

$$\begin{cases} D4 \\ N1 \end{cases}$$

H/Y3

$$Y3 = 3_{\mathbb{C}}^0$$

$$c_1(3_{\mathbb{C}}^0) = 0$$

$$4 \frac{1}{5} \boxminus \frac{1}{5} = 4 \frac{0}{0}$$

Greene-Kirklin

HE8/Y3

particle multiplets = 27 of  $E_6$

unbroken gauge group=flux trapping  $\sim \pi_1(3_{\mathbb{C}}^0) = \mathbb{Z}_3$

Yukawa couplings=products  $H^*(3_{\mathbb{C}}^0)$

spin connection holonomy  $SU_3 \times 1 \subset E_8 \times E_8$

generations  $\overline{\chi(3_{\mathbb{C}})}/2$

CICY :  $\chi < 0$

complete intersection  $\mathbb{P}^3 \times \mathbb{P}^3$

$\pi_1 = 1 \Rightarrow$  CICY connected

$$\chi(3_{\mathbb{C}}) = -6 \Rightarrow 3_{\mathbb{C}} = \frac{\text{complete intersection } \mathbb{P}^3 \times \mathbb{P}^3}{\text{mod free } \mathbb{Z}_3 = \pi_1}$$

$\mathbb{T}^6 / \text{orbi} : \chi > 0$

Candelas Schimm

CY hypersurface weighted  $\mathbb{P}^4$ :  $\chi$  general

$\pi_1 = 1 \Rightarrow$  wpCY connected

quintic 3-fold  $\mathbb{P}^4[5] \begin{cases} \text{com int} \\ \text{wei pro} \end{cases}$

$\pi_1 = 1 \Rightarrow$  CICY  $\cup$  wpCY connected