

Einstein and Bohr's "Light Particle" Misapplication of Planck
***The Capacity of Oscillator Mechanics
to Explain Einstein's Photoelectric
Equation.***

Twentieth century science ignored the implication of the Rydberg formula — that all hydrogen radiation emissions are harmonic differentials of a root frequency. The second researcher to encounter a quantum phenomenon fared no better than Rydberg. He was the German physicist Max Planck¹.

In 1900, Planck discovered that black bodies absorb light radiation in units of energy he called "quanta." A "black body" is a mass which absorbs all light frequencies and converts them to heat. With black bodies, none of the radiant energy is released back as light, black being the absence of all chromatic light frequencies.

From this discovery, Planck developed his famous constant which may be one of the most important single contributions in the history of physics. Planck's Constant (designated by the symbol " h ") provides an energy formula measured in joules. It is a monochromatic formula in that a single frequency *times* Planck's Constant *times* a whole-number of oscillators at the frequency equals energy:

$$E = n(h)f; \quad f = \text{frequency}; \quad n = \text{whole number of oscillators at the frequency}$$

$$h = \text{Planck's Constant} = 6.6260755(10^{-34}) \text{ joules}$$

The energy absorbed by black bodies from radiation of a certain frequency was a whole-number function of frequency *times* a constant.

Early twentieth century physics took Planck's discovery and built an irrational quantum science upon it. They did so because they failed to recognize what Planck's Constant actually was; a measurement of the energy exchanged between nucleus and electron along a "string bond" between them.

In 1905, Albert Einstein used Planck to postulate a particle theory of light which he used to explain the "photoelectric effect."² To Einstein, Planck's "quanta" implied a mass-like light particle with frequency the equivalent of the velocity of the particle. Electrons were supposedly released by a momentum exchange with these light particles he called "photons."

However, I will show that Einstein's 1905 equation for the photoelectric effect did not, in fact, prove his particle theory of light. Einstein's photoelectric equations are the following:

$$h = \text{Planck's Constant}; \quad f = \text{frequency of light}; \quad f_0 = \text{threshold frequency}$$

$$hf = \phi + E \quad ; \quad \phi = hf_0 \quad ; \quad E = \frac{mv^2}{2} = hf - hf_0 = h(f - f_0)$$

$$\phi = hf_0 \text{ is the work function, min. energy needed to remove electron from surface}$$

$$f_0 = \text{threshold frequency for the photoelectric effect to occur}; \quad m = \text{mass of electron}$$

The energy in the electron released by light is equal to the Planck energy value of the light

¹ Planck, Max Karl Ernest Ludwig; 1858-1947; Universities of Kiel, Munich and Berlin.

² Einstein did so in the German physics journal "*Annalen der Physik*" in 1905.

for one second minus the minimum Planck energy value for release of the electron from orbit for one second. It is Planck energy devoid of time as a continuous factor.

In 1916, Robert Millikan experimentally proved Einstein's mathematics to be correct. Despite this fact he made the following observation: "Einstein's photoelectric equation...cannot in my judgment be looked upon at present as resting upon any sort of a satisfactory theoretical foundation.³" He was referring to Einstein's "photon" explanation.

Robert Millikan's scientific reputation suffered because of this opposition to the Einsteinian "photon." Millikan was a "mere experimentalist" whose prestige could never equal the "theoretician" Einstein who had become a cultural icon after his general relativity field equations had been confirmed by astronomical observations during two solar eclipses.

Nonetheless, quantum electron string harmonics and the data generated by negative radiation studies is proving Millikan to be right and Einstein wrong.

Quantum String Harmonics Duplicate the Einstein Photoelectric Formula

The potential energy state for any quantum string length has been identified by N-radiation experimentation as Planck's Constant *times* the string frequency⁴. This is the potential energy which can be exchanged by the electron and nucleus. Frequency is determined by the string lengths which are produced by the negation of subdivision of the root frequency:

h = Planck's Constant ; n = series or "band" number ; c = speed of light

n' = series' element number; $n' > n$; λ_r = root wavelength (91.14 nm)

$$\text{String Potential Energy} = PE = h \left(\frac{1}{n^2} - \frac{1}{n'^2} \right) \frac{c}{\lambda_r} ; \text{ by } N\text{-radiation data}^{24}$$

Any derived string length is harmonically related to root string by the following formula:

$$PE_{r/d} = PE_{\text{deriv.}} - PE_{\text{root}} = h \left(\frac{1}{n^2} - \frac{1}{n'^2} \right) \frac{c}{\lambda_r} - h \frac{c}{\lambda_r} = \left(\frac{1}{n^2} - \frac{1}{n'^2} - 1 \right) h \frac{c}{\lambda_r}$$

always a negative number

Any harmonically related string length has *negative potential energy* definition on any higher harmonic frequency. Lower frequencies strings impede higher frequencies as follows:

(harmonics for root frequency demonstrates general principle)

Total energy = E_t = (Mechanical Impedance Energy = E_i) + PE

$$E_i = h \frac{c}{\lambda_r} ; PE_{r/d} = \left(\frac{1}{n^2} - \frac{1}{n'^2} \right) h \frac{c}{\lambda_r} - h \frac{c}{\lambda_r}$$

$$E_t = h \frac{c}{\lambda_r} + \left[\left(\frac{1}{n^2} - \frac{1}{n'^2} \right) h \frac{c}{\lambda_r} - h \frac{c}{\lambda_r} \right]$$

$$E_t = \left(\frac{1}{n^2} - \frac{1}{n'^2} \right) h \frac{c}{\lambda_r}$$

$$\left(\frac{1}{n^2} - \frac{1}{n'^2} \right) h \frac{c}{\lambda_r} = PE \text{ (of derivative string)}$$

³ Physical Review, 22 April, 1916.

⁴ See "The N-Irradiation of Cotton Derives Planck's Constant" The Snake River N-Radiation Lab; in *The Quantum Dimension* (Paradigm Publishing 2009)

Lower Frequencies Must Harmonically Impede at Own String Potential Energy

The above equations demonstrate that a lower frequency, harmonically related string, can impede or absorb higher frequency light but only at the string's own potential energy level. There is a variance between the Planck energy in the light and the Planck energy absorbed by the harmonically related string. The available energy is greater than can be absorbed by the string:

let $h(f_l)$ = energy of light ; let $h(f_h)$ = harmonically related string potential energy.

let E = available energy

$$E = h(f_l) - h(f_h)$$

But this harmonics formula is a duplication of the Einstein formula if we allow " $h(f_h) = h(f_0)$ "

$$hf_l = \phi + E \quad ; \quad \phi = hf_0 \quad ; \quad E = \frac{mv^2}{2} = hf_l - hf_0 = h(f_l - f_0)$$

$$h(f_h) = h(f_0)$$

$$E = \frac{mv^2}{2} = hf_l - hf_h = h(f_l - f_h)$$

The Rydberg frequencies are a quantum harmonic distribution of string lengths. They are similar to the Euclidean harmonic distribution of string lengths except that Euclidean harmonic lengths are determined by subdivision and quantum harmonic lengths by the negation of subdivision for the quantum squared. Both can vibrate sympathetically or in resonance with frequencies higher in the harmonic series.

The above equations demonstrate that the amount of energy any electron string can absorb in resonant vibration with higher frequencies is the string's own potential energy. String potential energy has been experimentally shown to be Planck's Constant times the string's frequency of vibration.⁵ There is a variance, however, in the energy in the higher frequency light (Planck's Constant times light frequency) and the lower frequency string potential energy (Planck's Constant times string frequency). Einstein's photoelectric equation shows that this variance can be applied to aiding an electron's escape from the atom and into a current.

In summary, the photoelectric effect is shown to be a phenomenon of the fixed orbits of light-absorbing conductors, fixed orbits which do not allow the electron to acquire the orbital level of higher frequency harmonically related light. It does not require a light particle or photon to explain — as Millikan correctly anticipated.

The photoelectric effect is due solely to the variance between the energy in light and the ability of a fixed orbit — but harmonically related — electron string to absorb the light energy. The excess energy is invested in emitting the electron from the atom, as Einstein's formula demonstrates. The experimental scientist Millikan, was right. The cultural icon, Einstein, was wrong. The "photon" is not needed to explain the photoelectric effect.

Particle momentum-exchanges (Einstein's photon) and wave impedance (electron string behavior) have completely different energy signatures. This is due to differing applications of the time variable.

⁵ "The N-Irradiation of Cotton Derives Planck's Constant" The Snake River N-Radiation Lab; in *The Quantum Dimension* (Paradigm Publishing 2009)

In a momentum exchange, time determines the rate of acceleration/deceleration and therefore the force component of the energy equation. Time is the period covering the acceleration/deceleration.

For a waveform, however, energy is the number of energy “peaks” which pass a point in space during a period of one second. Energy is a function of frequency and the frequency of the wave is measured *per second*. Planck energy is the energy *per second*. The Constant *times* frequency produces the number of energy “hits” per second.

For an orbiting electron, “ $h (f)$ ” must be multiplied by the number of seconds the electron string is vibrating to equate to energy. Time is a continuous factor, not a specific period determining a single energy event.

In the case of a photoelectric event, the period covering the “event” (the ejection of the electron from the atom) is also determined by frequency. The period of the “event” is framed by the time factor for the frequency. The relationship between time and frequency is the following: $t = 1 / f$. The time which one vibration takes (in seconds) is equal to one divided by frequency.

This translates into the following energy equation: $E = h / t$. Planck’s “joules *times* frequency” are now expressed in a small fraction of a second equal to “ $1 / f$ ” — or the time required by one vibration. Planck’s Constant can be stated in smaller amounts of time which multiplies total energy. The time period determines the expression of energy. The expression of the energy ejecting the electron from the atom requires the following amount of time:

$f_l =$ frequency light ; $f_h =$ frequency harmonic string

photoelectric energy = $E_p = \frac{h}{t_p} = h(f_l - f_h)$; photo electric time period = t_p

$$t_p = \frac{1}{f_l - f_h}$$

The time taken to eject the electron from the atom; the “period of the event.” will be:

$$t_p = \frac{1}{f_l - f_h}$$

The time will be one *divided* by the frequency of light *minus* frequency of impeding string.

Time covering the ejection of the electron is determined by the frequencies of the carrier light wave and the frequency of the impeding electron string, not by the momentum exchanged on impact with an alleged :photon.

Acceleration/deceleration of impacting particles is a one-time energy event and time is a set period determined by relative momentums. Frequency is a multi-energy event over time. To confuse the two is, to say the least, irrational thought.

In 1913, Niels Bohr tried to explain Rydberg’s and Planck’s quantum discoveries with Einsteinian photons. To do so, Bohr had to treat Planck’s “packets of energy” as stripped of their time component.

Specifically, Bohr explained Rydberg frequencies as photons output by electrons falling between quantum orbits. These “falls” were one-time events and supposedly resulted in one-time releases of a photon.

Bohr proposed that electron orbits were restricted to quantum distances. Each electron quantum orbit possessed a potential energy value which he identified as “electron voltage.” He calculated electron voltage from the Planck energy value for the Rydberg root frequency as divided by the elementary charge.

Bohr’s formula was the following:

$$\text{Rydberg root frequency} = \frac{c}{\lambda_r} ; \text{ Planck's Constant (in joules)} = h$$

$$\text{elementary charge of electron (in coulombs)} = \epsilon ; \text{ electron volts} = eV$$

$$\text{Energy} = (\text{charge})(\text{volts}) ; \text{ from the equation for an electrical capacitor field.}$$

$$h \frac{c}{\lambda_r} = (\epsilon)(eV)$$

$$(\text{electron volts}) = h \frac{c}{\lambda_r} / \epsilon = h \frac{c}{\lambda_r \epsilon} = 13.6 \text{ joules per coulomb}$$

$$(\text{Planck energy})/(\text{elementary charge}) = \text{Electron Volts}$$

This calculated to 13.6 electron volts which Bohr defined as the base or highest energy state of the electron at quantum orbit number “1.”

The orbit’s potential energy was defined as “-13.6/ 1² eV.”

Each subsequent quantum orbit would have a potential energy defined as “-13.6/ n² eV.” Orbits could only acquire quantum values defined by the whole number “n.”

When the electron fell from a *lower* potential energy quantum orbit (greater “n” value) to a *higher* potential energy orbit (lower “n” value), it gained energy. This acquired energy was emitted as a “photon.”

$$\left(\frac{-13.6}{n^2} \right) - \left(\frac{-13.6}{1^2} \right) = \frac{13.6}{1^2} - \frac{13.6}{n^2} = \left(1 - \frac{1}{n^2} \right) 13.6 \text{ eV} = \text{energy emitted as “photon”}$$

The alleged photon had an energy value determined by the “static ” value of Planck’s Constant. It equaled Planck energy for one second of time only. Bohr had used the static Planck’s Constant to calculate electron volts.

However, Einstein’s “static” Planck energy allegedly possessed by “photons,” were frequency values which kicked an electron out of its orbit. Static Planck values were never applied to orbiting electrons which were continuously emitting light.

I have shown above that Planck’s Constant distributed into the time demarcated by frequency, establishes the period of electron ejection. Static Planck energy can be used to mathematically describe the photoelectric ejection of electrons.

It is true that static Planck energy might also describe change in orbit as Bohr is arguing. The period covering the change in state can be described by frequency demarcated time as with the Einstein equation. Any energy gain by this change in orbital state, however, could

never be output as a “burst of light” (Einstein’s photon). The energy thus gained would be needed to sustain the new orbit *over time*.

Any electron state continuously emitting light must be described by *non-static Planck energy*. An orbit itself cannot be restricted by time. The vibrational frequency of that orbit is restricted by time, but the string must be free to absorb and emit the light at frequency for an unresolved amount of time.

Any static energy gained by change in orbit must be applied to string potential energy. In fact, Bohr’s electron “fall” to a higher potential energy electron state would be, mathematically, the reverse of the Einsteinian photoelectric equation as modified by Rydberg string harmonics:

$$eV = \frac{E}{\epsilon} = \frac{hf_l}{\epsilon} = \frac{h(f_l - f_h)}{\epsilon} + \frac{hf_h}{\epsilon}$$

This is based upon the reverse of the Einsteinian photoelectric equation and applies to electrons which are not restricted to fixed harmonic orbits (such as the hydrogen electron and possibly, the covalent hydrocarbon bond).

The electron can acquire a higher energy state when it impedes a higher frequency within the harmonic series. By the rules of harmonic impedance, it can only absorb energy values equal to the potential energy of its current orbital string length. The variance between string potential energy and light energy can be applied to “jumping” to the higher and more energetic orbit. Planck light energy equals variance plus string potential energy.

Change in orbit is described by variance energy which is a static Planck value. It must be added to current string potential energy to gain the string length equal to the Planck potential energy for the carrier light wave. The period of transition between orbital string lengths is given by the time value for light frequency *minus* original string frequency. It is only the transition or change in state which can be described by static Planck energy.

In summary, quantum electron string harmonics allows for a change in static Planck energy being applied to transitions between orbital energy states as Bohr proposes. However, this change in static Planck energy cannot be applied to the output of a fictional photon. The whole of the change in static Planck energy must be invested in the new energy state.

The Einsteinian-Bohr misunderstanding of the use of frequency-based time for transitional static energy had serious consequences. A virtual Gordian Knot of mysticism was wrapped about light radiation, leading ultimately to Heisenberg’s uncertainty principle and its absurd proposition that time and space are no longer connected on the atomic level.⁶

It is pointless and futile to attempt to unravel these layers of time-irrational mysticism. It is better to sever the knot in one blow, with the time-correct interpretation of the Rydberg and Planck discoveries.

This correction begins with the recognition that time and space are not as we imagine them to be. Our geometry is four dimensional, not three and the extra dimension is the quantum dimension. Both the electron and vacuous space are defined by this unrecognized fourth dimension. They operate by principles we have failed to identify.

⁶ This is the only conclusion one can draw from the “uncertainty principle” which asserts that, if the position of a particle (its spacial measurement) is known, the particle’s momentum (its measurement over time) is uncertain. Space and time are disconnected.