

Western Institute  
for  
Advanced Study

a meeting of minds and effort

# An ambitious mission

The Western Institute for Advanced Study is devoted to facilitating scientific research into historically intractable problems, with a highly interdisciplinary and open atmosphere to promote intellectual progress.

- founded in 2018, incorporated in 2019
- 501(c)3 organization based in Colorado
- issues Grand Challenges and puts together teams to tackle them, with the goal of solving long-standing problems in mathematics, physics and biology



# The first Grand Challenge

## *The physical basis of consciousness*

A mechanistic explanation of consciousness has long proved elusive to philosophers and scientists. It is simply not understood what perceptual experience is, or how mental states are produced by the operations of neural networks, or how we might be able to initiate volitional action. The overall goal of this Grand Challenge is to devise a theoretical framework for understanding consciousness in accordance with physical laws, as a form of non-deterministic computation. This first effort was a massive success, resulting in a new theoretical framework which is now being tested in the laboratory and the clinic.



# The next Grand Challenges

## *Physical information and quantum computation*

The toolkits from computational physics that were adopted and adapted to address the first Grand Challenge will be generalized to address three other problems. These newly-established mathematical approaches will allow us to model how free energy is distributed across space and time, allowing two or more interacting particle systems to identify a mutually compatible state. This approach permits an ambient-temperature quantum computer to solve a set of computationally-complex problems; grow into a more ordered system state over time, and generate shared information between two or more systems, yielding gravitational forces at significantly larger scales.



# Reporting results

- Results from our first Grand Challenge have been presented at several scientific conferences.
- An informal overview of the theory (28 minutes):  
[Interview with Scientific Director Izi Stoll, Ph.D.](#)
- A relatively non-technical summary (48 minutes):  
[Consciousness as Non-Deterministic Computation](#)
- A full technical presentation (2 hours 32 minutes):  
[Probabilistic Coding in Cortical Neural Networks](#)
- A paperback book introducing the new theory:  
[What We Are: The Physical Basis of Consciousness](#)
- Pre-prints of the original research papers:  
[Western Institute for Advanced Study Archives](#)



# Building momentum

The next steps include:

- The publication of research papers addressing our first Grand Challenge. These manuscripts will be published in open-access peer-reviewed academic journals.
- Building scientific partnerships to test the predictions of this new theory of natural computation.
- Building scientific partnerships to complete the next three Grand Challenges.
- Building spin-out companies for practical applications.
- A publicity effort to communicate these research findings to the broader scientific community and the public.



# Current goal

Raise funds to support future research projects:  
\$1,200,000 per year (for the next three years)

Building on previous founding donations of:  
\$301,432 in cash + in-kind (as of Mar 2023)



# Resource allocation

Annual budget over the next five years (**\$1,200,896**):

- 3 Grand Challenge Fellowship Awards: \$360,000
- 2 Program Director Salaries: \$240,000
- 4 Support Staff Salaries: \$288,000
- Conference Presentation/Organization: \$70,000
- Open-Access Scientific Publications: \$28,000
- Intellectual Property Services: \$28,800
- Payroll Taxes and Benefits: \$172,000
- Auditing and Accounting Services: \$11,984
- Web Services and Mailing Services: \$2,112





# Oversight and governance

- The Board of Directors is currently being overhauled from its start-up stage, with the inclusion of more financial, legal, and public communications expertise to complement our technical expertise.
- We are deeply tied into venture capital networks, and are building relationships with university leadership teams, policy groups, and philanthropic foundations.
- With this expanded leadership structure - and a growing number of Governance Advisors with expertise in non-profit management - we are on-track to ensure the Western Institute for Advanced Study is a sustainable and successful research organization.



# Alliances and collaborations

- A Board of Scientific Advisors is being recruited, to guide the direction of the Western Institute with a wide variety of field expertise in mathematics, physics, and the biological sciences.
- Collaborations with philosophers, physicists, and neuroscientists are now being initiated, to build on our first success.
- During this emerging transitional stage, three Scientific Fellows will be invited to lead three additional Grand Challenges – focusing on major problems in each of their fields.





# Shared Leadership Plan

- Foundational Phase (2018-2023): The Founder creates a framework, then recruits a Board of Directors and a Board of Advisors.
- Transitional Phase (2024-2027): The team expands its leadership structure, fosters partnerships in the scientific community, and builds interest on the part of the lay public.
- Mature Phase: The Western Institute has a solid reputation, a physical location, and a competitive fellowship program that supports exciting research into intractable problems.

Thank you very much for your time & support.

Western Institute for Advanced Study

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