



CSH Workshop

Collective Resilience Across Scales

October 19-21, 2022

COMPLEXITY SCIENCE HUB VIENNA
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About the workshop

Collectives emerge, change, grow and dissolve across temporal and spatial scales. These processes have been studied and modeled in different species, but many of the underlying mechanisms and regularities still remain elusive. This is problematic as understanding these collective processes is essential for maintenance, curation, and development of our own, human societies facing a rapid succession of physical and social challenges.

This workshop will bring together scientists studying collectives from biological, evolutionary, neurological, psychological, and sociological perspectives, to discuss the following questions:

1. Are collectives bound by the same forces of selection as are multicellular species? Do collectives develop, reproduce (fission), age and die, analogous to multicellular individuals?
2. How do collectives adapt and evolve to maintain/increase function (obtain resources, protect against antagonists, expand in size) and to what extent are there trade-offs, or constraints that result in aging and failure through time?
3. How can collective responses to perturbations and challenges across scales inform theories, quantitative models, and design of resilient social systems including human societies?

Organizers

Mirta Galesic, Santa Fe Institute, Complexity Science Hub Vienna

Michael Hochberg, Santa Fe Institute

Jeremy van Cleve, Santa Fe Institute

About the Complexity Science Hub Vienna

The objective of CSH is to host, educate, and inspire complex systems scientists who are dedicated to collect, handle, aggregate, and make sense of big data in ways that are directly valuable for science and society. Focus areas include smart cities, innovation dynamics, medical, social, ecological, and economic systems. CSH is a joint initiative of the AIT Austrian Institute of Technology, Austrian Chamber of Commerce, Central European University CEU, Graz University of Technology, International Institute for Applied Systems Analysis IIASA, Medical University of Vienna, University of Continuing Education Krems, TU Wien, University of Veterinary Medicine Vienna, and the Vienna University of Economics and Business.

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Agenda

Day 1 - October 19, 2022 (Salon)

- 09:00 - 09:30 GENERAL INTRODUCTION
- 09:30 - 10:00 Alma Dal Co, University of Lausanne
Evolutionary demographic models and the birth and death of collectives
- 10:00 - 10:30 Jeremy Van Cleve, University of Kentucky
Too big to (not) fail: how scale and size affect the resilience of collectives
- 10:30 - 11:00 Coffee break
- 11:00 - 11:30 Ralf Kurvers, Max Planck Institute for Human Development
Resilience and adaptation of social network dynamics across socio-ecological contexts
- 11:00 - 12:00 Mirta Galesic, Santa Fe Institute
Collective Adaptation
- 12:00 - 01:30 Lunch
- 01:30 - 02:00 Daniel Oro, CSIC
Simple collective behaviour for the resilience of open populations
- 02:00 - 02:30 Stefan Thurner, CSH Vienna (tbc)
- 02:30 - 03:00 Silvia De Monte, Department of Biology Ecole Normale Supérieure IBENS
To cheat or not to cheat: in this a dilemma?
- 03:00 - 03:30 Coffee break
- 03:30 - 04:30 BREAKOUT DISCUSSION
Questions + theories, methods, data to answer them
- 04:30 - 05:30 WHOLE GROUP DISCUSSION, REPORTAGE
- 05:30 End of Day 1

Day 2 - October 20, 2022 (Salon)

- 09:00 - 09:30 Peter Turchin, Complexity Science Hub Vienna
Applying Cultural Multilevel Selection Theory to Human Politics
- 09:30 - 10:00 Michael Hochberg, CNRS, SFI
Resilience and aging
- 10:00 - 10:30 Annette Baudisch, University of Southern Denmark
Evolutionary demographic models and the birth and death of collectives
- 10:30 - 11:00 Coffee break
- 11:00 - 11:30 Erol Akçay, University of Pennsylvania
- 11:30 - 12:00 Daniel Nettle, Ecole Normale Supérieure-PSL
- 12:00 - 1:30 Lunch
- 01:30 - 02:30 BREAKOUT DISCUSSION
Questions + theories, methods, data to answer them
- 02:30 - 04:00 WHOLE GROUP DISCUSSION
- 04:00 End of Day 2

Day 3 - October 21, 2022 (E02)

- 09:00 - 10:30 GROUP WORK
(Develop promising ideas from discussions into outlines for papers/grants)
- 10:30 - 11:00 Coffee break
- 11:00 - 12:00 GROUP WORK
Submit written outlines - organizers will collate and share
- 12:00 - 12:30 WHOLE GROUP DISCUSSION: NEXT STEPS
- 12:30 - 02:00 Lunch (optional)
- End of Meeting