DATE: June 6-7, 2023 9am - 5pm
PLACE: Dartmouth College, 74 College St, Hanover, Kellogg 200
FORM: in-person, 20 participants max
Lunch and coffee breaks sponsored by bioMT

BioImage Analysis and Superresolution Microscopy Workshop 2023

Day 1 (Tue, June 6)	
9:00 – 9:15	**Welcome note**
9:15 – 10:00	**Introduction to microscopy: methods, principles, theoretical background (Zdenek Svindrych)** ● Image formation in a fluorescence microscope ● Resolution and noise
10:00 – 10:15	Coffee Break
10:15 – 11:00	**Introduction to superresolution microscopy: methods, principles, theoretical background (Zdenek Svindrych)** ● Single-Molecule localization Microscopy (STORM, PALM, DNA-PAINT) ● Structured Illumination Microscopy (SIM, ISM, Airyscan, SoRa)
11:00 – 11:10	Short Break
11:10 – 12:00	**BioImage processing in Fiji, theory (Zuzana Burdikova)** ● Image formats, multi-dimensional image, data types, LUTs ● Data visualization, 3D visualization ● Histogram, measurement of different parameters ● Quantitative analysis
12:00 – 1:00	Lunch
1:00 –2:00	**BioImage processing in Fiji, hands on (Zuzana Burdikova**, Jakub, Martin, Zdenek**)** ● Two channel colocalization ● Image filtering ● Quantitative measurements

2:00 – 2:45	**ThunderSTORM: a comprehensive ImageJ plug-in for SMLM data analysis and superresolution imaging (Zdenek Svindrych)** **https://zitmen.github.io/thunderstorm/** ● Single Molecule Localisation (brief recap) ● The idea behind ThunderSTORM ● Workflow - localization, filtering, rendering ● 3D STORM - astigmatism method ● Simulation engine
2:45 – 3:00	Coffee Break
3:00 – 4:00	**Noise2Void, StarDist (Jakub Soukup)**
4:00 – 5:00	**Data Management (Martin Schätz)**
Day 2 (Wed, June 7)
9:00 – 9:45	**Introduction to Huygens deconvolution software (SVI.nl**, remotely**)** ● Deconvolution in widefield, confocal, and superresolution microscopy
9:45 – 10:00	Coffee Break
10:00 – 11:30	**ThunderSTORM hands-on session (Zdenek Svindrych**, Martin, Jakub, Zuzana) ● Processing of 2D and 3D datasets ● 3D Calibration (astigmatic method)
11:30 – 11:40	Short Break
11:40 – 12:30	**Ilastik (Martin Schätz)**
12:30 – 1:30	Lunch
1:30 – 2:20	**Scientific lecture: Detyrosinated microtubules buckle and bear load in contracting cardiomyocytes (Pat Robison)**
2:20 – 2:30	Short Break
2:30 – 3:30	**Customizing Fiji with ImageJ Macro language, hands-on (Zdenek Svindrych**, Pat, Jakub, Zuzana**)** ● ImageJ Macro language ● Useful commands and functions
3:30 – 4:00	Coffee break

| 4:00 – 5:00 | **Interactive Design of GPU-accelerated Image Data Flow Graphs in Fiji (CLIJ2), hands-on (Martin Schätz**, Zuzana, Jakub, Robert Haase**)** |