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### **Symmetries and Geometry**

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In this talk, I will describe global and gauge symmetries and the interplay between them. The meaning of global symmetries is clear: they act on physical observables. Gauge symmetries are more elusive as they typically do not act on physical observables. Gauge symmetries are redundancies in the mathematical description of a physical system rather than properties of the system itself. The existence of nonperturbative dualities makes it clear that this distinction is unavoidable. Yet in our best understanding the gauge symmetries are deeper. The lepton number symmetries that are probed by the wonderful experimental results that will be reported in this session give an excellent illustration. They are regarded in the Standard Model as indirect consequences of gauge symmetries and they are expected to be only approximate. This expectation is supported by the observation of neutrino oscillations.