

AXIOMS FOR THEORETICAL PHYSICS, MATHEMATICAL ANALYSIS, MATHEMATICAL LOGIC, THEORETICAL COMPUTATION AND GEOMETRIC ALGEBRA

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Abstract

In this document I lay down the Axiomatics of Modern Science

1 Axioms For Theoretical Physics

First Law of The Theory of Quantum Relativistic Fields: In an isolated Quantum Relativistic Field the variation of energy goes off as time elapses

$$dU \rightarrow 0 \text{ as } t \rightarrow \infty$$

Second Law of The Theory of Quantum Relativistic Fields: In a Quantum Relativistic Field the density of the variation of energy is the sum of densities of the variations of energy of the subfields

$$\frac{dU}{U} = \frac{\sum U_i}{U}$$

2 Axioms For Mathematical Analysis

The Variational Principle of the Calculus of Variations: For every functional the density of the variation is the sum of densities of the variations in its parameters

$$\frac{dL}{L} = \frac{\sum \frac{dL}{da_i}}{L}$$

3 Axioms For Mathematical-Logic

Axiom of Algebraic Logic: A logic system is a categorical algebra

Axiom of Categorical Logic: A formal system is a preorder category

Axiom of Thermobiochemical Logic: A thermobiochemical system is a variational logic system

4 Axioms For Theoretical Computation

Cordero-Grau-Church-Turing Axiom of Categorical Computation: In a spacetime universe all the models of computation are equivalent

Cordero-Grau-Cobb-Eddington Axiom of Computability: In a model of computation the tractable functions are the polynomial programs

Cordero-Grau Axiom of Computational Complexity: In a computational complexity the computable programs are the polynomially reducible programs

Cordero-Grau Axiom of Logic Computation: A model of computation is a formal logic system

5 Axiom For Geometric Algebra

Cordero-Grau Axiom of Geometric Algebra: An algebra has a fibered bundle of fibered algorithms

6 Applications

6.1 To Biology, Chemistry and Physics

The Axioms for Theoretical Physics apply to all Biology, Chemistry and Physics, in particular, to Genetics, Evolution and Pharmacology

6.2 To The Theory of Radiation

The Variational Principle of the Calculus of Variations apply to all Physics and Mathematics, especially, to the Theory of Radiation for which assures that chaotic behaviour arises as linear variations of energy between the radiation inwards and the radiation

tion outwards cease giving out the following Principle
of the Modern Theory of Radiation

$$\frac{d\varphi_i}{\varphi} = \frac{d\varphi_o + dK}{\varphi}$$

6.3 To The Theory of Logic, Model Theory and Category Theory

The Axioms of Algebraic Logic, Categorical Logic
and Geometric Algebra have important consequences

The Fundamental Theorem of the Theory of Logic:
Every structure has a model

The Fundamental Theorem of Model Theory: Ev-
ery model has a larger model

The Fundamental Theorem of Category Theory:
Every category has a dual category