Presentation of the institute of modeling in neurosciences and cognition

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Director

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30 June 2022 – NeuroMod meeting

An original utopian community
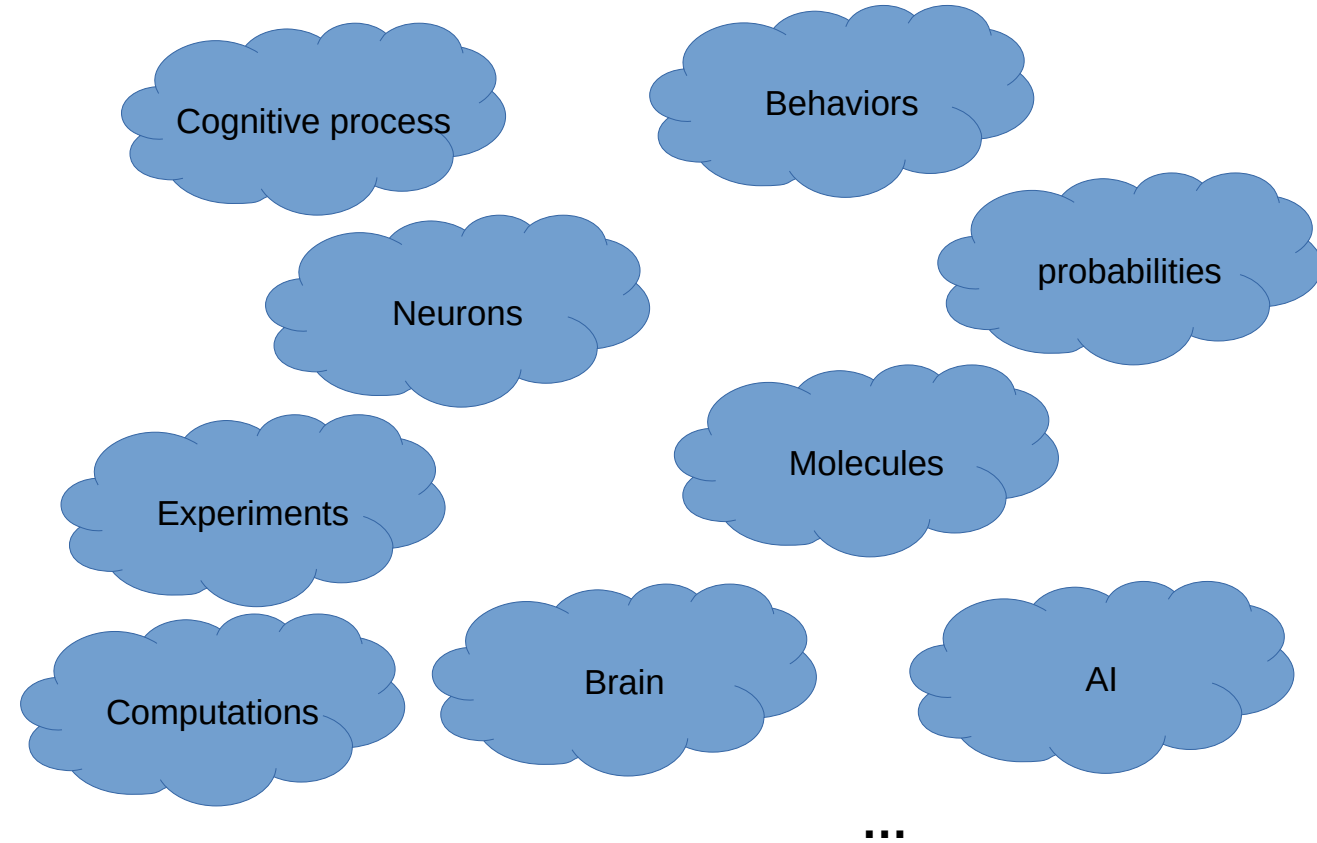

With initial communication issues

An original utopian community

With initial communication issues ➡ … and different research objects
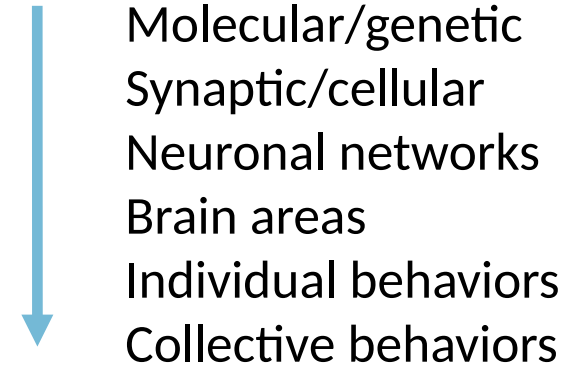
An original utopian community

- How to conciliate our scientific utopia with increasingly constraints/changes in the academic world?

- Our experience of creation of an international institute: NeuroMod

- An experiment in the inter/national and local ecosystem

Objectives of NeuroMod

- **A pluridisciplinary approach**

Modeling
Mathematical formalism
Computational
Artificial Intelligence
NeuroMorphic

Continuous/integrative approach

Molecular/genetic
Synaptic/cellular
Neuronal networks
Brain areas
Individual behaviors
Collective behaviors

- **Ecosystem development** (our « community »)

- **Promotion at** local, national, international levels

- **Specificity**: Sophia technopole, modeling

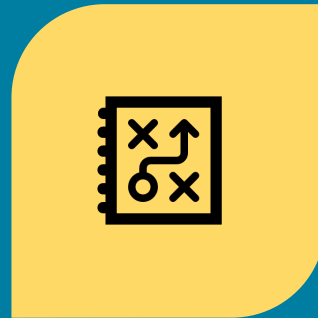   <-> neurocognition: from cellular to human cognition

What is NeuroMod ?

Community of more than 250 people with 170 permanents over 16 laboratories or entities (CHU, Inria, etc.)

COGNITION ~ 25

MSHS, BCL, GREDEG, LAPCOS, LHAMESS, COBTEK, LINE

Psychology, linguistic, behavioral economics, education sciences

MODELING ~ 80

LJAD, I3S, INRIA, LEAT, INPHYNI, ICN

Mathematics, computer science, AI, electronics, chemistry, physics

MEDICINE ~ 20

CENTRE MÉMOIRE, NEUROSCIENCES CLINIQUES, IMAGERIE, GÉRONTOLOGIE, CHU LENVAL, FRIS

Neurology, neurosurgery, psychiatry

BIOLOGY ~ 50

IBV, IPMC, LP2M

Cellular and integrative neuroscience, cognitive neuroscience, neurophysiology

Not in any Univ. School

UNIVERSITÉ CÔTE D'AZUR

History

2013

Interdisciplinary axis MTC-NSC

2016 IDEX UCA Jedi

Creation of C@UCA - 1 over 9 structuring programs of excellence univ. initiative (Idex)

2018

Only structuring program authorized to become an institute after think tank opinion

2020

Component of Université Côte d'Azur in charge of two academic trainings

UCA JEDI
Joint, Excellent and Dynamic Initiative

Olivier FAUGERAS
DR Inria
Academy of sciences
Mathematician

Sylvie MELLET
DR CNRS
Previous VP Research UCA
Research director Idex UCA-Jedi
Linguist

Antonio Galves

Aditi Lahiri

Gianluiggi Mongillo

Anne-Sophie Rigaud
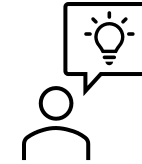
Willhem Stannat

Susanne Ditlevsen

NeuroMod

+ strategic program of UCA[JEDI]/Inria/CNRS
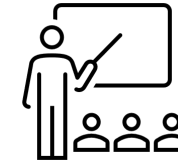
Functioning of NeuroMod

- **Call for <u>interdisciplinary</u> projects over the course of the year**
  - Allows to share material/knowledge/funding
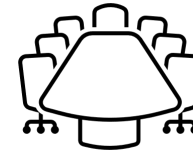 - Small amounts (<10kE)

- **Phd / postdoc fundings**
  - Regular 4 years, partnership with other Univ. schools and 3IA in 2021

- **Diffusion / animation**
  - Mini-Courses, « Future challenges », annual conference, invited researchers
  - Joint seminar with NeuroMat (Sao Paulo, Brasil)
  - Inauguration in March 2021 (in line, more than 200 participants connected from 10 different countries)
  - Brain week (Semaine du Cerveau)

- **Representation of the communuty**
  - In local institutions
  - At national levels (eg, PEPR: Priority research programs and equipment)

Staff of NeuroMod

- **Legal statutes**

  Scientific committee of 19 members + 2 industrials (too many pictures on the web)

- **One director, one deputy director**

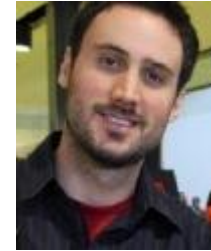- **Two administrative people**

- **Research engineer**

  A need for software development from the community
  Funded by UCA Jedi (recruited in august 2021)
  > Neuromod Software Platform

Two acad. trainings NeuroMod

- **Master National de Sciences Cognitives (10/20 students)**
  Experimental training, in french
  120 applications in 2021/2022 (during covid)

- **Master of Science (MSc) Mod4NeuCog (20/30 students)**
  International paying training in english
  Comp. modeling, Neurosciences, Cognition, AI
  60 applications in 2021/2022 (during covid)

- **An asset for research**
  Automatic funding of internships, in particular inter-laboratoires
  > emergence of new interactions
  Strong investment of researchers (CNRS, Inria, Inserm) for teaching
  Almost 3/4 of each class ends up with a thesis, 1 or 2 per year on site

4 research projects honored each year

- **Turnover, one in/out each year**

- **MNC3 out last year**

  Beyond fantastic assessment, it is in the heart of axis 2 of 3IA

- **Current projects**
  - From Mind To Brain (1 article, 5 workshops, 1 postdoc, 2 theses, collab BCL-inria)
  - ComputaBrain (11 articles, 1 book chapters, 5 communications, 7 fundings et 9 int. collaborations)
  - Olfaction (1 postdoc, 4 confs, some projects/interships, 1 ANR, 1 Cifre, Olfascan, Msc)
  - Education (3 articles, internships, convention minister on AI-Education, participative science)

Platforms (co)funded by NeuroMod

1. **Platform in Human Sciences: COCOLAB (MSHS)**
    EEG, eyetracking, emotions, olfactive cabin, interaction between participants….

2. **Platform in Life Sciences: BioMAP (IPMC + iBV)**

    Identification of neuronal networks and cog. Processes during cognitive tasks (*in vivo* et *ex vivo*)

3. **Platform in Medicine: Memory Centre (CoBTEK)**
    Serious games, virtual reality, transcranian stimulation…

4. **Platform in Education: CreaMaker (LINE)**
    Problem solving tasks (Creacube), implementation in schooles, videos and analysis

5. **Platform for software dev. at NeuroMod (partnership with Inria)**
    Software development, graphical interfaces, HPC, diffusion

Types of funding from NeuroMod:

- Equipment

- Internships

- Payment of studies and participants

- Engineers

Also possibility of interaction with industrialists/other territorial actors on these platforms

Some small victories... 🏆

- **Distinctions**
    ERC
    Silver medal from CNRS, Prize Pierre-Faurre from Academy of Sciences
    5 Chairs 3IA (half of axis 3, but also in axes 1 and 2)
    One member of Academia Europaea
    1 Prize of the fondation Medisite
    1 Prize of "La Main à la pâte"
    1 Prize Honoré Chavée of the Académie des Inscriptions et Belles Lettres
    1 Prize Camille Woringer, Fondation pour la Recherche Médicale
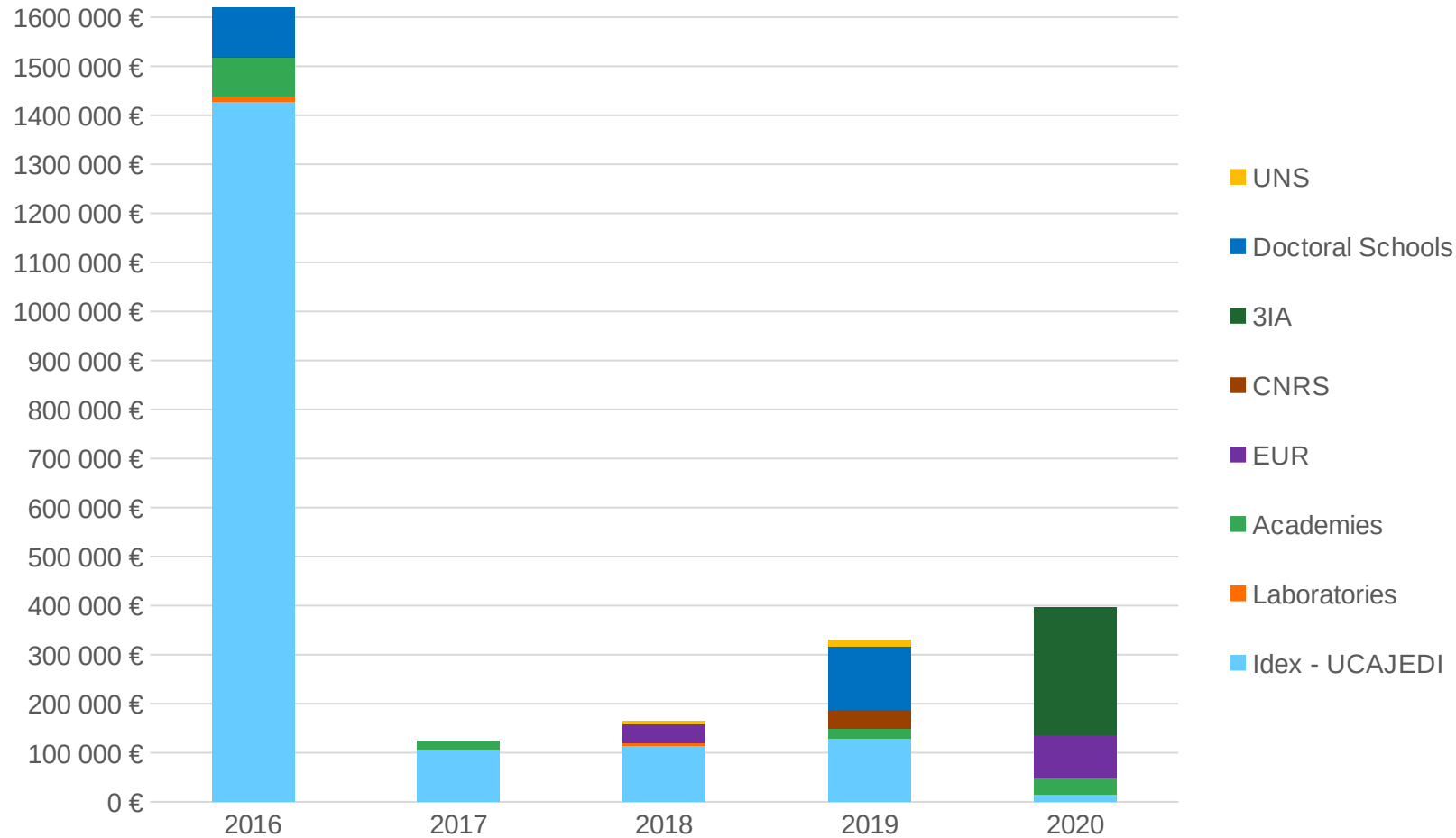
- **Participation to the writing of projets PEPR (PIA4)**
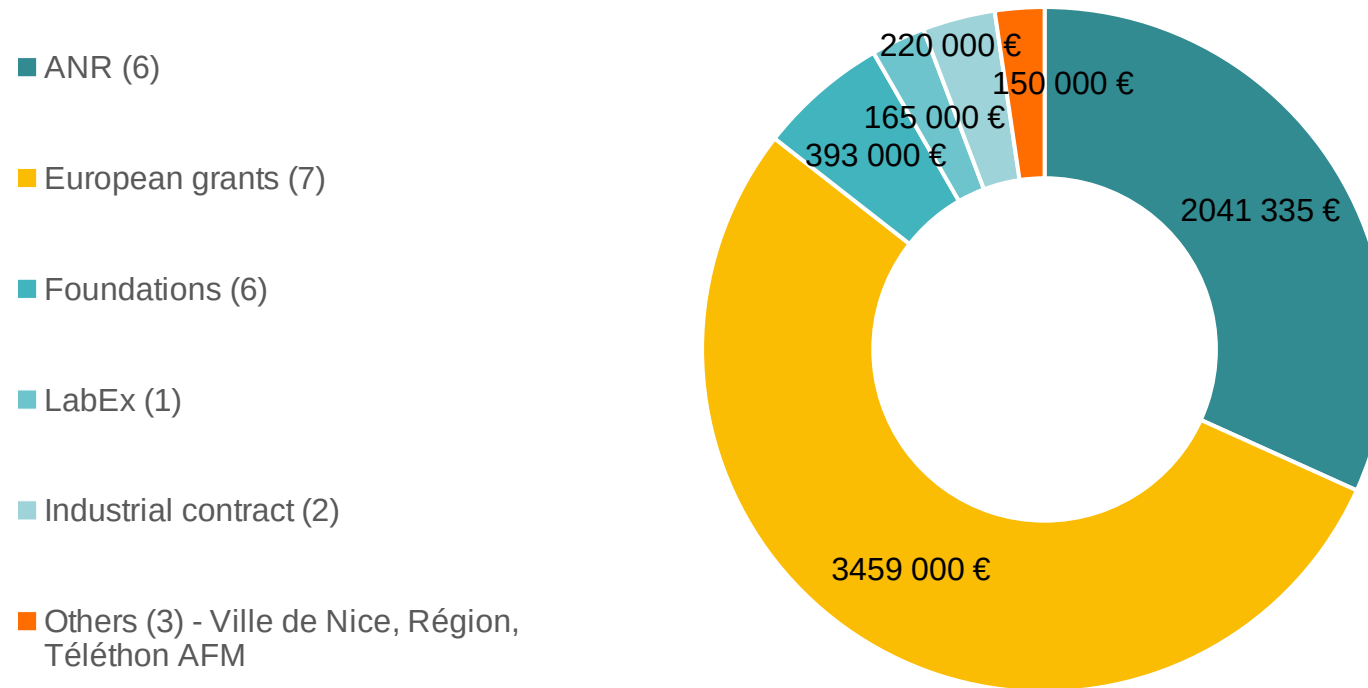   Behavioral sciences (CODEX)

- **CPJ with UCA**
    Raphaël Fargier (Neuro-Psycho-Linguistics, Oslo) is recruited in October 2022

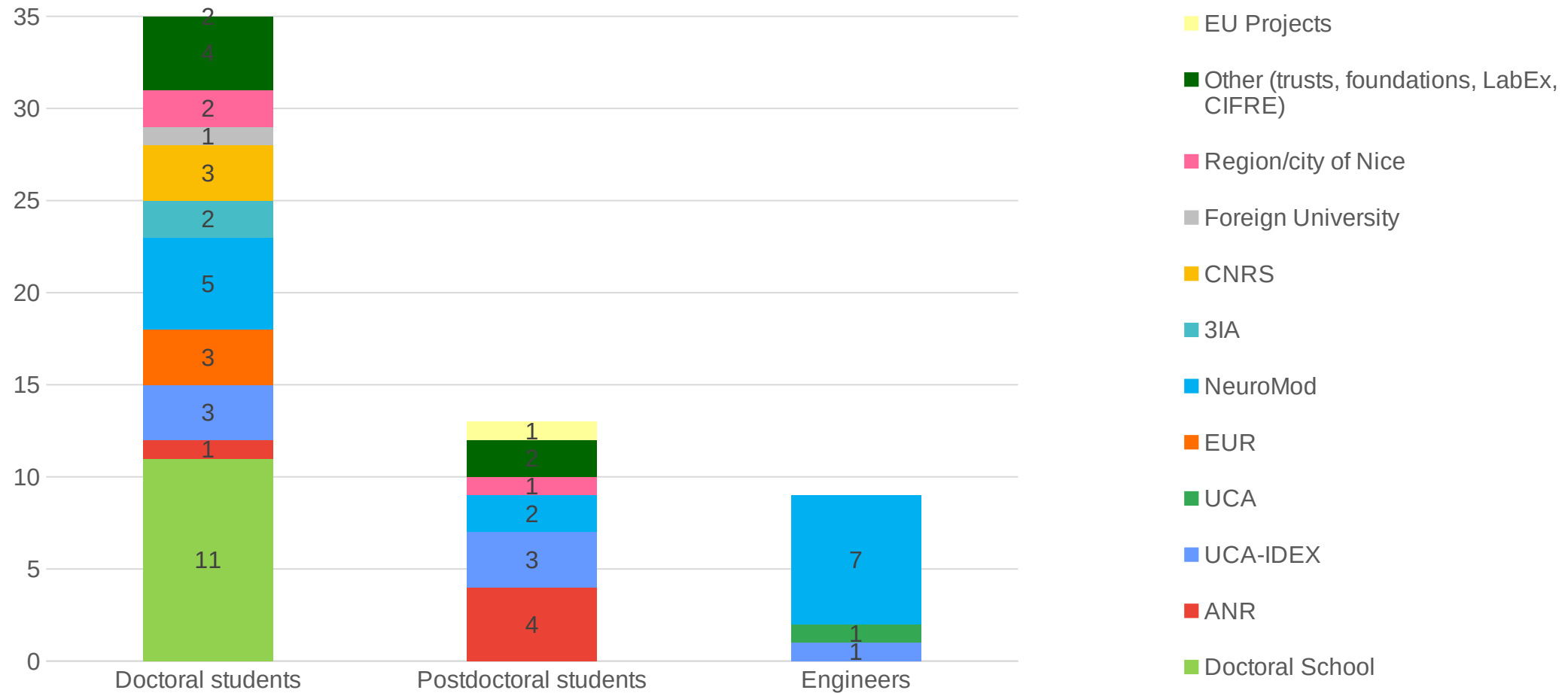# Funding of Université Côte d'Azur in link with NeuroMod: 2.6 Me

Careful, this includes the projects funded by the idex like Computabrain

Leverage effect: a favorable ratio of internal/external funding 2.6/6.4 Me

- ANR (6)
- European grants (7)
- Foundations (6)
- LabEx (1)
- Industrial contract (2)
- Others (3) - Ville de Nice, Région, Téléthon AFM

Chart values: 220 000 €, 150 000 €, 165 000 €, 2041 335 €, 393 000 €, 3459 000 €

Sources of funding for recruitments

So what is NeuroMod?

"An institutional UFO (unidentified flying object)"

- **Univ. Côte d'Azur, Idex and Inria**

  Priority program on "computational neurosciences"

- **Univ. Côte d'Azur**

  24 full time (associate) professors
  Strong funding support from UCA and Idex
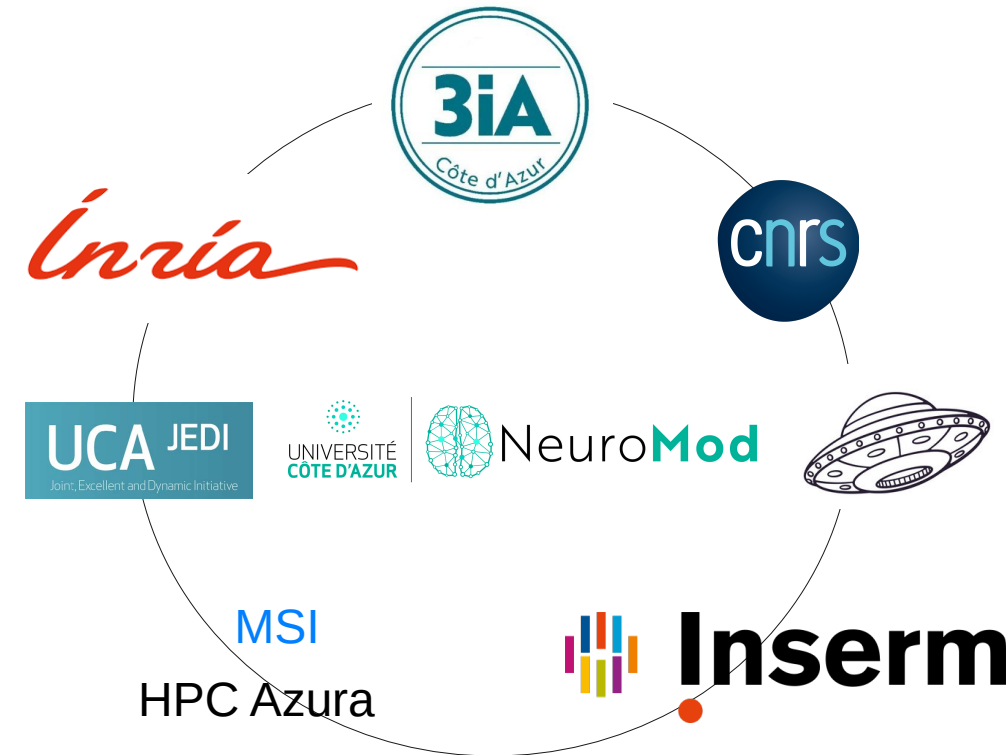
- **CNRS**

  12 full time researchers
  Unic PRIME math-info team eXplAIn at national level

- **Inria**

  10 full time researchers
  Hosting NeuroMod
  SED support of soft. engineer

- **INSERM**

  4 full time researchers

MSI
HPC Azura

THANKS for your ATTENTION!

THANKS to ALL!