

**Prerequisites.** 1. Some mathematical maturity. 2. Differential forms and Stokes' theorem at the level of our first-semester core topology class.

I should have added:

3. Lie groups, Lie algebras and the relation between them (yet no need for representation theory or for structure theory of semi-simple algebras).

4. Bundles, connections, curvature at definitions level.

The "missing links" of MissingLinks.pdf are still mostly missing.

Perhaps I should have planted somewhere a "pushforward toolbox" class:

$$1. d\pi_* W = \pi_* dW - (\partial\pi)_* W$$

$$2. \begin{array}{ccc} F^k & \longrightarrow & T W \\ \pi \downarrow & & \downarrow \pi_* \\ M & \xrightarrow{\alpha} & \pi_*(W \cap \pi^* \alpha) = (\pi_* W) \cap \alpha \end{array}$$

3. Push forward of a pushforward is a pushforward.

4. Pushforward commutes w/ pullback:

$$\begin{array}{ccc} \pi_2^* \pi_1^* T_1 & \xrightarrow{\beta} & T_1, W \\ \pi_2 \downarrow & & \downarrow \pi_1 \\ B_2 & \xrightarrow{\beta} & B_1 \end{array} \quad \beta^* \pi_1^* W = \pi_2^* \beta^* W$$