

Recall:  $\mathfrak{g}$  - Kac-Moody algebra w/  $(A, \pi, \pi^\vee, \rho, \rho^\vee)$   
(over  $\mathbb{F}$ )

$U_q(\mathfrak{g})$  - the assoc. algebra over  $\mathbb{F}(q)$

What problems in the real world do Kac-Moody algebras solve?

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Def A  $U_q(\mathfrak{g})$ -mod  $V^q$  is a "weight module" if it admits a weight-space decomposition:

$$V^q = \bigoplus_{\mu \in P} V_\mu^q \quad V_\mu^q = \{v \in V^q : q^h v = \dots\}$$