DOES GOD NEED QUANTUM MECHANICS?

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Magic: How do we know it’s not real?
Noninterventionism and Divine Action:

God does not violate the laws of nature
Newtonian Physics & Determinism
Laplacian Demon
Quantum Mechanics and Indeterminism
Quantum Determination

The Entangled Trinity
Quantum Physics and Theology

Divine Action by way of quantum randomness

Ernest L. Simmons
Style A

Standard, - - - - - $750.00
P.O.B. Milwaukee, Wis.

Capacity, - - Two passengers
Wheels, - - - - 28-inch
Tire, - - - 3-inch pneumatic
Gasoline Tank, - - 5 gallons
Water Tank, - - 21 gallons
Weight, empty, - - 700 lbs.
Weight, full tanks, - - 900 lbs.
Seat, - - - Spindle back
Tread, - - - 4 feet 6 in.

Style B

has 6-gallon gasoline tank and
30-gallon water tank, with wider
body, and 41-inch seat in the
clear; stick seat instead of
spindle. Price, $850.00.

EQUIPMENT

Rubber Storm Apron, Rubber
Mat, Side Lamps and Covers,
Odometer, Torch and all neces-
sary tools.
Collapse of the Wave function

The Copenhagen Interpretation:

Wave Function
\[ \Psi \]

Position in Space

Measurement

wave function "collapse"

Position in Space
Determinism and Chaos Theory

Sensitive Dependence on Initial Conditions

How much chaos is there?
The Theory of Everything

R. B. Laughlin* and David Pines†‡§

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Contributed by David Pines, November 18, 1999

We discuss recent developments in our understanding of matter, broadly construed, and their implications for contemporary research in fundamental physics.

we have learned why atoms have the size they do, why chemical bonds have the length and strength they do, why solid matter has the elastic properties it does, why some things are transparent while others reflect or absorb light (6). With a little more
Protectorates

- Differentiable Dynamics
  - Non-chaotic attractors
- Continuum Mechanics
  - Constitutive equations
- Condensed Matter Physics
  - Laughlin and Pines
Nicolas Saunders:

- [In] a totally deterministic world . . . the causal nexus of science is drawn so tight that there is no real freedom for either God or human beings. In such a world Laplace’s famous demon reigns supreme. God cannot act in any creative way through the causality of science and still remain true to the deterministic rules put in place at creation. (Saunders 2000, 254)
“Nothing happens in nature that does not follow from her laws”
Existence and uniqueness of solutions

Consider the ODE \( \frac{dy}{dx} = f(x,y) \)
and the initial value \( y(a) = b \).

When does a solution to this initial value problem exist? If it exists, is it unique?

- if \( f \) is continuous "near" \((a,b)\)
then a solution exists.
Preserving existence and uniqueness

No Collisions
Determinism:
Problems and Patches

A Primer on Determinism
John Earman

Graduate Texts in Mathematics
V.I. Arnold
Mathematical Methods of Classical Mechanics
Second Edition

D. Reidel Publishing Company
Springer
Nature is more open than we suppose
(Although Sir John would not approve of my way of fleshing this out)
Mechanical & Deterministic

An uncontroversial example
Divine Action & Determinism

There's a difference, but not vis-à-vis determinism
John Wheeler:
“Couldn’t God make a go of it without the quantum?”