

## TOPOLOGICAL MANIFOLDS || PROBLEM SHEET 4

**Problem 1.** Every microbundle over a paracompact contractible space  $B$  is isomorphic to the trivial microbundle over  $B$ .

**Problem 2.** Let  $M^m \subseteq N^n$  be a submanifold with a normal microbundle  $\mathfrak{n}_M$ . Then

$$\mathfrak{t}_M \oplus \mathfrak{n}_M \cong \mathfrak{t}_N|_M.$$

Look in Milnor's paper on microbundles for the idea, but fill in the details.

**Problem 3.** For  $X$  compact and  $Y$  a metric space, the compact-open topology on

$$\mathcal{C}(X, Y) := \{f: X \rightarrow Y \mid f \text{ continuous}\}$$

coincides with the uniform topology coming from

$$d(f, g) := \sup_{x \in X} d_Y(f(x), g(x)).$$