1070-54-78   **Deirdre M Scully*** (`dmscul11@holycross.edu`). *Overtwisted Contact Structures.*

A contact structure on a 3-dimensional manifold is a completely non-integrable plane field. In this project we study overtwisted contact structures, that is, which contain overtwisted disks. Contact structures without overtwisted disks are called tight. In particular we consider the complements of closed curves tangent to the contact structure in Dymara's overtwisted three-dimensional sphere. The goal of this project is to prove that the complement of certain closed curves tangent to Dymara's contact structure has no overtwisted disks.

    Our method for proving the complement has no overtwisted disks is to decompose it by cutting along convex Seifert surfaces. A Seifert surface is a surface whose boundary is the closed curve in question. A Seifert surface is convex, if the contact structure is a product in a product neighborhood of the surface. Then we analyze the family of curves or foliation induced by the contact structure on the resulting boundary surfaces. Techniques that we have used in this process include simple perturbations and manipulation theorems from Eliashberg and Fraser. (Received January 26, 2011)