



Biological rhythms, concerted, harmonious actions in all areas of life and nature – in animals, plants, fungi, bacteria, etc. were originally explained by trivial biophysical and biochemical phenomena.

However, the high complexity and extremely rapid progression of the underlying processes left questions unanswered - until quantum physics came into play - with coherence, entanglement, superposition, and tunneling etc.

Multi-frequent biorhythms and fluctuations in gene expression, protein metabolism, highly differentiated and complex biomolecular dynamics obey quantum mechanical biofunctional processes.

Pacemakers in the suprachiasmatic nuclei (SCN), biological 'clocks', set the rhythm, like metronomes, modified under the underestimated influence of light (chronodisruption e.g.) by intrinsic photosensitive melanopsin retinal ganglion cells (ipRGCs). The oscillators of the SCN influence rest and activity phases, the sympathetic and parasympathetic nervous systems, body temperature cycles, ECG, EEG, melatonin, cortisone, and the transcription serum response factor (SRF), mitochondrial respiration and enzymatic activity, metabolism, and cellular biorhythms (1).



From millisecond neural oscillations to seasonal cycles (hibernation), quantum effects with their quantum coherence, entanglement, tunneling, etc., orchestrate robust biorhythms – infradian to

ultradian – in all tissues and cells, temperature-independent and rapidly synchronizing, precise, extremely stable, with long-range coherence, phase-accurate over longer distances – “system-wide.”

Ergo: *'Quantum effects are the crucial players'*. (2). Circadian biorhythms have diverse effects on the eye: on axial lengths ('growing eyes of chickens and monkeys'), choroidal thickness, intraocular pressure, scleral matrix synthesis, dopamine and melatonin metabolism, as well as on the expression of clock genes, all dependent on light rhythms, spectra, and intensities (3,4).



Homo sapiens foolishly commit unforgivable anthropogenic climate change 'sins' caused by self inflicted ignorance or injudiciousness and unwittingly destroy the harmony of these subtly coordinated natural rhythms and vibrations – the magnificent symphony – through malnutrition, lack of exercise, bluish, bright light – from too close a distance (smart phones), gaming, at the wrong time (5) through chrono-



disruption, and overstimulation (e.g. over-accentuated LED daytime running lights causing distraction blindness – with fatal consequences).

Widespread, if not universal, unnecessary artificial light – 'light pollution' in all its forms - worst case – potentially phototoxic, garish, short-wave dominated, irritating, and above all distracting.

Conclusion:

'Renaturation' is required, moderate artificial light ubiquitous – within a natural world, certainly no short-wave dominated spectra: It cannot be ruled out that the pandemic-threatening increase in myopia might be mitigated finally (6).

Epilogue:

Quantum rhythms are endangered, comparable to ecosystems; what would the original status quo have been like? Without glare and 'light stress' ('blue hazard'), without LED daytime running lights and their irritations in extreme cases fatal, distractions? Life-saving – in the best-case scenario?



"But you stay in a circle and don't make any progress." *A Brotherly Feud* (Franz Grillparzer). Jean Baptiste Fourier described the greenhouse effect in 1824. No less than a hundred years later, this effect was accused of being one of the contributing factors to climate catastrophes. And another hundred years later – 'here the pen bristles'..* Quantum physics must not wait any more to stabilize biorhythms and cycles of any kind.

Future:

Quantum biology and chronobiology should have been 'entangled' long ago. There is much more to the photon, such as spin e.g. (7, 8). "One day – as predicted – there will be effective and successful clinical applications of quantum physics techniques and processes".

Quantum technologies could serve as valuable instruments and tools for prophylaxis and measures (9) to mitigate the effects of climate change (10,11). In any case - the biggest player of all is quantum physics in space (12, 13, 14).

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Gender: beyond

Interest: no conflict

AI/KI: AI-free wording