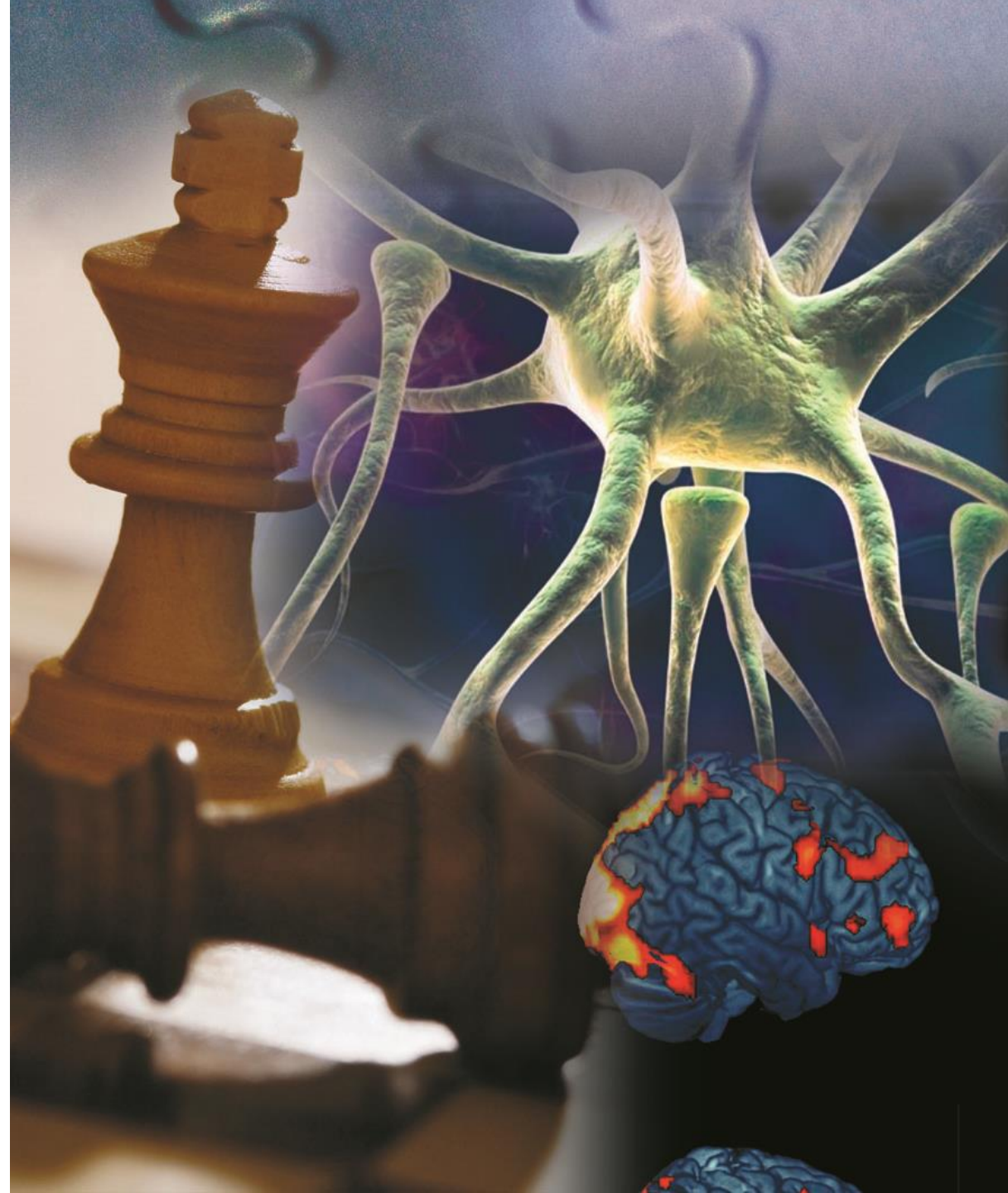




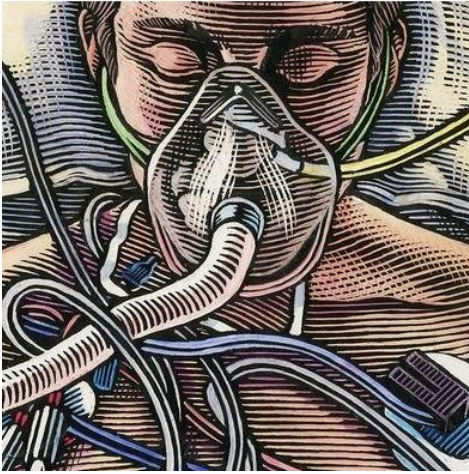
# MSc Brain and Cognitive Sciences

Crossing the border  
between the brain and the mind

*Dr. Umberto Olcese*  
*November 5<sup>th</sup>, 2024*



# Brain and Cognitive Sciences



Are they conscious?



How does language emerge?



What are the neural bases of emotions?

*And much much more...*



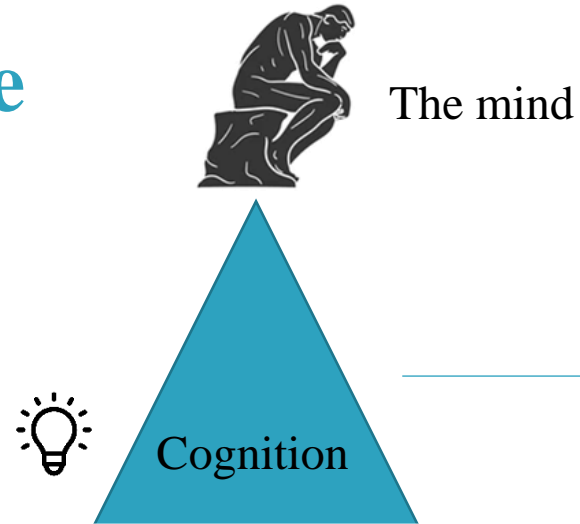
UNIVERSITY OF AMSTERDAM  
Faculty of Science

# Brain and Cognitive Sciences

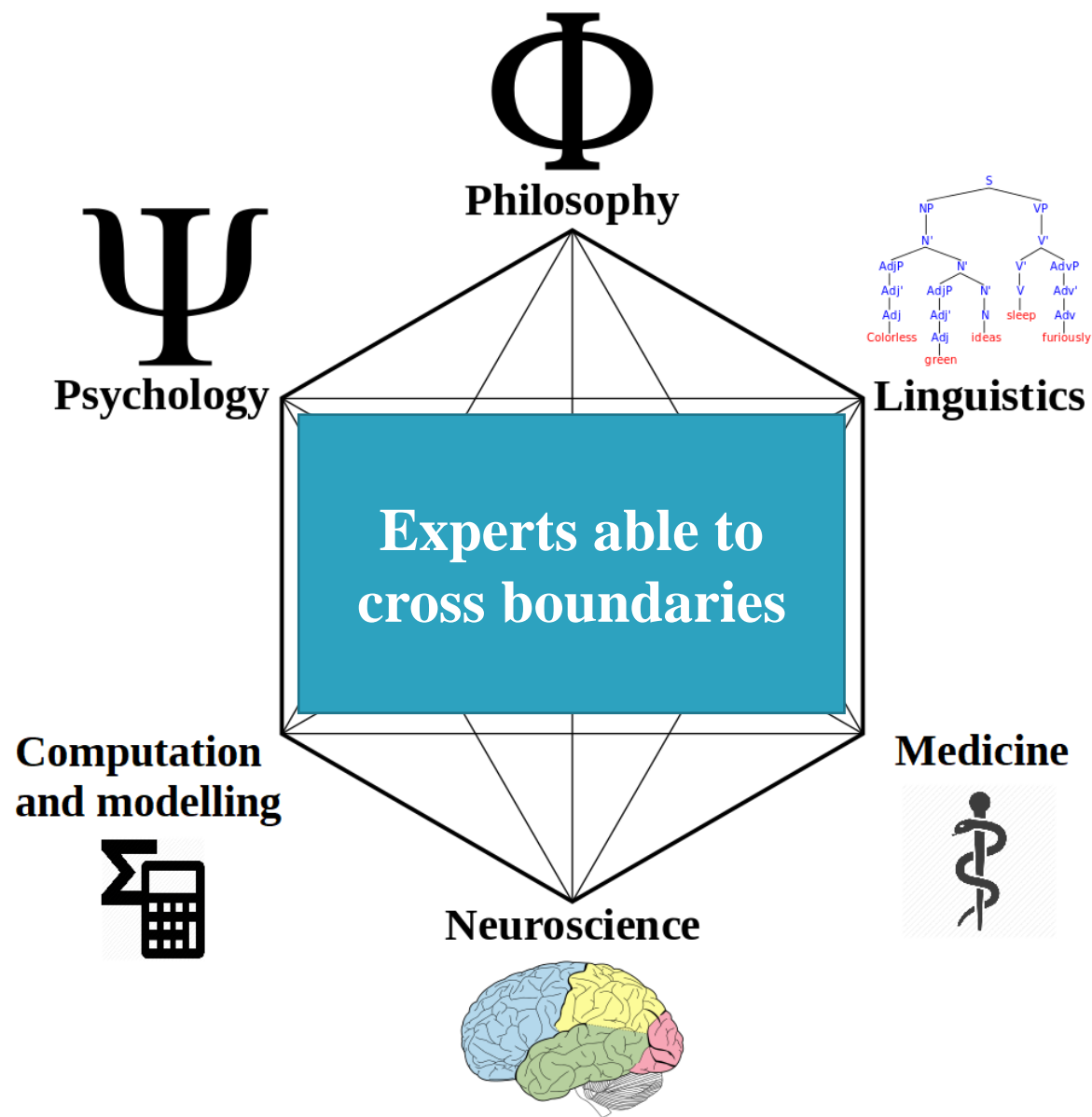


The mind

# Brain and Cognitive Sciences



Cognitive psychology  
Linguistics  
Philosophy of mind  
Logic  
Artificial intelligence







## What makes MBCS unique?

- Interdisciplinary skills
- Freedom of choice
- Excellence and community
- Preparation for PhD and research career



# Research Master Brain and Cognitive Sciences



- ✓ Institute for Interdisciplinary Studies
- ✓ UvA's expert institute for interdisciplinary training



- ✓ Amsterdam Brain and Cognition Center
- ✓ Fosters interdisciplinary research
- ✓ Hosts Research Priority Area Brain and Cognition
- ✓ Scientific excellence



## Meet the team



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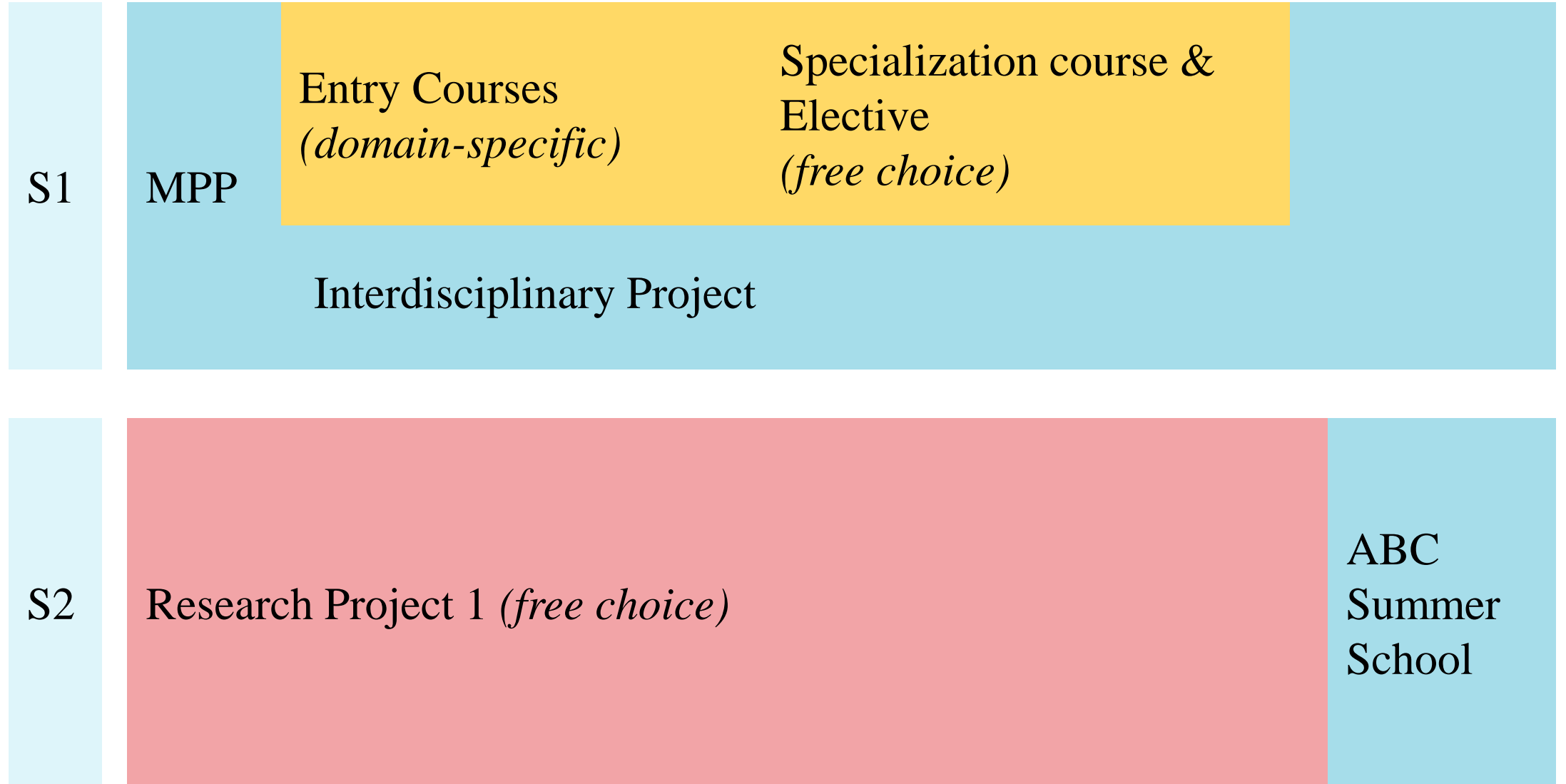


**Vincent Tijms**  
Programme Coordinator  
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**Year 1**





**Year 2**

S1

Electives (*free choice*)

Literature Thesis (*free choice*)

Research Project 2 (*free choice*)

S2

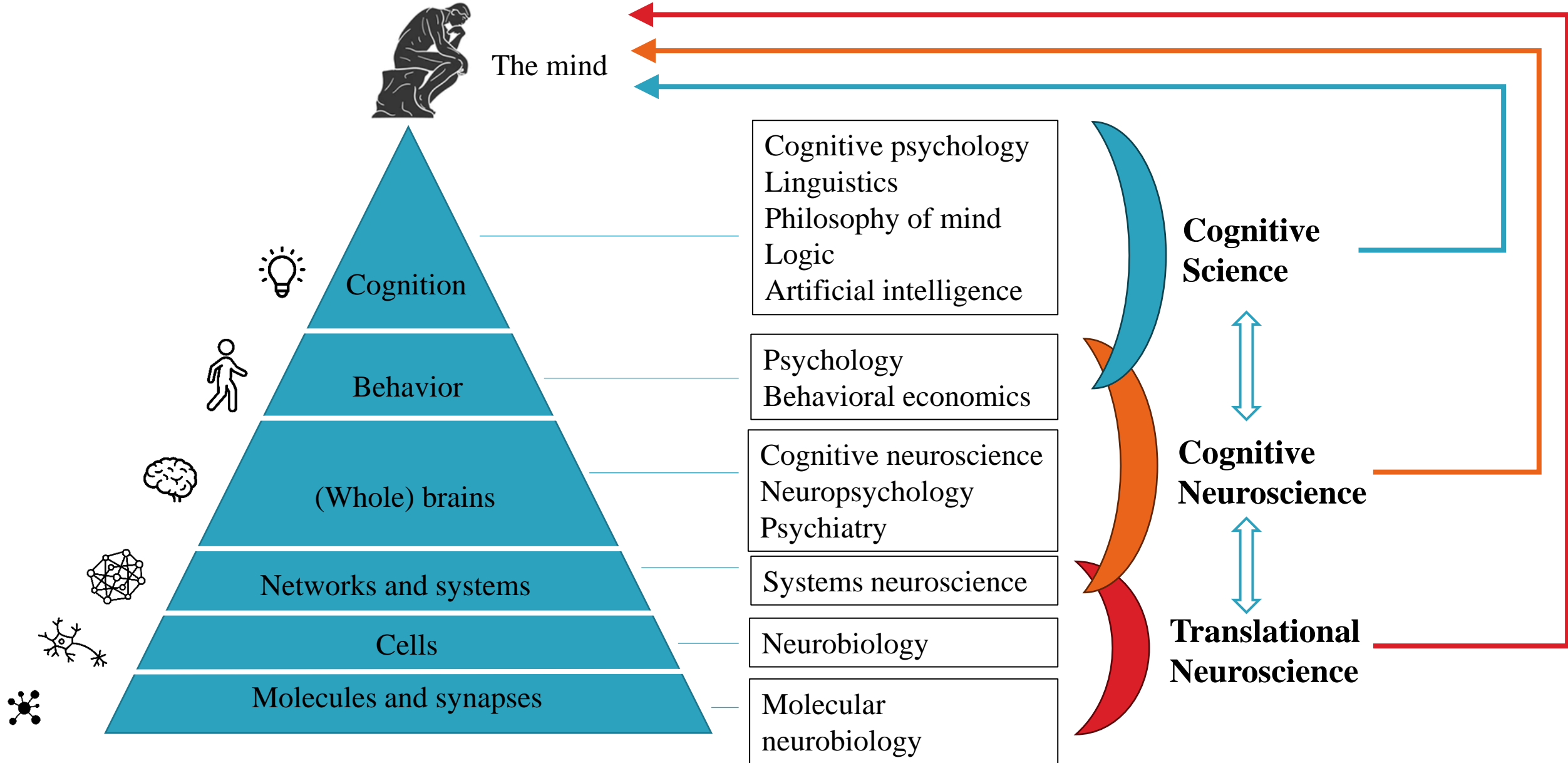
Research Project 2



## Three domains (~20 students/domain)

- Translational Neuroscience
- Cognitive Neuroscience
- Cognitive Science









# Translational Neuroscience (TNS)

## *From molecules to behaviour*

Discover the mechanisms and processes that determine the development of neural systems and the control of behaviour, from molecules to neuronal networks.

### **Entry courses:**

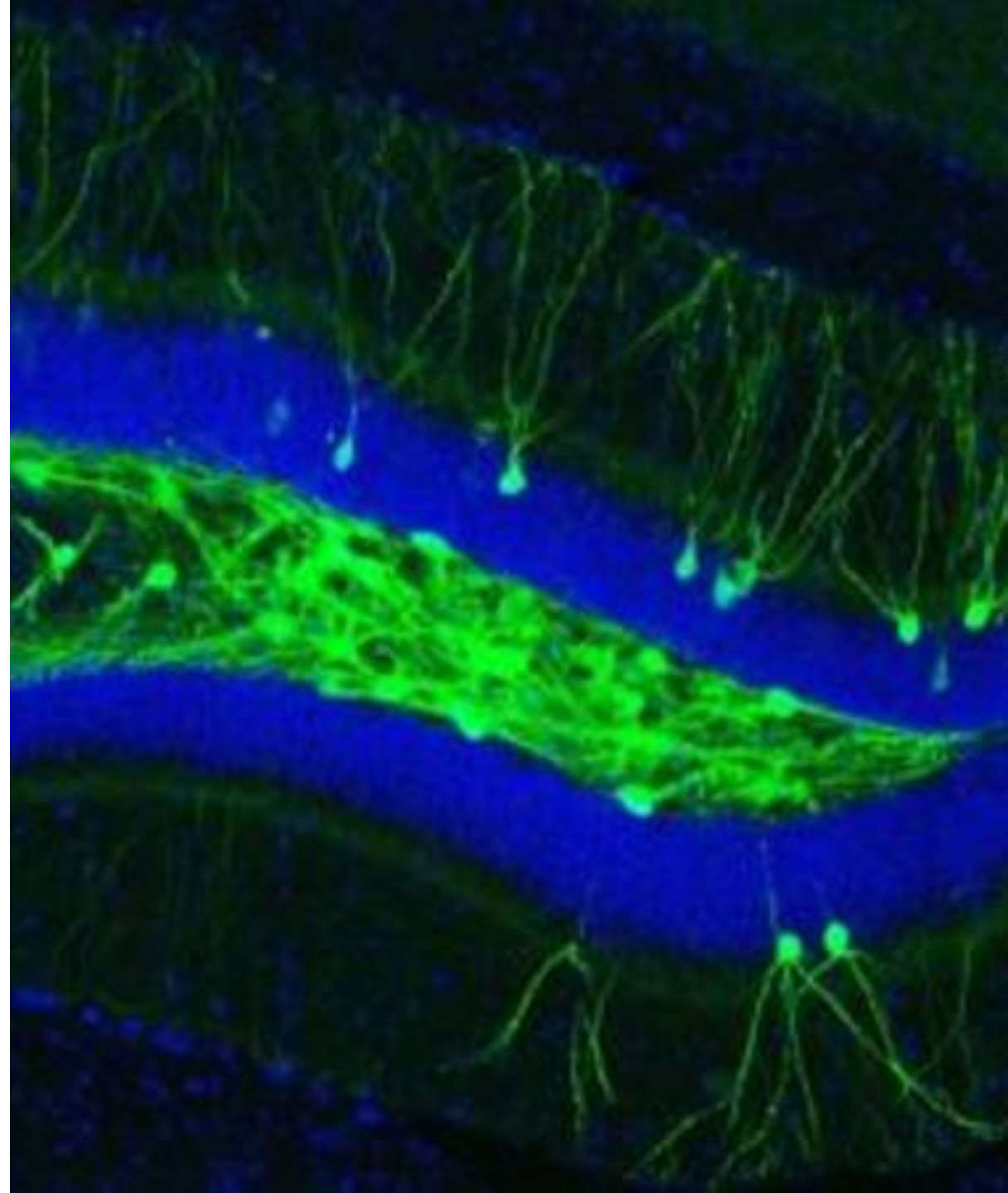
- Neuroscience: From cell to behaviour
- Experimental Neurobiology





## Research projects TNS

- “Requirement of pain experience ACC neurons in freezing behaviour during pain observation”  
- *Netherlands Institute for Neuroscience, NL*
- “Structural morphometry patterns across the incremental stages of cognitive decline in Parkinson’s Disease” *UvA, NL*
- “The Role of The Superior Colliculus in Express Reaches” *Gaze Control Lab, London, Canada*





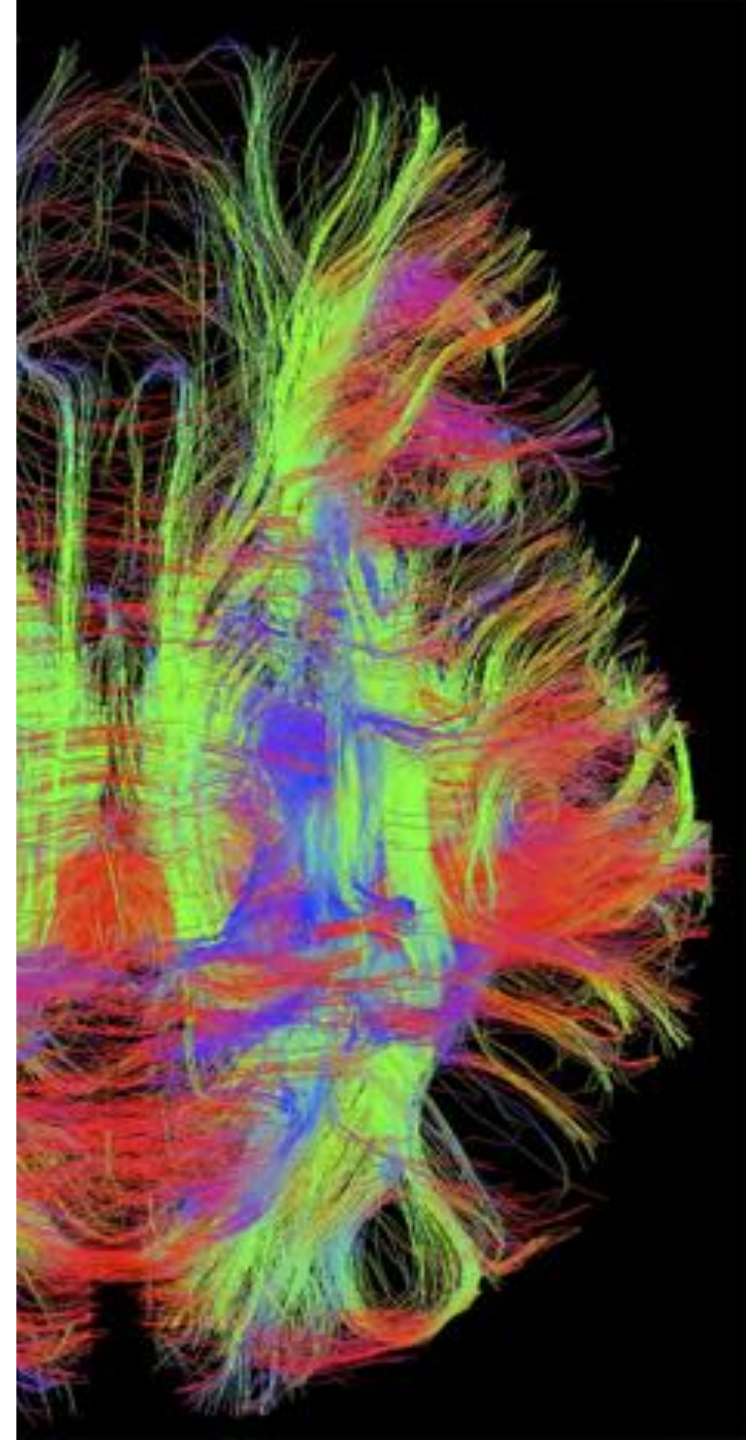
# Cognitive Neuroscience (CNS)

## *The neural bases of cognition*

Bring together neuroscience and psychology to understand the development and execution of cognitive functions underlying behaviour.

### **Entry courses:**

- Brain Organization and Cognition
- Neurophysiology: Introduction to Electrophysiology and Imaging







# Research projects CNS

- “Neural correlates of consciousness during epileptic seizures” *University of Wisconsin, USA*
- “This is Your Brain on Swearing: The Effect of Swearing on Error-Related Negativity as an Indicator for State Disinhibition.” *UvA, NL*
- “Representational dynamics in source space – interactions between lower and higher visual cortices” *University of Cambridge, UK*







# Cognitive Science (CS)

## *Computational methods to study cognition*

Discover the mechanisms of the mind and study cognitive and computational models to explore processes underlying language, music and other higher cognitive functions, whether in humans or artificial intelligence.

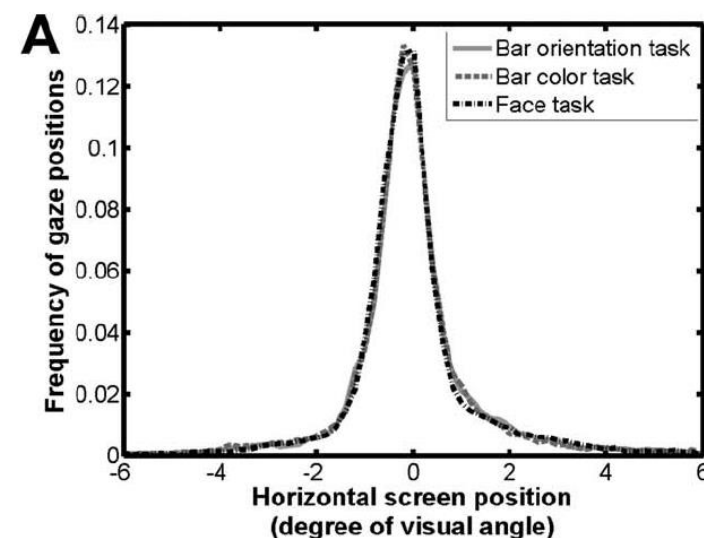
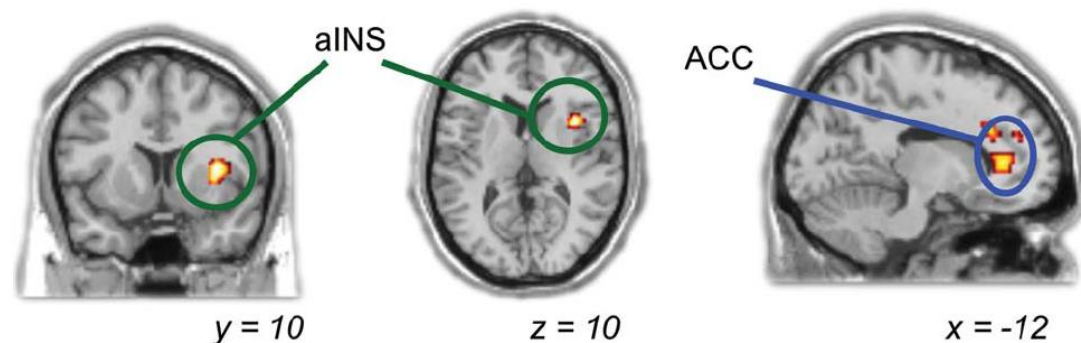
### **Entry courses:**

- Higher Cognitive Functions
- Introduction to Computational Cognitive Neuroscience



## Research projects CS

- “Spontaneous Vocal Behaviour in Grey Seal Pup Groups” *Seal Center Pieterburen, NL*
- “The Temporal Dimension of Self: Behavioral Effects and Underlying Mechanisms” *University of Ottawa, Canada*
- “Energy Optimization Induces Predictive-coding Properties in a Multicompartment Spiking Neural Network Model” *UvA, NL*

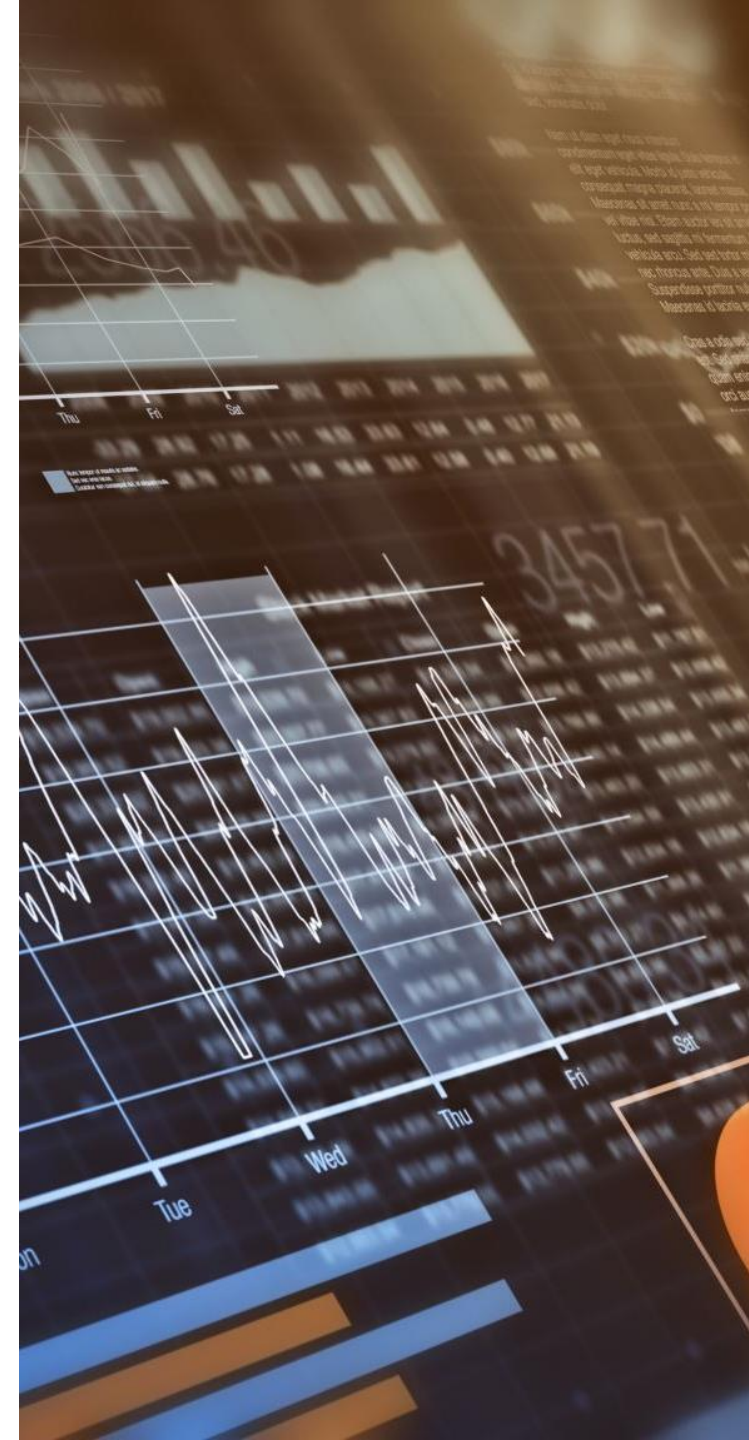


$$\Phi = \frac{1}{L} \sum_j \frac{P(D_j | old)}{P(D_j | new)} = \frac{1}{L} \sum_j \lambda_j$$



# Specialisation courses

- Introduction to Python Programming for Neuroscientists
- Research Design & Statistics
- Neuroimaging: BOLD MRI
- Advanced Neural and Cognitive Modelling
- Cognitive Data Analysis

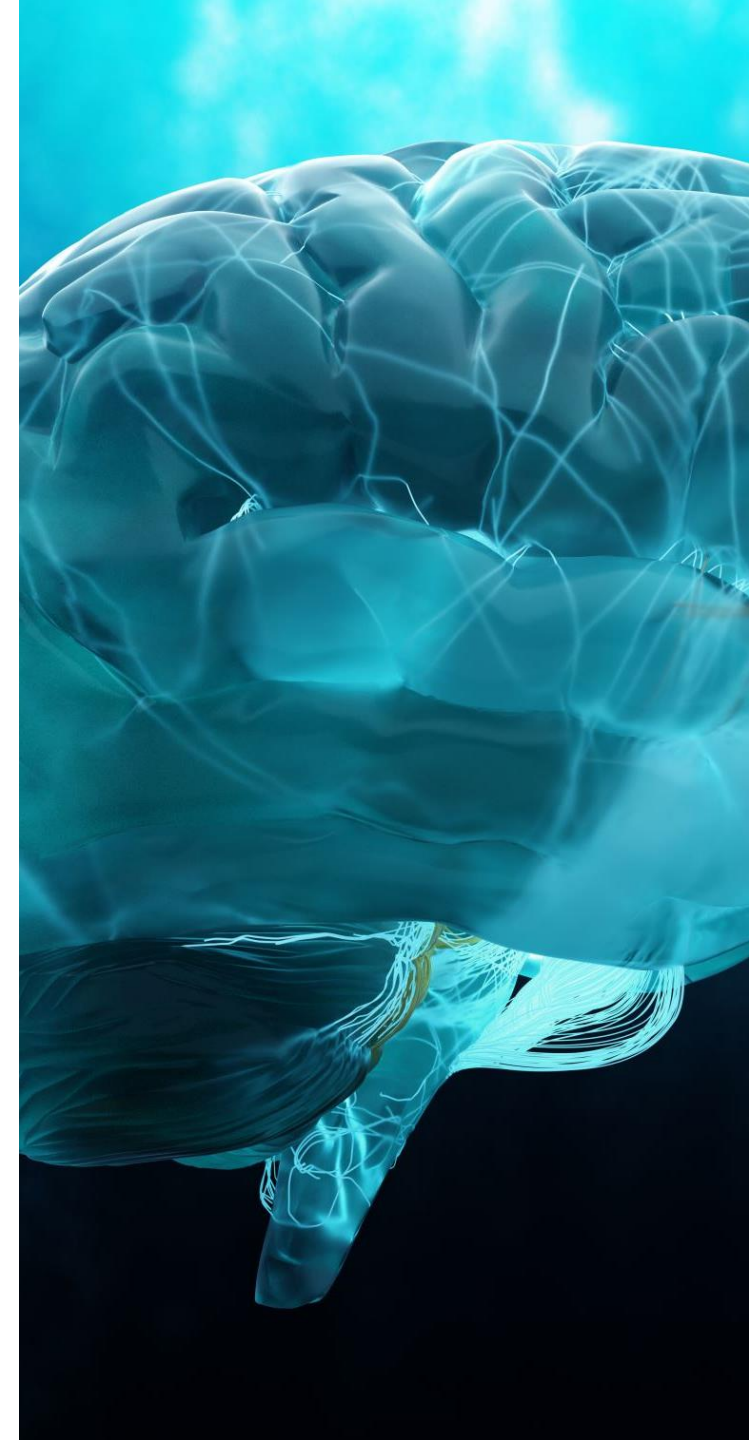






## Electives (organised in-house)

- Cognition & Language Development
- Introduction to Python Programming for Neuroscientists
- Introduction to Neuroscientific Methods and Brain Anatomy
- Research Design & Statistics
- Advanced Neural and Cognitive Modelling
- Philosophy of Cognition and the Brain: From Neurons to Embodied Cognition
- How Music Works: Music Cognition
- Cognitive Data Analysis
- Digital Twinning







# Inspiring community

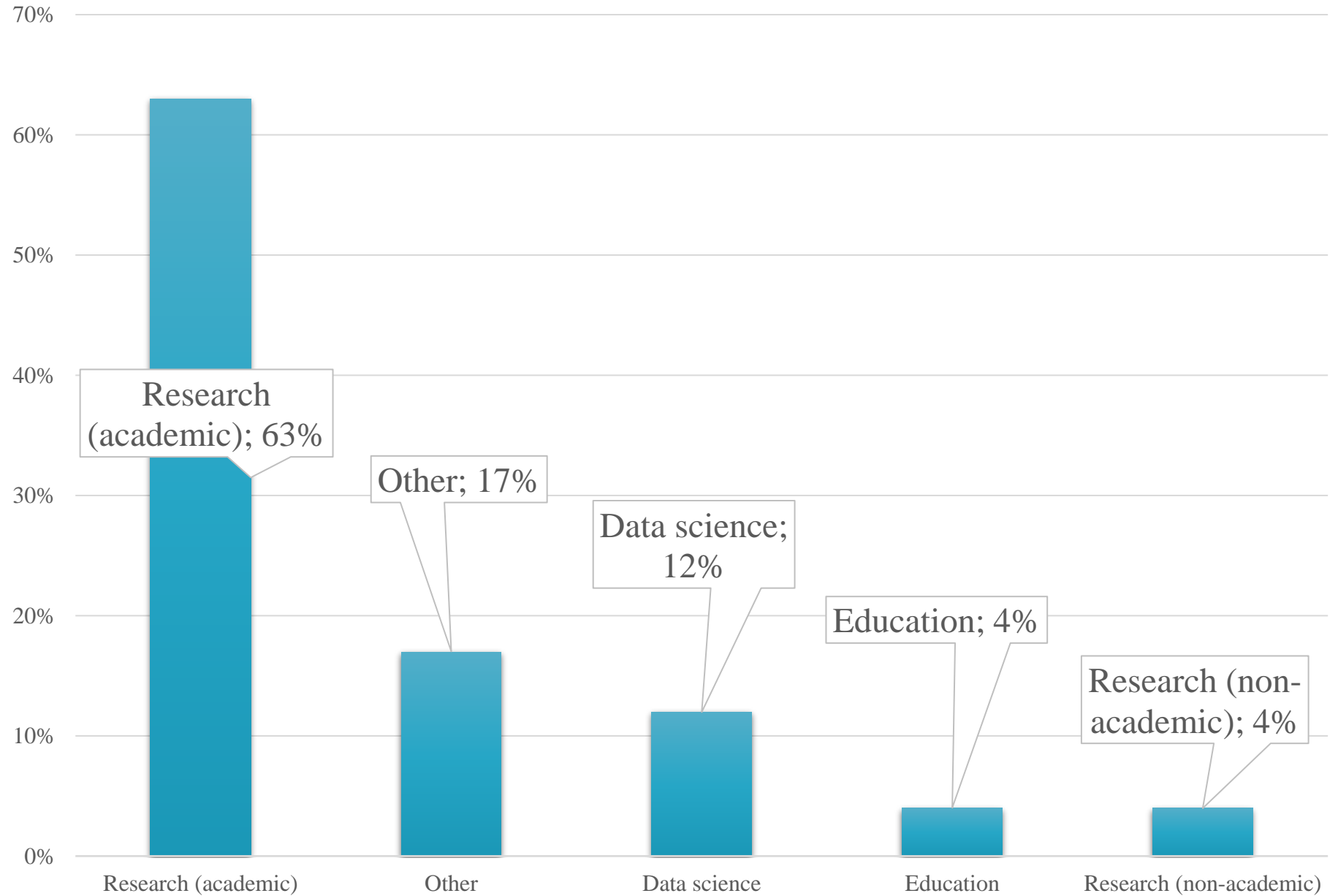
- Selective, full-time programme
- Community events:
  - Brain Slicing Event
  - Meet the Company
  - Cognitalks
  - Study trip
  - ABC Symposium



# Graduates

(Cohorts 2018-2020)

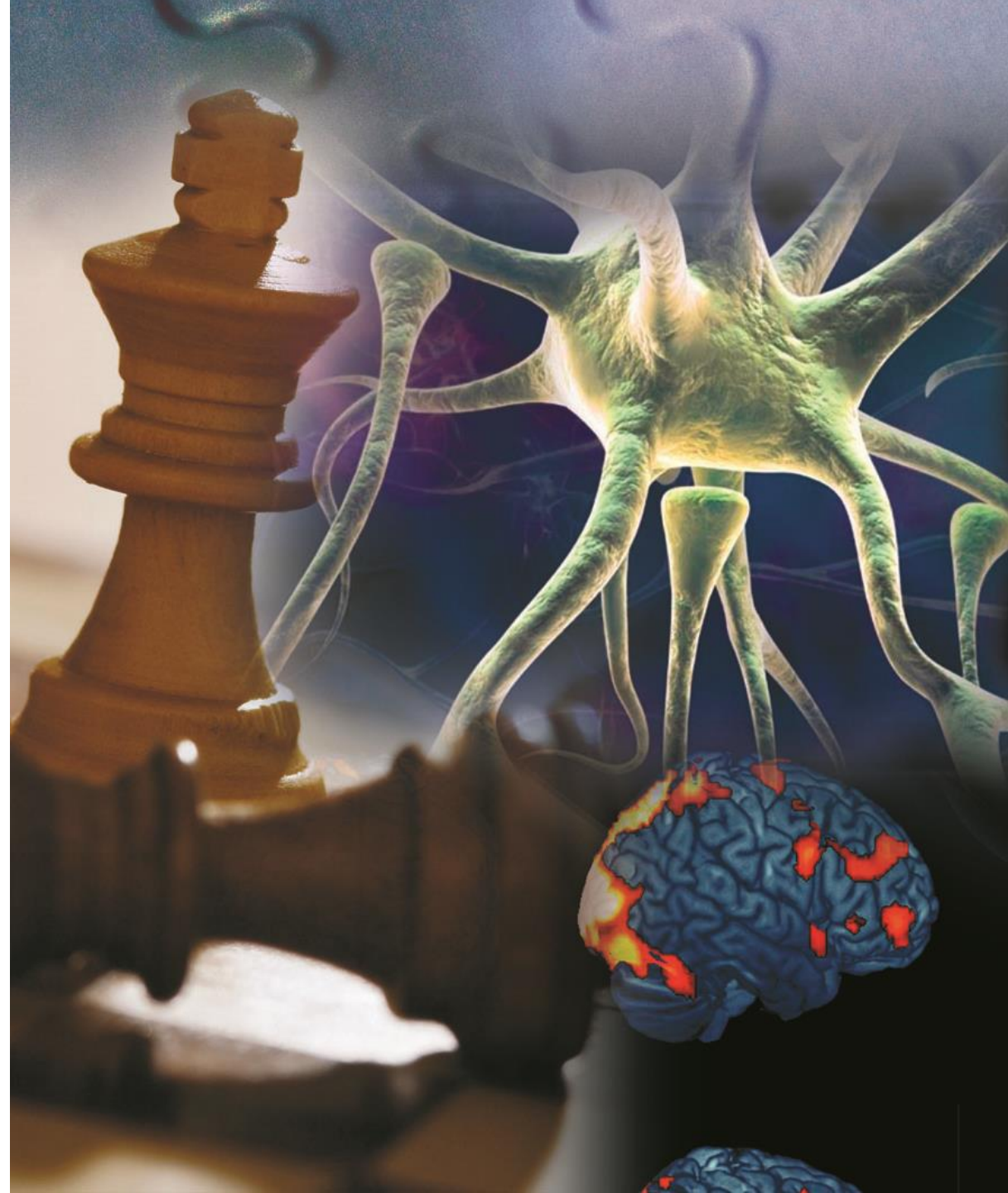
## First job after graduation





## Selection criteria

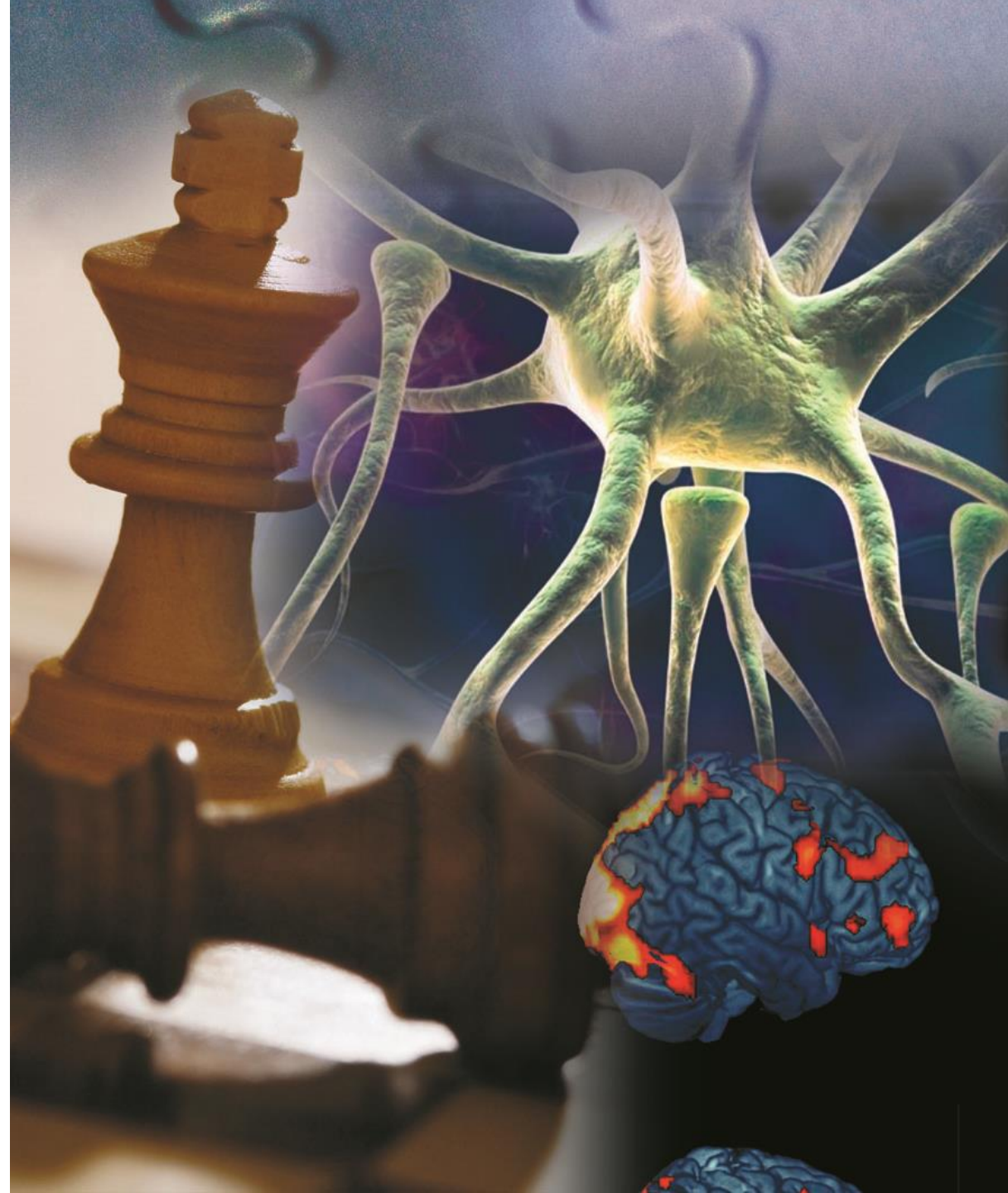
- Clear motivation for research in brain and cognitive sciences
- Coursework on neuroscience or cognition
- Research preparedness
- Interdisciplinary attitude
- GPA of 7.5 or higher
- Positive references





## Selection process

- Application deadline EU: 30 April, non-EU: 31 January.
- Admissions Board will review:
  - Motivation letter
  - Resume
  - Written work (e.g. BSc thesis)
  - Course transcript
  - GPA
- Immediate decision for top and bottom percentiles
- Rest ranked by score, decision in May





## Want the inside view?

- Meet the MSc:  
<https://gss.uva.nl/content/artikelen/meet-the-master-day.html>
- February 13: Live Master's Evening (Science Park)
- Contact us for matching via [info-mcs@uva.nl](mailto:info-mcs@uva.nl).







# Student experiences: Nikita and Nynke







## Contact and information



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**Vincent Tijms**  
Programme Coordinator  
v.tijms@uva.nl

Go to [uva.nl/msc-bcs](https://uva.nl/msc-bcs)

Or meet us during the live  
Master Evening in February