

Simons Computational Neuroscience Imbizo

12 January to 2 February 2025

[- Schedule; Working day format & Map -](#)

Draft Schedule

Sunday 12 Jan - arrival:

18h00 : Welcome proceedings at The Team House

Dinner - 18h30: Braai @ The Team House (weather dependant)

Cycle 1: Biophysics, Plasticity and Neural Recordings & Mechanistic Insight of Neural Network Dynamics and Learning

Day 1, 13 Jan

Morning: Welcome from Directors and TAs

Morning: Ions, membranes and spikes

Afternoon: TA Tutorial: Math intro

Dinner - 18h30: The Team House

Day 2, 14 Jan

Morning: An intro to the brain, cell types, systems and neuroinfections

Morning: Experimental techniques in neuroscience and cockroach practical

Afternoon: TA Tutorial: Creative approaches to problem-solving using Python

Dinner - 18h30: The Team House

Day 3, 15 Jan

Morning: Networks and Balance

Morning: Sensory Processing / Rate networks

Afternoon: TA Tutorial: Differential equations and LIF model

Afternoon: Diversity Discussion: AMA Neuroscience in Africa
Dinner - 18h45: The Team House

Day 4, 16 Jan

Morning: Synaptic Plasticity
Morning: Introduction to Hippocampus and Memory
Afternoon: TA tutorial: Neural population dynamics
Dinner - 18h30: The Team House

Day 5, 17 Jan

Morning: Neuromodulation and Reinforcement learning
Morning: Simulation based inference
Afternoon: TA Tutorial: Plasticity models
Dinner - 18h30: The Team House

Day 6, 18 Jan

Morning: Basal Ganglia and Decision making
Morning: Soft skills
Afternoon: TA Tutorial: Data Analysis with DL models
Lunch time Diversity Discussion : Gender in Science
Dinner - 18h30: The Team House

Day 7, 19 Jan

Day off

Choose between a surf lesson at Muizenberg beach or a trip to Boulders Beach to see the penguins
Cash for lunch will be given
Dinner - 18h30 The Team House

Cycle 2: Higher Level Function, Motor Control & Decision Making

Day 8, 20 Jan

Morning: Mechanisms of vocal learning and production

Morning: Inverse model versus reinforcement learning

Afternoon: Tutorial project time

Dinner - 18h30: The Team House

Day 9 , 21 Jan

Morning: How to make a model

Morning: What does it mean to understand how the brain works

Afternoon: Tutorial project time

Dinner - 18h30 : The Team House

Day 10, 22 Jan

Morning: 09h00-10h00 Human electrophysiology recordings (single unit / LFP) in epilepsy patients and clinical applications of DNNs in epilepsy research

Morning: Bird Song production

Afternoon: Tutorial project presentations

Dinner - 18h45 Dinner at Aegir

Day 11, 23 Jan

Morning: Robotics in Africa

Diversity discussion: Careers in Science

Afternoon: Writing workshop

Dinner - 18h30: The Team House

Day 12, 24 Jan

Morning: Control of movement: basics

Morning: Control of movement: an RL perspective

Afternoon: Project time

Dinner 18h30 The Team House

Day 13, 25 Jan

Morning: Dynamical systems part 1

Morning: Dynamical systems part 2

Afternoon: Project time

Dinner 18h30 The Team House

Day 14, 26 Jan

Off day- Red bus tour day

08h00-17h30

Dinner - 18h30: Braai atThe Team House

Cycle 3 : NeuroInspired AI

Day 15, 27 Jan

Morning: Deep Learning Theory

Afternoon: Website Workshop

Afternoon: Project time

Dinner - 18h30: The Team House

Day 16, 28 Jan

Morning: Topographically/biologically constrained representations

Afternoon: Project time

Dinner - 18h30: The Team House

Day 17, 29 Jan

Morning: Project time

Afternoon: Applied Machine Learning

Dinner - 18h30: Dinner at Team House

Day 18, 30 Jan

Morning: Navigation in the brain as RL

Afternoon: Project time

Dinner - 18h30: The Team House

Day 19, 31 Jan

Morning: Structure in the brain

Afternoon: Project time

Dinner - 18h30: The Team House

Day 20, 1 February

Morning: Project Presentations

Afternoon: Project Presentations

Gala **Dinner** (semi-formal event) off site

Day 21, 2 February

Checkout and departure

Teaching Day Format @ Imbizo 2025 :

Breakfast 07h30 - 08h50 at The Team House (students & TAs)

Morning: Lectures at The Team House

OPTION 1 [3 x 1-hour lectures, 2 x 15-min break]

09h00-10h00

Tea Break- 10.15 - 10.30

10h15-11h15

Tea Break- 11h15-11h30

11h30-12h30

OPTION 2 [4 x 45-min lectures, 3 x 10-min breaks]

09h00-09h45

Tea Break 09h45-09h55

09h55-10h40

Tea Break- 10h40 - 10h50

10h50-11h35

Tea Break - 11h35 -11h45

11h45-12h30

The option will vary by day and lecturer

Morning coffee break snacks served at 10h15 & Lunch served until 13h30

Project time / tutorials and homework 14h00 to 18h00 (breaks vary by tutorial)

Dinner at 18h30 (location varies, see schedule)

Project Work time - Tutors will generally be around no later than 22h30

NOTES

****Lunchtime Mall visit 12.45-13.45****

These visits are subject to change but a 12 seater shuttle will be available at least once a week for trips to purchase essentials you may need

**** Laundry Days for Students and TAs****

A laundry service will be provided by the TH for students and TAs. You will be allocated a laundry day on check in.

Noordhoek Map

Key: The Team House (TH) = Lecture Venue and student/ TA accommodation

Monkey Valley(MV) = Faculty & TA accommodation

There is a footpath between TH and MV for Faculty and TAs to use during the day. A shuttle service will be provided for MV guests in the evenings after dinner.

