

Brain Organization and Network Dynamics (**BOND**)

Leonardo L. Gollo

Ramón y Cajal Fellowship

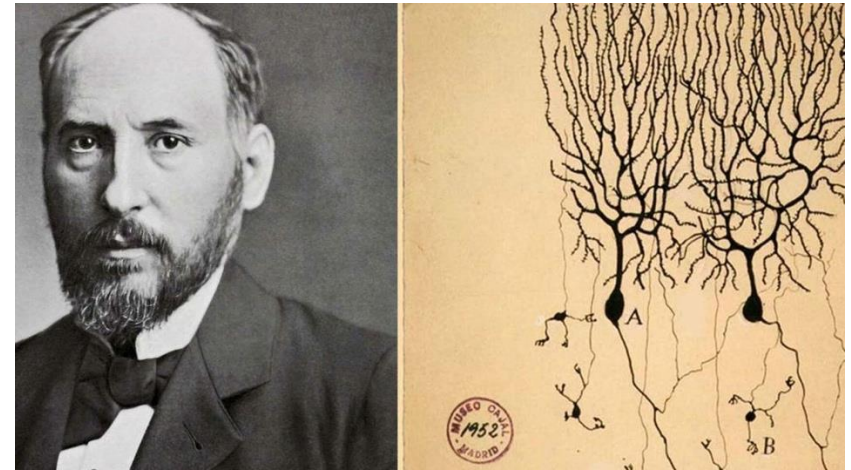


EXCELENCIA
MARÍA
DE MAEZTU
2023 - 2027





Ramón y Cajal Program 2023



Research Activities = 120.000 €

Talent attraction CSIC ~ 183.000 € (3 years)

Total budget ~ 303.000 €

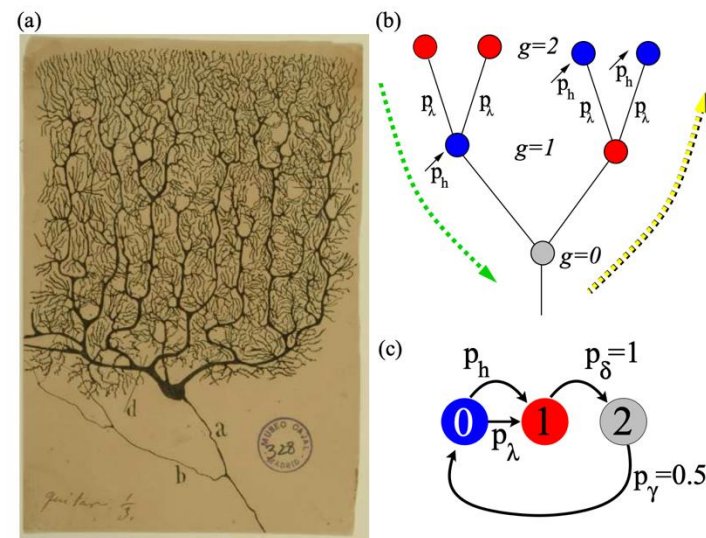
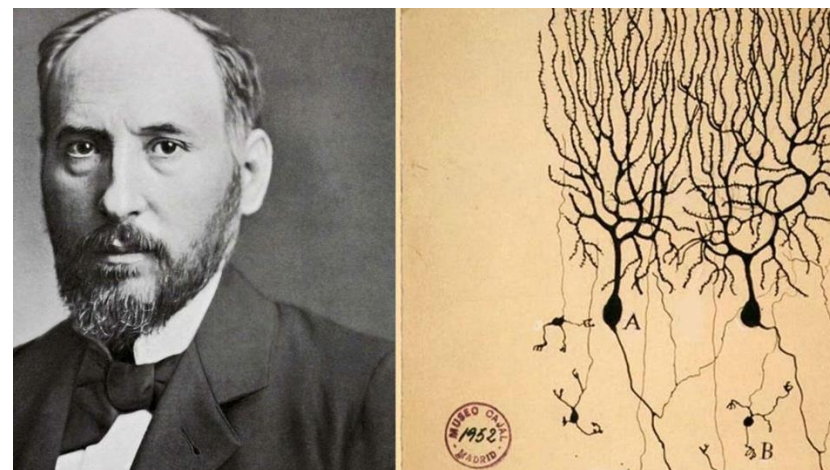


Ramón y Cajal Program 2023

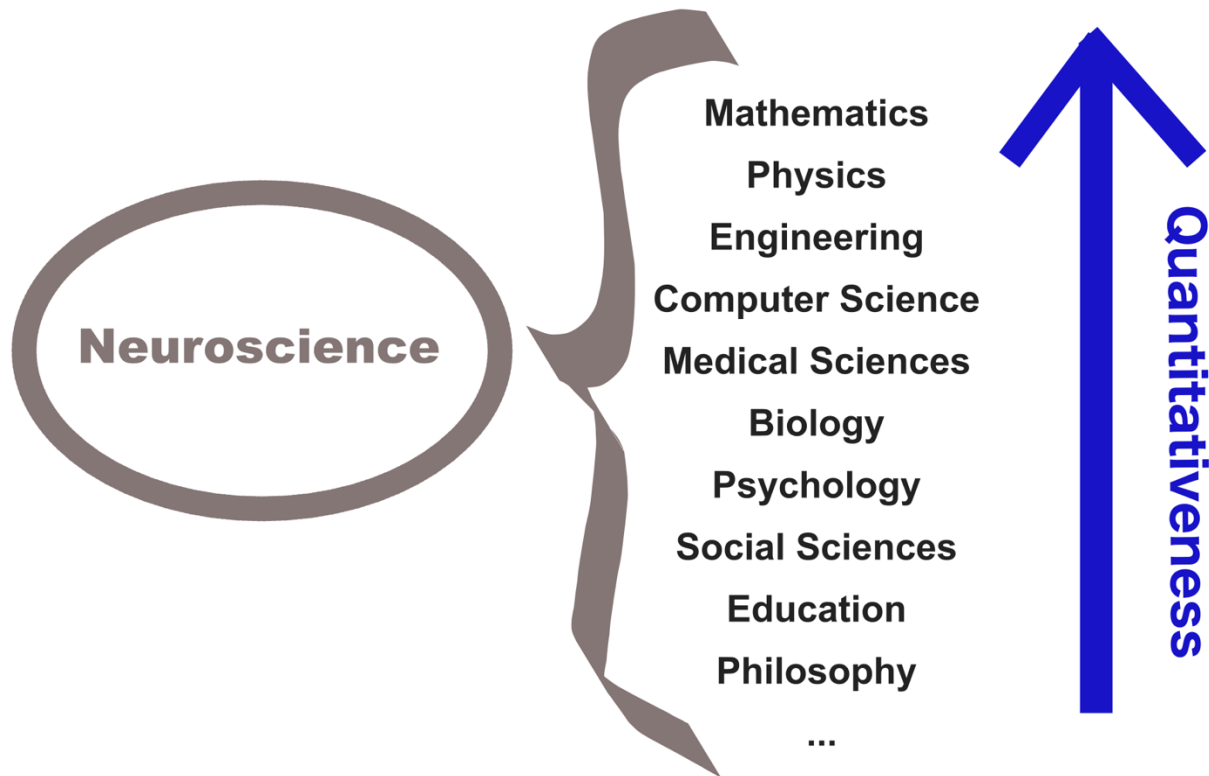
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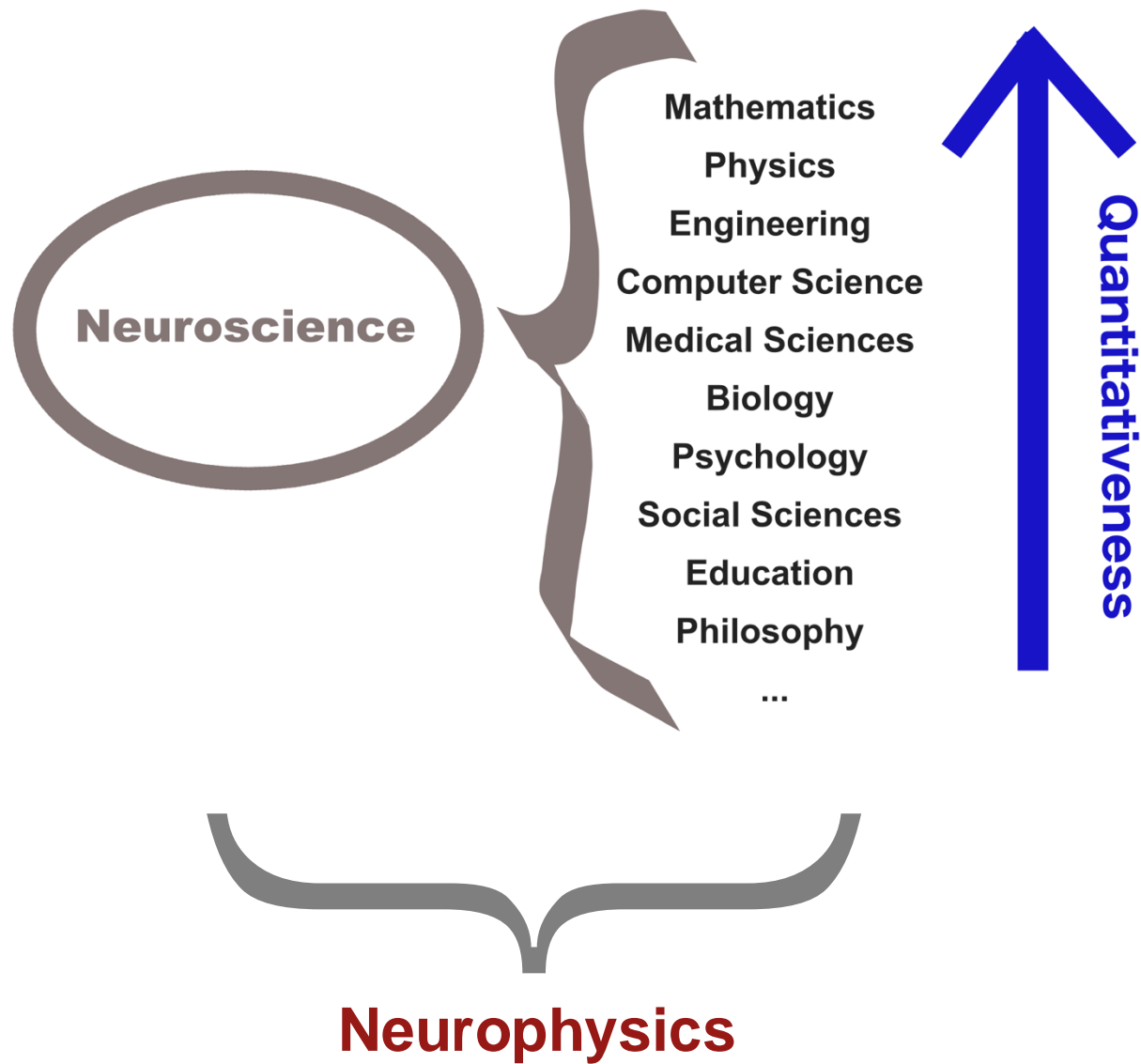
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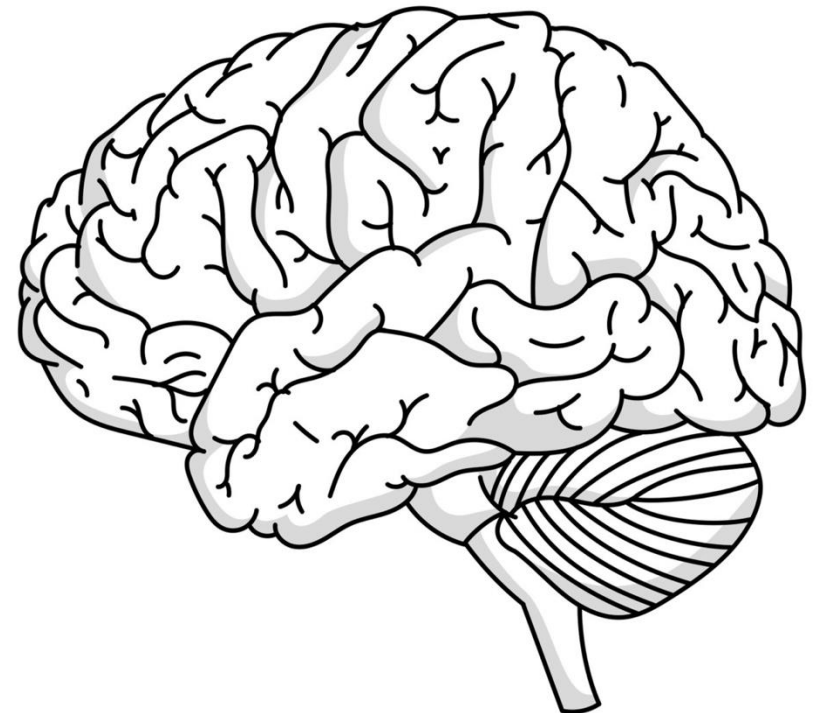


SIRS model (Gollo et al., 2012)



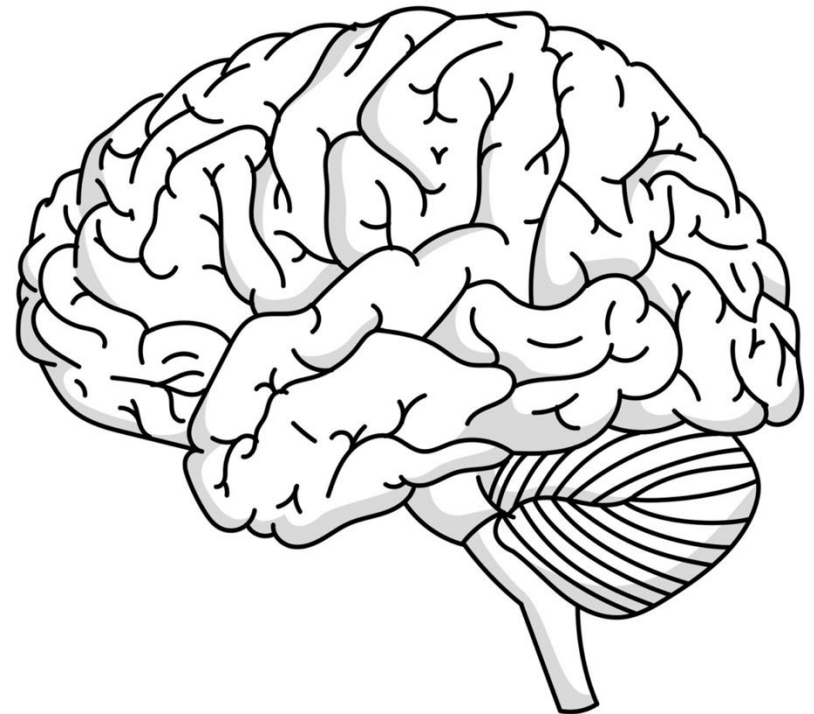


- Emergent Behavior (consciousness, plasticity)
- Enormous Interconnectivity (multiscale, integration of localized functions)
- Energy efficiency (*"expensive but cheap"*)
- Nonlinear dynamics
- Self-organization (development)
- Robustness/redundancy
- Brain-body interactions
- Complex diseases
-



neurophysics → interdisciplinarity + a complex system

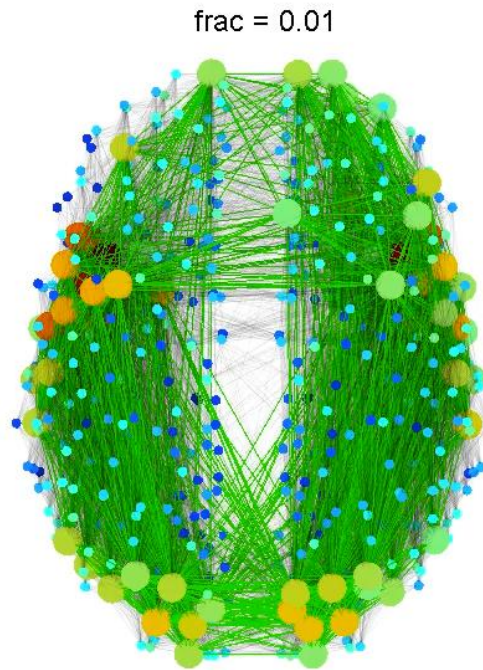
Neuroscience has a lot of data
Neurophysics aims to provide
quantitative models



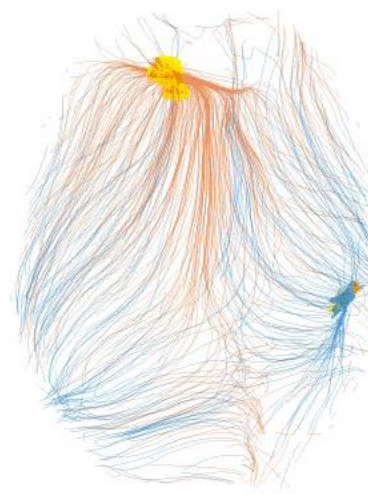
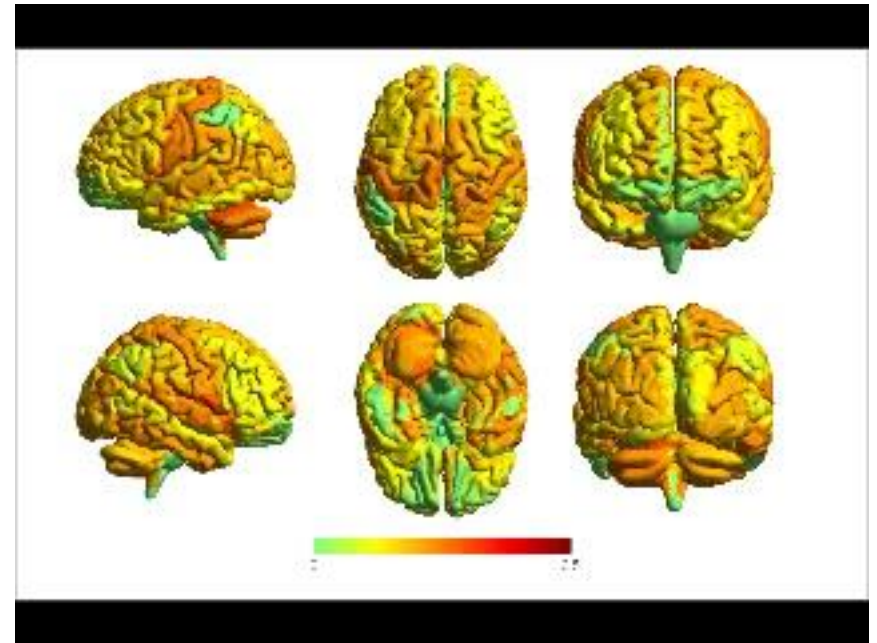


Dynamics of functional brain networks

Brain structure



t = 0 ms



Brain dynamics:
Metastable brain waves

Details @IFISC seminar
next month

collaborations

Pierpaolo Sorrentino (Aix-Marseille University)
Ben Fulcher (University of Sydney)
Mauro Copelli (UFPE)
Kaichao Wu (Monash University)
Michael Breakspear (University of Newcastle)
Andrew Zalesky (University of Melbourne)
Claudio Mirasso (IFISC)
James Roberts (QIMR)
Alex Fornito (Monash University)
Martijn van den Heuvel (Vrije Universiteit)
Tjeerd Boonstra (Maastricht University)
Raul Vicente (University of Tartu)
Ingo Fischer (IFISC)
James Pang (Monash University)
Osame Kinouchi (USP)
Fernanda Matias (UFAL)
Víctor Eguíluz (IFISC)
Olaf Sporns (Indiana University)

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THANK YOU

for your attention

