Northern California Symplectic Geometry Seminar

Monday, April 5, 2021

Virtually held at **UC Davis**

`https://ucdavis.zoom.us/j/98670964004`
Meeting ID: 986 7096 4004
Passcode: NCSGSUCD

1:00 pm (Pacific)
Angela Wu (University College London)

Weinstein handlebodies for complements of smoothed toric divisors.

In this talk, we are concerned with two important classes of symplectic manifolds: toric manifolds, which are equipped with an effective Hamiltonian action of the torus, and Weinstein manifolds, which come with handle decompositions compatible with their symplectic structures. The complements of a class of smoothed toric divisors which we call "centered" support a Weinstein structure, thus can be fully described by Weinstein diagrams. I will show you an algorithm which produces the specific Weinstein handlebody diagram of such complements. This is based on joint work with Acu, Capovilla-Searle, Gadbled, Marinković, Murphy, and Starkston.

2:30 pm (Pacific)
Bulent Tosun (University of Alabama)

Symplectic and complex geometric aspects of 3-manifold embedding problem in 4-space.

The problem of embedding one manifold into another has a long, rich history, and proved to be tremendously important for development of geometric topology since the 1950s. In this talk I will focus on the 3-manifold embedding problem in 4-space. Given a closed, orientable 3-manifold Y, it is of great interest but often a difficult problem to determine whether Y may be smoothly embedded in $\mathbb{R}^4$. This is the case even for integer homology spheres, and restricting to special classes such as Seifert manifolds, the problem is open in general, with positive answers for some such manifolds and negative answers in other cases. On the other hand, under additional geometric considerations coming from symplectic geometry (such as hypersurfaces of contact type) and complex geometry (such as the boundaries of holomorphically or rationally or polynomially convex Stein domains), the problems become tractable and in certain cases a uniform answer is possible. For example, recent work shows for Brieskorn homology spheres: no such 3-manifold admits an embedding as a hypersurface of contact type in $\mathbb{R}^4$. This implies restrictions on the topology of rationally and polynomially convex domains in $\mathbb{C}^2$. In this talk I will provide further context and motivations for these results, and give some details of the proof. This is joint work with Tom Mark.