



Introduction to the Diverse Intelligences Initiative: IPAM Feb. 18, 2022

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TEMPLETON WORLD
CHARITY FOUNDATION

- Our goal is to investigate the pervasive and expansive aspects of intelligence as a “basic force, concept and reality ... even though they not yet be easily measured.” (MoA. IV.a)
- We have become aware of—and may be on the verge of creating—a *spectrum of intelligent capacities*.
- These raise profound questions about the origin, purpose, and potential of intelligence in all its diversity.
- And raise questions about human nature, and how it may be transformed by new technologies and new intelligences.



The Diverse Intelligences theme is inspired directly by Sir John's fascination with intelligence in its range, mystery, and diversity.

To Apprehend is to recognize the pervasive organizing principle of the world

Heraclitus calls this the *logos*, an active principle imbuing everything in the world with its energizing influence. The term also comes to be used to describe the organized thought of human reason. And, powerfully, it is taken up by late antique philosophers and becomes embedded in Western culture -- a pervasive conceptual ordering, the divine plan as instantiated by the word.

It is the intellect (*nous*) that bind us to this logos and so every action that resonates with the universal organizing principle is, by definition, an action of mind.



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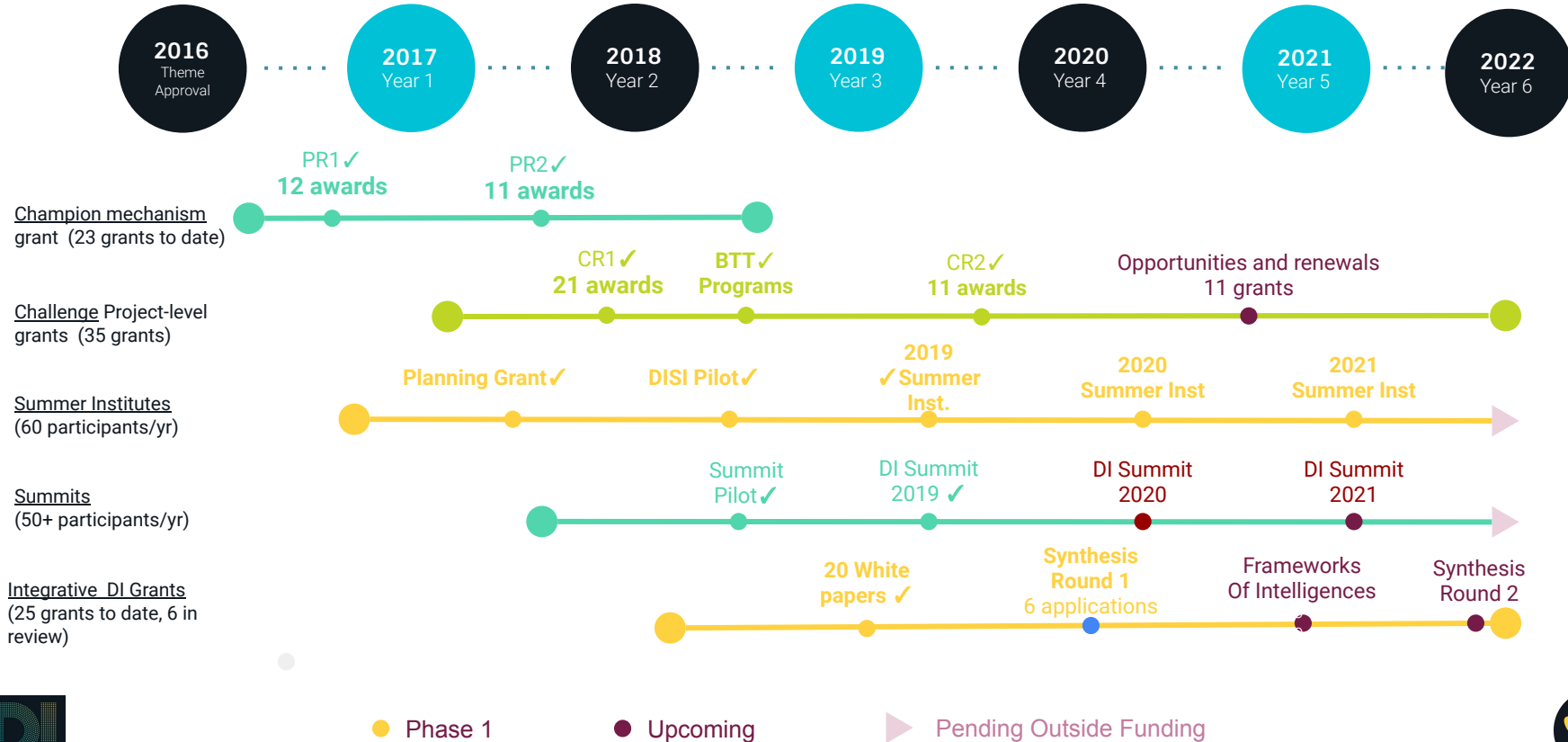
- Recent Interest in “Multiple Intelligences” (c.f. Howard Gardner’s impact on psychology and social sciences)
- Whose problems anyway? (must stand outside of task to associate a *reward function* to it).
- Constant, dynamic reassociation of goals makes *any* static measure unrealistic.
- Are narrative, *gestalt*, *umwelt* useful alternative ways of thinking about intelligence?
- If not problem-solvers, what are intelligent agents up to and how else can it be made intelligible?

- **Phase I**
 - Scoping Grants
 - Challenge-based grants
 - Community Building
- **Phase II**
 - Synthesis
 - Broadening
 - Frameworks of Intelligences
- **Phase III**
 - DI-2030
 - Partnerships



- **Launched 2017**
- **\$40 Million funding envelope**
- **Approximately 75 grants funded or in process**
- **Ethology, Comparative Psychology**
- **Specific issues in AI (moral capacity building, e.g.)**
- **Some human studies**
- **Philosophy of science**
- **DOMAIN-CROSSING FRAMEWORKS!**

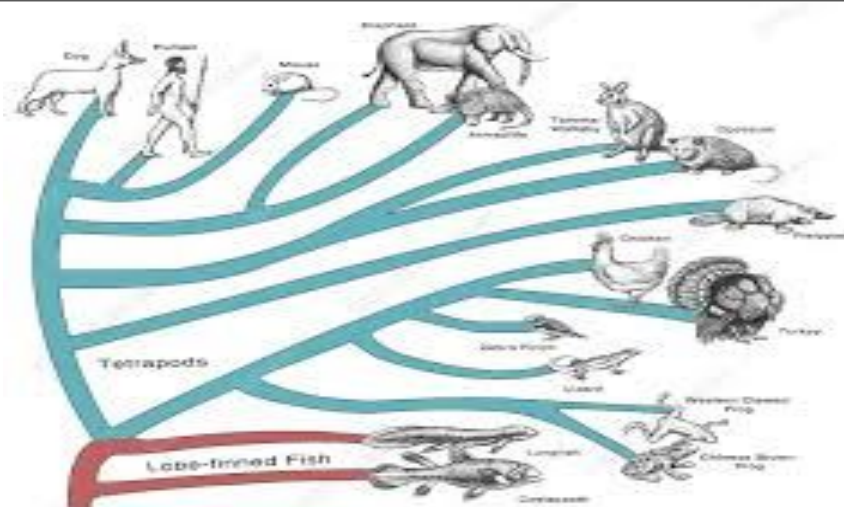
Diverse Intelligences Timeline: Feb 2020



Relating Intelligences Across Species

Are there universals in the way many species apprehend the world?

- **Hare** is building a species-independent platform where researchers can compare results and collaborate
- **Szathmary** proposes a broad evolutionary theory of learning across species.
- **Osvath** is studying common cognitive patterns across wildly divergent evolutionary branches from birds to Tasmanian devils



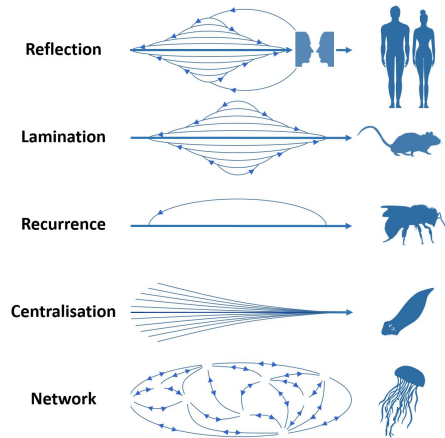
Many other grantees and applicants have results that could feed into this common platform and they are excited to use it.

Major Transitions in Cognitive Evolution

Andrew Barron, Macquarie University

With: M. Halina, Cambridge and C. Klein, Australian Nat'l. Univ.

Physical evolution has seen repeated emergence of major transitions in the history of life. Can a similar pattern be found in the evolution of minds?



The dizzying diversity of intelligences makes it hard to compare across the varieties of life

The same degree of complexity is found physical evolutionary theory

A team of biologists, philosophers and historians of science present and will test a new theory of major transitions in the evolution of intelligences



Three other Frameworks

Under development, hoped to begin this year

Can Collectives Think More Rationally than Individuals?

In what situations might collective action allow for reasoning-like processes to overcome heuristics necessary on individual-agent level?

Dora Biro et al.

Compositionality and The Emergence of Intelligent Capacities

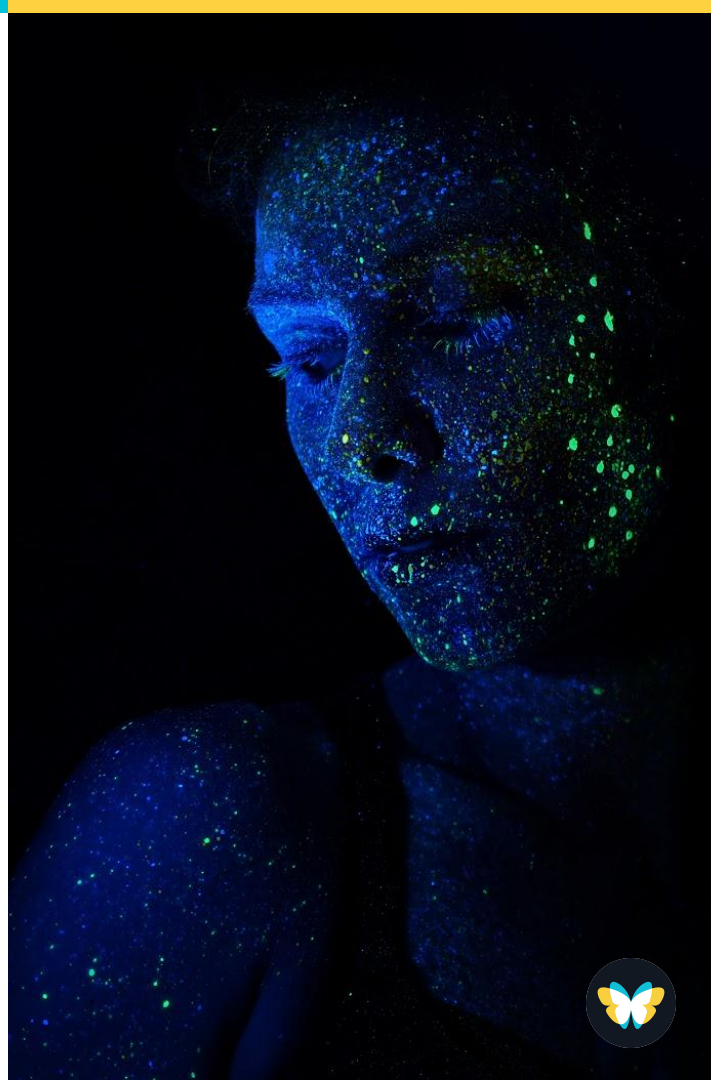
Are intelligences contingent, temporary structures composed of modules and can we divine the base rules for those modules and their composition?

Jacob Foster et al.

Constraints and Degrees of Freedom Define Subspaces of Intelligences

Do things like communications bandwidth, lifetime, and reflectivity create qualitatively different kinds of intelligences?

Tom Griffiths et al.





Diverse Intelligences Summer Institute and Summit

DIVERSE INTELLIGENCES

- **Piloted 2018**

- 40 Participants in DISI for 2 weeks
- 77 Participants (inc. 40 grantees at summit)

- **First full DISI 2019**

- 60 participants
- 3 weeks
- “Storytellers Track”

- **2019 Summit**

- Approx 90 attendees
- Workshops for Synthesis
- Communicating Science Sessions



Discussion Prompts

- What empirical work would feed your investigations?
What kind of intelligence researcher would you like to learn from?
- What do you think the mathematics community can offer intelligence researchers?
What messages haven't they heard yet?

