Embeddedness of minimal surfaces with total boundary curvature at most 4π

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A minimal surface in Euclidean space is a surface which is stationary for the area functional. Examples of such surfaces may be obtained by dipping wire in soapy water. The total curvature of a space curve is the total angle its tangent line turns as the curve is traversed.

In a celebrated paper of 1973, J.C.C Nitsche proved that any analytic simple closed space curve C of total curvature less than 4π bounds a unique minimal disk which is immersed. His analysis left open the following questions: Is the disk embedded and if C bounds other minimal surfaces must they also be immersed or in fact embedded? We shall show that the answer to both these questions are yes.

The talk is intended for non-specialists.