

$$\mathbb{R}^4 \times \mathbb{H}^7$$

$$m \in \mathbb{Z}$$

$$\Gamma_a \star \Gamma_b = -2\delta_{ab}$$

unbroken supersymmetries=Killing spinors=holonomy inv spinors

$$\tilde{D}_m = \partial_m - \frac{1}{4}\omega_m^{ab}(\Gamma_a\Gamma_b - \Gamma_b\Gamma_a) - \frac{1}{2}e_m^a\Gamma_a \text{ connexion}$$

$$\tilde{D}_m\psi = \underbrace{\partial_m - \frac{1}{4}\omega_m^{ab}(\Gamma_a\Gamma_b - \Gamma_b\Gamma_a) - \frac{1}{2}e_m^a\Gamma_a}_{\mathcal{L}}\psi = 0$$

$$\tilde{D}_m \star \tilde{D}_n = -\frac{1}{4}C_{mn}^{ab}(\Gamma_a\Gamma_b - \Gamma_b\Gamma_a) \text{ holonomy}$$

$$\tilde{D}_m \star \tilde{D}_n \psi = 0 \text{ holonomy inv spinors}$$

$$\begin{array}{c} +10|1 \\ +2|4 \end{array} \xrightarrow[\mathbb{S}^1]{} \begin{array}{c} \mathbb{S}^1 \\ +1 \end{array} \xrightarrow[\mathbb{S}^1]{} \begin{array}{c} +9,|1 \\ +1 \end{array}$$

$$\begin{array}{c} +10|1 \\ +2|4 \end{array} \xrightarrow[\mathbb{S}^1/2]{} \begin{array}{c} \mathbb{S}^1/2 \\ \mathbb{S}^1/2 \end{array} \xrightarrow[\mathbb{S}^1/2]{} \begin{array}{c} +9|h \\ +1 \end{array}$$

$$\begin{array}{c} +10|1 \\ +5| \end{array} \xrightarrow[\mathbb{T}^4]{} \begin{array}{c} \mathbb{T}^4 \\ \mathbb{T}^4 \end{array} \xrightarrow[\mathbb{T}^4]{} \begin{array}{c} +6,|1 \\ +1 \end{array}$$

$$\begin{array}{c} +10|1 \\ +5| \end{array} \xrightarrow[K3]{K3} \begin{array}{c} +6|h \\ +1 \end{array}$$

$$\begin{array}{c} +10|1 \\ +2|4 \end{array} \xrightarrow[\mathbb{S}^1]{} \begin{array}{c} \mathbb{S}^1 \\ +2 \end{array} \xrightarrow[\mathbb{S}^1]{} \begin{array}{c} +9,|1 \\ +2 \end{array}$$

$$\begin{array}{c} +10|1 \\ +5| \end{array} \xrightarrow[\mathbb{S}^1]{} \begin{array}{c} \mathbb{S}^1 \\ \mathbb{S}^1 \end{array} \xrightarrow[\mathbb{S}^1]{} \begin{array}{c} +9,|1 \\ +42 \end{array}$$