Info

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Differentiable structures

atlas compatibilities

Definition. $\mathcal{C}^\bullet$-compatible charts

Two charts (U, x) and (V, y) are said to be $\mathcal{C}^\bullet$-compatible if either

- $U \cap V = \emptyset$ or
- the map $y \circ x^{-1}$ is $\mathcal{C}^\bullet$
    - $\bullet = 0$
    - $\bullet = k \in \mathbb{Z}^+$
    - $\bullet = \infty$
    - $\bullet = \omega$

A $\mathcal{C}^\bullet$**-atlas** of a topological manifold is an atlas of pairwise $\mathcal{C}^\bullet$-compatible charts. We denote it by $\mathscr{A}_\bullet$

A $\mathcal{C}^\bullet$-atlas $\mathscr{A}_\bullet$ of a topological manifold is a **maximal** $\mathcal{C}^\bullet$**-atlas** if for every $(U, x) \in \mathscr{A}_\bullet$ we have all the charts $(V, y) \in \mathscr{A}_\bullet$ that are $\bullet$-compatible with (U, x).
We denote it by $\mathscr{A}_\bullet^{\max}$

$\mathcal{C}^\bullet$-manifold

Definition. $\mathcal{C}^\bullet$-manifold $(M, \mathcal{T}_M, \mathscr{A}_\bullet^{\max})$

A $\mathcal{C}^\bullet$**-manifold** is a triple $(M, \mathcal{T}_M, \mathscr{A}_\bullet^{\max})$ where

- $(M, \mathcal{T}_M)$ is a topological manifold, and
- $\mathscr{A}_\bullet^{\max}$ is a maximal $\mathcal{C}^\bullet$-atlas.

Any maximal $\mathcal{C}^k$-atlas $(k \in \mathbb{Z}^+)$ contains a $\mathcal{C}^\infty$-atlas. Moreover, any two maximal C^k-atlases, that contain the same $\mathcal{C}^\infty$-atlas, are identical.

$\mathbb{C}^n$-manifold

Definition. $\mathbb{C}^n$-manifold

$\mathbb{C}^n$-manifold if

- it is a $(\mathbb{R}^{2n}, \mathcal{C}^1)$-manifold
- and the transition maps are continuous and satisfy the Cauchy-Riemann equations.

Current note has 0 direct children and 0 total descendants.

- structures based on sets
    - manifolds
        - $\mathbb{R}$-manifold topological
            - Differentiable structures

And it has 2 siblings.

- structures based on sets
    - manifolds
        - $\mathbb{R}$-manifold topological
            - Counting compact topological manifolds upto homeomorphism
            - Differentiable structures