26. For any finite cyclic group $C$ there exists a compact connected three-dimensional manifold whose fundamental group is isomorphic to $C$.

\textit{Hint:} Use the Hopf fibration.

27. For any abelian finitely generated group $A$ there exists a compact manifold whose fundamental group is isomorphic to $A$.

\textit{Hint:} Use the fact that any finitely generated abelian group is the direct product of cyclic groups (finite and infinite).

28. Prove that complex projective space $\mathbb{C}P(n)$ is simply connected for every $n$.

29. Introduce a metric $d$ on the Cantor set $C$ (generating the Cantor set topology) such that $(C, d)$ cannot be isometrically embedded to $\mathbb{R}^n$ for any $n$.

30. Construct a smooth atlas of the projective space $\mathbb{R}P(3)$ with as few charts as possible.

\textbf{"Extra credit" problems}

You may submit solutions until November 14.

\textbf{E6.} Introduce a metric $d$ on the Cantor set $C$ such that $(C, d)$ is not Lipschitz equivalent to a subset of $\mathbb{R}^n$ for any $n$.

\textbf{E7.} Prove that for any finite graph $G$, $\pi_n(G) = 0$ for any $n \geq 2$. 