

# Evolution of Social Complexity 2024

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THE UNIVERSITY OF  
SYDNEY

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We acknowledge the traditional owners of the land on which we meet: the Gadigal people of the Eora Nation, and we pay our respect to the knowledge embedded forever within the Aboriginal Custodianship of Country

## Inter-faculty centre:

- Science, Engineering, Arts and Social Science, Business, Medicine and Health, Architecture, Design and Planning
- approx. 35 researchers and 35 HDRs

## Six major themes (coordinated by the CCS members):

- |  |                         |
|--|-------------------------|
| ➤ collective & swarm intelligence                | A/Prof Tanya Latty      |
| ➤ natural language & universal laws              | Prof Eduardo Altmann    |
| ➤ brain dynamics & functions                     | A/Prof Pulin Gong       |
| ➤ urban systems & cities                         | A/Prof Somwrita Sarkar  |
| ➤ information dynamics & distributed computation | A/Prof Joseph Lizier    |
| ➤ pandemics & crisis modelling                   | Prof Mikhail Prokopenko |

## Big Questions at the physical-biological-social interface:

- ❖ is biology beyond physics: are there universal principles across both physical and biological phenomena?
- ❖ what are the principles underlying the emergence of consciousness, language and intelligence, and can these principles be applied to develop powerful AI?
- ❖ are there fundamental physical constraints guiding the rise and fall of civilisations?



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# Looking back... C<sup>3</sup>-2023



## CCS Workshop on Evolution of Social Complexity 2020

The Centre for Complex Systems held one-day workshop at the University of Sydney on February 13, 2020:

- Prof Paul Ormerod, Department of Computer Science, University College London and Algorithmic Economics Ltd, **An agent based model of the evolution of market structure and competition**
- Dr Rickard Nyman, Centre for Decision Making Uncertainty, University College London and Algorithmic Economics Ltd, **Identifying networks and their evolution from text**
- Prof David Christian, Macquarie University, **Complexity and Big History**
- Prof Mikhail Prokopenko, The University of Sydney, **Self-reference and Evolution of Evolvability**



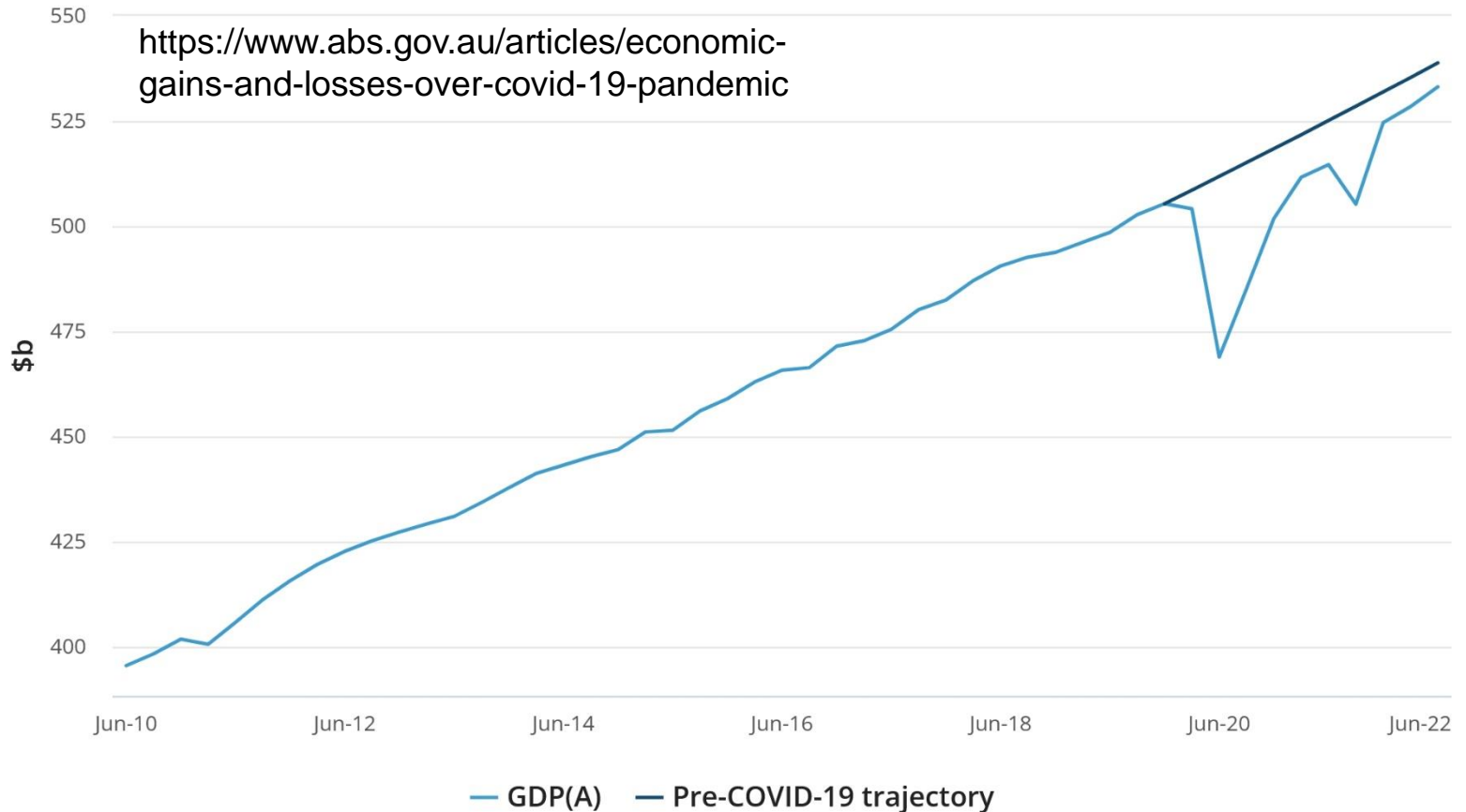


# The last few years...





Figure 1. GDP, actual and pre-COVID-19 trajectory, chain volume measures, seasonally adjusted



This \$158 billion loss was calculated using the average of the 3 GDP measures (Expenditure, Production and Income) as published in the Australian national accounts. Further analysis below looks at the components of the



# COVID-19's Total Cost to the U.S. Economy Will Reach \$14 Trillion by End of 2023

May 16, 2023 | By Jakub Hlávka, PhD and Adam Rose, PhD

Press contact: **Jenesse Miller** (213) 810-8554





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# Mar'inka, a frontline city in Ukraine (2023)



[war \(19886\)](#) [damage \(42\)](#) [Denys Shmyhal \(427\)](#)

## Ukraine's losses from war amount to almost \$499 billion - Shmyhal



As a result of Russia's war against Ukraine, the sectors of trade, industry, agriculture, energy, and transportation have suffered the most.

This was announced by Prime Minister Denys Shmyhal during the presentation of the third damage and recovery needs assessment of Ukraine

(RDNA3), conducted with the participation of the World Bank, [Censor.NET](#) reports.

"As of the end of 2023, Ukraine's total economic, social and other losses amounted to almost \$499 billion. The sectors that suffered the most were trade, industry, agriculture, energy and transportation," he said.

**Read more: [Since beginning of full-scale invasion, Russia has caused \\$155 billion worth of damage to Ukrainian infrastructure, - KSE](#)**

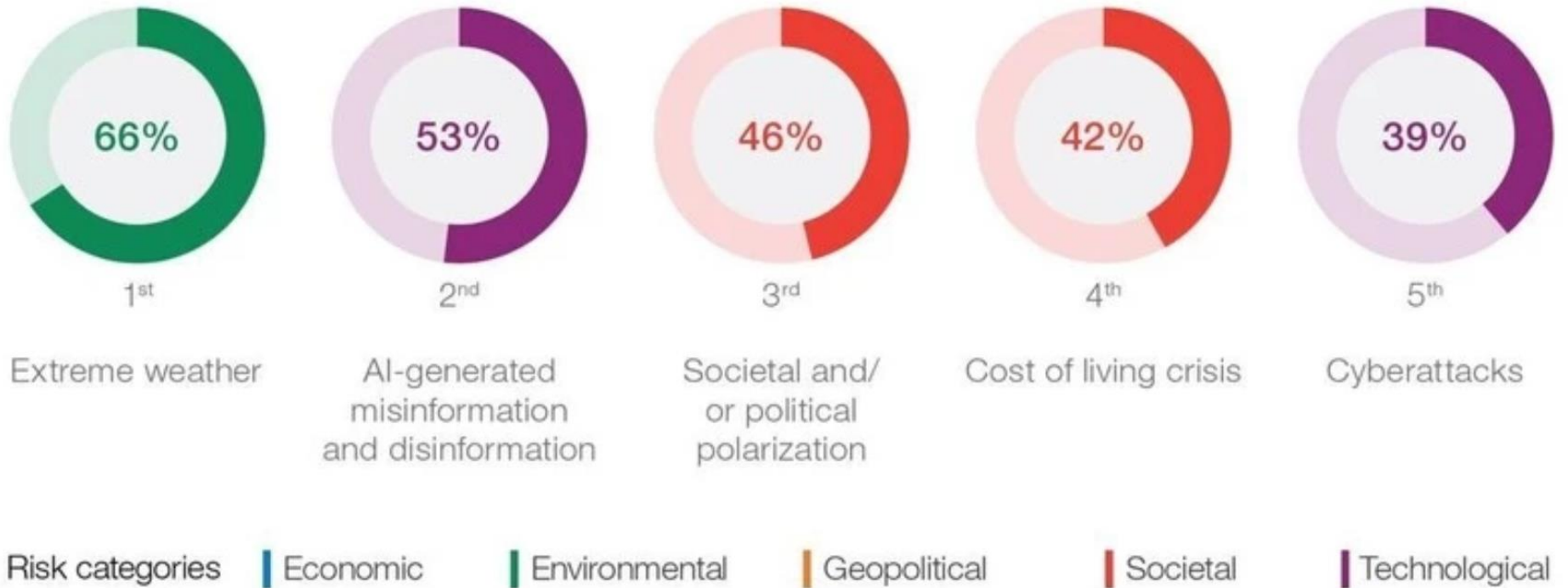
The Prime Minister reminded that currently the financial need for the reconstruction of Ukraine is almost 486 billion dollars.

# Where did the term polycrisis come from and what does it mean?

**Adam Tooze:** It's an idea that was launched by a [French theorist of complexity called Edgar Morin](#), and then it was picked up by [Jean-Claude Juncker](#), the President of the European Commission, in 2016, to describe the experience of trying to govern Europe when you had to deal with the Greek debt crisis, Putin's first aggression against Ukraine and the rumblings of Brexit in the background, and the refugee crisis in Syria spilling over into Europe.

# Current risk landscape

"Please select up to five risks that you believe are most likely to present a material crisis on a global scale in 2024."



Source: World Economic Forum Global Risks Perception Survey 2023-2024.



“The risks are growing –  
but so is our capacity to respond”



[Global Cooperation](#)

[Davos Agenda](#)

[Climate and Nature](#)

# **Global Risks Report 2024: The risks are growing – but so is our capacity to respond**

## CCS Workshop on Evolution of Social Complexity 2024

The Centre for Complex Systems (The University of Sydney) invites for one-day workshop on February 21, 2024.

**Venue:** G04.02.270. **Wilkinson Building. Wilkinson Lecture Theatre (2) 270**

(The University of Sydney, the School of Architecture, Design and Planning, 148 City Road, Darlington)

### **Preliminary program:**

**9:15 - 9:30** Mikhail Prokopenko, University of Sydney: Introduction

**9:30 - 10:30** Paul Ormerod, Volterra Economics, UK (**keynote**): "Complexity and urban scaling in productivity"