FRI 4: Foundational / Mathematical Aspects – Alternative Views

Time: Friday 10:45–12:30 Location: ZHG004

FRI 4.1 Fri 10:45 ZHG004

Three Steps Turn Euclidean Relativity Into a Pillar of Physics — •Markolf H. Niemz — Heidelberg University, Germany

In special relativity (SR), there is coordinate time t and proper time τ. Two facts deserve reflection: (1) Clocks measure τ, but the construct t is more common in the equations of physics than natural τ. (2) Cosmology is aware of the Hubble parameter H_θ, but the parameter τ is preferred to $\theta = 1/H_\theta$ in both SR and general relativity (GR). **We show:** Euclidean relativity (ER) describes nature exclusively in natural concepts. Three steps make ER work: (1) The new time coordinate is τ. (2) The new parameter is θ. (3) An observer's reality is a projection from 4D Euclidean space (ES). Because of the different concepts, ER neither conflicts with nor requires SR/GR! All energy moves through ES at the speed c. Absolute ES is experienced as a relative Euclidean spacetime: Each object experiences its 4D motion as its proper time and the other three axes as its proper space. Both the Lorentz factor and gravitational time dilation are recovered in ER. Thus, ER predicts the same relativistic effects as SR/GR. In ER, τ is the length of a 4D Euclidean vector "flow of proper time" $\boldsymbol{\tau}$. Gravity makes its comeback as a force. Any acceleration rotates an object's $\boldsymbol{\tau}$ and curves its worldline in ES. $\boldsymbol{\tau}$ is crucial for objects that are very far away or entangled. Information hidden in θ and in $\boldsymbol{\tau}$ is not available in SR/GR. ER solves the wave–particle duality and explains entanglement without postulating non-locality. Entangled objects have never been spatially separated in their view, but their proper time flows in opposite 4D directions. https://www.preprints.org/manuscript/202207.0399

FRI 4.2 Fri 11:00 ZHG004

On Schrödinger's requirements for space functions — •Dieter Suisky — Berlin (suisky5@aol.com)

It will be demonstrated that the wave function and the energy of the ground state of a quantum mechanical system can be derived from the requirements which had been posed by Schrödinger in the First Communication in 1926: In order to substitute the traditional quantum conditions Schrödinger looked for real, single-valued in the whole configuration space, finite and twice continuously differentiable functions. From these requirements alone and the theorem of Rolle it follows that there is such function which (1) is symmetric and zero in the end points, (2) has one maximum and two turning points, (3) the position of the maximum is at x =0. Furthermore, a differential equation of 1st order can be established from which the wave function of the ground state can be calculated. The coordinates of the turning points can be obtained by the differential equation of 2nd order which follows straightforwardly from the previously derived differential equation of 1st order if the condition for all turning points of the twice differentiable space function f(x) is taken into account. Moreover, the energy value of the lowest state can be calculated too and is different from zero, $E > 0$, which is typical for the quantum mechanical systems. The procedure fits for the quantum mechanical harmonic oscillator. The differential equation of 2nd order is nothing else the well-known Schrödinger equation, which is now already obtained from a differential equation of 1st order. The analysis of the relations between differential equations of different orders can be traced back to Euler.

FRI 4.3 Fri 11:15 ZHG004

How come the quantum? Testing a proposal for the origin of Planck's quantum of action — •Christoph Schiller — Motion Moutain

The answer to Wheeler's question "How come the quantum?" given by Kauffman is presented and explored. The answer, going back to an approach by Dirac, proposes a topological origin of Planck's quantum of action. The proposal is checked against all quantum effects, including non-commutativity, spinor wave functions, entanglement, Heisenberg's indeterminacy relation, and the Schrödinger and Dirac equations. The principle of least action is deduced. The spectra of elementary particles, the gauge interactions, and general relativity are derived. Estimates for elementary particle masses and for coupling constants, as well as numerous experimental predictions are deduced. Complete agreement with observations is found. The derivations also appear to eliminate alternatives and thus provide arguments for the uniqueness of the proposal.

Details, publications and preprints at https://motionmountain.net/strands

FRI 4.4 Fri 11:30 ZHG004

A Fresh Geometric Perspective of an Electron and its Waves — •Fong Yang — Minnesota, United States

Matter consists of particles and waves. Every day we interact with particles while essentially disregarding waves. Quantum mechanics mathematically describe matter from the waves perspective while disregarding particles. This description does not reflect our everyday experience with matter.

The double slit experiment shows that electrons inherently have wave properties. Quantum mechanics can predict time-elapsed double slit experiment results using wave mechanics. But it is unable to explain how electrons interact with the macroscopic environment within this experiment.

My theoretical research illustrates how electrons interact with its macroscopic environment using basic geometry and algebra, and the conservation of energy concept.

Theoretical research begins with a suggested first-person perspective of a traveling electron and its waves. The physical restrictions of the double slit experiment setup, the mathematical geometrics of the electron's waves, and the conservation of energy concept, together constrains the electron to certain locations in space until its interaction with the macroscopic environment. Basic algebra is then used to translate the geometric perspective into two distinctive wave properties. These properties are at a minimum a 99% match compared to double slit experiment calculations derived from conventional trigonometric perspective of the electrons' waves.

FRI 4.5 Fri 11:45 ZHG004

Superposition and Entanglement of Polarized Photons without Hidden Variables — •Eugen Muchowski — Primelstraße 10, 85591 Vaterstetten

Superposition and mixtures of indistinguishable photon beams are equivalent under certain conditions. This idea explains the correlations of entangled photons as well as entanglement swapping and teleportation without using hidden variables. This sheds new light on the Einstein-Bohr debate. The superposition of indistinguishable photon beams can be experimentally demonstrated with a Mach-Zehnder interferometer.

FRI 4.6 Fri 12:00 ZHG004

Particle masses generated by mass quanta and elementary charges circulating in individual eigenspaces of particles, not embedded in space-time. — •Herrmann Hans-Dieter — Berlin

Intrinsic properties of particles such as invariant mass, spin, magnetic dipole moment and Compton wave length are modelled assuming an extra space fixed to the structure of an individual particle. The particle appears as composited and extended in its eigenspace. The eigenspace resembles the space spanned by body-fixed coordinates of a spinning top, a satellite or a drone. The structural building stones of particle models are so called rotons with D=3+1 dimensions. The biroton with D=5+1 dimensions represents the minimum structure of a lepton model or a quark-equivalent. The meson model consists of a biroton and an anti-biroton with D=9+1 dimensions. A baryon model needs D=25+1 dimensions, it consists of six birotons with quarter-valued spins. This model structure provides mass values, spin and magnetic momenta in reasonable agreement with the experiment.

The mass quantum mQ approx.= 1/32 of the muon mass is calculated using muon data as input and serves as a universal constant. It may have both signs in the eigenspace, such that the small electron mass and the vanishing neutrino masses can be modelled as differences between positive and negative partial masses. The partial masses of a particle may be located at different positions in space-time, this could explain quantum nonlocality as well as nonlocal gravity.

FRI 4.7 Fri 12:15 ZHG004

The alleged necessity of quantum mechanics — •Albrecht Giese — Taxusweg 15, 22605 Hamburg

To what extent is quantum mechanics unavoidable for describing elementary particles? Historically the existence of quantization occurred in the investigations of the energy levels of atoms. Atoms are oscillators and these oscillators are subject to specific constraints. It is a physical fact that certain constraints permit only specific oscillation energies. However, the development of QM has since led to the assumption that most physical quantities are subject to quantization. Is this a reasonable or necessary development?

We have examples of specific facts about elementary particles that can be better, or even only, explained classically. A striking example is the development of inertia, where the classical derivation yields precise results, whereas the accepted Higgs model does not give us any. There are other examples where known rules have been successfully postulated in quantum mechanics but can instead be *derived using classical methods. A prominent example is the Planck relation E = h*ny.

We will recommend a discussion on the conclusions that can be drawn from this fact.