

Orderability and (Non)Squeezing in Contact Geometry

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We say that a contact isotopy of a contact manifold is “positive” if during the isotopy each point of the manifold moves in a positively transverse direction to the contact hyperplane distribution. The question of whether this notion induces a partial order on the universal cover of the identity component of the contactomorphism group — whether the contact manifold is “orderable” — turns out to be sensitive to the topology of the contact manifold, and is related to nonsqueezing phenomena in contact geometry, as studied by Eliashberg, Kim and Polterovich.

I will begin by explaining this relation and what we know so far about the orderability question, and then describe a version of contact homology for domains that enables us to detect relevant contact nonsqueezings. This will be illustrated by standard contact sphere (not orderable) and lens spaces (orderable), and, if time permits, by general prequantization spaces. Towards the end, I will indicate what the analogue of rotation number for a circle diffeomorphism might be in this context.

1:00 p.m.
Math 507
Columbia University