



Colloque

Intersecting paths across mathematics, biology, and epistemology: A colloquium in honor of Giuseppe Longo and Ana Soto

Avec Giuseppe Longo, Ana Soto et

Carlos Sonnenschein, Paul-Antoine Miquel, Simone Martini, Pierre-Louis Curien, Mathias Girel, Nicolas Cabaton, Barbara Demeneix, Thierry Paul, José Antonio Pérez Escobar, Alessandro Sarti, Alberto Vianelli, Angelika Hilbeck, Denis Noble, Matteo Mossio, Maël Montévil, Jean Lassègue, Alain Supiot, Marie Chollat, Andrea Angelini et Marie-Claude Bossière

Vendredi 21 octobre 2022, 9h30-18h, amphithéâtre Évariste Galois, ENS
Samedi 22 octobre 2022, 9h30-18h, salle Dussane, ENS

Organisation : Maël Montévil, Barbara Bravi and José Antonio Pérez Escobar

Intersecting paths across mathematics, biology, and epistemology

A colloquium in honor of Giuseppe Longo and Ana Soto

ENS Paris, 21-22 October 2022

Organizers: Maël Montévil¹, Barbara Bravi² and José Antonio Pérez Escobar³

In this colloquium, we celebrate the 75th birthdays of Giuseppe Longo and Ana Soto. We have chosen to show their distinct trajectories and then how they intersect while working on the foundations of theoretical knowledge with a biology focus. In this respect, both Giuseppe Longo and Ana Soto maintain a close relationship with philosophy and philosophers. At the same time, both are also involved in “the life of the polis”, this is, addressing the repercussions of science in society and the environment, both as scientists and intellectuals.

On the first day, we will discuss a sample of their contributions. Giuseppe Longo is first a mathematician. His work focus on the mathematics and logic of computing while also examining the foundations of mathematics. Together with Francis Bailly he expanded this initial inquiry by examining the foundations of physics, cognitive sciences and biology. His subsequent research has gradually turned towards the epistemology of new interfaces.

Ana Soto is first a biologist, who investigated the control of cell proliferation by hormones. This work, done in partnership with Carlos Sonnenschein, led them to empirical discoveries, notably their pioneering research on endocrine disruptors, and theoretical ones, on the principles necessary to understand the control of cell proliferation, and a new theory of carcinogenesis where cancer is viewed as development gone awry. Thus, Ana Soto's work encompasses experimental and theoretical biology at the frontier between biology and philosophy.

The second day is devoted to Ana's and Giuseppe's joint endeavors. The first morning is devoted to the theory of organisms, a work that took place mainly within the framework of Ana Soto's Blaise Pascal Chair at the Ecole Normale Supérieure, hosted by Giuseppe Longo. The afternoon highlights how they address issues of our time, at the interface of the natural sciences and the humanities. In this light, their work contributes by responding to the urgent need to address the critical state of the biosphere in the Anthropocene.

Language: en, fr

Webpage: <https://republique-des-savoirs.fr/events/event/from-foundations-of-mathematics-to-the-epistemology-of-new-interfaces-a-colloquium-in-honor-of-ana-soto-and-giuseppe-longo/>

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Venue: ÉNS de Paris, 45 rue d'Ulm and online

Online: <https://cnrs.zoom.us/j/97288722965?pwd=NkJoYS9yV2hjNll1bG9WNSStFamFhUT09>

21 october: Amphithéâtre Galois (2ième sous sol)

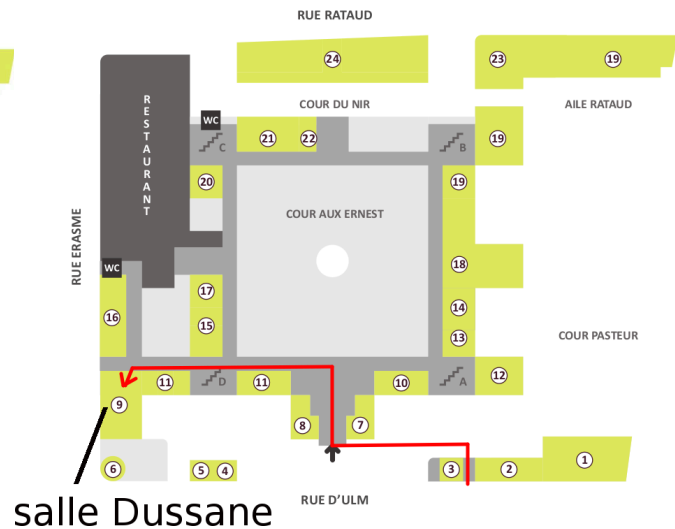
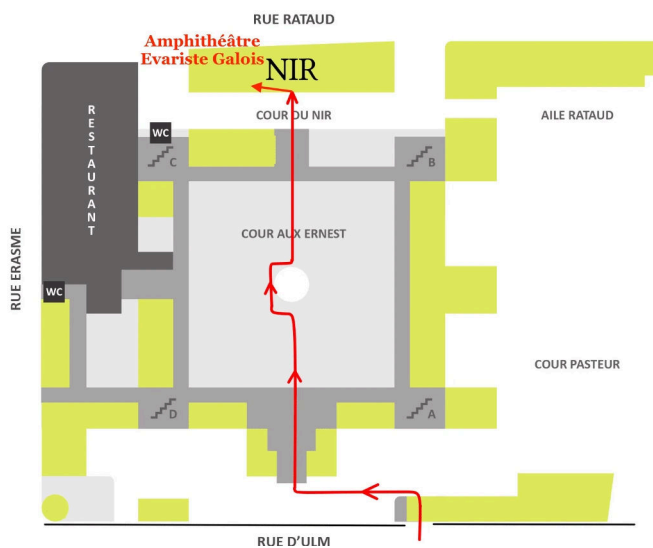
22 october: Salle Dussane

45 RUE D'ULM, 75005 PARIS

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Program

Day 1

Morning - Session 1: The Society of Cells. Chair: Matteo Mossio

09:30 General introduction by the organizers

09:45 *Daring to ask why and why not?* Carlos Sonnenschein (Department of Immunology, Tufts University School of Medicine. Associated to Centre Cavallès, République des Savoirs)

10:15 *A propos de « la société de cellules », de Soto et Sonnenschein.* Paul-Antoine Miquel (Equipe de Recherche sur les Rationalités Philosophiques et les Savoirs, Université de Toulouse Jean Jaurès)

10:45 Questions to the speakers and Ana Soto

11:00 Break

Morning - Session 2: Foundations of Mathematics and Computing. Chair: Barbara Bravi

11:15 *Giving meaning to computations: the birth of a mathematical theory of computation* Simone Martini (Università di Bologna Dipartimento di Informatica, Scienza e Ingegneria)

11:45 *From the semantics of programming languages to the Condorcet paradox.* Pierre Louis Curien (IRIF, CNRS & Université Paris Cité)

12:15 Questions to the speakers and Giuseppe Longo

12:30 – 14:00 Lunch

Afternoon – Session 3: Endocrine disruptors. Chair: Mathias Girel

14:00 Introduction by Mathias Girel (Responsable du Centre Cavallès, Maître de conférences ENS-PSL, UAR 3608 République des Savoirs, ENS-Collège de France-CNRS)

14:10 *From Wingspread and Even More.* Barbara Demeneix (in streaming) (Physiologie moléculaire et adaptation, UMR 7221, Muséum National d'Histoire Naturelle)

14:40 *Endocrine disruptors: from their epistemology to our exposome, invading our daily products, until reaching our plates...* Nicolas Cabaton (INRAE, Research Centre in Food Toxicology, Université de Toulouse, INRAE, ENVT, INP-Purpan, UPS)

15:10 Round table with Ana Soto

15:40 Break

Afternoon – Session 4: Interface of Mathematics with Physics and Biology. Chair: José Antonio Perez Escobar

16:00 Short introduction by José Antonio Perez Escobar

16:05 *After "Le hasard et la nécessité", the conceptual necessity of randomness and more general presences of mathematics in quantum mechanics.* Thierry Paul (streaming) (CNRS Laboratoire Ypatia des Sciences Mathématiques and CNRS, Université Paris Cité, Laboratoire Jacques-Louis Lions)

16:35 *Mathematical counterfactuals and biological understanding: a number of problems and new directions.* José Antonio Perez Escobar (Centre Cavallès, UAR 3608 République des Savoirs, ENS-Collège de France-CNRS)

17:05 *Assemblage dynamics.* Alessandro Sarti (CAMS, CNRS-EHESS)

17:35 Round table with Giuseppe Longo

18:00 Conclusions

19:00 Dinner for the speakers

Day 2

Morning – Session 5: Theory of Organisms. Chair: Alberto Vianelli (Department of Theoretical and Applied Sciences, University of Insubria)

9:30 Short introduction by Maël Montévil

9:40 *Teosinte in Spain – The birth of an invasive species and a missed opportunity.* Angelika Hilbeck (in streaming) (Institute for Integrative Biology in the Department of Environmental Systems Science at ETH Zurich and ENSSER)

10:10 *A brilliant theory can be destroyed by a single experiment. But does it also happen the other way round?* Denis Noble (in streaming) (Department of Physiology, Anatomy & Genetics, University of Oxford)

10:45 Questions to the speakers

10:55 Break

11:10 *Organisms as autonomous systems.* Matteo Mossio (CNRS, Institut d'histoire et de philosophie des sciences et des techniques, UMR 8590, Paris 1)

11:40 *Towards a theory of organisms: state and directions.* Maël Montévil (CNRS, Centre Cavallès, UAR 3608 République des Savoirs, ENS-Collège de France-CNRS)

12:10 Round table on the theory of organism, with: Paul-Antoine Miquel, Carlos Sonnenschein, Maël Montévil, Matteo Mossio, Ana Soto and Giuseppe Longo.

13:00-14:30 Lunch

Afternoon – Session 6: Interface with humanities. Chair: Paul-Antoine Miquel

14:30 Short introduction by Paul-Antoine Miquel

14:35 *How to do science with words – A tribute to Giuseppe Longo's work.* Jean Lassègue (Centre Georg Simmel - Recherches franco-allemandes en sciences sociales, EHESS)

15:05 *tbd* Alain Supiot (Collège de France et Université de Nantes)

15:35 Questions to the speakers

15:50 Break

Afternoon – Session 7: Taking care of the biosphere. Chair: Marie Chollat

16:10 Introduction by Marie Chollat (Co-vice présidente de l'AAGT, Ingénieure Agroparistech, Docteur en Onco-immunologie)

16:20 *Ecosystème, régulation, santé : un regard critique sur la médecine environnementale.* Andrea Angelini (EA 4008 Laboratoire d'études et de recherches sur les logiques contemporaines de la philosophie, Université Paris 8 Vincennes Saint-Denis)

16:50 *Disruption relationnelle et développement des jeunes humains d'aujourd'hui.* Marie-Claude Bossière (Institut de Recherche et d'Innovation)

17:20 Round table with Giuseppe Longo and Ana Soto

18:00 Conclusions by Giuseppe Longo and Ana Soto

18:10 **Cocktail**