



Department of
Mathematical Sciences

Dissertation Defense

Mr. Arka Banerjee

PhD Graduate Student

Under the Supervision of Boris Okun

Friday, April 29th,
2022 @ 11:30am

Online via. Zoom



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Coarse cohomology of the complement

John Roe introduced the notion of coarse cohomology of a metric space to study large scale geometry of the space. This cohomology roughly measures the way in which uniformly large bounded sets fit together. In the first part of this dissertation, we describe a joint work with Boris Okun that generalizes Roe's theory to define coarse (co)homology of the complement of any given subspace in a metric space. Inspired by the work of Kapovich-Kleiner, we introduce a notion of a manifold-like object in the coarse category (called coarse PD(n) space) and prove a coarse version of the Alexander duality for these spaces. In the second part of this thesis, we generalize a Theorem of Roe to compute coarse cohomology of the complement for many spaces by relating coarse cohomology of the complement with the Alexander-Spanier cohomology. In the final part of this dissertation, we introduce an equivariant version of the coarse cohomology of the complement. We then use this theory to find an obstruction to coarse embedding of a given space into any uniformly contractible n-manifold.

This event will be streamed online via. Zoom. Link to online event:
<https://tinyurl.com/ARKABANERJEE>

Committee Members:

Prof. Jonah Gaster, Craig Guillbault, Chris Hruska and
Kevin McLeod



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