

Space Science Seminar
Tuesday, 2018 July 10
10:30 a.m.
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**Super-Resolution Imaging for Biological
Research Applications**

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Host: Mitzi Adams
(Sponsored by ST13)

Biomedical research has benefited heavily from advanced imaging techniques which have enabled scientists to literally witness a variety of biological processes. There are various imaging techniques that range in capability, but the primary goals of all these techniques are to image faster, with higher access to more chemical/functional information, at finer scales of detail and with minimal invasiveness to samples/subjects/patients. Multi-photon fluorescence microscopy is an imaging technique particularly suited for imaging sub-cellular structure and chemical/functional information with minimal damage to surrounding tissue and can even be done on live animals. While this is already a highly effective tool for biological research, there is still yet another regime of scale for which live imaging capabilities would be a dramatic improvement - molecular scales (~10s-100s nm). Presented here is a multi-photon imaging technique which is theoretically capable of imaging on the single molecule level with minimal change to standard 2-photon systems. The simulation, design, and preliminary experimental results are presented for this new technique known as multi-photon Saturated EXcitation (mpSAX) microscopy. In this talk, we will also discuss some of the cross over between imaging for biological vs. astronomical applications.

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