

# Against the Physicists, #2: On the Energy–Time Uncertainty and the Impossibility of Sharp Realism

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## How To Derive The Energy-Time Uncertainty Principle Quantum Mechanics

$$\sigma_H \frac{\sigma_Q}{|d\langle Q \rangle/dt|} = \boxed{\Delta E \Delta t \geq \frac{\hbar}{2}}$$

(Dietterich Labs, 2019)

### 1. The Dogma Stated

The physicists proclaim: “*Every natural system possesses, at every instant, a definite energy.*” Such claims echo the old metaphysical confidence of classical mechanics, where every dynamical variable was presumed determinate even when unknown (Born, 1949). The modern realist inherits the posture but none of the foundations.

We suspend assent. Let the trope unfold.

### 2. The Equal Strength of Position–Momentum

*Dogmatic claim:* The particle has both position and momentum—indefinite only in measurement, not in being.

*Sceptical reply:* We grant the appearances. Wave-packets spread, localisations loosen. The realist then retreats to the familiar “epistemic vagueness” defence, as if Bohr had merely misplaced his spectacles rather than reconstructed the entire grammar of physical description (Bohr, 1935).

So far the trope stands. Until energy-time enters, with no such mercy.

### 3. The Energy–Time Trope

*Observation:* Energies change in finite time — decays, scatterings, absorptions.

*Dogmatic necessity:* A real, isolated natural system must have a sharp energy.

Quantum mechanics responds with its characteristically impolite negativity: a zero energy spread ( $\Delta E = 0$ ) yields a stationary state, not an evolving world. This is no mere textbook cliché; Landau and Lifshitz already warned that stationary states “possess no time dependence of any sort,” a remark which, if taken literally, wipes out the realist’s ontology of “process” (Landau and Lifshitz, 1965).

Thus finite-time change demands  $\Delta E > 0$ . Sharpness is forfeited.

### 4. The Aporia

Premise (Realist)	Quantum Consequence	Conflict
System has definite energy	$\Delta E = 0$	No evolution in finite time
System changes in finite time	$\Delta E > 0$	Energy not definite

The realist cannot affirm both without performing the very *self-refuting conjunctions* Wittgenstein mocked in the *Philosophical Investigations*: “Here it is before me — and yet it is not” (Wittgenstein, 1953: p. ??, §125).

### 5. Attempted Escapes — and Their Equal Refutation

*Escape 1:* “Energy is vague, like position.”

*Reply:* Position-vagueness allows motion; energy-vagueness forbids it. The analogy collapses, like all “unified uncertainty” tropes (Jammer, 1974).

*Escape 2:* “The natural system is not isolated during change.”

*Reply:* Then the term “natural system” no longer refers. This manoeuvre is indistinguishable from the scholastic tactic of redefining the battlefield mid-siege.

*Escape 3:* “Bohmian guidance restores sharp particles.”

*Reply:* Bohm sharpens positions, yes, but energy remains a functional of the wave, a property of the holistic field, not the particle (Holland, 1993).

The realist saves one sharpness by sacrificing another.

## 6. The Mandelstam–Tamm Dagger

Let  $\tau$  be the characteristic time of noticeable change. Quantum mechanics imposes the relation:

$$\Delta E \times \tau \geq \hbar/2$$

This is not a measurement quirk but a dynamical bound (Mandelstam and Tamm, 1945).

The realist wants both: sharp energy, and rapid evolution. The inequality forbids their cohabitation. No metaphysical “hidden state” can rescue the contradiction without denying the very mathematics that defines the theory.

## 7. Suspension (ἐποχή)

We have opposed the core claims:

Sharp energy  $\rightarrow$  no change.

Change  $\rightarrow$  no sharp energy.

The two are equipollent; neither compels assent.

Following Sextus (PH I.10–15), we neither affirm nor deny the unseen “inner reality” of the system. We dwell with the appearances: particles scintillate, decay, scatter—and nothing further is required.

## 8. Peroration

Energy–time uncertainty is not a measurement puzzle but a dynamical aporia. Where position–momentum uncertainty allows the realist to dream of epistemic vagueness, energy–time withdraws the pillow. Sharp realism cannot survive the temporal structure of quantum change.

Let the physicists dispute among themselves. We, in the manner of Sextus, suspend judgment.

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