

Cosmic Ecology

An exploration of the cosmic significance of humanity based on the natural philosophy of J.G. Bennett and drawing on multiple sources of science and spirituality,

Part 1 – Human Beings in the Universe

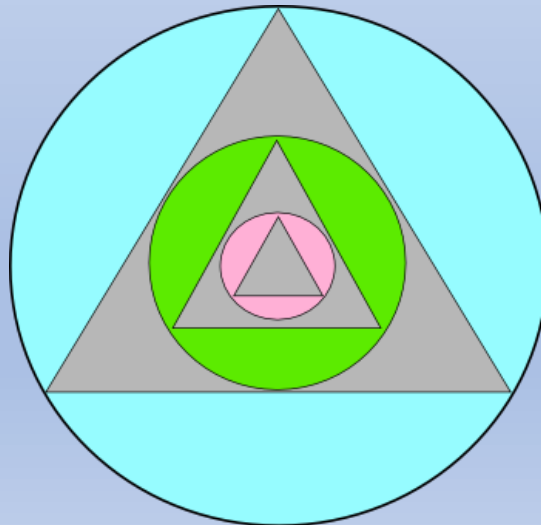
Module 3 – The Qualities of Energy at Each Level

Dr. Anthony Hodgson



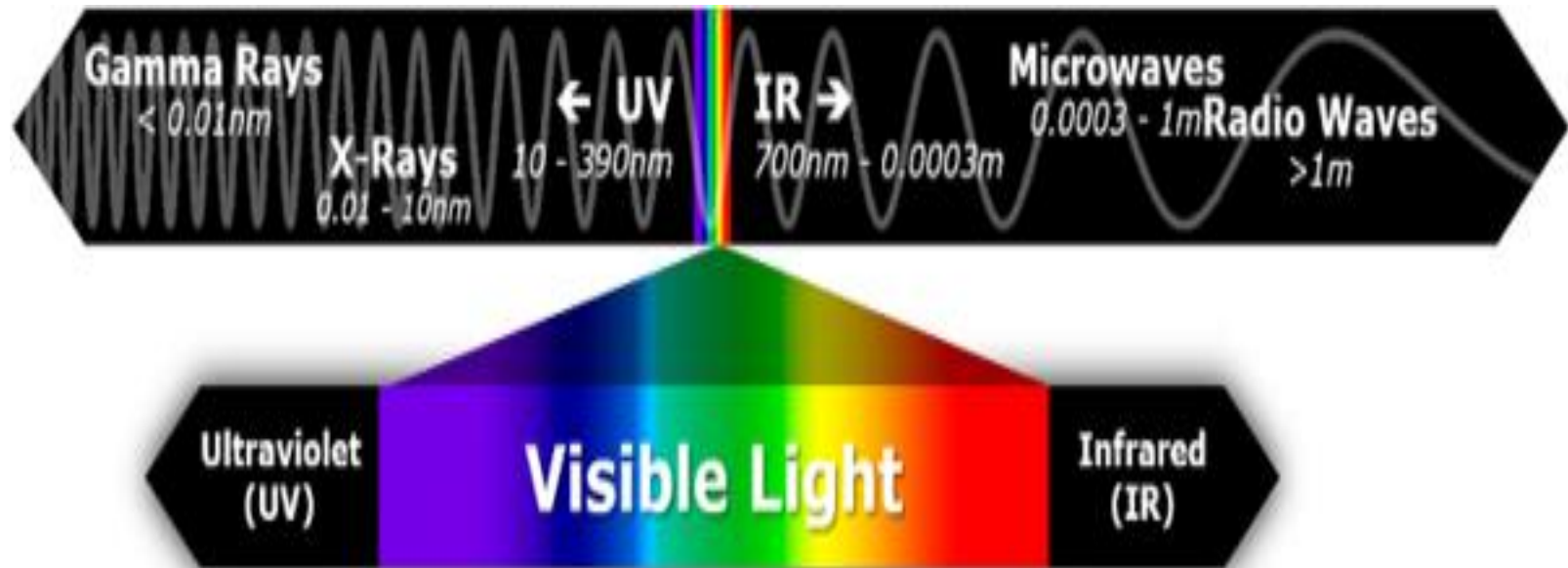
Section 1

Reality is not what it
seems to be



REALITY

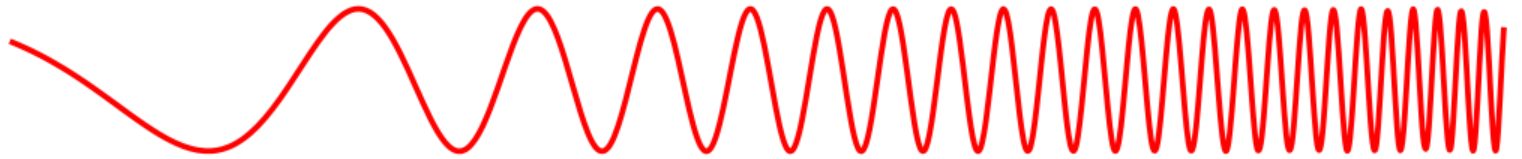
We see but a tiny slice



What we take to be 'reality' is a very small part of what is out there. So limit our interpretations to what we see shuts out most of the universe. Put the other way, the visible universe is just a hint of what it is all about.

The Range of the EM Spectrum

Penetrates Earth's Atmosphere?



Radiation Type
Wavelength (m)

Radio
 10^3

Microwave
 10^{-2}

Infrared
 10^{-5}

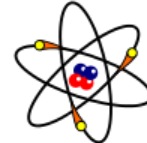
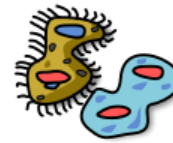
Visible
 0.5×10^{-6}

Ultraviolet
 10^{-8}

X-ray
 10^{-10}

Gamma ray
 10^{-12}

Approximate Scale
of Wavelength



Buildings

Humans

Butterflies

Needle Point

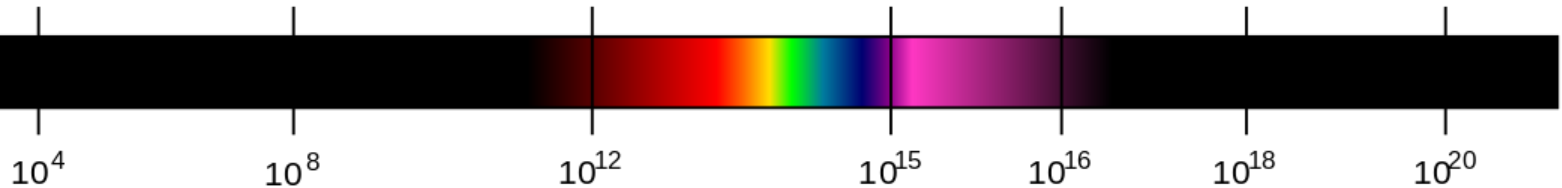
Protozoans

Molecules

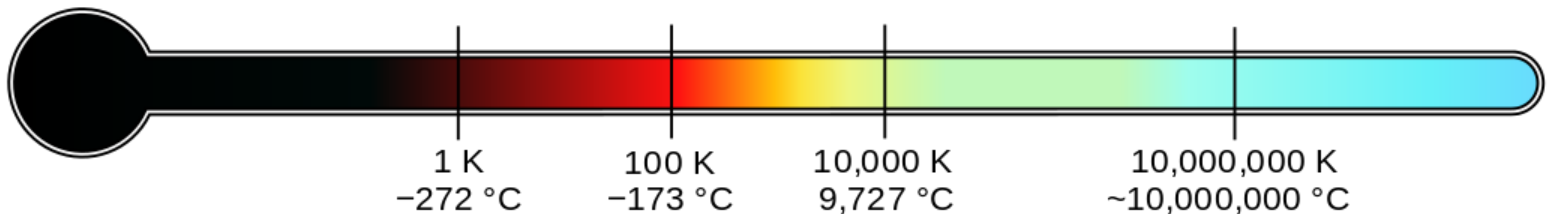
Atoms

Atomic Nuclei

Frequency (Hz)

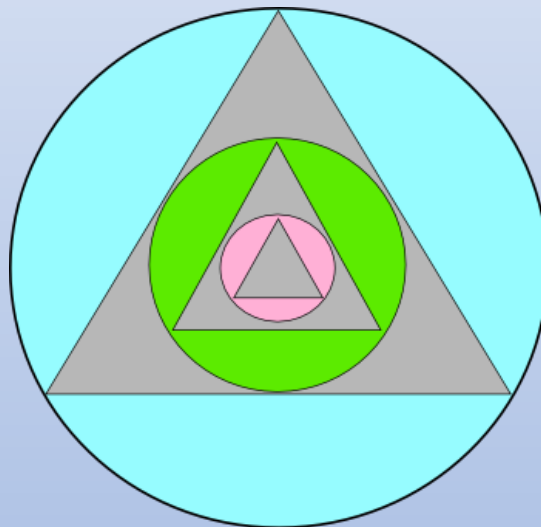


Temperature of
objects at which
this radiation is the
most intense
wavelength emitted



Section 2

We explore here the view that energy has Qualities of Intelligence – in a dimension to orthogonal to the EM spectrum and gravity

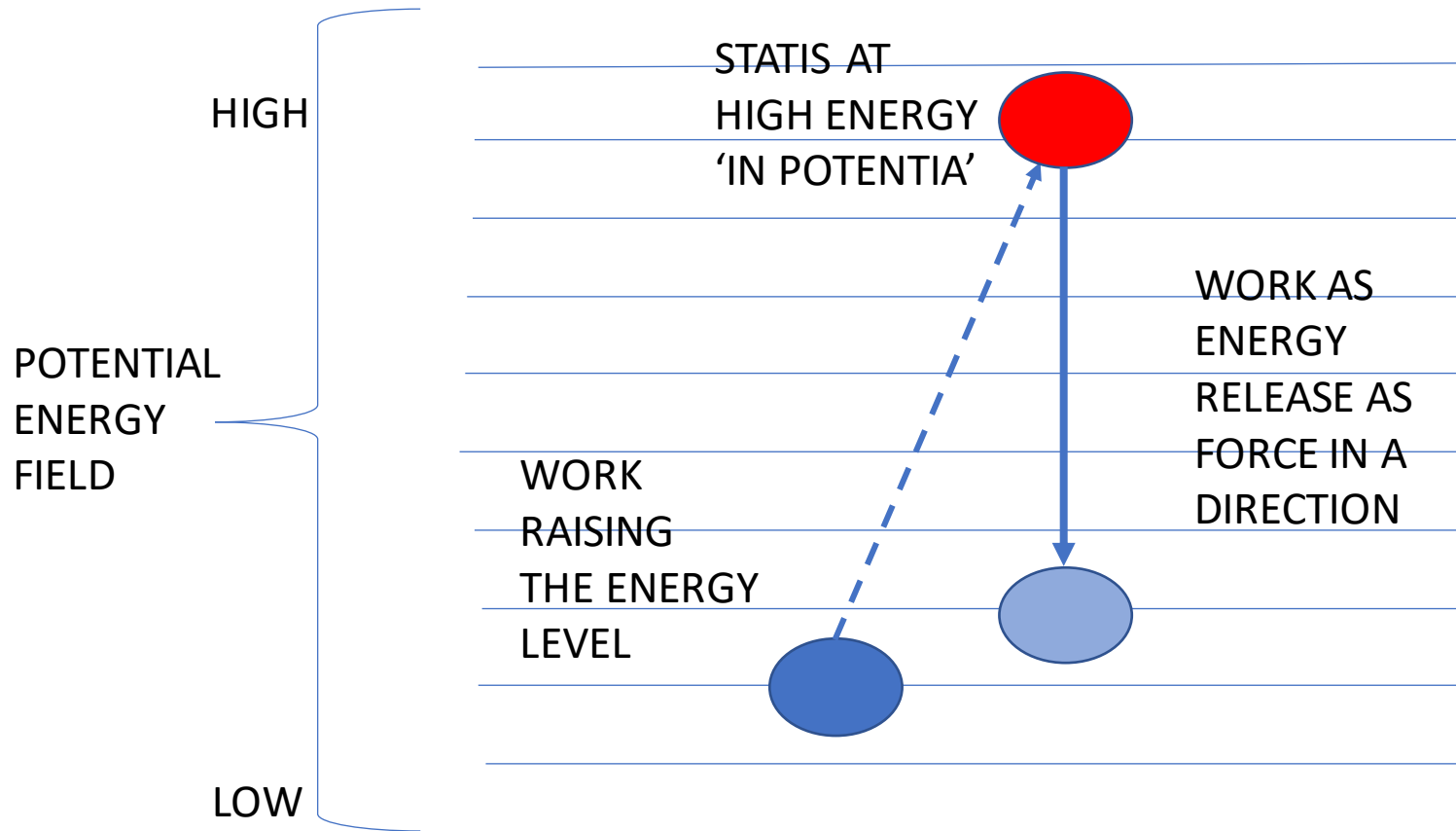


What is Energy?

The capacity to do work

- Any given energy can be defined by its quality (where it sits in the cosmic hierarchy), its quantity (the presence and availability of that energy) and its intensity (the degree to which it is focused to create special conditions).
- We attribute the qualitative role of the different energies as the active side of universal substance which has its own mass energy equivalence at each level.
- It also has its own inherent intelligence to generate its particular range of effects or manifestations at that level.

Kinetic and Potential Energy



Examples – lifting a stone (gravity); shooting an arrow from a bow (mechanical distortion)

Experiencing Energy Fields

GRAVITY

ELECTRICITY

CHI

Discussion Interlude 2

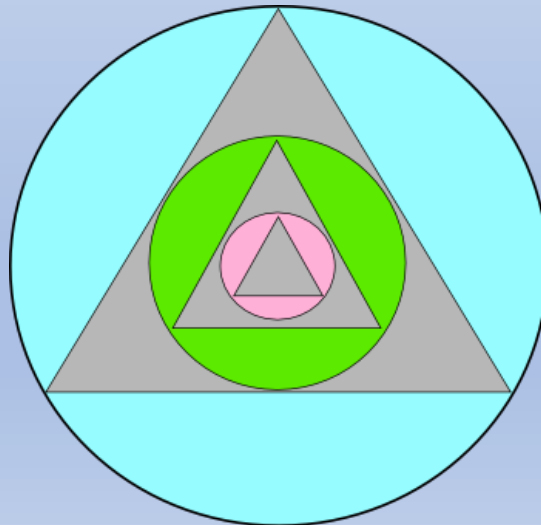
What energy fields are operating in in our daily lives both naturally and technologically?



RANDOM
TRIOS

Section 3

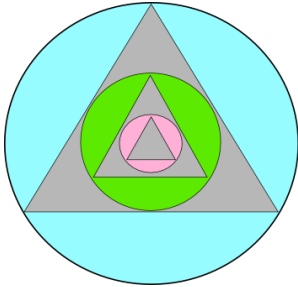
The Universe as a Nexus of
Energies of Different
Qualities at Different Levels



Postulate of Discontinuity of Beingness

- The equivalent of the quantum leaps at the universal level
- Each level plays a different role in the cosmic ecology
- A cosmos is an interacting combination of levels
- So we need the levels to be able to conceive of the cosmoses

Three Aspects v Three Perspectives



*Energy as
measurable
function in
time*

*Energy as
power of
inner
togetherness*

*Energy as an
instrument of
law and
intent*

FUNCTION

BEING

WILL

COSMIC

PROCESS

HOLONS

LAWS

PLANETARY

BEHAVIOUR

ENERGIES

PATTERNS

HUMAN

KNOWLEDGE

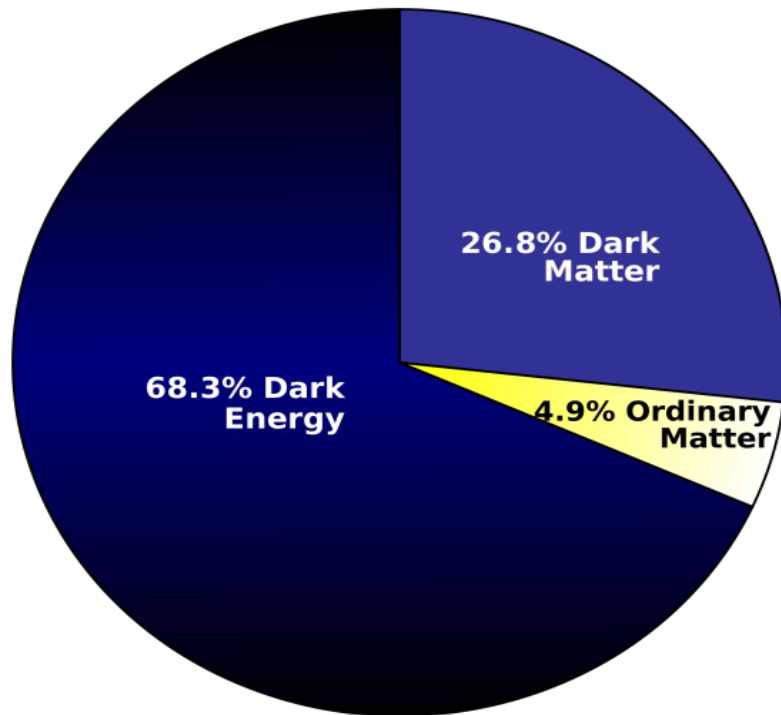
CONSCIOUSNESS

PARTICIPATION

The Twelve Levels and their Qualitative Energies



E12 Zero Point Energy



- This energy embodies the quality of latent cosmic resource from which and within which the complex and multi-labelled functions of the universe can emerge.
- It is also the distributed field (increasingly referred to by physicists as 'fluid') which provides a substrate for the transformational processes through which the structure of the universe is brought into manifest being.

the standard model



fermions

fermions include all quarks and leptons, as well as any composite particle made of an odd number of these, such as all baryons and many atoms and nuclei. all fermions are particles with half-integer spin, and possess conserved baryon or lepton

quantum numbers. in total, there are twenty-four different elementary fermions: six types of quarks and six types of leptons, combined with corresponding antiparticles. composite fermions, such as protons and neutrons, are key building blocks of everyday matter.

bosons

bosons include the force-carrying gauge bosons, the higgs boson, as well as any composite particle made of an even number of these, such as all mesons and various atoms. all bosons are particles with integer spin, but their statistics do not

restrict the number that can occupy the same quantum state. in total, there are five different elementary bosons: the three gauge bosons mediating the weak force, the gluon mediating the strong force, the higgs boson and the still theoretical graviton.

quarks



leptons



gauge bosons mediating the weak force



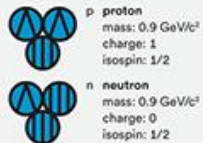
gauge bosons mediating the strong force



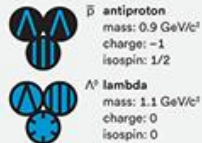
unobserved particles among others



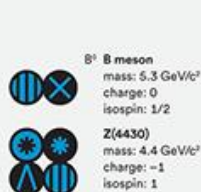
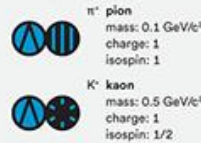
baryons among others



mesons among others



mesons among others



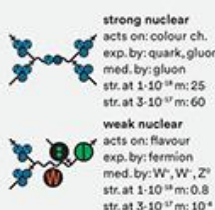
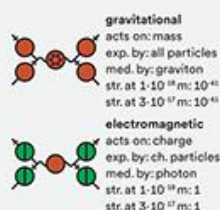
antiparticles

for every particle there is an equivalent antiparticle, denoted by a bar over the particle symbol (unless a charge is shown). both the particle and antiparticle have an identical mass and spin but the charge is the opposite. some electrically neutral bosons are their own antiparticles. below, the symbols for the elementary antiparticles are drawn.



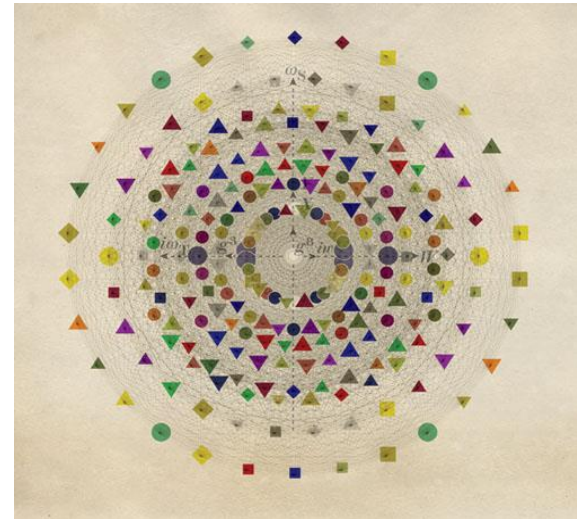
fundamental forces

conventionally accepted are four fundamental forces: gravitational, electromagnetic, strong nuclear, and weak nuclear. the gravitational and electromagnetic forces act over potentially infinite distance. the two nuclear forces act over subatomic distances. all forces but gravitational associate with elementary particles, whose behaviors are modelled in quantum mechanics: force-carriers (gauge bosons) interact with matter constituents (fermions). the electromagnetic and weak nuclear forces appear to be very different at low energies. however, above the unification energy ($\sim 100 \text{ GeV}$), they merge into a single electroweak force.

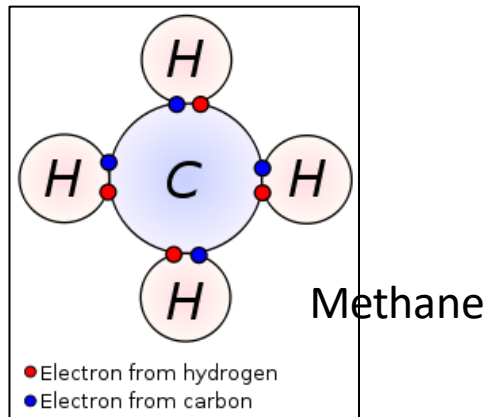


E11 Patterning Energy

This energy appears to us (by inference) as families of elementary particles. These are organised by four forces – electromagnetic, gravitational, strong and weak – each of which relates to some aspect of the cosmos. There are more than two hundred.



E10 Cohesive Energy



Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period 1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57-71 Lanthanides & Actinides	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89-103 Lanthanides & Actinides	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Periodic Table Key

X Synthetic Elements
X Liquids or melt at close to room temp.

X Solids

X Gases

Alkali Metals

Alkali Earth Metals

Transition Metals

Other Metals

Metalloids

Other Non Metals

Halogens

Noble Gases

Lanthanides & Actinides

- At the level of E11, although there is patterning, it is not at the levels of the material world as we experience it. Beyond elementary particles there is the construction of the atomic level.
- The properties of atoms in the form of the various elements have the power to combine to form molecules and crystals which have qualitatively different properties beyond their constituent parts.

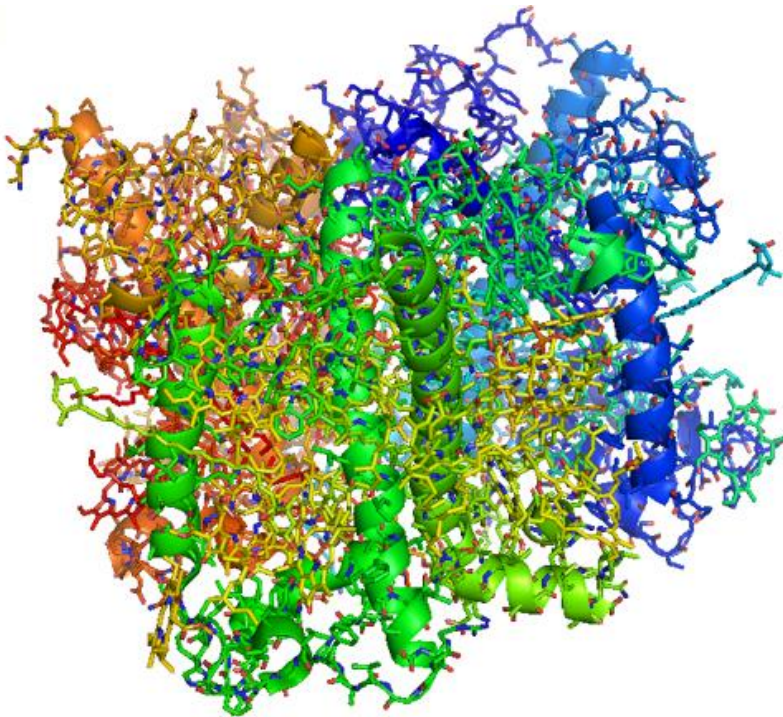
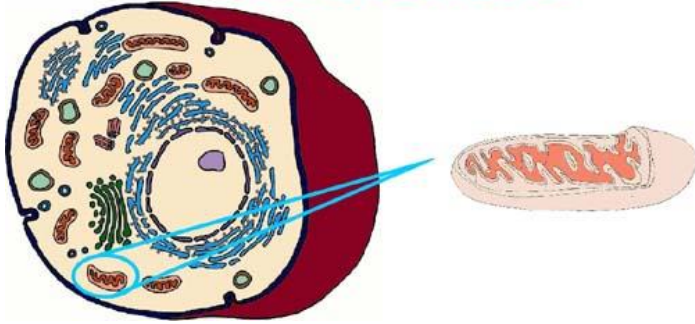
E9 Tensile Energy



- Adaptive or Tensile energy is very manifest in our world of experience as the elasticity, plasticity and resilience of the material world as well as living forms. It has the capacity to withstand and recover from deformation
- The frog can store energy in the tendons (not the muscles) and their tension release catapults the frog so that it can jump, proportionally, ten to twenty times further than a human.

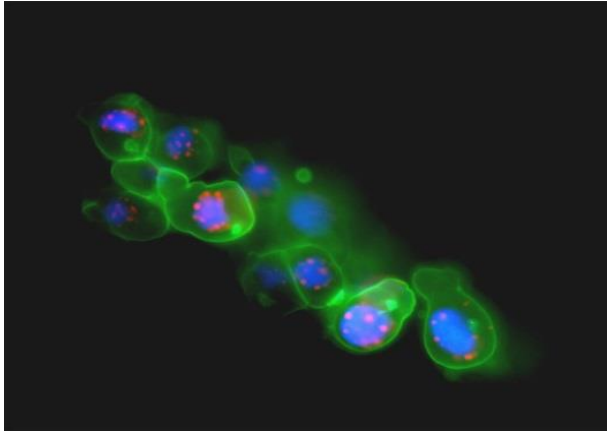
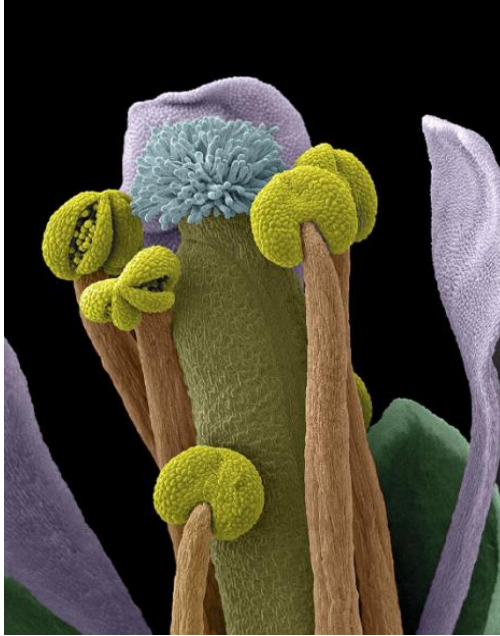
E8 Constructive Energy

Mitochondria



- This level of energy is the vitality in living systems. It comes from amazing constructions that go beyond normal chemistry. (For example chlorophyll and haemoglobin).
- The complex mitochondrial cells are the energy generators for life which enables a plant literally to feed off light. Their structures are immensely complex as in this light harvesting protein.

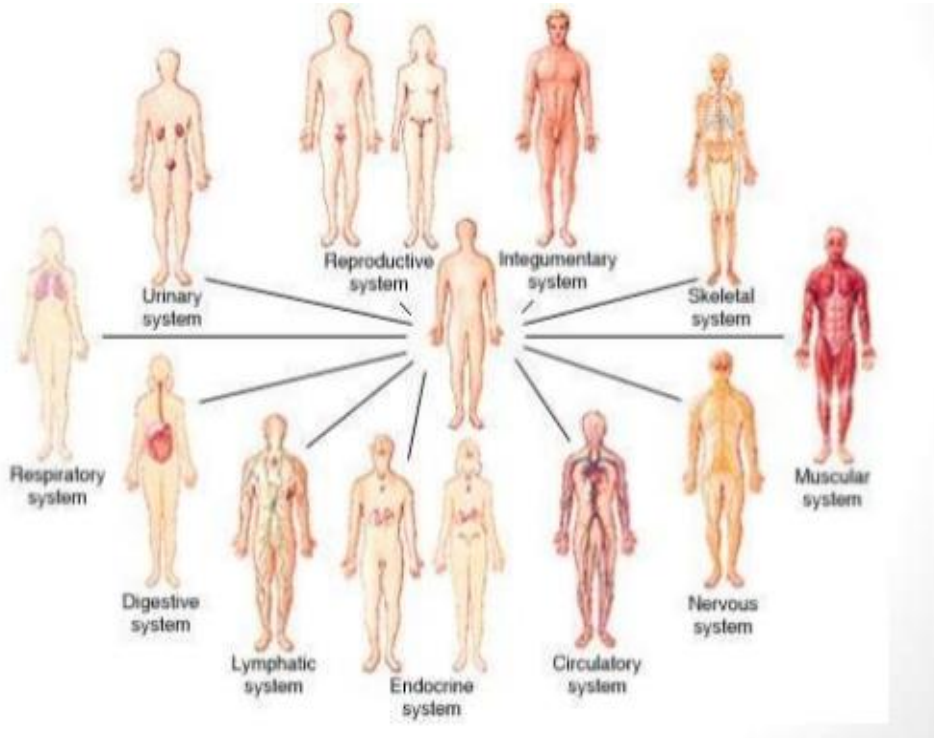
E 7 Regenerative Energy



- Regenerative energy embodies the quality of fertility which enables the variety and abundance of life in the biosphere. E7 is the energy in life that enables reproduction beyond growth and expansion.
- It also the power of stem cells to generate a wide variety of cell types that then can grow into diverse organs.

E6 Organismic Energy

Organismic energy operates at the level where complex functions, such as digestion and respiration, are made possible by functional differentiation on a scale way beyond that of the cellular structure.



The variety and range of specialisations of the animal kingdom enable many different patterns of autonomous behaviour we associate with the different characters of animals.

E5 Sensitive Energy



This level of energy is imbued with awareness and is experienced in humans as what we conventionally call consciousness. This is the stream of awareness which is taken as the waking state. However, it is not true consciousness.



Although strongest in humans there is also evidence that this is also present in animals which we experience as the sense of being stared at with emotion.

E4 Conscious Energy



We are unused to thinking of this level of energy as a distributed domain of the universe at large. It is not an energy we can possess but one that we can participate in.

This is usually experienced as an infrequent fleeting state that comes over us and can be experienced as an inner detachment from the 'normal' self of sensitive awareness.

Only with self-transformation can human beings develop a being that is able to sustain the participation in consciousness.

NOTE:

$CONSCIOUS_h$ = human level

$CONSCIOUS_c$ = universal level

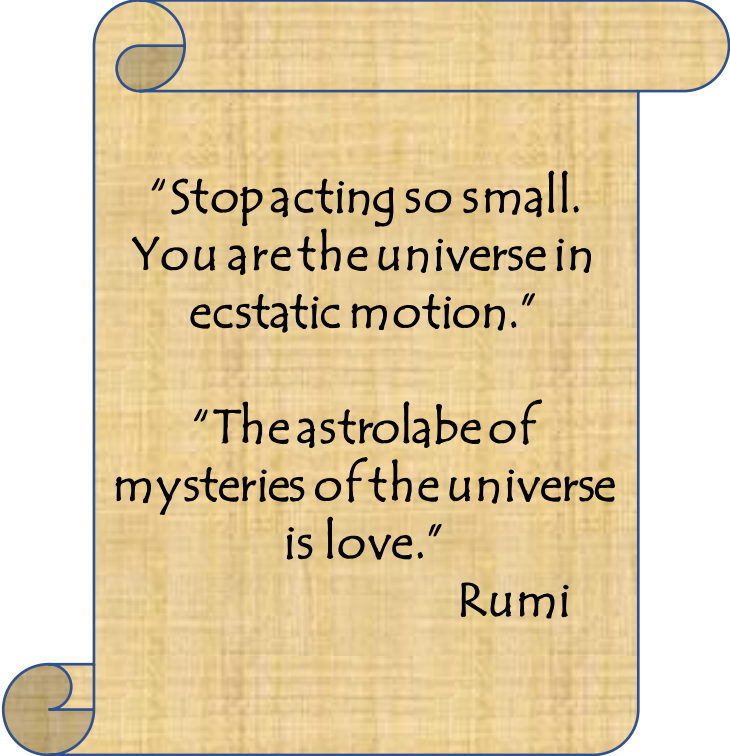
E3 Creative Energy



Creative energy does the work of originating and enabling the manifest universe. It is the 'work horse' of creation. It is even less available for possession by humans than conscious energy and yet it is at play in a whole range of aspects of human existence from procreation to the creative dilemma of culture.

Beyond the human scale it can be considered as the source of cosmic fecundity.

E2 Unitive Energy



"Stop acting so small.
You are the universe in
ecstatic motion."

"The astrolabe of
mysteries of the universe
is love."

Rumi

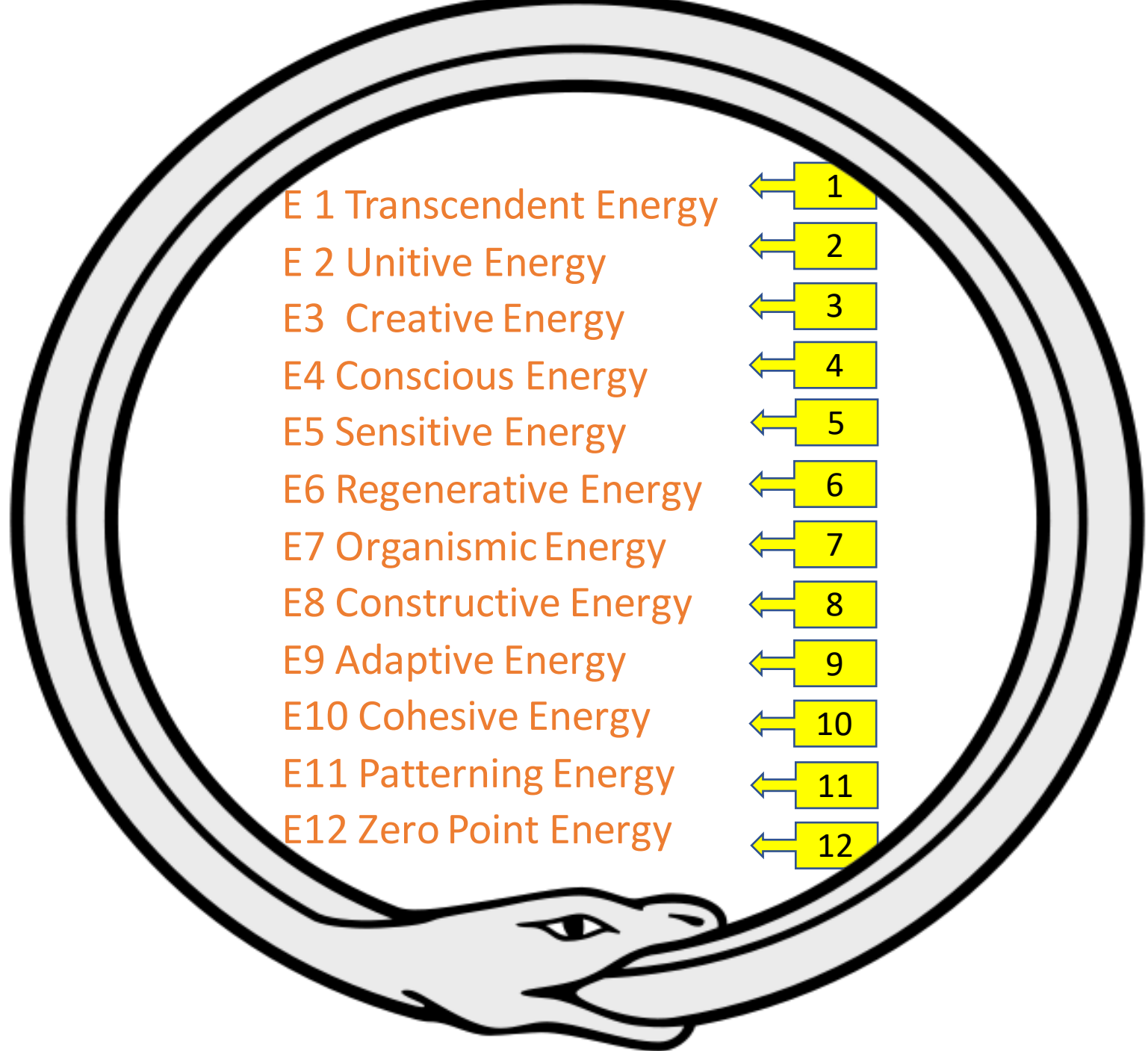
Creativity itself is
wild and unruly
unless a yet higher
energy is present that
is able to integrate,
make whole and
sustain wholeness.
This is the energy of
love and compassion
that is at the heart of
the entire universe,
manifest and
unmanifest.

E1 Transcendent Energy

The Tao gives birth to the One,
the Origin.
The One, the Origin gives birth to
the Two.
The Two gives birth to the
Three.
The Three gives birth to every
living thing.
All things are held in yin and
yang: and they are held together
in the qi of teeming energy.

Tao Te Ching

The ultimate energy is also the ultimate mystery. Perhaps it could be called the 'dark energy' of the Prime Source. Although we cannot know it we have the possibility of participating in its inclusive and undivided nature of non-duality in which separations such as human and cosmic, man and God, created and creator are not applicable. We are at a loss to express its nature – 'The Tao which can be described is not the true Tao'.



Discussion Interlude 2

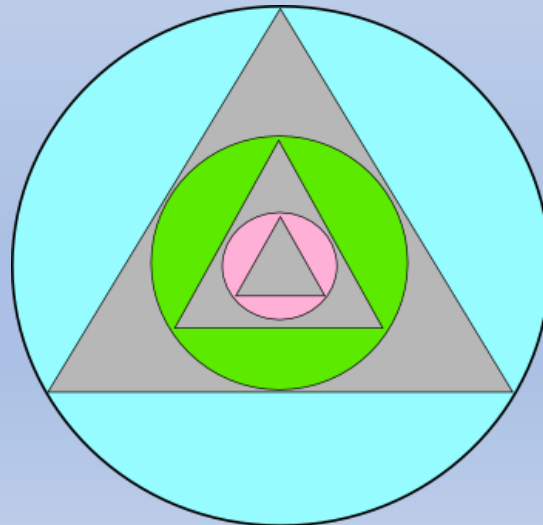
What connections occur to you between this scheme and your own view of the nature of nature and the universe



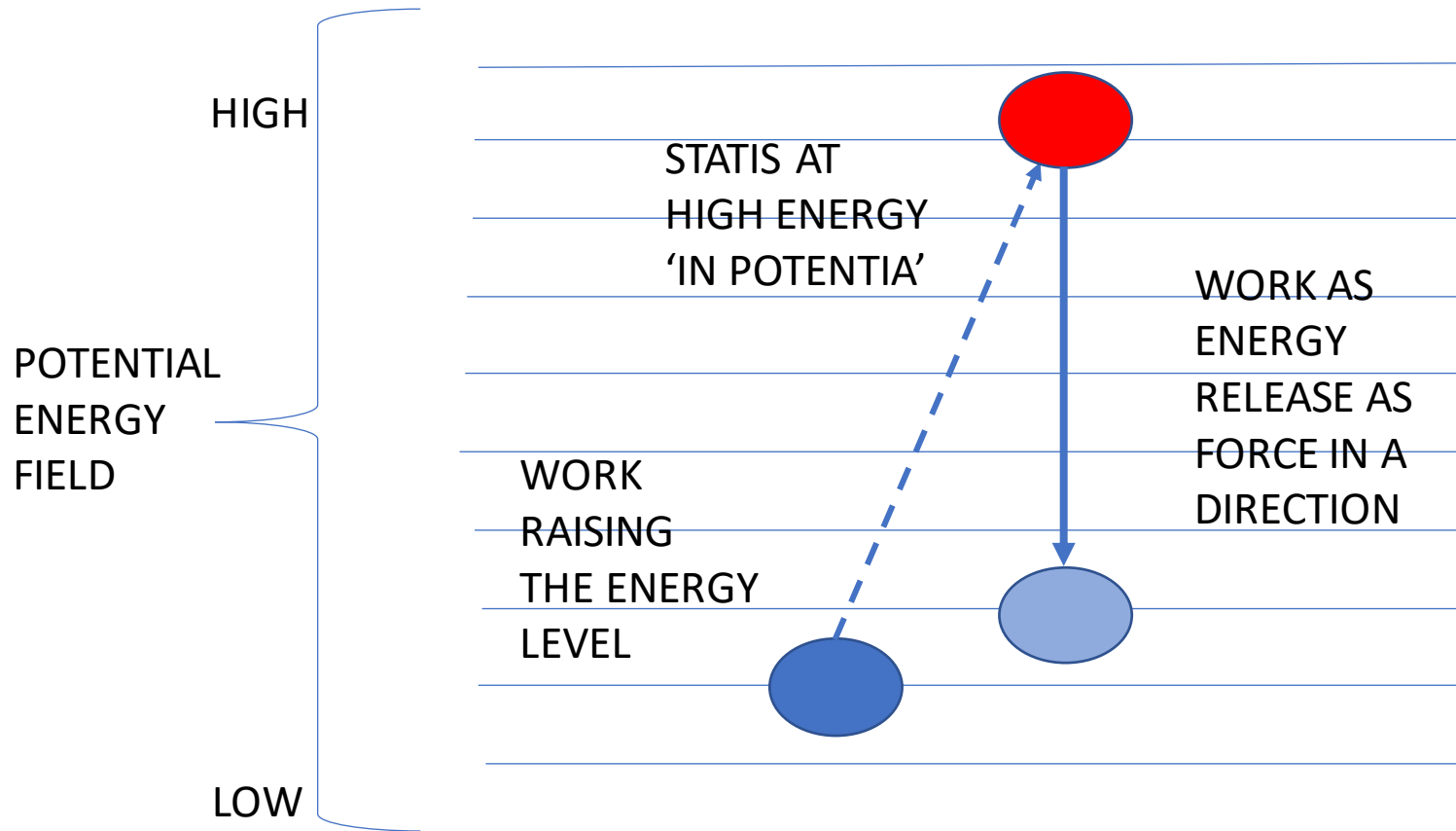
GROUPS
FOLLOWED
BY PLENARY

Section 4

Qualitative Energy Fields

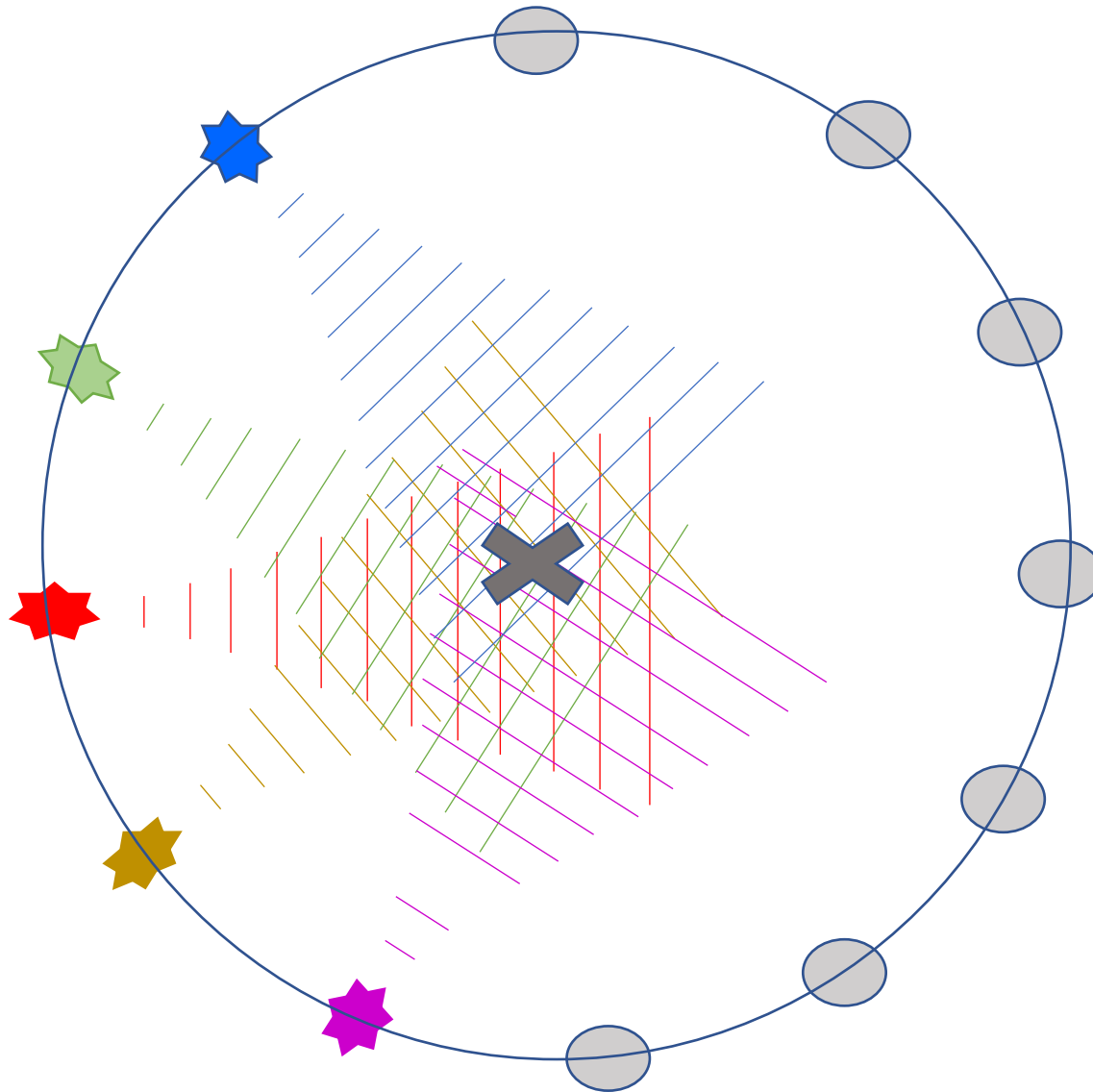


Kinetic and Potential Energy



Examples – lifting a stone (gravity); shooting an arrow from a bow (mechanical distortion)

Interweaving Energy Fields



NOTES

The stars represent energy sources.

The colours indicate they are of different qualitative levels.

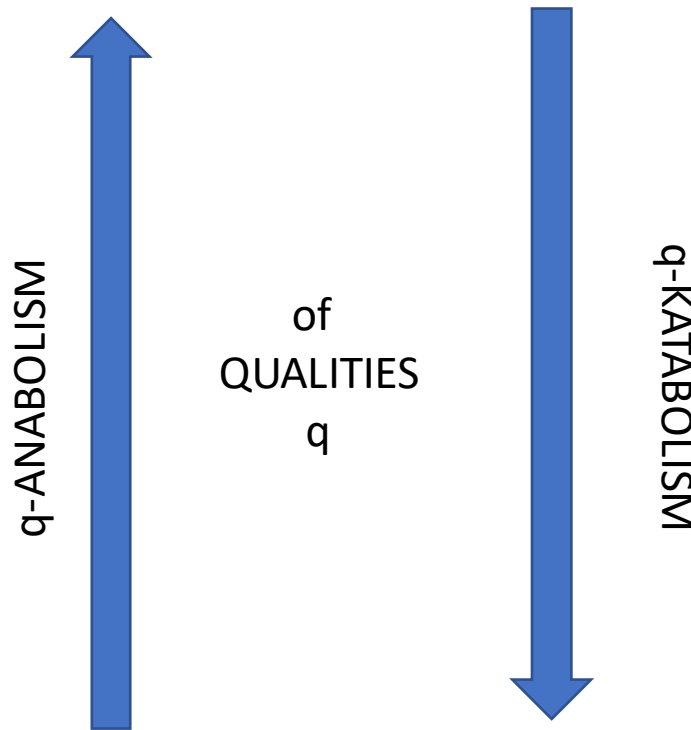
The lines are the energy field radiating from the source.

The cross represents some system that is interacting with all five levels of energy in one location.

The Dual Process of Metabolism

- ANABOLISM – building up a more complex structure
- KATABOLISM – degrading to a simpler structure

The prefix 'q'
denotes that a
given transaction
is between
qualitative levels



The Cosmic Metabolism

- This principle is expressed in some traditions is that everything is food for something and eats something else in a great chain of being.
- The scientific meaning of 'being eaten' is essentially metabolism in which a substance (food) at a level unusable directly by an organism is broken down by a higher principle, for example an enzyme, and a refined material is constructed that can be utilised as a specific energy by the organism. We extend this structured process to be a universalised process that operates in all of the 8 cosmoses.
- When a transformation takes place properly (in a law conformable manner) then the created energy involved tends to divide into three parts. One part serves the cosmic purpose (synergy), one third is burnt up in the action (entropy) and one third returns to the initiator of the transformation for its own evolution (regeneration).

Our Human Energetic Structure

LEVEL	THINKING	FEELING	SENSORY-MOTOR	
Conscience	Personal Integrity			E 2 Unitive Energy
Creativity	Transformative Ideation	Transformative Inspiration	Transformative Action	E3 Creative Energy
Consciousness	Reflective Self-inquiry	Emotional field awareness	Directed energy work	E4 Conscious Energy
Sensitivity	Specialised thinking skill	Polarised Opinionation	Repetitive skill	E5 Sensitive Energy
Organic	Associative `monkey` mind	Reactive like/dislike	Attraction/ aversion	E6 Regenerative Energy
Biological	Head brain function	Heart brain function	Gut brain function	E7 Organismic Energy

Discussion Interlude 3

Further questions

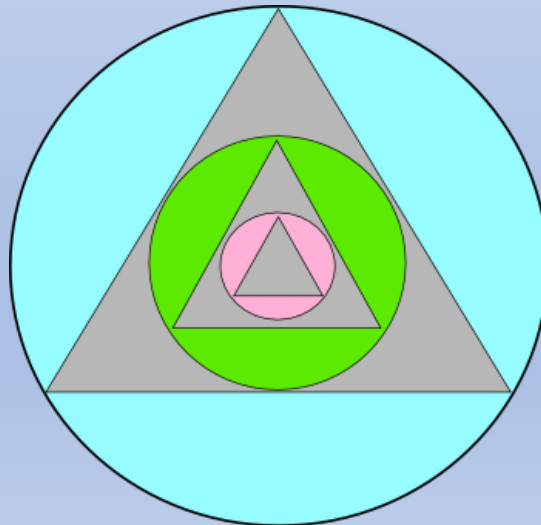


PLENARY

Conclusion

Q-ENERGY
TRANSFORMATION

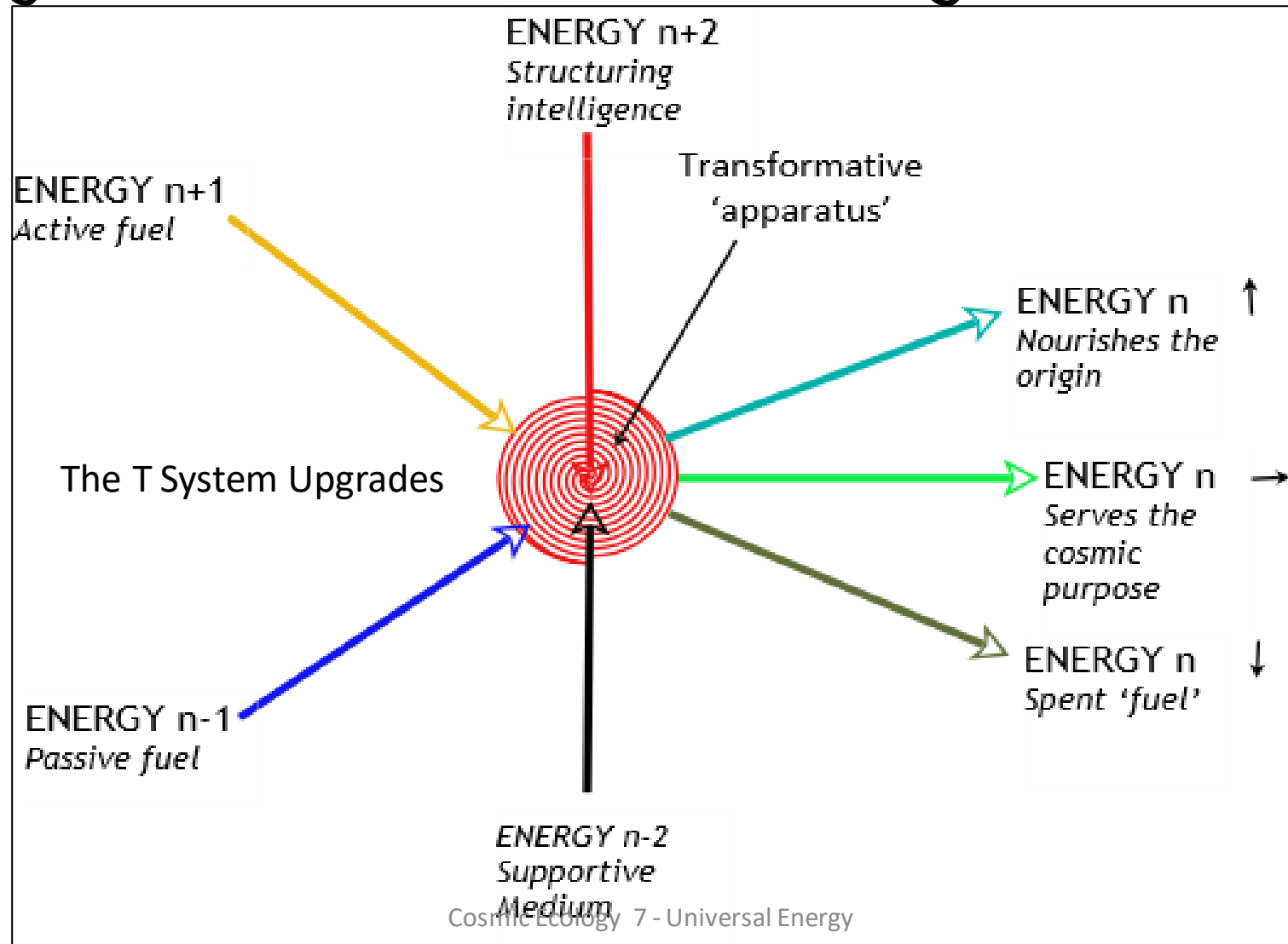
Heart of the Cosmic Ecology



Each has a Qualitative Energy

COSMOS	FOCAL COSMIC QUALITY
C8 Crystalline	Materiality
C7 Sustaining	Differentiation
C6 Phytogenic	Vitality
C5 Germinal	Fertility
C4 Animal	Idiosyncrasy
C3 Human	Perceptivity
C2 Generative	Individuality
C1 Undivided	Unity

The Generic Energy Transformation System – “The Cosmic Engine”



Reciprocal Transformation

We now have the foundation for constructing the cosmic ecology of what Gurdjieff called reciprocal maintenance of the entire universe at every level.

However, there are steps to be made in the way of

- How we think about wholes, patterns of connection and the nature of qualitative systems.
- How we think about the nature of space and time, extending our understanding of multi-dimensionality

We need to learn some basics of the frameworks, structures and principles that will help to make sense of this cosmic ecology and how it hangs together.

- Understanding qualitative systems and the qualitative significance of number.
(Module 4)
- Shifting from a four dimensional universe to a seven dimensional universe
(Module 5)
- Reciprocal Maintenance and the Eight Cosmoses
(Module 6)

