

## TENSS 2017 Final schedule

DATE	DAY	TIME SLOT	MAIN RESPONSIBLE	GROUPS	VENUE	CONTENT
31/5/2017	1	19:30 – 20:30	Florin, Raul, Adam			Introduction to the course and the people
		20:30 – 21:30	Dinner			
1/6/2017	2	08:00 – 09:00				Morning run/swim
		09:00 – 10:00				Breakfast
		10:00 – 11:30	Florin Albeanu			Intro to Optics
		11:30 – 11:45				Coffee break
		11:45 – 13:00	Fred Marbach			Optical elements and intro to image formation
		13:00 – 14:00				Lunch
		14:00 – 16:30	TAs	ABCD	Lecture Hall	Simple microscopes : Lenses and image formation properties
		16:30 – 16:45				Coffee break
		16:45 – 18:00	Priyanka Gupta			Koehler Illumination; numerical aperture and resolution
		18:00 – 20:30	TAs	ABCD	Lecture Hall	Bench-top koehler microscopes – depth of field and aperture
		20:30 – 21:30				Dinner
21:30 – 23:00	TAs	ABCD	Lecture Hall	Bench-top koehler microscopes – depth of field and aperture		

2/6/2017	2	08:00 – 09:00				Morning run/swim
		09:00 – 10:00				Breakfast
		10:00 – 11:00	TAs		Lecture Hall	Recap of concepts from Day 1
		11:00 – 11:15				Coffee break
		11:15 – 13:00	Florin Albeanu			Wide-field fluorescence microscopy: basic concepts and resolution
		13:00 – 14:00				Lunch
		14:00 – 16:30	TAs	ABCD	Lecture Hall	Convert bench-top koehler microscopes to epi-fluorescence
		16:30 – 16:45				Coffee break
		16:45 – 18:30	Petr Z			Detecting signals: Noise, Cameras, PMTs and diodes, Introducing lab session on noise measurements
		18:30 – 20:30	TAs	ABCD	Lecture Hall	Noise measurements, measure PSFs using fluorescent beads
		20:30 – 21:30				Dinner
		21:30 – 24:00	TAs	ABCD	Lecture Hall	Discussion, analysis, continue Labs

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3/6/2017	3	08:00 – 09:00				Morning run/swim
		09:00 – 10:00				Breakfast
		10:00 – 11:15	Ruben Portugues			Fluorescent probes: GFP, calcium indicators vs. voltage dyes, synaptophluorins
		11:15 – 11:30				Coffee break
11:30 – 13:00	Tomas, Goncalo, Rob			Programming I: Basics		

		13:00 – 14:00			Lunch
		14:00 – 17:30	Tomas, Goncalo, Rob		Programming II: Arduinos
		17:30 – 17:45			Coffee break
		17:45 – 20:30	Tomas, Goncalo, Rob	ABCD	Programming III: Matlab and Data acquisition
		20:30 – 21:30			Dinner
		21:30 onwards	TAs	ABCD	Lecture Hall Image fixed brain slices on the bench-top fluorescence microscopes. Analyze noise and PSF measurements, compile results and make presentations.

4/6/2017	4	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 11:30			Student presentations (10 + 5 minutes): PSFs, noise characterization of wide-field microscopes
		11:30 – 13:00			Free time to relax
		13:00 – 14:00			Lunch
		14:00 – 19:30			Free time to relax
		19:30 – 20:30	Mark Hubener		Intrinsic Imaging - Principles and Intro to Lab session - practical aspects and comparison with wide field fluorescence imaging
		20:30 onwards			Dinner, Student chinks* and party after

5/6/2017	5	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 11:30	Florian Engert		Scanning and Confocal Microscopy

11:30 – 11:45				Coffee break
11:45 – 13:00	Florian Engert			Multiphoton Microscopy
13:00 – 14:00				Lunch
14:00 – 16:15	TAs	AB	Bunker	Set up microscopes for intrinsic and widefield fluorescence imaging and determine optimal imaging parameters
		CD	Lecture Hall	Building a two-photon microscope – general discussion on practical aspects and optical diagram
16:15 – 16:30				Coffee break
16:30 – 20:30	TAs	AB	Bunker	Image intrinsic optical and fluorescence signals, analyze acquired signals
16:30 - 18:00	TAs	CD	Lecture Hall	Two-photon bench top – Walking the beam and assembling benchtop scanning systems
18:00 - 20:30	TAs		Lecture Hall	Wavefront shaping using SLMs and Deformable mirrors
20:30 – 21:30				Dinner
21:30 – 22:30	Mark Hubener			Research Talk
22:30 onwards	TAs	AB	Lecture Hall	Data analysis of widefield data and making presentations
		CD	Reception	Meet your 'future 2p'

6/6/2017	6	08:00 – 09:00		Morning run/swim	
		09:00 – 10:00		Breakfast	
		10:00 - 11:30	Ruben Portugues		Light Sheet and Light Field Microscopy
		11:30 – 11:45			Coffee break
		11:45 – 13:00	Petr, Florin		Optogenetics: Overview of stimulation methods, including DLPs
13:00 – 14:00				Lunch	

14:00 – 16:15	TAs	AB	Lecture hall	Building a two-photon microscope – general discussion on practical aspects and optical diagram
		CD	Bunker	Set up microscopes for intrinsic and widefield fluorescence imaging and determine optimal imaging parameters
16:15 – 16:30				Coffee break
16:30 - 18:00	TAs	AB	Lecture hall	Two-photon bench top – Walking the beam and assembling benchtop scanning systems
18:00 - 20:30	TAs		Lecture hall	Wavefront shaping using SLMs and Deformable mirrors
16:30 – 20:30	TAs	CD	Bunker	Image intrinsic optical and fluorescence signals, analyze acquired signals
20:30 – 21:30				Dinner
21:30 onwards	TAs, Ruben	AB	Reception	<b>Light sheet demo</b> , Meet your 'future 2p'
		CD	Reception, Lecture hall	<b>Light sheet demo</b> , Data analysis of widefield data and making presentations

7/6/2017	7	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 11:15			Student presentations (10 + 5 minutes): Widefield imaging
		11:15 – 11:30			Coffee break
		11:30 – 13:00	Rob TAs	AB CD	Lecture hall Reception
		13:00 – 14:00			Lunch
		14:00 – 19:00	Rob TAs	AB CD	Lecture hall Reception
		19:00 – 19:15			Coffee break
		19:15 – 20:30	Tom Mrsic Flogel		Research talk with 2p focus



		20:30 – 21:30				Dinner
		21:30 onwards	Rob, Petr TAs	AB CD	Lecture hall Reception	Image Analysis Building a two-photon microscope – image fixed samples
8/6/2017	8	08:00 – 09:00 09:00 – 10:00				Morning run/swim Breakfast
		10:00 – 11:15	Georg Keller			Research talk with 2p focus, open/close loop experiments
		11:15 – 11:30				Coffee break
		11:30 – 13:00	TAs Rob	AB CD	Reception Lecture hall	Building a two-photon microscope – excitation optics Write X-Y- Z scanning and image acquisition software
		13:00 – 14:00				Lunch
		14:00 – 19:00	TAs Rob	AB CD	Reception Lecture hall	Building a two-photon microscope – excitation and emission optics Write X-Y- Z scanning and image acquisition software followed by Intro to Image analysis
		19:00 – 19:15				Coffee break
		19:15 – 20:30	Rob Campbell			Telescopes
		20:30 – 21:30				Dinner
		21:30 onwards	TAs Rob, Petr	AB CD	Reception Lecture hall	Building a two-photon microscope – image fixed samples Image Analysis
9/6/2017	9	08:00 – 09:00 09:00 – 10:00				Morning run/swim Breakfast
		10:00 – 11:00	Marius		Lecture hall	Introduction to analysis - large 2p data sets
		11:00 – 13:00	TAs Marius, TAs	AB CD	Reception Lecture hall	In vivo 2p Lab imaging session Image Analysis of example in vivo 2p data

13:00 – 14:00				Lunch
14:00 – 16:00	Marius, TAs TAs	CD AB	Lecture hall Reception	Image Analysis of example in vivo 2p data In vivo 2p Lab imaging session
16:00 – 17:00	Sonja Hofer			Research Talk
17:00 – 19:30	Marius, TAs	ABCD	Lecture hall	Analysis of 2p imaging data acquired in the morning sessions
19:30 – 20:30	Florian Engert			LASERS
20:30 – 21:30				Dinner
21:30 – 23:30	Marius, TAs	ABCD	Lecture hall	Analysis of 2p imaging data, make presentations

10/6/2017	10	08:00 – 09:00 09:00 – 10:00		Morning run/swim Breakfast
		10:00 – 11:15		Student presentations - multiphoton microscopy
		11:15 – 11:30		Coffee
		11:30 – 13:00	Nacho	Intro to Animal Behavior and Machine Vision/Bonsai
		13:00 – 20:30		Picnic/Barbecue on the hills featuring speed dating - project discussion
		20:30 onwards		Dinner and Party

11/6/2017	11	08:00 – 09:00 09:00 – 10:00		Morning run/swim Breakfast
		10:00 – 11:00	Jakob/John	Introduction to chronic extracellular recordings



11:00 – 14:00	Upi, Iuliu, Adriana TAs	AB CD	Cell in a dish: Bench top electronics and basics of electrophysiology, Tetrode Making Animal behavior I - Assembling 'controlled' setups
14:00 – 15:00			Late Lunch
15:00 – 18:00	TAs Upi, Iuliu, Adriana	AB CD	Animal behavior I - Assembling a simple re-inforcement learning setup Cell in a dish: Bench top electronics and basics of electrophysiology, Tetrode Making
19:00 – 19:15			Coffee break
19:15 – 20:30	Botond Roska		Circuit tracing
20:30 – 21:30			Dinner
21:30 – 22:45	Tony Zador		Connectome

12/6/2017	12	08:00 – 09:00 09:00 – 10:00		Morning run/swim Breakfast
		10:00 – 11:15	Tomas Hromadka	Introduction to patch clamp
		11:15 – 11:30		Coffee break
		11:30 – 13:00	Upi Bhalla	Biophysics of neurons - RC circuits, dipoles and impedance (Introduce 'cell in a dish' lab demo)
		13:00 – 14:00		Lunch
		14:00 – 17:00	TAs	AB CD Building Tetrodes and tetrode drives Animal behavior II - machine vision
		17:00 – 17:15		Coffee break
		17:30 – 20:30	TAs	AB CD Animal behavior II - machine vision Building Tetrodes and tetrode drives

20:30 – 21:30			Dinner
21:30 – 22:30	Sonja Hofer		Two Photon and Patching
22:30 – 23:30	Suhasa		Robopatcher
23:30 onwards		ABCD	Continue building drives

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13/6/2017	13	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast
		10:00 – 13:00	TAs	AB	Physiology basics - record from implanted mice, spike detection, sorting, optogenetic tagging
			TAs	CD	Animal behavior III
		13:00 – 14:00			Lunch
		14:00 – 15:00	Marcus		
		15:00 – 18:00	TAs	AB	Animal behavior III
			TAs	CD	Physiology basics - record from implanted mice, spike detection, sorting, optogenetic tagging
		18:00 – 18:30			Coffee break
		18:30 – 20:30	TAs	ABCD	Analysis of acquired data (filtering, spike sorting, PSTH)
		20:30 – 21:30			Dinner
		21:30 – 22:30	Adam Kampff		Large scale single unit recordings - CMOS probes - why did it take so long to get here?
		22:30 – 23:30	Marius Pachitariu		Kilosort
		23:30 onwards	TAs	ABCD	Continue analysis

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14/6/2017	14	08:00 – 09:00			Morning run/swim
		09:00 – 10:00			Breakfast

10:00 – 13:00	TAs Tomas, Suhasa	AB CD	Physiology III - recording from behaving mice In vivo patch clamp
13:00 – 14:00			Lunch
14:00 – 15:15	Winrich Freiwald		Talk title : TBA
15:15 – 17:15	Tomas, Suhasa TAs	AB CD	In vivo patch clamp Physiology III - recording from behaving mice
17:15 – 17:30			Coffee break
17:30 – 18:30	Liora		Wireless electrophysiology
18:30 – 20:30		ABCD	Continue lab/analysis/presentation making
20:30 – 21:30			Dinner
21:30 – 23:00	David kleinfeld		Talk on behavior and physiology
23:00 onwards		ABCD	Continue lab/analysis/presentation making

15/6/2017	DAY 15	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:15	ABCD	Student presentations - behavior and physiology
		11:30 – 20:30		Trip to Cluj and Turda
		20:30 – onwards		Dinner and Party

16/6/2017	DAY 16	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:00	<i>Chrish Xu</i>	3 photon microscopy
		11:00 – 12:00	<i>David Kleinfeld</i>	Wide field of view two photon microscopy

12:00 – 13:00		Early lunch
13:00 – 15:00	TAs Tomas & Suhasa	AB CD Student Projects In vivo patching
15:00 – 15:15		Coffee
15:15 – 17:15	TAs Tomas & Suhasa	CD AB Student Projects In vivo patching
17:15 – 17:30		Coffee
17:30 – 20:30	TAs	Student Projects
20:30 – 21:30		Dinner
21:00 – 23:00	TAs	Student Projects

17/6/2017	DAY 17	08:00 – 09:00		Morning run/swim
		09:00 – 10:00		Breakfast
		10:00 – 11:00	<i>Wolf Singer</i>	TBA
		11:00 – 12:00		
		12:00 – 13:00		Lunch
		13:00 – 18:00		Group Experiments
		18:00 – 20:30		Group Experiments
		20:30 – 21:30		Dinner
		21:00 – 23:00		Group Experiments

18/6/2017	DAY 18	08:00 – 09:00		Running around
		09:00 – 10:00		Breakfast
		10:00 – 11:00	<i>Hannah Monyer</i>	TBA

11:00 – 12:00	<i>Raul Muresan</i>	Neural oscillations: generation, function, estimation
12:00 – 13:00		Lunch
13:00 – 18:00		Group Experiments
18:00 – 20:30		Group Experiments
20:30 – 21:30		Dinner
21:00 – 23:00		Student presentations - group projects

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19/6/2017	DAY 19	08:00 – 09:00	Morning run/swim
		09:00 – 10:00	Breakfast
		10:00 – 11:45	Informal chalk board talks by students (10 + 5 minutes): Very brief intro to current research work and defend future proposals to use knowledge acquired at the course
		11:45 – 12:00	Coffee
		12:00 – 13:30	Informal chalk board talks by students continue
		13:30 – 14:30	Lunch
		14:30 – 16:00	Round up and feedback
		Evening onwards	Music, movies, swim and party

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