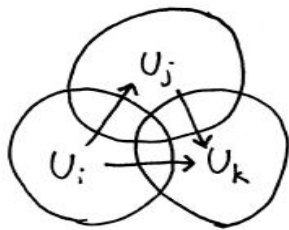


This and the local nature of physics makes it unnatural to restrict attention to trivial $U(1)$ bundles; we can build locally trivial ones by gluing trivial ones together:



$$g_{ij} : U_i \cap U_j \rightarrow U(1)$$

such that

$$g_{ij} g_{jk} = g_{ik}$$

These define a Čech 1-cocycle in sheaf of smooth $U(1)$ -valued functions, so $U(1)$ -bundles are classified by

$$\check{H}^1(M, \underline{U(1)}) \cong H^2(M, \mathbb{Z})$$

↑
[F] lives here!
