# Introduction to

# Imaris

Imaris x64 9.0.2 [Oct 10 2017] Build 44695 for x64 Copyright © 1993-2017 Bitplane AG

www.imaris.com welcome@imaris.com





7<sup>th</sup> November 2017

### **Course Schedule**

#### 09:30-10:30 Session 1 – Understanding the Basics

- 10:45-12:30 Session 2 Initial Scene Objects, Taking Snapshots and Making Movies
- 13:30-15:00 Session 3 Creating Spots and Surfaces, Annotation
- 15:30-17:00 Session 4 Creating Cells

### **Session 1 – Understanding the Basics**

- 1. Using Arena to upload and organise your images
- 2. Understanding the basic interface
- 3. Adjusting brightness and contrast
- 4. Editing look-up tables
- 5. Checking image parameters
- 6. Group Exercise



	Imaris Start	Imaris for Adv. Tracking	Imaris Single Full	Imaris for Neuroscience	Imaris for Cell Biologists	Imaris Whole Slide
Imaris Core Render 3D/4D images, detect objects, snapshot & animation	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓
Imaris MeasurementPro Report and interact with detected object measurements	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓
Imaris Coloc Visualize and quantify colocalized regions	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
Imaris Vantage Plot in 1D-4D, compare groups with statistical tests	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Imaris TrackLineage Track motion in 2D/3D, detect divisions, create lineage tree		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
Imaris Filament Tracer Trace filamentous structures, neurons, vessels, detect spines			$\checkmark$	$\checkmark$		
Imaris Cell Segment and analyze cells and their compartments			$\checkmark$		$\checkmark$	
<b>Imaris XT</b> Customize analysis with Matlab, Python, Java, R			$\checkmark$	$\checkmark$	$\checkmark$	
Imaris Batch Utilise saved protocols for batch analysis			$\checkmark$			

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Create an Assay as the top level of your image database





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Single left-click on thumbnail to see image properties

Properties Tags Objects	
Parameter	Value
<ul> <li>Channel 0</li> </ul>	
colorrgb	255
componentcount	1
Ismemissionwavelength	595.000
lsmexcitationwavelength	561.0
lsmpinhole	0.000
name	TRITC
ocname	
▼ Image	
datatype	UInt16
filename	D:/Simon/Imaris Training Images/Confocal stack1.nd2
lenspower	12
manufactormodel	ND2
manufactorstring	
manufactortype	Nikon
microscopemodality	Widefield Fluorescence, Laser Scan Confocal
name	Confocal stack1
numberofchannels	
numericalaperture	1.400
recordingdate	2016-08-09
unit	um
<ul> <li>ND2_Attributes</li> </ul>	
uibpcinmemory	16
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uicomponents	1
uicompression	2 (None)
uiheight	1024
uiquality	0
uisequencecount	13
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ND2 Capturing	
001	Nikon A1plus\r
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	Zoom: Medium Icons

# **Organising Your Images In Arena**

Create a Group as a subfolder within your assay





# **Organising Your Images In Arena**

New empty container

- Double-click to see contents
- Drag in image files to create new entries
- Drag in thumbnails from Arena View to duplicate











#### **Object List**

All components in the scene are shown



**Object Properties** Details relating to the selected object are shown

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#### **View Area**

Display/interaction area for images and objects.

- Left-click to rotate 3D view
- Right-click to pan
- Mouse wheel to zoom in/out







#### **Slice View**

- Switch to slice view to see raw image data •
- Click and drag on the left hand slider to • move between the image slices
- Click on the ulletsequence
  - icon to play the image

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#### **Slice View Options**

- Slice view shows individual images
- Section shows Orthoganol views
- Gallery shows section thumbnails
- Easy 3D shows maximum intensity projection





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3D View

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#### **Camera/Pointer**

Display and selection options

ദ	Camera / Labels
Camera	
Pointer	
<ul><li>Select</li><li>Navigate</li></ul>	
Camera Type	
O Orthogonal	
Perspective	45°
	•
🚮 InMotion	
	Center to Selection
	Fit to Selection
	Set Center
Fix Center	



#### Labels

#### Options for labelling information



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# Display Options

Use to e.g. re-size and reset

viow

Zoom: 88% 🔻 🗷 Fit 💹 Reset 👰 Full Screen 🛞 Navi

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Display Adjustment Window (Edit>Show Display Adjustment, Ctrl D)



- Channel name shown
- Tick indicates channel is displayed
- Background colour indicates assigned Look-Up Table (LUT)





#### **Display Adjustment Window**

- Use left side slider to adjust minimum intensity threshold
- Use right side slider to adjust brightness
- Type in numbers to set specific intensity levels to view





#### **Display Adjustment Window**

- Use left side slider to adjust minimum intensity threshold
- Use right side slider to adjust brightness
- Type in numbers to set specific intensity levels to view
- Use middle slider or Gamma field for non-linear adjustment

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Timage Properties	
Channel T Tennel Tennel T Tennel Tennel T	Geometry Data Set Channels Channel 1 Thumbnail Parameters
OK Cancel	Introduction to Imaris- Imaging Facilit



#### **Image Properties Window**

Base Color Mapped Color

- Slide the small box to adjust the colour Look-Up table (LUT)
- Dragging the small box to a corner of the hexagon will set one or two of the Red, Green and Blue (R,G,B) values to 1
- Set one of the R, G or B values to 1 and the remaining two colour values to 0 for a 'pure' LUT
- Set R, G, B values to 1 for white LUT
- Use the lower slider to set the intensity range



#### **Image Properties Window**



- Create a custom LUT by selecting individual coloured boxes and then Edit.. (or double-click on the box)
- Export to save
- Use Import... or the drop-down list to load a pre-defined multi-colour LUT



Geometry Data Set		Geometry					
Channels Channel 1		Туре					
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Geometry Data Set	Data Set					
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	Lens Power:		1.2	Modality:	Fluorescence, Laser Scan Confocal	
	Numerical Apert	ure (N.A.):	1.400			

Geometry Data Set	Thumbnail
<ul> <li>Channels</li> <li>Channel 1</li> </ul>	Туре
Thumbnail Parameters	○ None ○ Middle Slice ④ MIP ○ Blend
	Preview

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Geometry Data Set	Parameters		
Channels Channel 1	0.000 1.000 -0.000		
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	Color	0.000 1.000 -0.000	
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	ColorRGB	255	Delete Parameter
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	ColorTableLength	256	
	ComponentCount	1	
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	ExtMax0	-27731.2	
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	ExtMin1	2591.4	
	ExtMin2	1863.28	
	Filename	D:\Simon\Imaris Training Images\Confocal stack1.nd2	
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	ManufactorString		
	ManufactorType	Nikon	
	NumberOfChannels		
	RecordingDate	2016-08-09 16:01:58.481	
	ResampleDimensionX	true	
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	uiBpcSignificant		
	uiComponents		
	uiCompression	2 (ivone)	
	uiHeight	1024	
	uiQuality	12	
	uiSequenceCount	13	
		1024	

# Group Exercise 1 (easy)

- Import File 'Zeiss 4-channel confocal stack1' into Arena
- Adjust display settings
- Create new LUT on Channel 2

### Group Exercise 2 (not so easy)

- Import data series in folder 'Confocal z t tiff stack' into Arena
- Reconstruct time/z series (126 time points, 24 z planes)
- Assign correct dimensions (0.16 μm in x&y, 0.5 μm in z)
- Create new LUT