

MATERIALS SCIENCE GRADUATE PROGRAM

SEMINAR ON LIQUID CRYSTALS

SPRING 2023



**WEDNESDAY,
FEBRUARY 8TH
3:20PM**

ZOOM

MEETING ID: 891 7721 3383

PASSCODE: MSGP



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Imaging the 3D Orientation of Molecules, How?

3D anisotropic molecular alignment occurs commonly in natural and synthesized materials, including liquid crystals. Molecular alignment, which often occurs heterogeneously at several length scales, defines materials' physical, chemical, and biological properties. However, there is no quantitative imaging technique of 3D molecular orientation for complex organic materials with sufficient spatial resolution. Here, I will briefly review earlier orientation measurements and introduce my new analytical method to determine the 3D orientation angles of molecules using polarization-controlled infrared (IR) and Raman signals. I will also share a few recent findings related to 3D chain orientation in polymer films unraveled by these new non-invasive, label-free imaging methods. Details can be found in my papers published in 2022 in *Macromolecules* (<https://doi.org/10.1021/acs.macromol.1c02036>) and *JACS* (<https://doi.org/10.1021/jacs.2c10029>).



Materials Science
Graduate Program
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