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``Properly embedded minimal surfaces of finite topology''

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Not counting the plane, the first minimal surfaces (those that locally minimize area) were discovered in the 18th Century: the catenoid by Euler in 1744 and the helicoid by Meusnier in 1776. These clasical minimal surfaces are topologically the sphere with a point (two for the catenoid) removed. No new examples of complete properly embedded minimal surfaces of finite topology in Euclidean space were found until the mid 1980s. There has been progress in the last few years in understanding the general nature of the space of all such surfaces. For instance, it is now known that if such a surface has more than one topological end, it must have finite total curvature, and each end must be asymptotic to either a plane or a catenoid. The discovery in the mid 90s of a “genus-one helicoids” has focused research on trying to understand and classify one-ended examples. Other than the plane, are they all asymptotic to the helicoid? Are the plane and the helicoid the only simply connected examples? The talk will include a short computer animation.

See the home page of the Scientific Graphics Project for some relevant images.