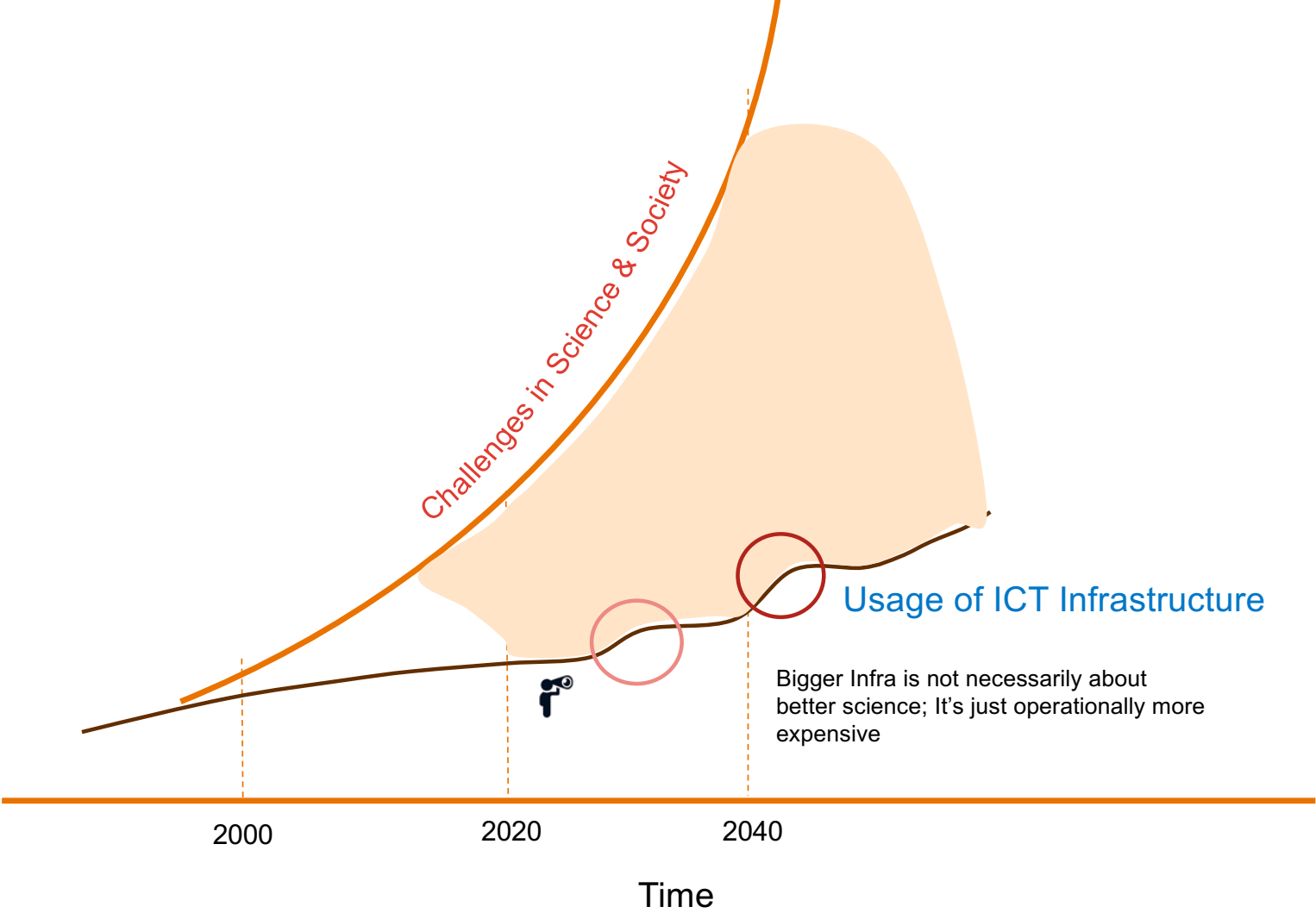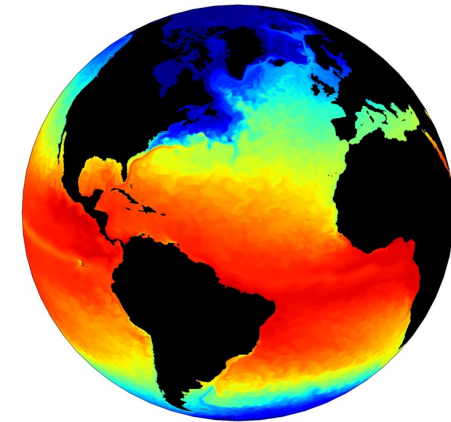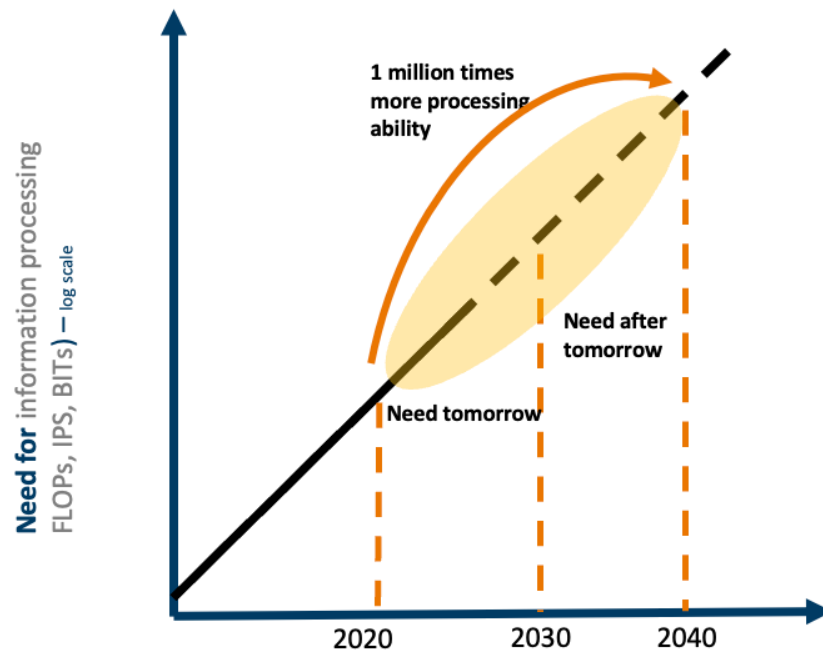Science, Society and Economy depends more
& more **on Computing.**

SURF

Future demands a **new direction to the Digital Infrastructure Ecosystem. ; It requires a fundamental re-design of value**
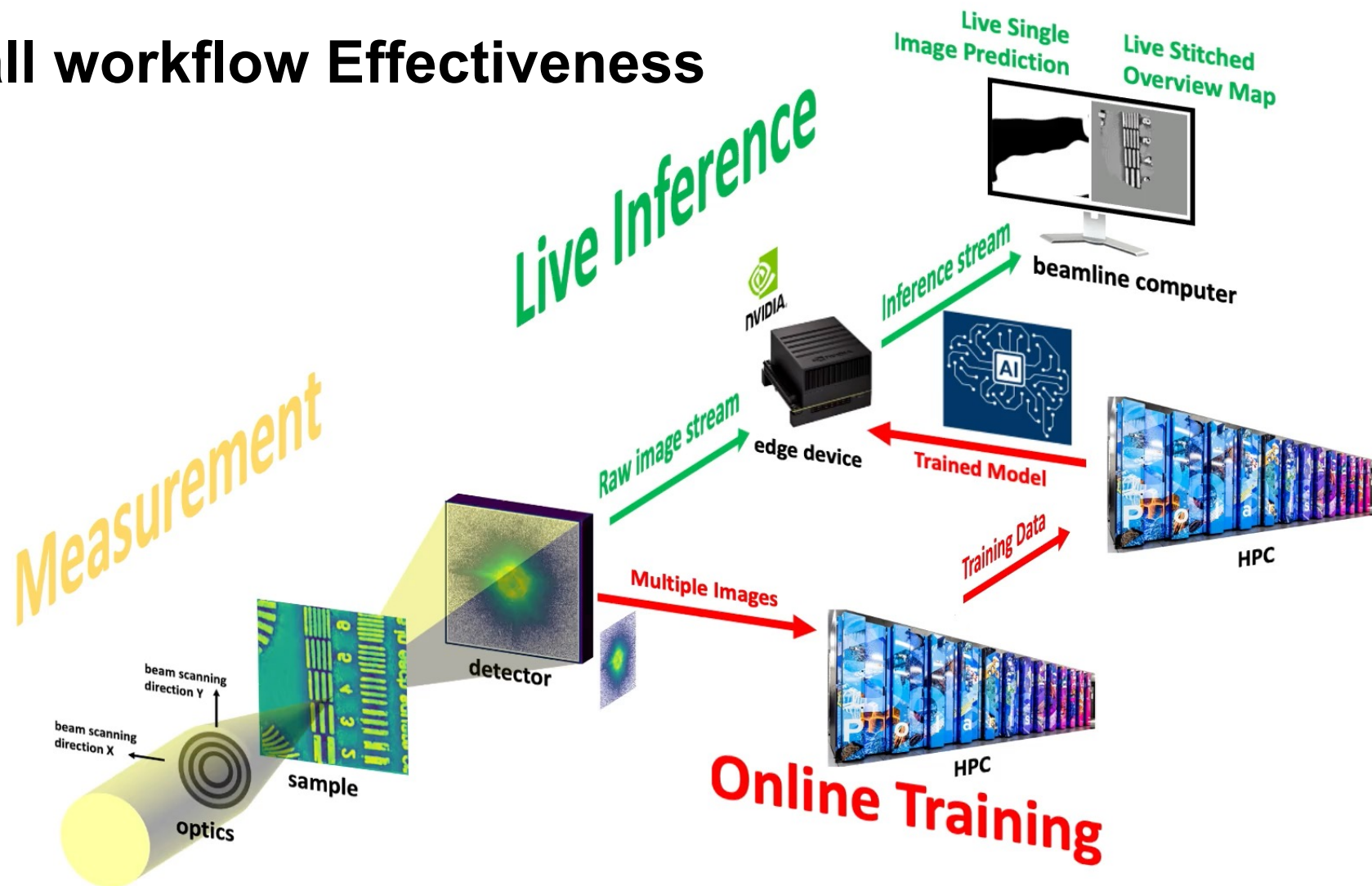
SURF

Relative Evolution

Challenges in Science & Society

Usage of ICT Infrastructure

Bigger Infra is not necessarily about better science; It's just operationally more expensive

2000

2020

2040

Time

SURF

Challenge-based information processing capability?

Need for information processing
FLOPs, IPS, BITs) — log scale

1 million times
more processing
ability

Need after
tomorrow

Need tomorrow

2020   2030   2040

Think about **global** climate simulations.

10x more fidelity in space & time needs
O(10^6) mixed precision information
processing

Ocean component output of an Earth System Model simulation - Rene van
Westen, Henk Dijkstra, Ocean Eddies Strongly Affect Global Mean
Sea-level Projections - Science Advances 7, 2021

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Overall workflow Effectiveness

https://danielzt12.github.io/latest_news/2022/07/11/AI-enabled-on-the-fly-phase-retrieval.html

Application Workflow Footprint
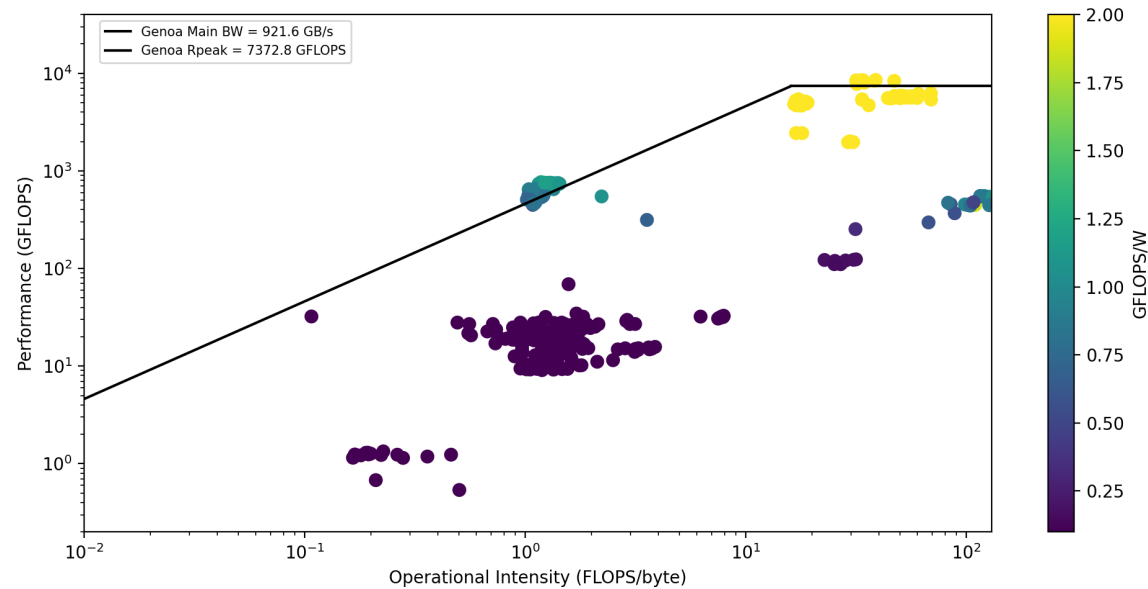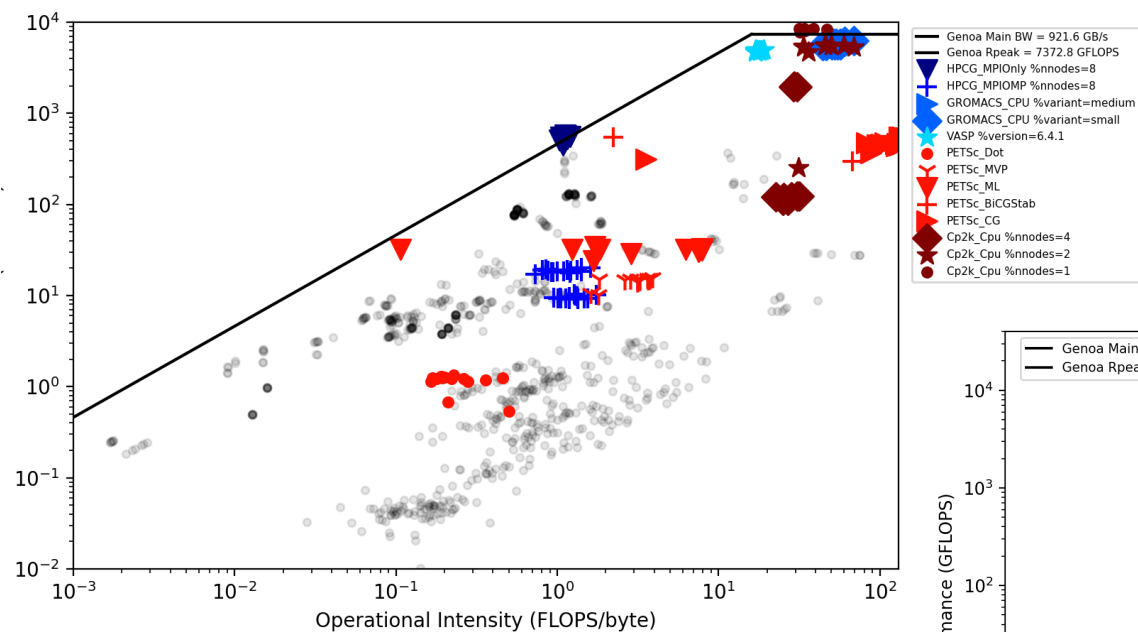
Change the lens of the metric

Overall Societal Value (vertical axis)
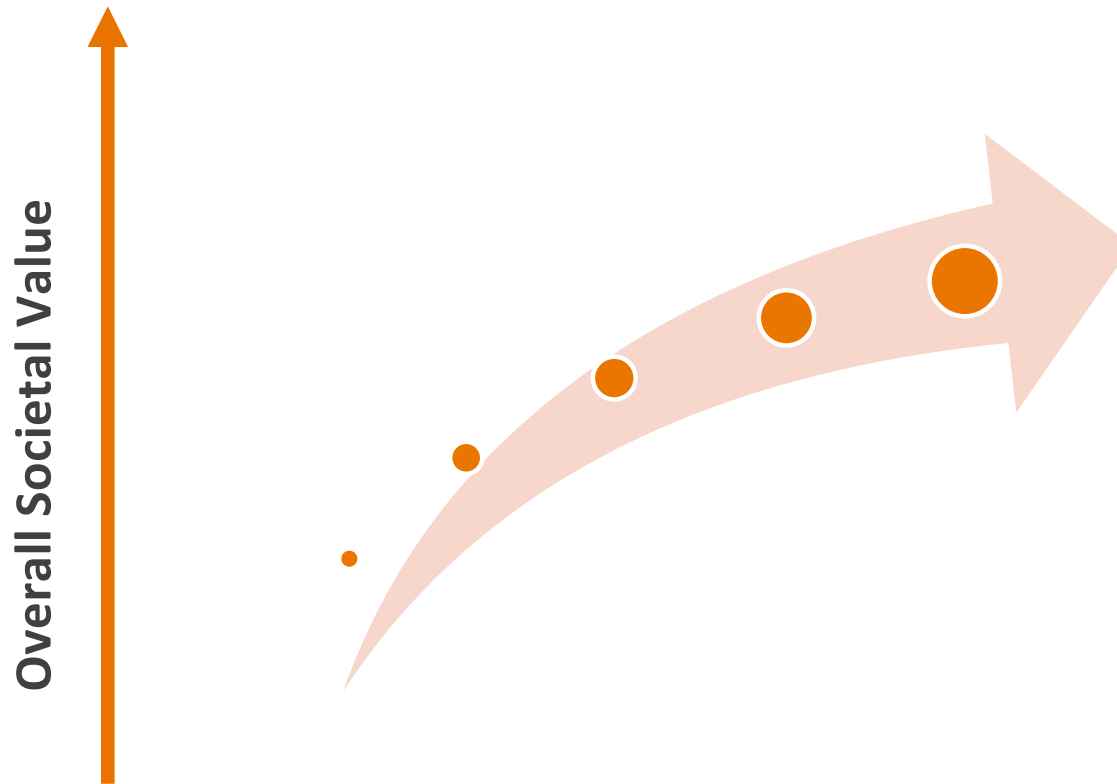
Utility-centric ecosystem
- What is the footprint for achieving a scientific outcome with computing?

Resource-centric viewpoint
What is the impact of running an application?

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Key Arguments?

- Close the Gap
- Information processing for addressing challenges
- Better application-workflow design
- Wholesome application workflow footprint
- Question the assumption : Change lens

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