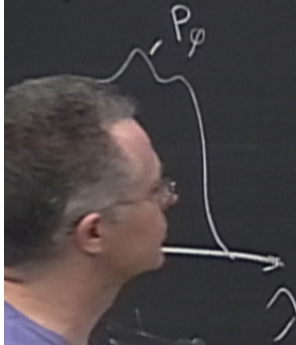


$\wedge$ assumption $\Rightarrow \psi$ -ontic

Defⁿ ψ -epistemic not ψ -ontic

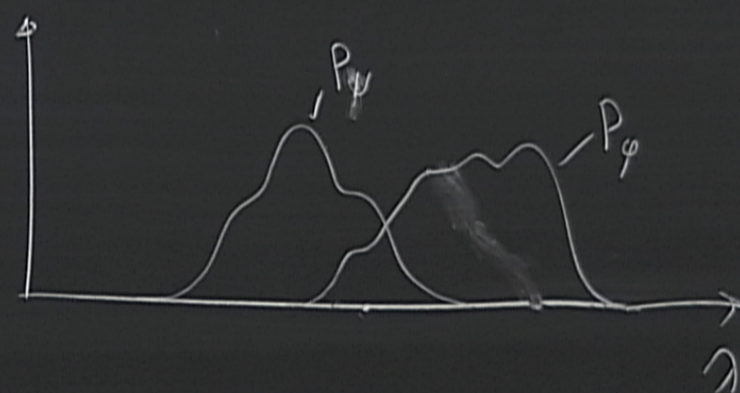


lapping
distributions -



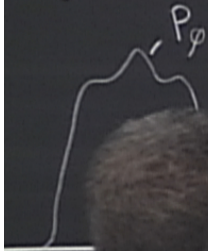
Defⁿ ψ -epistemic not ψ -ontic

$p(\lambda|P)$



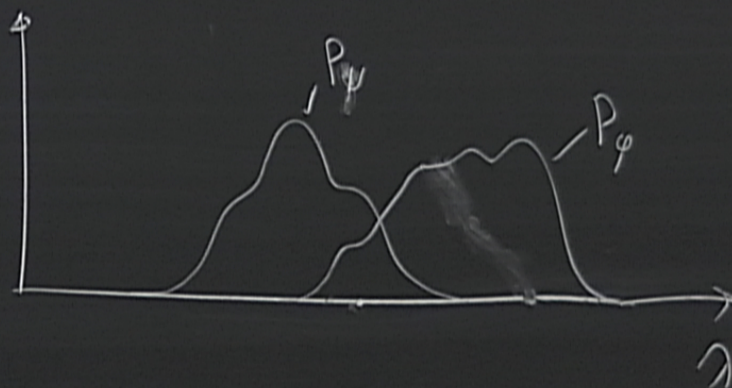
epistemic $\Rightarrow \psi$ -ontic

lapping
distributions -

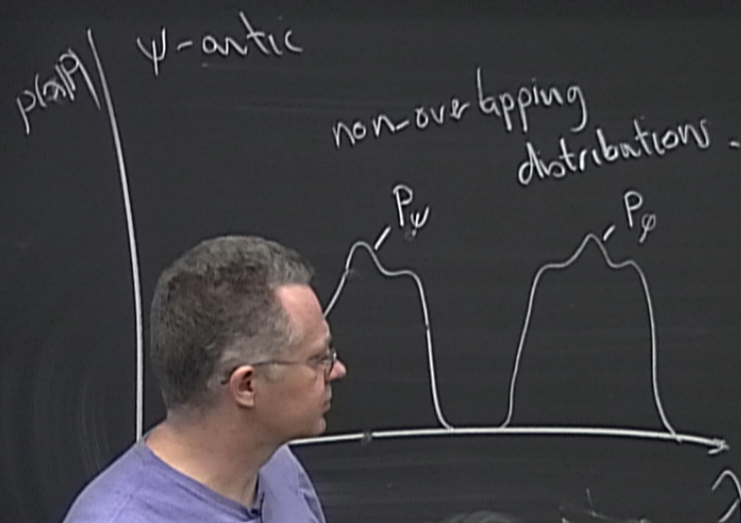


Defⁿ ψ -epistemic not ψ -ontic

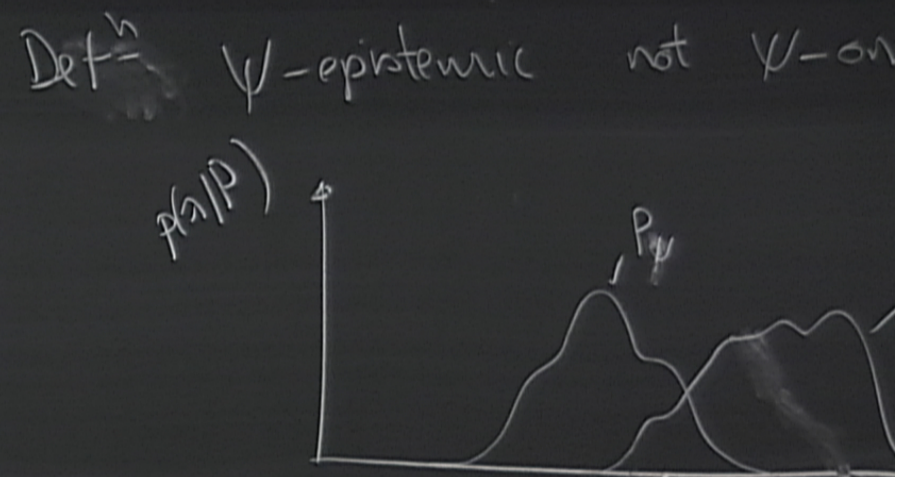
$p(\lambda|P)$

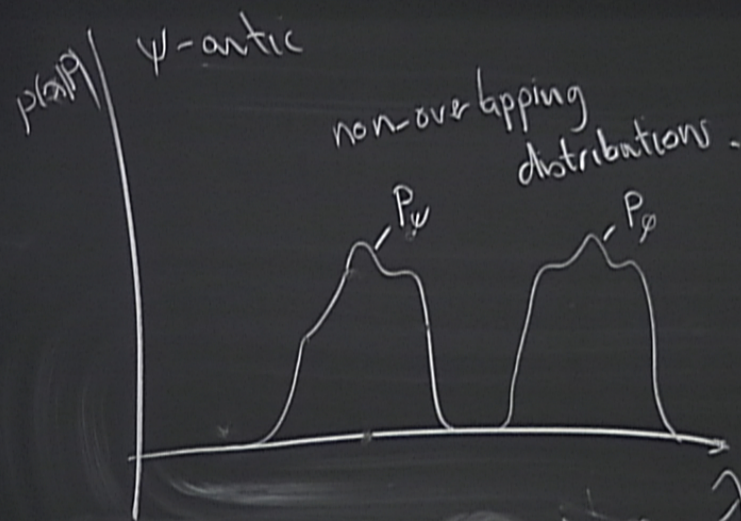


$\Rightarrow \psi$ -ontic



$PT \wedge \text{revision} \Rightarrow \psi\text{-antic}$

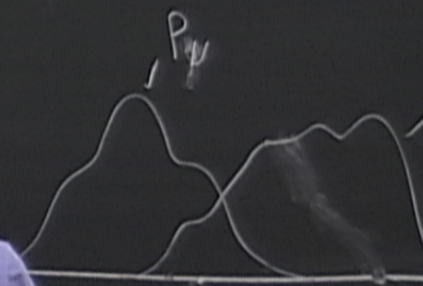


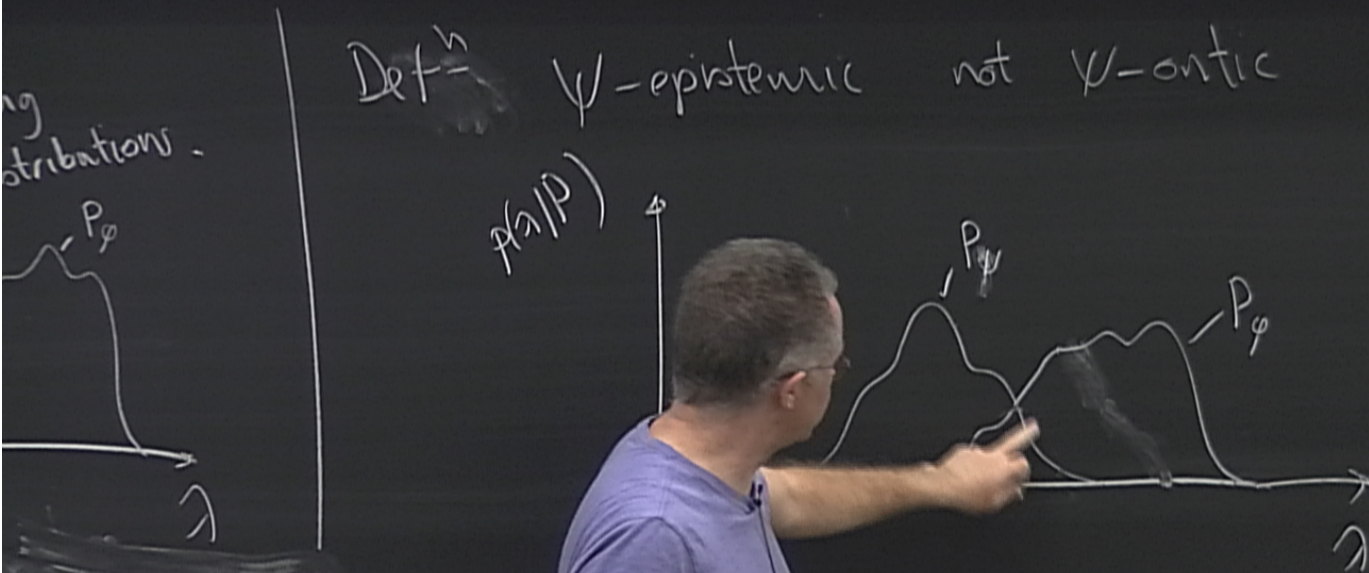


PBR QTA assumption $\Rightarrow \psi$ -ontic

Defⁿ ψ -epistemic not ψ -ontic

$p(\lambda|P)$





Defⁿ ψ -epistemic not ψ -ontic

$$|\langle \psi | \phi \rangle|^2$$

condition $\Rightarrow \psi$ -ontic

$$|\langle \psi | \phi \rangle|^2$$

Defn ψ - complemented.

Λ is isomorphic to $(|\psi\rangle\langle\psi|, \omega)$

$$|\langle \psi | \phi \rangle|^2$$

Defn ψ - supplemented.



is isomorphic
to the
space of $(|\psi\rangle, \omega)$

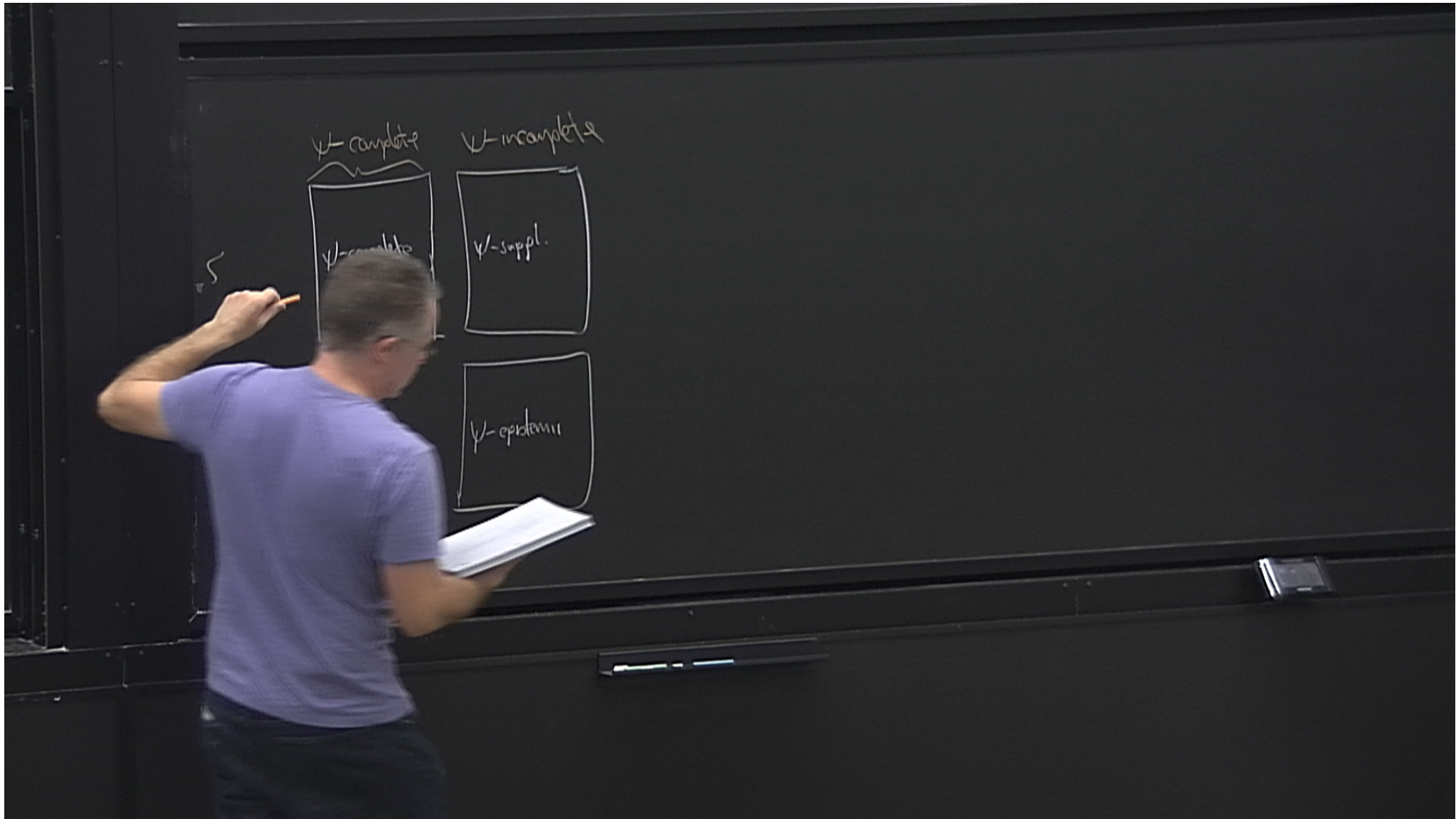
$$|\langle \psi | \phi \rangle|^2$$

Defn ψ -supplemented.



is isomorphic
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space of $(|\psi\rangle\langle\psi|, \omega)$

$$\omega \in \mathcal{F}$$



Is there
real stuff

