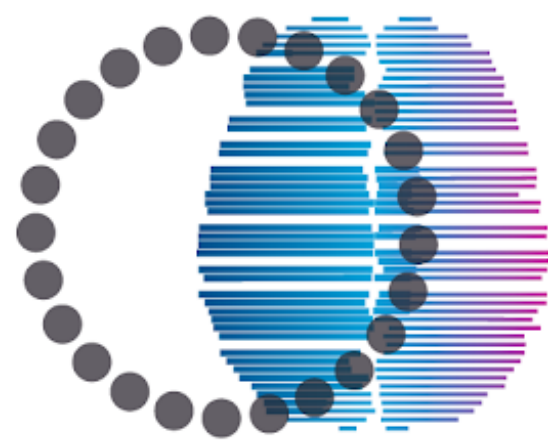


The International Brain Laboratory

*building a global collaboration for more
reproducible neuroscience*



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BRAIN
LABORATORY

Anne Urai
Leiden University
VU Data Conversations, 28 November 2020

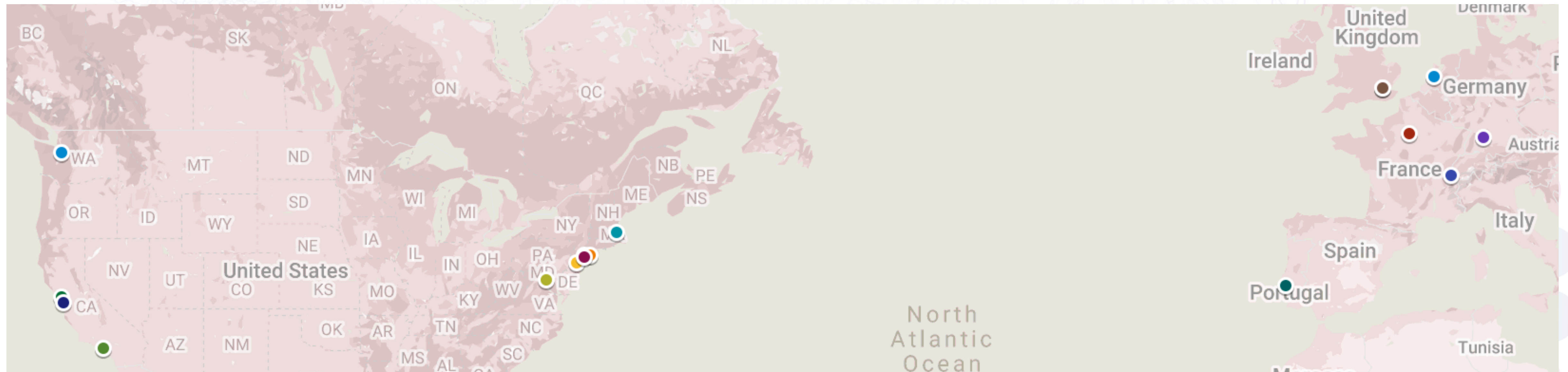
The state of systems neuroscience

- “How do neural circuits function?”
- No single lab can study the large set of regions, connections, and cell types that underlie even a modestly complex behavior
 - *“Neuroscientists would rather share their toothbrush than their data”*
- Collaborating in the age of big data
 - Traditional small-scale collaboration
 - Centralized corporate organizational structure
 - Meso-scale, decentralized

The International Brain Lab model

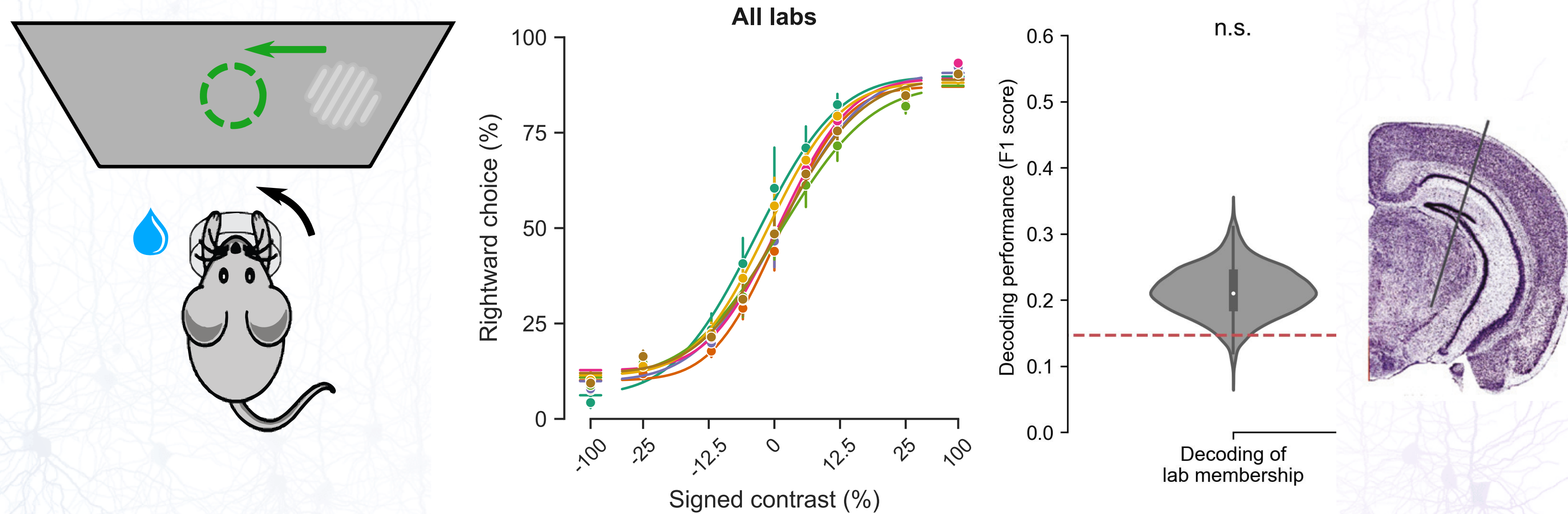
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- Meso-scale collaboration



The International Brain Lab model

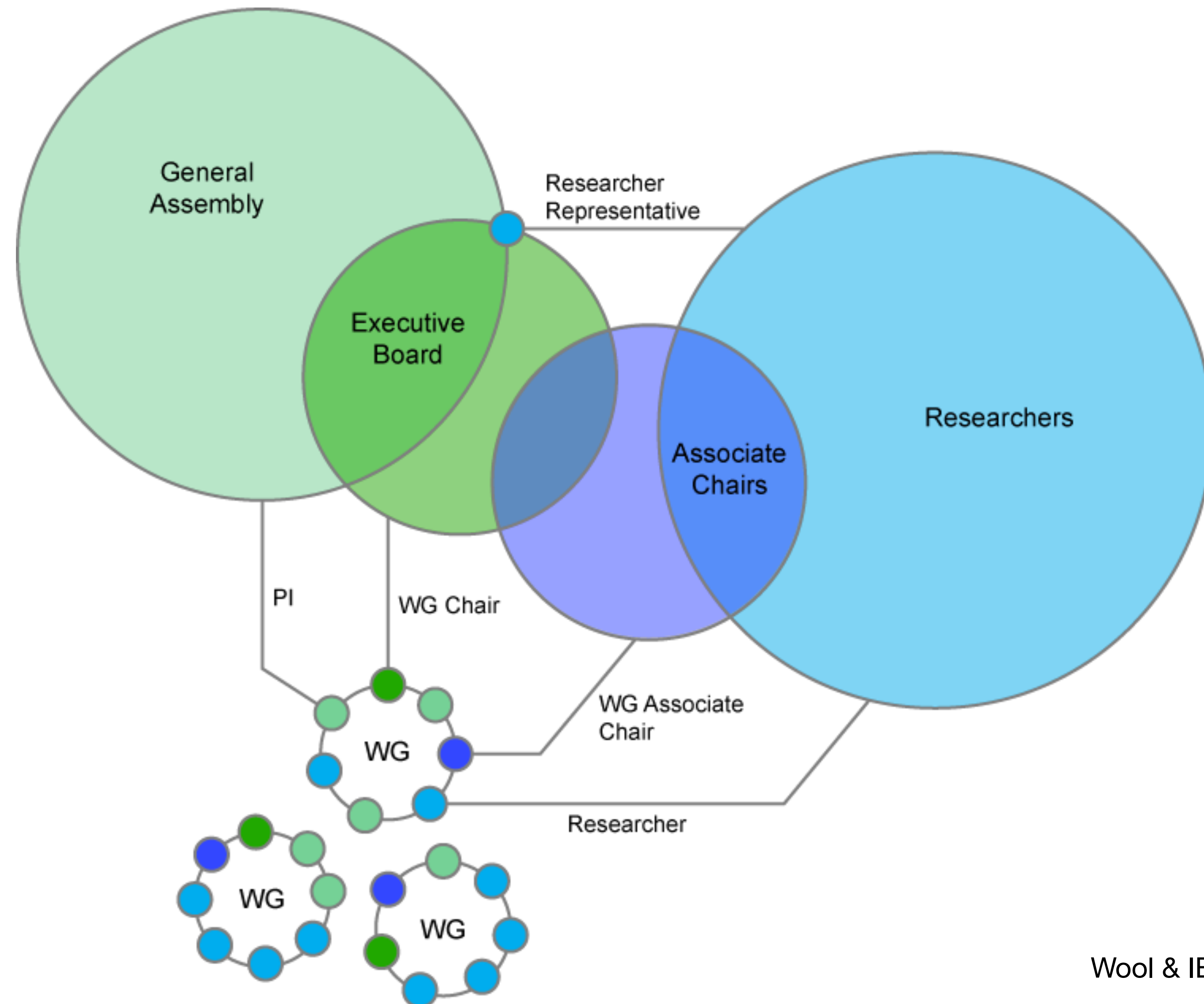
- Meso-scale collaboration
- Clearly delineated scientific objective



The International Brain Lab model

- Meso-scale collaboration
- Clearly delineated scientific objective
- Standardized methods and protocols
- Data architecture and computational pipelines
- Closely linking theory and experiments
- Training not just mice, but people too!

1. Organizational structure

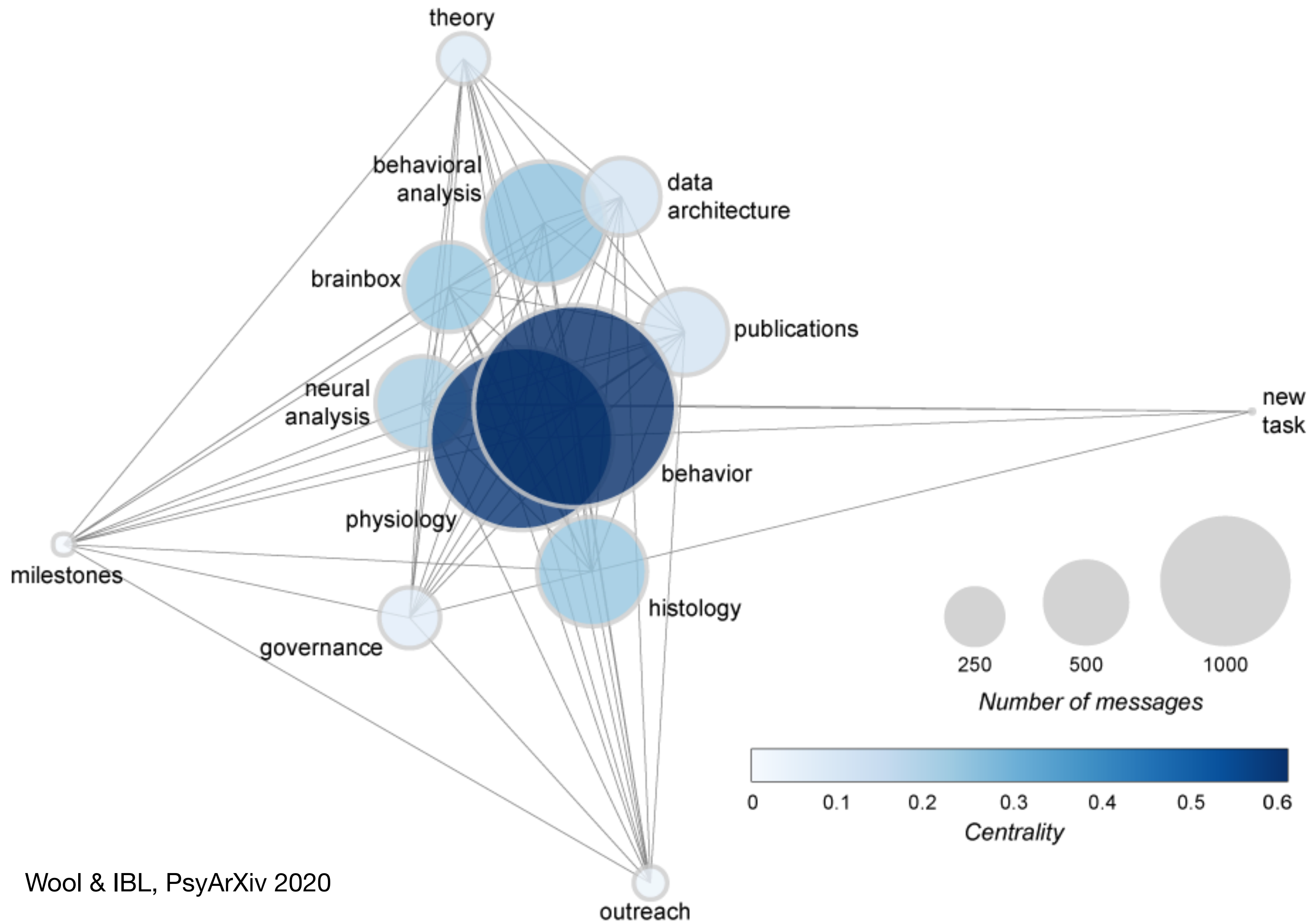


2. Build infrastructure

- Digital tools
 - Slack, GSuite, Zoom, GitHub
 - digital lab notebooks, data server, JupyterHub

open access has facilitated a culture of transparency [19], the total amount of information generated within the collaboration presents an enormous practical obstacle: as of April 2020, there were 34,478 public Slack messages; 363 recorded Zoom meetings; 187 presentation slide decks, 233 spreadsheets, 1618 text documents, and 7603 PDFs in GSuite; 6148 Github commits; and over 500,000 experimental files in Datajoint. The IBL ecosystem, like other biological and social systems, is a network [20], but successfully distributing this much information across it is a daunting proposition.

2. Build infrastructure

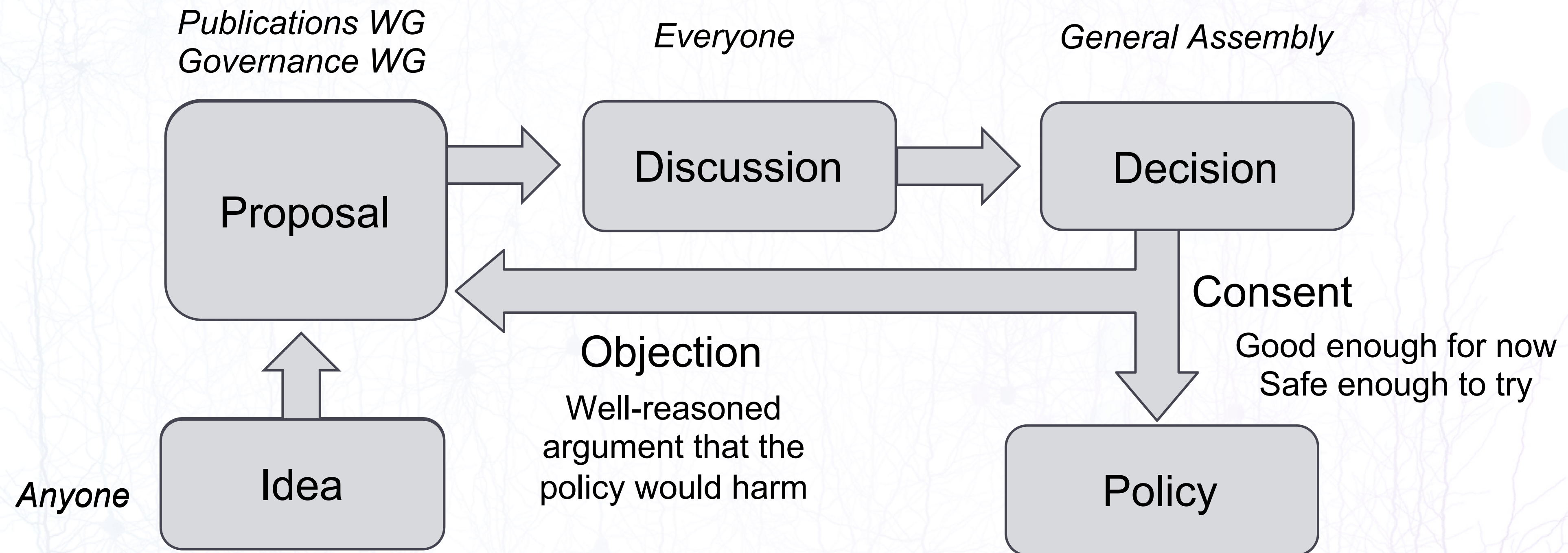


Wool & IBL, PsyArXiv 2020

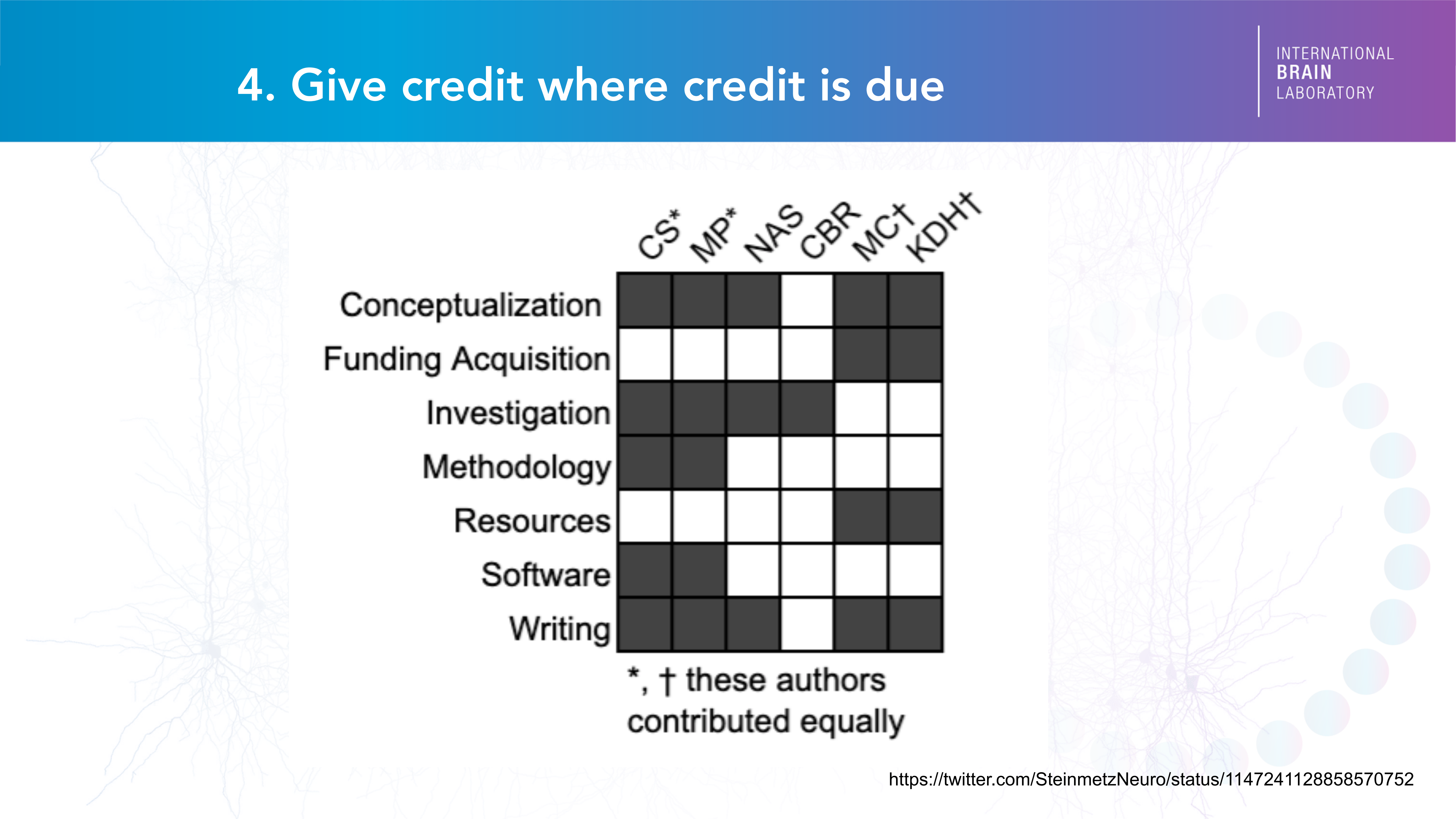
2. Build infrastructure

- Digital tools
 - Slack, GSuite, Zoom, GitHub
 - digital lab notebooks, data server, JupyterHub
- Communicate, communicate, communicate!
- Personal connections
- Experts and 'hub/bridge people'
 - Danger: sensitive to drop-out

3. Making decisions: the sociocracy model



4. Give credit where credit is due



	CS*	MP*	NAS	CBR	MC†	KDH†
Conceptualization						
Funding Acquisition						
Investigation						
Methodology						
Resources						
Software						
Writing						

*, † these authors contributed equally

4. Give credit where credit is due

IBL et al. (2020) bioRxiv:909838.



5. Trade-off individual and teamwork

int-brain-lab / project_registration Private

Unwatch 11Star 1Fork 0

<> Code

! Issues 32

🔗 Pull requests 0

▶ Actions

🛡 Security

📊 Insights

Filters

is:issue is:open stimulus

🏷 Labels 4

📅 Milestones 0

New issue

✕ Clear current search query, filters, and sorts

! 7 Open ✓ 1 Closed

Author

Label

Projects

Milestones

Assignee

Sort

! [PROJECT]: Ashwood, Cazettes - Neural Substrates for Behavioral States PROJECT

#31 opened on Jun 19 by zashwood

! [PROJECT]: Luigi Acerbi - The ideal Bayesian learner PROJECT

#30 opened on Jun 2 by lacerbi

! [PROJECT]: Zoe Ashwood - State-dependent modeling of psychophysical behavior during decision making PROJECT

#29 opened on May 30 by zashwood

! [PROJECT]: Lauren E. Wool - Cortical correlates for integrating sensory evidence and upcoming reward PROJECT

#28 opened on May 30 by lewool

! [Project]: Guido Meijer - The role of serotonin in state inference project_proposal

#27 opened on May 24 by guidomeijer

2

! [PROJECT]: Anne Urai - the effects of choice history on visual processing and evidence accumulation PROJECT

#26 opened on May 24 by anneau



Wool & IBL (2020) *Knowledge across networks: how to build a global neuroscience collaboration*. *Current Opinion in Neurobiology* 65:100–107

IBL et al. (2020) *A standardized and reproducible method to measure decision-making in mice*. *bioRxiv*:909838

IBL (2017) *An International Laboratory for Systems and Computational Neuroscience*. *Neuron* 96:1213–1218



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