Contrary to the original expectations, TGD seems to allow a generalization of the space-time SUSY to its 8-D variant with masslessness in 4-D sense replaced with masslessness in 8-D sense. The algebra in question is the Clifford algebra of fermionic oscillator operators associated with given partonic 2-surface. In terms of these algebras one can in turn construct generators super-symplectic algebra as stringy Noether charges and also other super-conformal algebras and even their Yangians used to create quantum states. This also forces to generalize twistor approach to give 8-D counterparts of ordinary 4-D twistors.

The 8-D analog of super Poincare algebra emerges at the fundamental level through the anti-commutation relations of the fermionic oscillator operators. For this algebra ${\cal N}=\infty$ holds true. Most of the states in the representations of this algebra are massive in $4-D$ sense. The restriction to the massless sector gives the analog of ordinary SUSY with a finite value of ${\cal N}$ - essentially as the number of massless states of fundamental fermions to be distinguished from elementary fermions. The addition of a fermion in particular mode defines particular super-symmetry. This super-symmetry is broken due to the dynamics of the K\"ahler-Dirac operator, which also mixes M^4 chiralities inducing massivation. Since right-handed neutrino has no electro-weak couplings the breaking of the corresponding super-symmetry should be weakest.

The question is whether this SUSY has a restriction to a SUSY algebra at space-time level and whether the QFT limit of TGD could be formulated as a generalization of SUSY QFT. There are several problems involved.

\begin{enumerate}

\item In TGD framework super-symmetry means addition of a fermion to the state and since the number of spinor modes is larger states with large spin and fermion numbers are obtained. This picture does not fit to the standard view about

super-symmetry. In
particular, the identification of theta parameters as Majorana spinors and super-charges
as Hermitian operators is not possible.

 The belief that Majorana spinors are somehow an intrinsic aspect of super-symmetry is
 however only a belief.   Weyl spinors meaning complex theta parameters are also
 possible. Theta parameters can also carry fermion number meaning only the supercharges
 carry fermion number and are non-hermitian. The general classification of
 super-symmetric theories indeed demonstrates that for $D=8$ Weyl spinors and complex and
 non-hermitian super-charges are possible. The original motivation for Majorana spinors
 might come from MSSM assuming that right handed neutrino does not exist. This belief
 might have also led to string theories in D=10 and D=11 as the only possible candidates
 for TOE after it turned out that chiral anomalies cancel.

In superstring theory the hermiticity of super generator G_0 giving as its square
scaling generator L_0 is strong argument in favor if Majorana spinors since G_0
appears as a propagator. In TGD framework the counterparts of G_0 in quark and lepton
sector carry fermion number so that identification as a propagator does not make sense.
The recent formulation of scattering amplitudes in terms of Yangian algebra allows to
circumvent the problem. Fundamental propagators are fermion propagators for fermions
massless in 8-D sense.

\item The spinor components of imbedding space spinors identifiable with physical helicities and
with fixed fermion number correspond to the generators of the SUSY algebra at QFT limit.
This SUSY is broken due to electroweak and color interactions. Right-handed neutrinos do
not have these interactions but there is a mixing with left-handed neutrinos due to the
mixing of M^4 and CP_2 gamma matrices in the K\"ahler-Dirac gamma matrices appearing
in the K-D action. Therefore also the ${\cal N}=2$ sub-SUSY generated by right-handed
neutrinos is broken.

\end{enumerate}

In this chapter the details of the above general picture are discussed. A brief summary of the basic aspects of SUSY is included and the constraints on the formulation of the SUSY limit are discussed in detail. The formulation itself is left to the reader possessing the needed technical skills. In principle there seems to be no reason preventing the formulation in terms of super fields: the only new elements relate to the fact that baryon and lepton number are conserved now so that Majorana spinors are replaced with Weyl spinors combining to from Dirac spinors.