

The precise topics discussed in the course may decide on the interests of the class (and the whims of the instructor), but to give a flavor of the material to be covered, I have listed here some references which suggest the central concerns of the course:

- Kashiwara-Schapira, *Sheaves on Manifolds*
- Guillermou, Sheaves and symplectic geometry of cotangent bundles, <https://arxiv.org/pdf/1905.07341.pdf>
- Tamarkin, Microlocal criterion for non-displaceability, <https://arxiv.org/pdf/0809.1584.pdf>
- Zhang, Quantitative Tamarkin category, <https://arxiv.org/pdf/1807.09878.pdf>
- Kuwagaki, Introduction to sheaf quantization <https://arxiv.org/pdf/2205.02661.pdf>
- Nadler-Shende, Sheaf quantization in Weinstein symplectic manifolds, <https://arxiv.org/pdf/2007.10154.pdf>

Possible additional topics to be discussed: The role of the J-homomorphism in microlocal sheaf theory; irregular Riemann-Hilbert correspondence; perverse sheaves and perverse schobers.

Undergraduate students interested in taking this course should seek permission from me first. Undergraduates and pre-quals graduate students, who require grades for the course, will be required to prepare a final project or presentation, and possibly also to complete exercises I assign during the course.

Further references:

Hyperfunctions:

- Komatsu, An introduction to the theory of hyperfunctions <https://link-springer-com.ezp-prod1.hul.harvard.edu/content/pdf/10.1007/BFb0068144>
- Martineau, Les hyperfonctions de M. Sato http://www.numdam.org/item/SB_1960-1961__6__127_0.pdf
- Bony, Hyperfonctions et Équations aux dérivées partielles http://archive.numdam.org/article/SB_1976-1977__19__73_0.pdf

Background on sheaves:

- Dimca, Sheaves in Topology
- Virk, some operations on sheaves: <http://rvirk.com/notes/topology2012/operations.pdf>

Background on derived categories:

- Mazel-Gee, An invitation to higher algebra <https://etale.site/teaching/w21/math-128-lecture-notes.pdf>
- Mazel-Gee, The Zen of infinity-categories, <https://etale.site/writing/zen-of-infty-cats.pdf>

Helpful notes:

- Li, [Sheaf theory in symplectic geometry](#)
- Notes from Nadler seminar on microlocal sheaves: <https://math.berkeley.edu/~phaine/#GRT-2021-2022>

Legendrian knots and front projections:

- Ng, [Gallery of Legendrian knots](#)
- Entyre, [Legendrian and transversal knots](#)
- Casals, [Mastering the Art of Front Cooking](#)
- Shende-Treumann-Zaslow, [Legendrian knots and constructible sheaves](#)

Persistent homology:

- Jun Zhang, Quantitative Tamarkin Category (linked at top)
- År̃iga Virk, [Introduction to persistent homology](#)
- Gary Koplik [Persistent Homology: A Non-Mathy Introduction with Examples](#)
- Gunnar Carlsson, [Topology and data](#)