The Alphabet of Knowledge – ABC

Philosophy and Theory of Science
General Principles & Items in Terms

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References & Bibliography
Theory of Cosmos, John A. Economides, Athens 2010, Greek
The Universe of Interactions, Athens 2012, English

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The Alphabet of Knowledge
Energy and Dynamics
The Scalar Properties of Energy
Variation, Dimension, Motion, Information, **Interaction**
Theory of Science - Interpretation and Definition
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Part I

A. **Energy** is the dynamic substance (**charge**), which everything is made of. Everything exists in energy and energy does **everything**. The energy charge is **all** and **universal**. Energy has two scalar attributes, which are **power** – therefore **dynamics** (charge) and **force** (field and elements). In energy dynamics, power is **potential (quantum)** condition (charge) and force is **real** (**physical**) condition (field and elements). From these attributes develop the **scalar** properties of energy which are dynamic relativity (**interchange** between physical and quantum states) and derivative **limitation**, **variation**, **dimension**, **mass**, **motion** and **information**. Energy originates from gravitational singularity (**contraction**), which was the starting point of the universal evolution and the **composition** of dimensional mass, via the Big Bang. In **expansion**, energy powers variations which configure into particles and interactions (**interactive particles**). Interactions are **relations** therefore they are **forces**.

B. **Gravity** is the f**undamental** force of energy dynamics. Gravity is **systolic** (dynamic) form of energy, so it shares the attributes of power **(charge)** and force **(field and elements)** and the scalar properties of energy, limitation, variation, dimension, mass, motion and information. Gravity has the properties of **density**, which has the attribute of **pressure**

and energy, which has the attribute of **temperature**. When **positive** (dynamic and potential), gravity is contractive and attractive force. When negative (defined and real), gravity is expansive (**diastolic**) and repulsive force. When neutral, gravity combines the **quantum** and **physical** energy states of material dimensional mass. In interim (dimensional) interaction (motion), **quantum** (dynamic) and **physical** (defined) energy states, interchange. From **gravity decoupled** the strong and weak **nuclear** forces and the **electromagnetic** force. These forces (interactions / relations) decoupled in the density (and **definition**) variation from contraction to expansion (development of mass) and specifically, in the consequent **decomposition** and **re-composition** (multiplication) process of gravitational singularity.

- **Gravity** is systolic, therefore contractive, dynamic, **non-dimensional**, de-composing force**,** which decouples into the strong and weak nuclear forces and the electromagnetic force (interactions).
- The strong and weak **nuclear** forces and the **electromagnetic** force (interactions), are diastolic, therefore expansive, motional, **dimensional** and re-composing **forces,** which recouple into gravity.

The scalar properties of energy originally combined in the **potential** (dynamic) **simplicity** and singularity of gravitational force (charge) and the **real** (defined) plurality and **multiplicity** of the particular derivative nuclear and electromagnetic forces (field and elements in mass) at the start of the Big Bang evolution. Gravity and the derivate nuclear and electromagnetic forces, relatively **combine** in the contractive non dimensional singularity and then **interchange** in the expansive dimensional, mass energy dynamics (**quantum / physical** interchanges) in symmetric positive – negative scales of **definition**.

C. **Dynamics** are the scalar **properties / attributes** of energy, power and force, **limitation**, **variation**, **dimension**, **mass**, **motion** and **information**. Typically, dynamic is action, motion and information in the dimension of **space** and the in direction of **time**. In gravity energy dynamics are non – dimensional. In the nuclear forces and the electromagnetic force (interactions) energy dynamics are dimensional. Energy dynamics configure into the scalar properties of power, (which is abstract and **potential**) and force, (which is real and **applied**). Energy dynamics configure relatively and specifically in the derivative **interchanges** between the **quantum** (dynamic) and the **physical** (defined) states of the expansive dimensional (structured) mass. Dynamic interchanges typically configure into **interactive particles**. Energy dynamics and derivative interchanges, determine **dimension, variation, definition and information**.

- Practically, dynamics **combine** (interchangeably couple and decouple) the **four fundamental forces** (gravity plus derivative dimensional nuclear and electromagnetic forces).

- Theoretically, energy dynamics drive the **unification** of the Standard Model of **Classical Physics** (physical states of mass) and the theories of **General** and **Special Relativity** (gravity, energy and dimensional states of mass) with **Quantum Mechanics** (quantum states of mass), via the

    a. Real and potential **unity, continuity** and dynamic **equation** of energy dynamics in subatomic and atomic levels (and between any other division) in universal (structural) mass,
    b. Mathematical configuration (calculation) of **variable definition** in universal energy dynamics,
    c. Derivative description of **Theory of Everything**.

D. **Limitation** is the fundamental property of **energy** and **gravity**. Limitation configures in the **dynamics** of energy. This configuration features in non-dimensional gravity and in the **scalar** properties of energy and specifically in **variation**, **motion**, **mass**, **dimension** and **information**. Limitation **defines** the dynamics of energy, is relative in the interchange of **quantum** and **physical** states and so determines the properties of the dynamics of energy. Thus, limitation configures the **scalar** properties of energy in the dimensional and universal **mass**. Limitation **develops** variation, dimension, definition and information, particularly in the (concurrent) **interchange** of **quantum** and **physical** states of mass.

E. **Variation** is the main (**scalar**) property of energy. Variation is powered by **energy** and driven and defined by **limitation**. Variation and limitation draw from gravitational singularity and from its **dynamic** interchange with material plurality and relative multiplicity. Variation unfolds from **gravity**, which is the fundamental state of **energy** and of derivative (dynamic) **potentiality**. The (absolute) potentiality of energy power and gravity contracts and expands into the relative (scalar) reality of density (temperature and pressure) in the **variation** of the **dimensional** universe. Powered by energy, variation configures the (concurrent) interchanges between **quantum** states and **physical** states and conversely defines the energy conditions of material mass.

F. **Dimension** is the **scalar** property of energy and attribute of variation, limitation, motion, definition and information. In dimension the **general potentiality** of gravitational **singularity** and power (energy and dynamic **charge**) develop into the **particular reality** of nuclear and electromagnetic **plurality** and force (**field**, particles and **elements** of structured mass). Dimension (of matter and mass) draws from expansion, variation, motion and information. These features attribute **scalar** properties to dimension, like **change** in **time** and **difference** in **space**. Likewise, dimension develops **scale** and **definition** in mass. Variations in the power of energy and force, correspond with the

variable interchanges between the **quantum** and **physical** states of dimensional (structural and **material**) **mass**. Dimension configures into space and time.

- **Space** is dimensional (structural) reproduction / **organization** of material mass. Space defines particle interactivity and specifically difference in **position**, motion, and direction of energy forces and of the variable (**scalable**) configurations of interactive particles (dynamic elements) composing **material** mass. Space follows the general structural, formative and **infrastructural** (organizational) physical features of dimensional and **material** dynamics. Essentially dimensional space (with time) is mass. Space follows also the general configuration attributes of dimension, **height** (**charge** in time), **width** (**field** in space), **length** (**element** in special – temporal motion). Space **defines** time.

- **Time** is dimensional (systemic) interaction / **relation** of energy. Time defines particle interactivity and specifically, **change** in energy, therefore **motion, velocity** and **momentum** of energy forces and of the variable (**scalable**) configurations of interactive particles composing mass (**matter**). Time follows the particular – systemic, relational, functional and **framework** features of dimension. Essentially dimensional time (with space) is mass. Time is defined in the dynamics of the **running present** in dimensional space. In the present of motion, flows the variation between the **past**, which is precise and **physical**, and the **future** which is probable and **quantum**. The dynamic **combination** of the reality of the past and the potentiality of the future in the **running present**, produces limitation, variation, dimension, mass, motion and information in spatial mass. Time **defines** space.

G. **Information** is the scalar configuration (**formation** and **definition**) of the **dimension** of mass. Information is the product of limitation, variation, dimension and motion in mass. Information is static in space, dynamic in time and conditional in the dimension of space – time. The flow of time and the development of information are **transitional** and **transformative** (organizational) attributes of **dimensional** matter and mass powered by energy. Information is driver of dynamics because it is integral in the properties of energy.

- Real, fixed and spacial attributes of information refer to the certain and precise (physical) **past**.
- Potential, variable and temporal attributes of information refer to the uncertain and probable (quantum) **future**.

These attributes feature in structure and form, system and function, define motion and dimension through the interchange of states of material mass in the currency of the (running) present.

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H. **Quantum states** are **dynamic** conditions of **lower definition** (and limitation) at fundamental or elementary (**micro**) levels of the composition of dimensional energy and the construction of material mass. Quantum states are indicative of the scale of variation (motion, mass, dimension, definition and information) and of the dynamics of energy. These states are **approximate** conditions of lower definition at the **potential indefinite** levels of dimension. The future in time is derivative of quantum state, therefore it is **dynamic** and **probable**. Quantum states are frequently referred as "**dark**" (matter and energy) conditions due to lower definition (and consolidation) at earlier stages of universal energy dimension (foundation, configuration, construction) and evolution. In the universal conjecture, decomposition of quantum states and re-composition of physical states, **interchange** at variable gradations of the dynamics of energy, in the currency of **motion** and in the (running) **present**.

I. **Physical states** are **dynamic** conditions of **higher definition** (and limitation) at composite and complex (**macro**) levels of the construction of dimensional energy and the composition of material mass. Physical states are indicative of the scale of variation (motion, mass, dimension, information) and of the dynamics of energy. These states are **accurate** conditions of higher definition at the real definite levels of dimension. Physical states are frequently referred as "**luminous**" (matter and energy) conditions due to higher definition (and consolidation) at later stages of universal energy dimension (foundation, configuration, construction) and evolution (mainly due to the separation of photons, electrons and of derivative radiation and light). In the universal conjecture, re-composition of physical states **interchange** with decomposition of quantum states at variable gradations of the dynamics of energy, in the currency of **motion** and in the (running) **present**.

J. **Particles** and **Interactions** are the main **material** configurations (elements) and **energy** carriers of relational interchanges of quantum and physical states. Interactive particles combine the potentiality of the dynamics of pressure and temperature with the material reality of **variation** in density and dimension. Particles and interactions run motion in dynamic dimensional mass. More specifically,

- **Particles** are **high energy** and **density** states of relative definition (**concentrations**). Therefore, particles are material (physical) states of energy. Particles interchange (alternate) their energy state with interactions. Particles denote real (fixed / precise) position of material in the dimension of **space**.

- **Interactions** are **low energy** and **density** states of relative definition (**expansions**). Therefore, interactions are quantum states of energy. Interactions interchange (alternate) the real energy states of particles. Interactions denote potential (variable / probable) direction of energy dynamics in the dimension of **motion** and **time**.

Furthermore, interactions are sequences of **interchanging actions** and **reactions**. Particles confer **power**. Interactions convey **forces**. According to the dynamics of energy, recurring interactions grow into replications and reproductions. **Interactions** develop **relations**. **Reproductions** develop **organizations**. Interactions and reproductions develop **conditions**. Relations, organizations and conditions grow into **structures** and **systems**, **forms** and **functions**. Interactions are relational forces, which develop bonds between particles (objects and entities).

K. **Mass** is the universal **framework** and **fabric** of energy in **scalable gradations** of **definition** and **configuration**. Mass composes of **quantum** variations, at the "**dark**" **lower** level and of physical interactive **particles** and **entities,** which are more defined, at the "**luminous**" **higher** level of energy and density gradation and organization. Mass grows in the transition from **contractive dynamic quantum** singularity of **energy** and gravity to the **expansive physical plurality** of **materiality**, particularity and interactivity. In this transition, gravity gradually and progressively transcends into the strong nuclear force, the weak nuclear force and the electromagnetic force and in the evolution of material **composition, dimension, definition** and **specification**. The decomposition and re-composition of gravity in the decoupling of the nuclear and the electromagnetic forces, is fundamental structural and systematic variation of energy in the **evolution** of universal mass. The fundamental forces (interactions) further configure energy into various forms like the kinetic energy, the potential energy, the elastic energy, the chemical energy, the radiant energy and the thermal energy between material substances, objects and entities. The variable interchange of **quantum** energy states and **physical** material states determines the **dynamics** of activity and definition in the dimensional (structural, formative, functional and systematic) mass.

L. **Motion** is the typical form of **variation** and **activity** in dimensional mass. Energy powers motion of particles, entities and objects via **interaction** (force) in the **dimension** of space and time. This **force** is fundamentally gravity in positive or negative configuration. The derivative nuclear and electromagnetic forces are also at play in motion. Corollary **limitation** determines momentum and **direction** of motion.

Motion is typical combination (concurrency) of interchanges of **quantum** states with **physical** states and configuration of definition variations (levels). Motion specifically configures into the **change** of **position** of the dynamic particle in **dimensional material** mass. The configuration of **power** and **force** in velocity (**acceleration** and rate of **speed**) is the main factor of motion which denotes the dynamics of energy in this dimensional function. Other factors are **displacement**, **direction** and **distance**. Motion configures variation into frequency by way of fluctuation when **extended** and circulation when **condensed**. The dynamics of motion, determine the relative conditions of dimension and direction, positive and negative. In **high** velocity, direction is **linear** (frequency low). In **low** velocity, direction is **elliptic** (frequency high). In **neutral** velocity direction is **cyclical** and depending on dynamics, **spherical**. The velocity and direction of (particle

position in) motion depends on (particle) interaction which confers energy in the dynamic **interchanges** of physical and quantum states (of mass). For example, linear direction runs at the **limit** of elliptic motion and specifically at the limit of speed, space and displacement (as in light photons). The linear limit of fluctuation and frequency and so of quantum invariance in linear motion is displayed in the maximum velocity of dimensional mass (example E=mc2). Changes of direction are indicative of variations in the dynamic combinations of **quantum** states and **physical** states and specifically in the composition of frequency in (particle) **interaction** and velocity in **motion**.

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