



TOPOLOGY SEMINAR SS 2021 (Prof. Banagl, with Ghaed Sharaf)

VERDIER SELF-DUAL SHEAVES ON SINGULAR SPACES

Time and Place: We meet Thursdays 2-4pm c.t. online using the University's heiCONF system. The first meeting is on April 15, 2021.

Registration: Please register for the seminar first on the MÜSLI-System. In addition, send an email to Shahryar Ghaed Sharaf, ssharaf@mathi.uni-heidelberg.de. Your email should contain name, matriculation number, and the desired talk. The schedule and available topics of talks can be found on

<https://www.mathi.uni-heidelberg.de/~ssharaf/Teaching.html>

The email you use should be under `uni-heidelberg.de`, for example `<uniid>@stud.uni-heidelberg.de`. You will receive an email from Shahryar Ghaed Sharaf containing the heiCONF-meeting room information.

Scientific Info: It is well-known that many of the key invariants in the high-dimensional classification of manifolds rely on Poincaré self-duality in one form or another. This global duality is actually induced by a local duality using the uniformity of manifolds. Singular spaces, on the other hand, are not uniform and their ordinary homology does not satisfy global Poincaré duality. Nevertheless, if one could construct objects on a singular space that have local self-duality everywhere, then this would again induce global Poincaré duality and hence powerful invariants such as characteristic classes arising from it. Formally the good way of addressing such questions is the language of sheaf-complexes, derived categories and Verdier duality, which will lie at the heart of this seminar. It turns out that not all classes of singular spaces can be equipped with appropriate self-dual sheaves. The seminar will clarify when a singular space carries such sheaves. Important examples are the intersection chain sheaves on complex algebraic varieties. Unfortunately, time does not permit a complete introduction to elementary sheaf theory, so if you are not familiar with it, I suggest reading Chapter 1 in the reference below. The seminar language is English.

Prerequisites: Some algebraic and/or differential topology; Chapter 1 in the reference below. A background in algebraic or analytic geometry should also suffice to participate, but is certainly not a requirement.

Literature:

M. Banagl, *Topological Invariants of Stratified Spaces*, Springer Monographs in Mathematics, Springer-Verlag, 2007.

Office Hours: Thursday 1-2 pm. The heiCONF-meeting room information will be sent to registered participants by email.