

Dynamic universe

Natural science and philosophy
in unison

Tarja Kallio-Tamminen

Conception of reality, worldview

- Worldview provides a window into reality
 - important for people to navigate in their daily life.
 - How to understand and explain things in a suitable way, and act in a sensible manner
 - long-lasting cultural constructions based on metaphysical presuppositions
 - taken as self-evident in “normal times”
 - recognized to be a temporary construction only when increasingly failing to explain new facts
- Natural science and philosophy were in unison in the Newtonian framework
 - In a coherent conception of reality physics and metaphysics should both come together.
 - Science is blind without philosophy
 - Proper interplay between science and philosophy
- Balance between empiricism and rationalism

Natural philosophy

- Primary thought focusing on existential things
 - Includes metaphysics, ontology, epistemology...
 - from phenomena to factual
 - from transformations to eternal laws
 - from perception to pure understanding
- Bloomed in antiquity and at the turn of the modern era.
 - Once again there is a need to make nature understandable
 - Abstract theories in modern physics are intangible for general public

DU – an opportunity to revise the primary framework

- Provides a new structure and dynamics for physical reality.
 - unifies the domains of theory of relativity and quantum physics
- Exceeds the level of present theories in philosophical virtues
 - a more encompassing theory based on smaller number of premisses
- Contains a clear picture of reality
 - Newtonian clockwork turns into an all-embracing entirety that organizes itself into a multilayered unbroken whole
- Settles several age-long disputes in natural philosophy
 - nature of space, time, and the basic substance of being..
 - Mind and matter can be reconciled to a one overall system that is ruled by the 'universal laws of nature'

Contents: towards the essence of reality

- Antiquity
 - basic approaches
- Turn of the modern era
 - focus on empiricism
- Modern physics
 - forward by refutation
- Dynamic universe

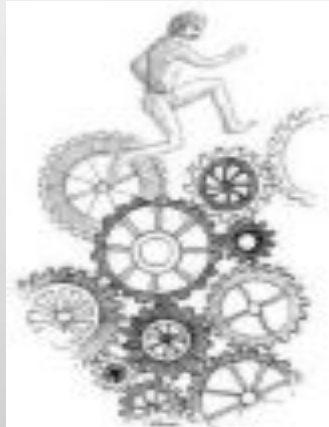
Antiquity

- Pre-Socratics
 - Milesians, Heraclitus, Pythagoras, Parmenides...
 - Basic substance, numbers, mathematics, logic
 - Being and Becoming
 - Atomists , eternal particles and empty void
- Plato and Aristotle
 - Stressed form in addition to matter
 - did not accept atomism
 - Undifferentiated matter has a potentiality to be influenced by various forms
 - change, life, human contribution...

Turn of the modern era

- Copernicus' heliocentric view
 - New space to find out new relations
- Kepler's planetary laws and Galilei's research on motion
- Newton's synthesis based on gravitation
 - separate bodies moved in empty space under the influence of gravitational force
 - The nature of the 'occult' force remained a mystery
- Descartes, Leibniz
 - argued for a full space consisting of continuous substance
 - yet natural science quite wholeheartedly adopted the meristic methodology
- Physicists and philosophers contributed to the creation of a new world view.
 - Metaphysics soon disappeared under the empirical practice.
 - atomist outlook and mathematical theories conforming to what actually could be observed and measured.

Revolution at the beginning of the modern era



Reality consist of matter in motion
-you cannot find a soul

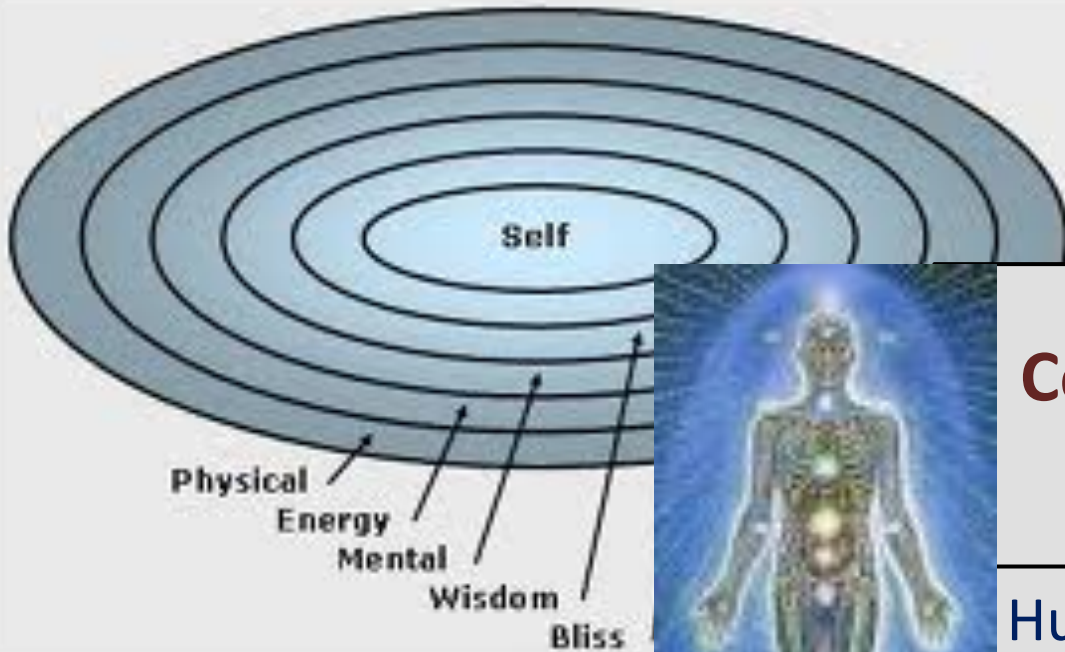


**Science replaced religion as
a cultural driving force**

Reality is comparable to a clockwork
mechanical, quantitative, and without a purpose



Contrast to perennial view:
Plurality emerges from one
immutable basis



**Consciousness and matter
are intrinsic to reality.**

Humans are conscious, evolving
beings who are embedded into
the corporeal layers of nature.



- **The particle-mechanistic world-view was taken to be true**
 - It was based on solid mathematical theory and confirmed by empirical observations
 - Yet it contained (unwarranted) metaphysical presuppositions
 - atomism, determinism, reductionism
 - objective, external observer



The framework was good enough

- to explain and solve countless problems
- boost up huge (technological) progress, and
- change the world.

Yet there are some disturbing anomalies and limitations in a clockwork reality

- How humans are related to nature?
 - No solution to mind-body problem
 - Dualism, materialism, idealism, functionalism...
 - No place for consciousness, freedom or responsibility
- The split between “the two cultures”
 - breakdown of communication between the sciences and humanities
- The “objective reality” is not immutable
 - The emergence of environmental problems
 - New technologies create new kind of conditions for future generations



Yet there are some disturbing anomalies and limitations in a clockwork reality

- How humans are related to nature?
 - No solution to mind-body problem
 - Dualism, materialism, idealism, functionalism...
 - No place for consciousness, freedom or responsibility
- The split between “the two cultures”
 - breakdown of communication between the sciences and humanities
- The “objective reality” is not immutable
 - The emergence of environmental problems
 - New technologies create new kind of conditions for future generations



Humans do affect the course of evolution
A better map for navigation is urgently needed

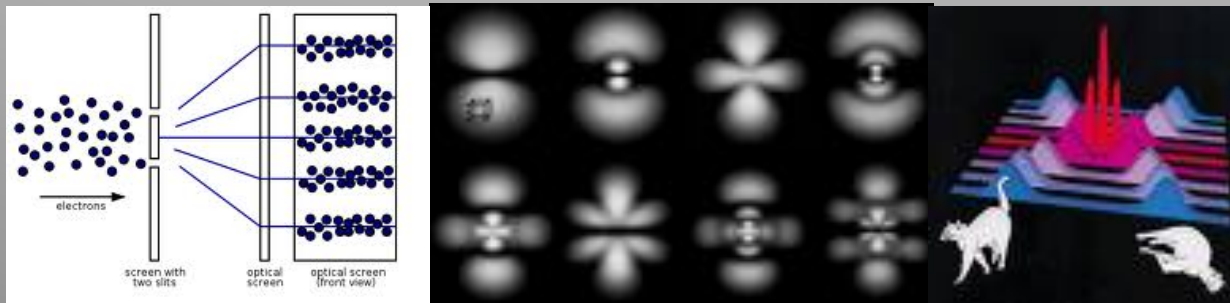
Quantum physics collapsed the familiar world view



- Quantum phenomena cannot be understood within the particle-mechanistic context
 - wave-particle dualism, entanglement, statistical predictions, measurement problem...
- The theory generated prolonged interpretation discussions
 - Copenhagen interpretation, Many-worlds interpretation, Statistical interpretation, Bohm's interpretation, Quantum logic, Decoherence, Consistent histories..
 - All the interpretations imply profound changes to the world view
- Ultimate metaphysical questions are at stage
 - a new general map is needed to enable navigation when dealing with quantum phenomena, complex systems, evolution, life...

Who knows?

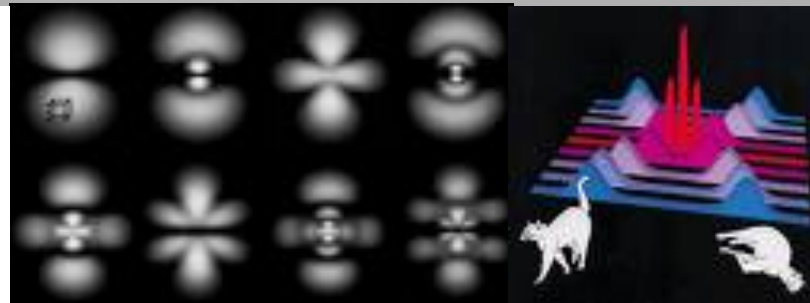
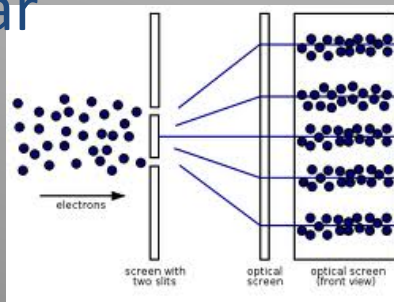
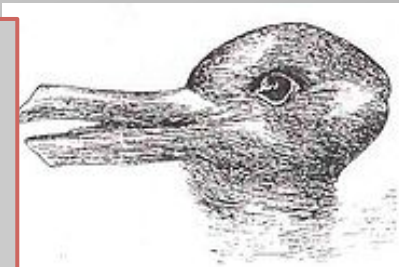
- What is the basic stuff everything is made of?
- What is the relation between the parts and the whole?
- How do the objects and their properties emerge?
- What is the role and locus of humans?



Who knows?

- What is the basic stuff everything is made of?
- What is the relation between the parts and the whole?
- How do the objects and their properties emerge?
- What is the role and locus of humans?

A major paradigm change may change the rules, raise up new questions, categories and distinctions. Many old problems and disputes may just disappear



Modern physics managed to falsify the Newtonian worldview but has not been able to provide an alternative


- Theories of relativity and quantum physics are incompatible
 - Physical understanding related to the basic principles of reality is not likely to proceed before their unification.
- The ontological content of abstract mathematical theories is vague
 - They are difficult to interpret
 - Abstract structures as such do not increase understanding
- Theories are often considered as operational tools rather than realist portrayals corresponding to reality.
 - Operational attitude undervalues conceptual matters which may be essential for detecting real causes and connections for the observed phenomena



Realist pursuit depends on conceptual clarification.

- Formulation of a plausible worldview is a creative task that demands
 - an appropriate mathematical model conforming to the observations, and
 - considerable philosophical talent to provide a sound metaphysical context

DU: basic principles and physical facts

- Mass and space as a surface of a 4-dimensional sphere
 - Mass can be energized but its amount conserves
- Zero-energy principle
-  Pendulating self-organizing whole in continuous change
 - seamless connection between mass, space, motion, and energy.
 - All the seemingly separated objects turn out to be internally interrelated
- State of motion does not affect time or spatial coordinates
- All the bodies can ultimately be constructed out of waves.

DU: basic principles and physical facts

- Clarifies the concept of mass
 - the origin of all existence.
 - Mass is an abstract quality that cannot be seen if it is not energized.
 - It is a hidden basis of everything, the foundation of all existence.
 - Because of gravitation, mass entails movement and provides potentiality for everything to actualize, for an evolving universe to manifest
 - Energy and mass are not to be equalized
 - all forms of energy are originally derivable from mass and its movement in 4th dimension
 - Mass is conserved whereas the sum of energy is always zero

DU's philosophical virtues compared to standard theories

- DU is a more encompassing theory which is built on a smaller number of premisses
 - covers the observed facts but does not seamlessly fit into the previous lines of thought
- The consistent theory does not need any ad hoc hypotheses to fit with the observed results in physics and cosmology.
 - In a wider ontological framework many present concepts, such as dilated time or dark energy, turn out to be mere epicycles
- Because of its clear principles and transparent mathematics, the theory can be easily interpreted, like Newton's synthesis at its time.
 - The precise model includes an obvious ontology which can be spelled out into an unambiguous interpretation.
 - Avoids mathematical complications by introducing a new, more natural perspective to the cosmos.

Notable metaphysical features in DU's picture of reality

- The invisible and change are naturally present.
 - Motion in space is related to the primary motion of space in 4th dimension
 - continuous change implies historicity in all that is manifesting (vrt Heraclitus)
- The whole is a lawful but much more flexible system than a clockwork
 - There is room for the Aristotelian kind of potentialities and the activity of human beings to affect the course of evolvment.
 - Because of interference and modulation various kinds of coincidences and internal tendencies may influence the self-organization that is happening in the (countless) cascaded subsystems
- Mass and zero-energy principle prevail everywhere determining the whole space.
 - Space and the gravitation potential field need not be separated
 - Particles are secondary constructions
 - Fits nicely to the ideas of undifferentiated continuous matter assumed by Plato, Aristotle, Descartes and Leibniz

Location for human beings

- In DU the age-old schism between materialism and idealism can be solved into a synthesis
 - The whole of existence is based on mass and its energization.
 - In complex systems there may also be more subtle forms of energy.
 - The phenomena we call 'mental' or 'spiritual', need not be disconnected from the totality emerging from mass and its energization
 - No need for Cartesian dualism. The whole supports material as well as mental phenomena and binds them together
- Human beings with all their features may be a result from natural evolution
 - We, like everything else, are born into certain historically determined frames that provide, as well as limit, the resources and possibilities that are available in given circumstances.
 - Whenever humans use their resources to modify something according to their intention a new form may be said to enter into the substance employed. A potentiality becomes actuality. It is an unavoidable ethical challenge for humans to think what to actualize

Thank you!