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UNDERSTANDING SYMPLECTIC FILLINGS OF CONTACT MANIFOLDS VIA ALGEBRAIC VARIETIES

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Abstract

This talk is an attempt for a (pandemic-conscious) invitation to contact topology via an algebro-geometric approach with the caveat that we admit having little to no understanding of many concepts in algebraic geometry. A very useful strategy in studying topological manifolds is to factor them into smaller pieces. Briefly, an “open book decomposition” on an n -dimensional manifold (the open book) is a type of fibration over a circle that helps us study our manifold in terms of its $(n - 1)$ -dimensional fibers (the pages) and $(n - 2)$ -dimensional boundary of these fibers (the binding). Open books provide a natural framework for studying the topological properties of a geometric phenomenon called “contact structures” on smooth manifolds. In this talk, we aim to provide an exposition of results, some of which are fruits of several joint works, concerning “symplectic fillings” of contact manifolds given by certain classes of algebraic varieties using their “supporting” open books.

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