The Hopf map

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The Hopf map is a continuous map from S^3 to S^2 that sends circles in S^3 to points on S^2. S^3 with one point omitted can be interpreted as $\mathbb{R}^3$, and so the Hopf map gives rise to a remarkable geometric structure in $\mathbb{R}^3$. From this structure, a vector field can be derived that has important applications in physics.