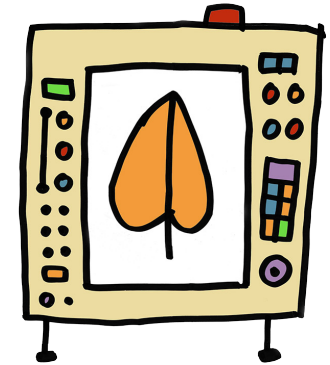


# SEIZING AN ALTERNATIVE

Toward an Ecological Civilization

June 4-7, 2015

Section IV: Reenvisioning Nature;  
Reenvisioning Science



# New physics of the electron

The new physics is:

- Quantum mechanical
- Special relativistic
- Whiteheadian organic realism
- and it works...

# The Vacuum in Quantum Physics

'It is to be expected that behind quantum mechanics there lies a lawfulness and a description that refer to the individual system. That it is not attainable within the bounds or concepts taken from classical mechanics is clear'. A. Einstein

A. Einstein, Einleitende Bemerkungen über Grundbegriffe, In: Louis de Broglie und die Physiker. P. 318. Claasen Verlag, Hamburg, (1955)

# Summary of what follows

- The oscillation of the Dirac electron
- The physical actualization of immaterial potential
- The doctrine of organic realism
- Electron-electron interactions
- Electron-proton interactions
- more...

# QM and the Dirac Electron

- QM is a highly successful theory, but lacks a quantum ontology
- We don't know what the electron & photon are doing or even what they are
- Here the Dirac equation for the electron supplies an

# A result of the Dirac equation

“...an electron which seems to us to be moving slowly, must actually have a very high frequency oscillatory motion of small amplitude superposed on the regular motion which appears to us”, P.A.M. Dirac

P.A.M. Dirac, Theory of Electrons and Positrons. Nobel Lecture. 1933. (Nobel Lectures Physics 1922-1941. Elsevier, Amsterdam 1965), p. 330.

# Aristotle & Heisenberg

- A.** Everything is both **actual** and **potential**, but not at the same time
- H.** To help understand the strangeness of QM, think of the system in terms of the **actualization of potential**

# More results of the Dirac equation

When translated from mathematics into ordinary language, the oscillating electron:

- moves at the speed of light
- requires time to be included in its description
- its energy level may be less than zero

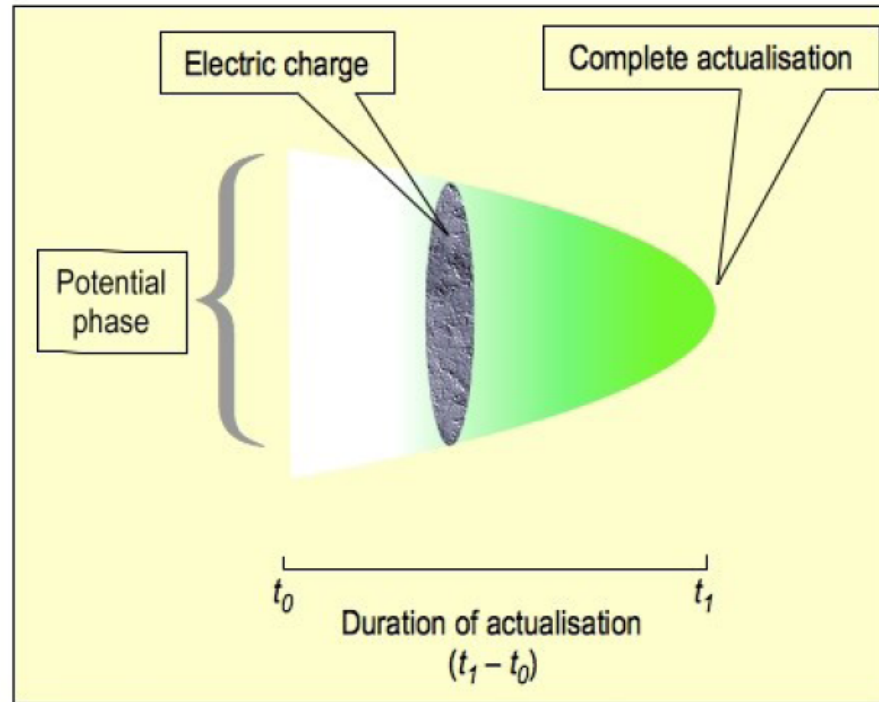


# Organic Realism–The Oscillation

- The electron is serial, energetic actualization of pure (immaterial) potential
- actualization terminates as an actual event in the life of the electron
- The actual (material) electron-event decays to a state of zero-energy, pure potential
- Organic realism contains the essence of the missing ontology of QM

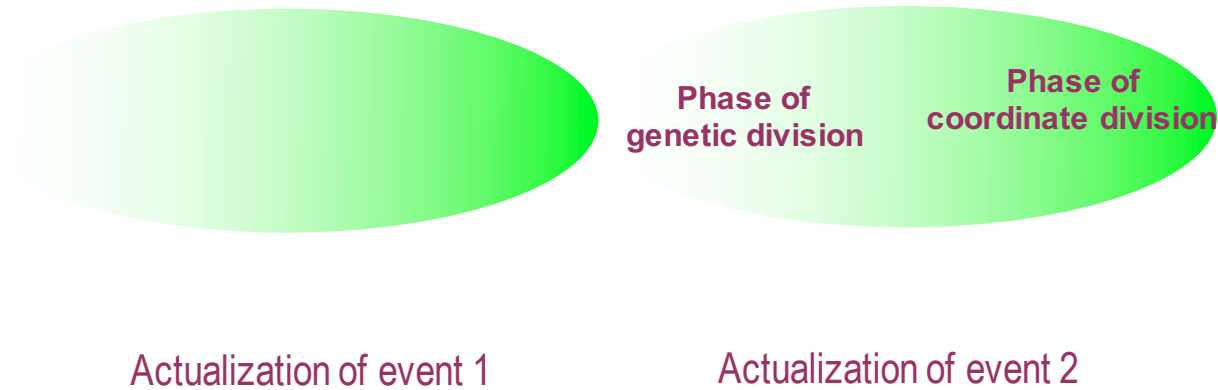
# Actualization of an Electron Event

...

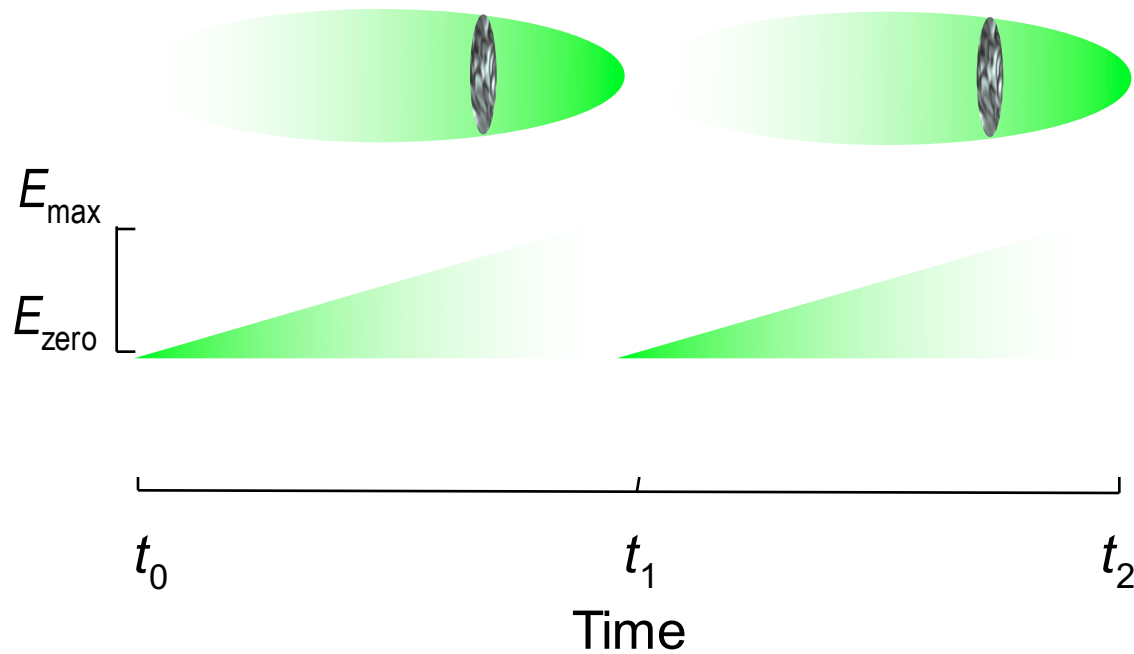


# Two serial electron events

▪



# The energy of electron actualization



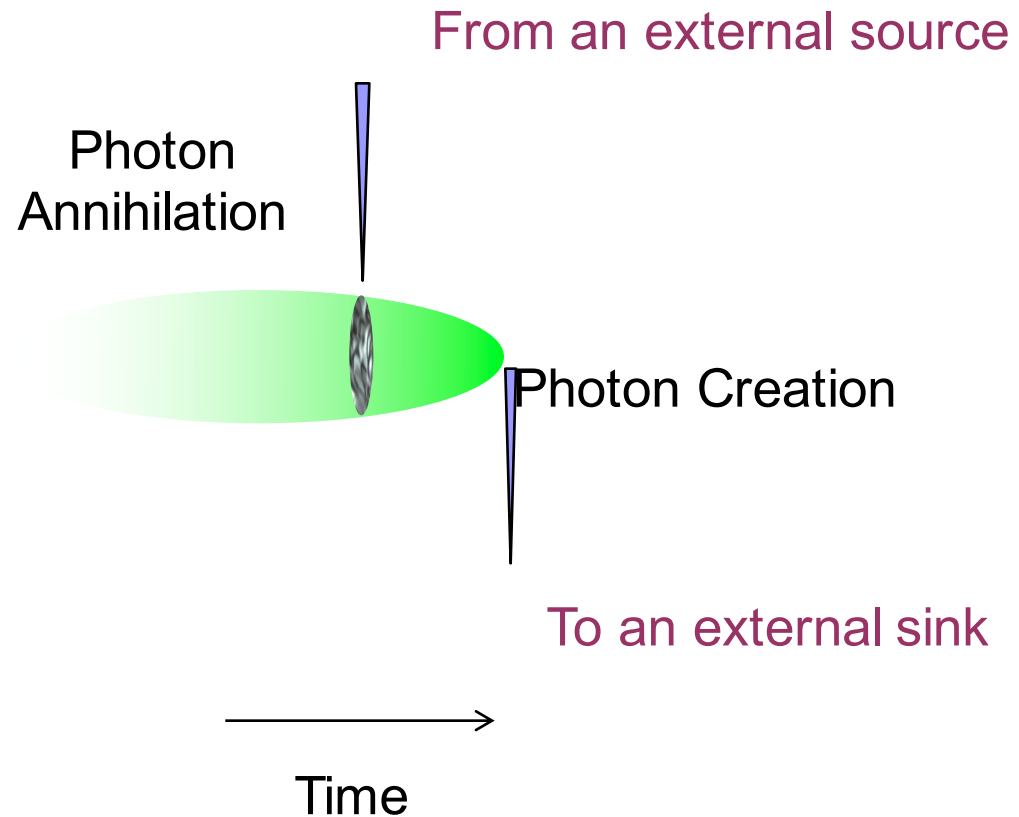
# The one-electron bond

An actual electron event is bound to the source(s) of the potential that it actualizes

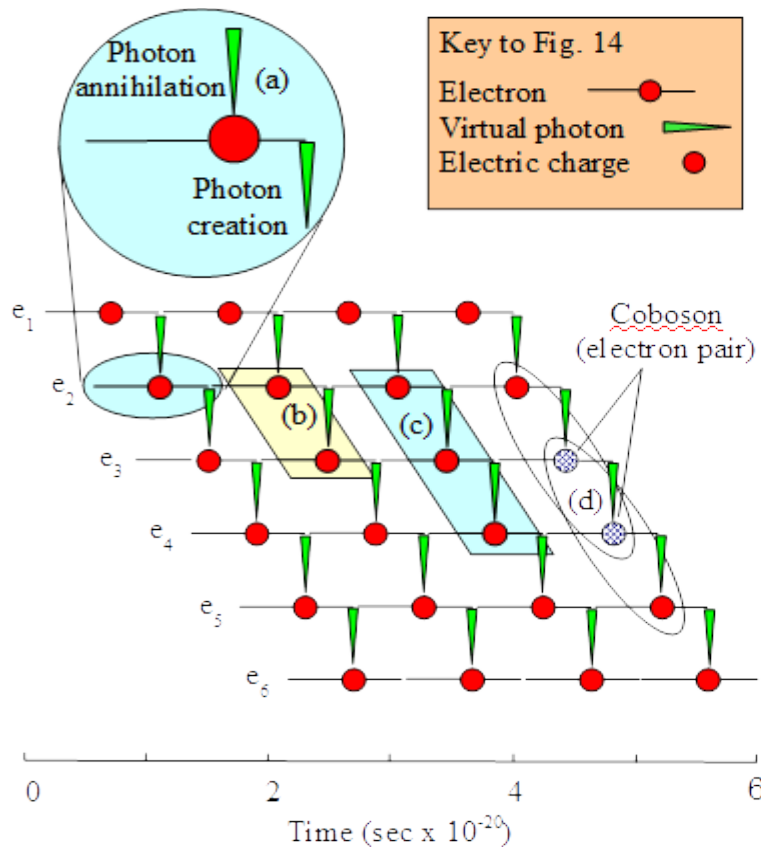
Sources:

- Its own immediate antecedent electron event
- The event which supplied the potential for the photon that was annihilated by the actualizing electron event

# Co-actualization: Electron + Photon

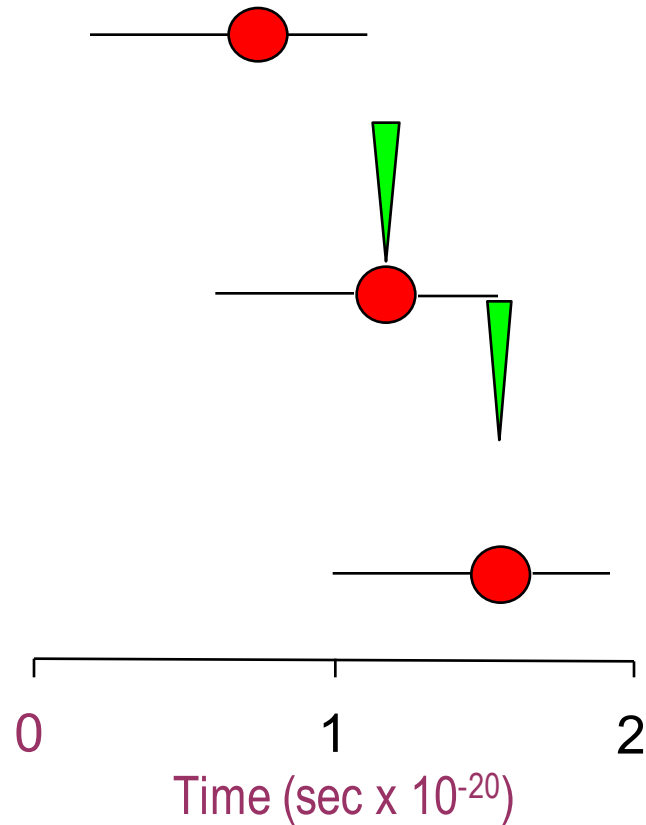


# The Many-Electron Interaction



- (a) one electron
- (b) electron pair
- (c) electron treble
- (d) pair of trebles

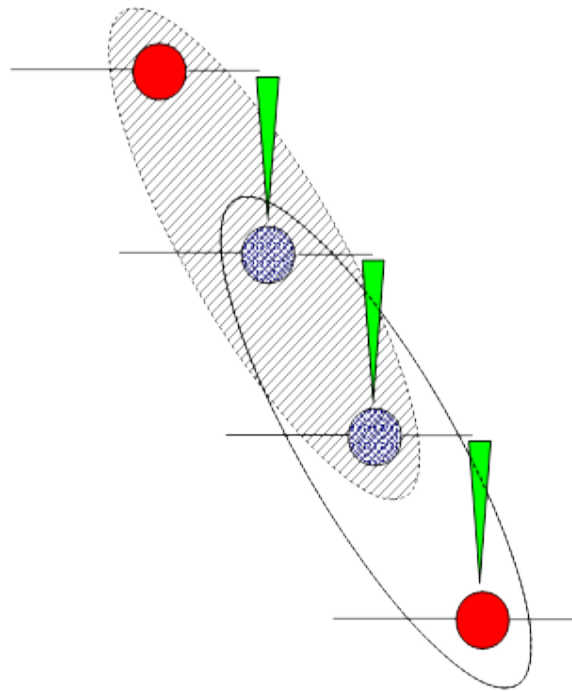
# The Treble Electron Bond





# The Treble to Treble Electron Bond

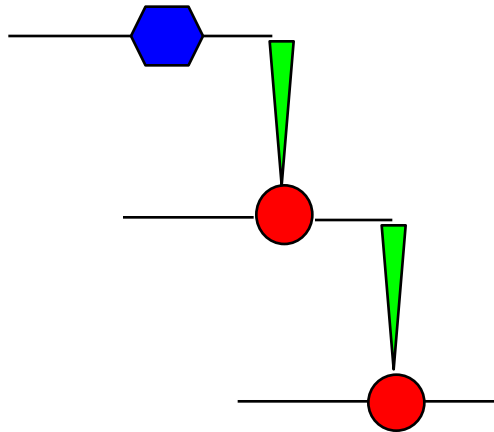
Actual treble  
 $3e^-$



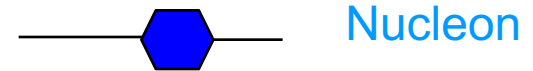
Potential treble  
 $1e^-$

# The Basic Atomic Treble

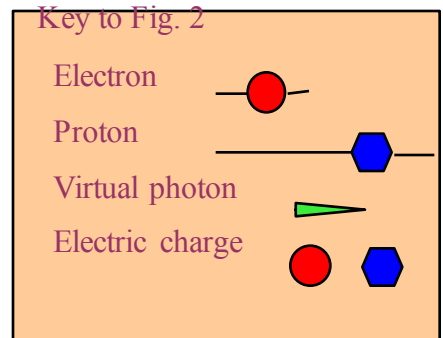
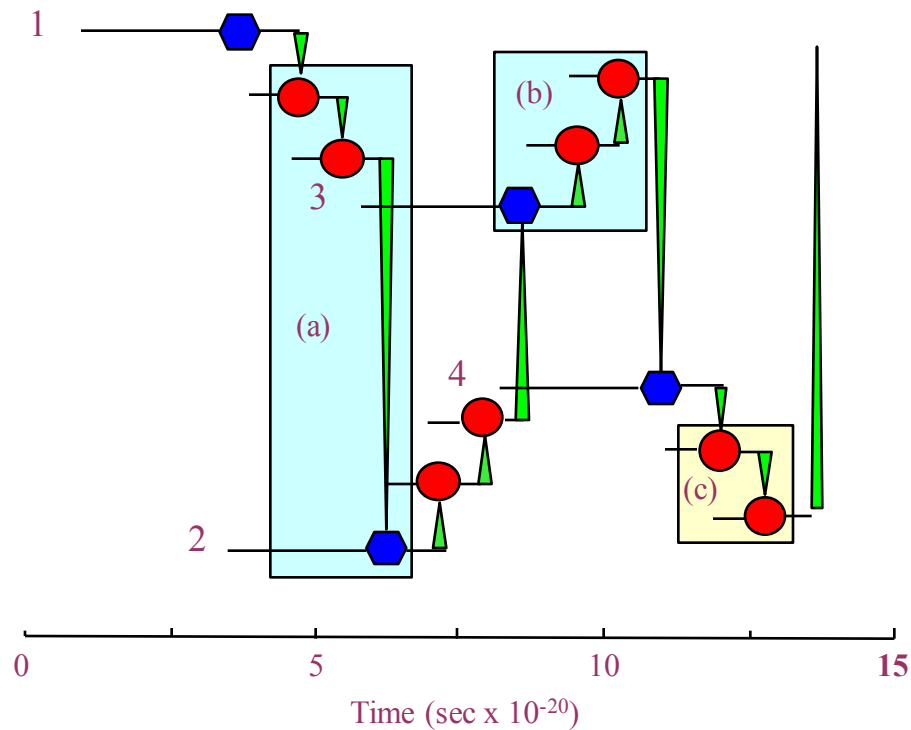
Actual treble



Potential treble



# The Atomic Treble Interaction



# He-4 Tabular Representation

Element	Electron collectivity <u>treble</u> AT*    PT	Coboson	Orbital configuration
Helium-4	2	2	1s <sup>2</sup>

\*AT actual treble

PT potential treble

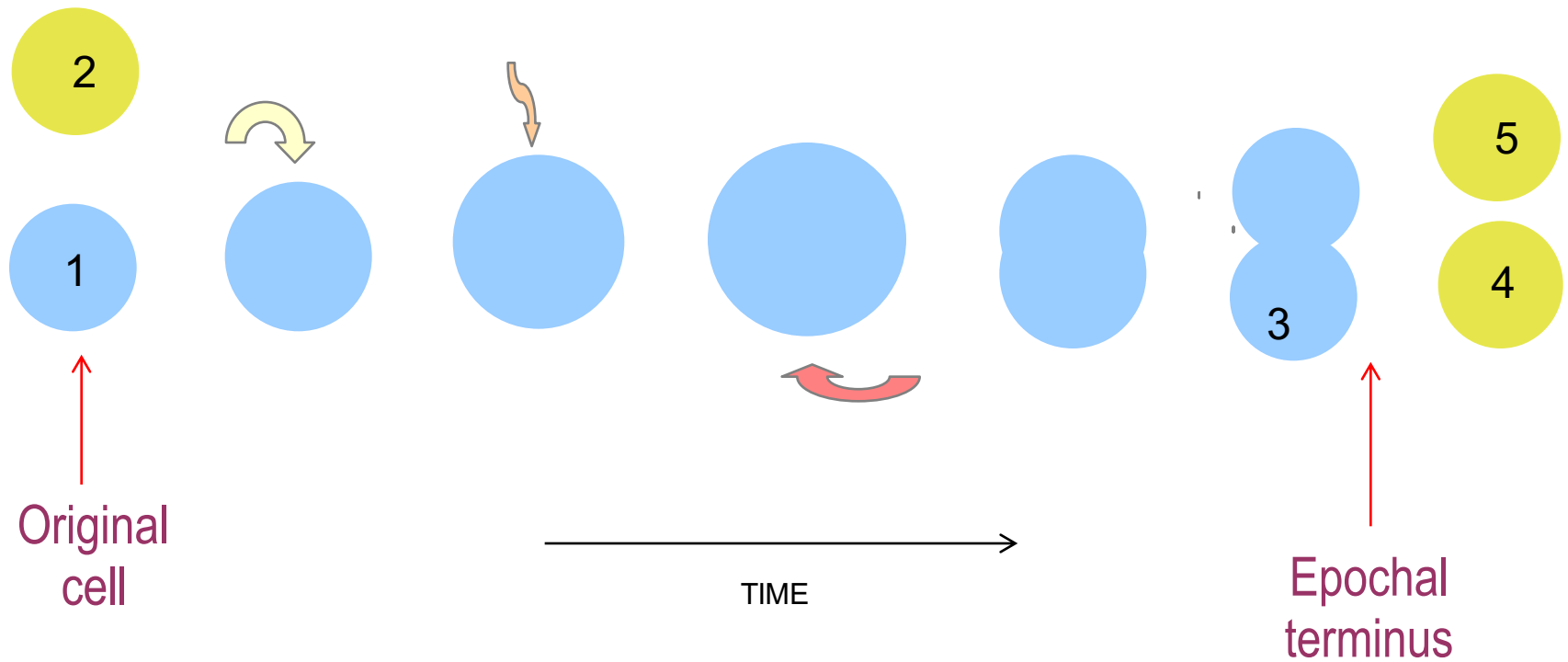
# Neon Tabular Representation

Element	Electron collectivity <u>treble</u> AT    PT	Co-boson	Orbital configuration
Neon	6    2 2	2	$1s^2, 2s^2, 2p^6$

# Electron Collectivity of The Group 18 Elements and Carbon

Element	Electron-Collectivity	Co-Boson	Orbital-Configuration
	2	2	1s <sup>2</sup>
Ne	6    2   2	2	1s <sup>2</sup> , 2s <sup>2</sup> , 2p <sup>6</sup>
Ar	6   2   2    6   2	2	1s <sup>2</sup> , 2s <sup>2</sup> , 2p <sup>6</sup> , 3s <sup>2</sup> , 3p <sup>6</sup>
Kr	6   2   2    6   2    6   2   2    6   2	2   2	<b>1</b> s <sup>2</sup> , 2s <sup>2</sup> , 2p <sup>6</sup> , 3s <sup>2</sup> , 3p <sup>6</sup> , 3d <sup>2,2,6</sup> , 4s <sup>2</sup> , 4p <sup>6</sup>
Xe	18   6   6    18   6	6	[Kr] 4d <sup>2,2,6</sup> , 5s <sup>2</sup> , 5p <sup>6</sup>
Rn	18   18   10    18   18   2   2	6	[Xe] 4f <sup>14</sup> , 5d <sup>10</sup> , 6s <sup>2</sup> , 6p <sup>6</sup>

# The Biological Process of AoP



# Conclusion

- The theory is congruent with well-known observations in the fields of physics, chemistry and biology
- The unreal physical consequences of the Dirac equation are a natural part of the theory
- A single principle, viz the physical actualization of potential, extends naturally from electrodynamics to biological cell division