Abstract Submitted
for the MAS17 Meeting of
The American Physical Society

Efficient processing of Lattice Light Sheet Microscopy data for visualization MIGLE SURBLYTE, AKSHAY NAIK, ROMAN VORONOV, New Jersey Institute of Technology — Fluorescent imaging of live cells is complicated by the effects of phototoxicity and photobleaching. Lattice Light Sheet Microscopy (LLSM) is a breakthrough technology by 2014 Nobel Laureate Eric Betzig that has opened up a new era of fluorescent imaging by minimizing these effects 100-fold. However, this method produces large amounts of data, which forces users to process data on clusters for most visualizations. The problem is exacerbated by the fact that most supercomputers do not support commercial visualization software due to high costs. Therefore, there is a need for an open source solution that can process and visualize the large data efficiently. To address this need, we have a created a program which automates the LLSM imaging, writes its results to the non-proprietary HDF5 data format, and then renders the images using Python scripts and the parallelized visualization software, VisIt. Our code supports time series, multiple color channels, and data cropping. Additionally, volume stitching is accomplished via image registration with Fiji. The resulting code is utilizable on most national supercomputers, allowing for virtually limitless sample sizes and duration of visualizations.

Migle Surblyte
New Jersey Institute of Technology

Date submitted: 28 Sep 2017 Electronic form version 1.4