Qft.

Fierz identities. $\bar{\psi}_1 \Gamma \psi_2 \bar{\psi}_3 \Gamma \psi_4 \sim \bar{\psi}_1 \Gamma \psi_4 \bar{\psi}_3 \Gamma \psi_2$

- how to prove?
  - → pick basis $\{ \delta_{ab}, \gamma^{\mu}_{ab}, \gamma^{\mu_1\mu_2}_{ab}, \gamma^{\mu_1\mu_2\mu_3}_{ab}, \gamma^{\mu_1\mu_2\mu_3\mu_4}_{ab} \}$
  - → expand bilinears of the form $\psi . \bar{\psi}$.
  - → split into chiral reps.

$N=1$ SYM → $d = 3, 4, 6, 10$ ← normed division algebras ($|xy| = |x||y|$)

$\mathbb{R}$ $\mathbb{C}$ $\mathbb{H}$ $\mathbb{O}$

$$PSL(2, \sqrt{\;\;\;}) \cong SO_+\left(\begin{matrix} 2 \\ 3 \\ 5 \end{matrix}, 1 \right)$$

Lorentz, part (connected to Id).

double cover of Lorentz group modded out by $\mathbb{Z}_2$

→ SUGRA: $d = 4, 5, 7, 11$ (strings „add a dimension")