



THE WEIZMANN INSTITUTE OF SCIENCE  
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Algebraic Geometry and Representation Theory Seminar

on Wednesday, Jun 03, 2020  
at 16:30

**ZOOM MEETING: [HTTPS://WEIZMANN.ZOOM.US/J/98304397425](https://weizmann.zoom.us/j/98304397425)**

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WIS

A relative de Rham theorem for Nash Submersions

Abstract:

For a Nash manifold  $X$  and a Nash vector bundle  $E$  on  $X$ , one can form the topological vector space of Schwartz sections of  $E$ , i.e. the smooth sections which decay fast along with all derivatives. It was shown by Aizenbud and Gourevitch, and independently by Luca Prelli, that for a Nash manifold  $X$ , the complex of Schwartz sections of the de Rham complex of  $X$  has cohomologies isomorphic to the compactly supported cohomologies of  $X$ .

In my talk I will present a work in progress, joint with Avraham Aizenbud, to generalize this result to the relative case, replacing the Nash manifold  $M$  with a Nash submersion  $f:M \rightarrow N$ . Using infinity categorical methods, I will define the notion of a Schwartz section of a Nash bundle  $E$  over a complex of sheaves with constructible cohomologies, generalizing the notion of Schwartz section on an open semialgebraic set. I will then relate the Schwartz sections of the relative de Rham complex of a Nash submersion  $f:M \rightarrow N$  with the Schwartz functions on  $N$  over the derived push-forward with proper support of the constant sheaf on  $M$ . Finally, I will conclude with some applications to the relation between the Schwartz sections of the relative de Rham complex and the topology of the fibers of  $f$ .

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