This article is the first part of the article, which tries to give a rough overall view about Topological Geometrodynamics (TGD) as it is towards the end of 2024. Various views about TGD and their relationship are discussed at the general level.

1. The first view generalizes Einstein's program for the geometrization of physics. Space-time surfaces are 4-surfaces in $H = M^4 \times CP_2$ and general coordinate invariance leads to their identification as preferred extremals of an action principle satisfying holography. This implies zero energy ontology (ZEO) allowing to solve the basic paradox of quantum measurement theory.

2. Holography = holomorphy principle makes it possible to construct the general solution of field equations in terms of generalized analytic functions. This leads to two different views of the construction of space-time surfaces in H, which seem to be mutually consistent.

3. The entire quantum physics is geometrized in terms of the notion of "world of classical worlds" (WCW), which by its infinite dimension has a unique Kähler geometry. Holography = holomorphy vision leads to an explicit general solution of field equations in terms of generalized holomorphy and has induced a dramatic progress in the understanding of TGD.

Second vision reduces physics to number theory.

1. Classical number fields (reals, complex numbers, quaternions, and octonions) are central as also p-adic number fields and extensions of rationals. Octonions with number theoretic norm $RE(o^2)$ is metrically Minkowski space, having an interpretation as an analog of momentum space M^8 for particles identified as 3-surfaces of H, serving as the arena of number theoretical physics.

2. Classical physics is coded either by the space-time surfaces of H or by 4-surfaces of M^8 with Euclidean signature having associative normal space, which is metrically M^4. $M^8 - H$ duality as analog of momentum-position duality relates these views. The pre-image of CD at the level of M^8 is a pair of half-light-cones. $M^8 - H$ duality maps the points of cognitive representations as momenta of fermions with fixed mass m in M^8 to hyperboloids of $CD \subset H$ with light-cone proper time $a = h_{eff}/m$.

   Holography can be realized in terms of 3-D data in both cases. In H the holographic dynamics is determined by generalized holomorphy leading to an explicit general expression for the preferred extremals, which are analogs of Bohr orbits for particles interpreted as 3-surfaces. At the level of M^8 the dynamics is determined by associativity. The 4-D analog of holomorphy implies a deep analogy with analytic functions of complex variables for which holography means that analytic function can be constructed using the data associated with its poles and cuts. Cuts are replaced by fermion lines defining the boundaries of string world sheets as counterparts of cuts.

3. Number theoretical physics means also p-adicization and adelization. This is possible in the number theoretical discretization of both the space-time surface and WCW implying an evolutionary hierarchy in which effective Planck constant identifiable in terms of the dimension of algebraic extension of the base field appearing in the coefficients of polynomials is central.

This summary was motivated by a progress in several aspects of TGD.

1. The notion of causal diamond (CD), central to zero energy ontology (ZEO), emerges

as a prediction at the level of H. The moduli space of CDs has emerged as a new notion.

2. Galois confinement at the level of M^8 is understood at the level of momentum space and is found to be necessary. Galois confinement implies that fermion momenta in suitable units are algebraic integers but integers for Galois singlets just as in the ordinary quantization for a particle in a box replaced by CD. Galois confinement could provide a universal mechanism for the formation of all bound states.

3. There has been progress in the understanding of the quantum measurement theory based on ZEO. From the point of view of cognition BSFRs would be like heureka moments and the sequence of SSFRs could correspond to an analysis, possibly having the decay of 3-surface to smaller 3-surfaces as a correlate.

In the first part of the article the two visions of TGD: physics as geometry and physics as number theory are discussed. The second part is devoted to $M^8 - H$ duality relating these two visions, to zero energy ontology (ZEO), and to a general view about scattering amplitudes.