

Agency and Directionality in Development Cluster Meeting
Institut d'histoire et de philosophie des sciences et des techniques (IHPST)
Thursday, 16 November - Friday, 17 November 2023

Day 1: Nov. 16

9:00-10:00 **Welcome**, Each sub-PI - Stuart, Ray, Ana, (or preferred designated speaker) begin the meeting with a brief (10 minute) progress report. 30 minutes for questions total, 10 minutes after each presentation.

10:00-10:30 **Coffee**

10:30-12:00 **First of three "key topics or questions": Organization & Self-Organization**

Moderator: Lenny **Presenters:** Maël, Sahotra, Stephanie

Panel discussion, each speaker allotted no more than 10 min. each, followed by a 5 min response from each panelist and a 45 min informal group discussion. Each panelist may choose one or two of these questions to focus upon in their short presentation. (i.e., They are not required to answer all questions!)

- What is organization?
- How do we observe organization?
- What is the difference between organization and self-organization? What role does historicity, and/or evolution play in explaining each such feature of biological systems?
- How are biological explanations of organization related to physical explanations?
- What experimental tests, using which model systems, can be brought to bear on questions about organization and its evolution in biological systems?
- What insights can we gain from formal representations or mathematical models of organized, complex systems? How do we best represent causal, dispositional properties of such systems?

12:00-13:30 **Catered lunch**

13:30-15:30 **Second of three "key topics or questions": Agency**

Moderator: Jim G. **Presenters:** Matteo, Lenny, Mariana

Panel discussion, each speaker allotted no more than 10 min. each, followed by a 5 min response from each panelist and 60-90 min. informal discussion. Each panelist/speaker may focus on one or two of the following questions. (i.e., They are not required to answer all the below questions!)

- What is agency?
- How do we observe it? How do observations inform our current accounts of agency?

- How ought we to reconcile competing accounts of biological agency (e.g., autopoiesis, the organizational approach)? What is flawed about current approaches to agency, and what required to complement current approaches?
- What have we learned from experimental study of prokaryotic and eukaryotic cell societies about transitions in agency? What can be learned by comparing different trajectories to multicellularity and reversals between unicellular and multicellular stages in social cellular organisms and animal cancers? What are some methodological challenges facing experimental study of agency in different model systems?

15:30-16:30 Coffee

19:30 Group dinner at Kitchen Ter(re), 26 Bd Saint-Germain, 75005 Paris
Directions from Hotel Oratio

- Head northeast (toward the river) on Rue des Bernardins toward Rue Monge (110 m)
- Turn right onto Bd Saint-Germain (170 m)

Day 2: Nov. 17

9:00-10:30 or 11: Third of three "Key topics or questions": Development

Moderator: Anya **Presenters:** Carlos, Ray, Stuart

Panel discussion, each speaker allotted no more than 10 min. each, followed by a 5 min response from each panelist followed by a 60-90 min. discussion. Each panelist may choose to focus on one or two of the below questions. (i.e., They are not required to answer all the below questions!)

- What is development?
- How do we observe development? What experimental tests, using which model systems and mathematical models are available to understand the physical dynamics or topological features of development?
- What is the relationship between the physical and biological explanations of development?
- To what extent can physical features of biological (i.e., evolved) systems account for directionality and purposeful behavior in multicellular development and evolution?

10:30 or 11:00 Coffee; Informal discussion

12:00-13:30 Catered Lunch

13:30-15:00 Final (closing) summary discussion: Suggested topics for future collaborative research. Contributions / overviews / open questions from commentators?

15:00-16:00 Coffee

Participants:

Plutynski, Anya

Jim Griesemer

Nadine Peyrieras

Thibaut Brunet

Newman, Stuart

Benitez Keinrad, Mariana

Moss, Lenny

Bhat, Ramray

Glimm, Tilman

Sarkar, Sahotra

Vásquez Arzola, Alejandro

Soto, Ana

Sonnenschein, Carlos

Montevil, Mael

Mossio, , Matteo

Longo, Giuseppe

Schaeberle, Cheryl

Torres-Sosa, Christian

Goldstein, Raymond

Hohn, Stephanie

Leptos, Kyriacos

Chui, Jane
