

A photograph of a dense forest with sunlight filtering through the trees. The text is overlaid on the image.

**Trees, Trees, Trees...**  
**Where's the Forest?**

# An Emergent Response to Benedict's Assault on Relativism:

## "IS" from Webster's Dictionary:

1. a) To equal in meaning: have the same connotations as: *God is love*

- Relativism
  - Relational

2. a) To have an object existence: have reality or actuality: *I think therefore I am*

- Fundamentalism
  - Essential

A recent senior thesis by Tegan Georges struck Anne and I as a useful place to start.

- Emergence is a process of creation that is not static or fundamental.
- Relativism is contextually constructed meaning – also not a static or fundamental process of creation.
- Are these equivalent or is at least a parallel processes?
  - Part of the impetus for this talk is to ground relativism in a unifying framework that connects quantum and wave function descriptions of inanimate matter to the homeostatic, reproducing characteristics of the animate. The animate is still too often associated with essences/souls and thought of as fundamentally different than inanimate matter. Confounding the issue are the disciplines of physics and biology that too often use different languages.
  - Emergence seems to offer as a means to making the connection between the two domains.
  - Yet, emergence remains a black box for the most part. From what I have learned, all I can say is that LIFE emerged from inanimate matter. I still seek a more definitive link between the two realms.
  - After many conversations and much research, I began to think interactions, rules of engagement and relationships between components may be a fruitful area to explore.
  - Which leads me to today's agenda...

- **Some intended goals of this discussion;**

- To briefly summarize *how* my understanding of emergence evolved. In re-tracing some old territory, I will highlight some questions I grappled with. My hope is that these questions will help to the topic of emergence. Maybe the view from a relative newcomer will shed some light on scope, depth and misconceptions.
- Explore my remaining questions, specifically with regards to defining types of interactions as an important aspect of understanding emergence. Specifically:
  - Can a general set of interactions be defined, such that physical wave functions/quanta (the primary agents) will give rise to life: bounded, homeostatic, self-replicating forms of energy involved in self-similar, reiterative coding and decoding?
- And finally to investigate interactions as a way to understand the generations of meaning ...and maybe clarify relationship between Fundamentalism and Relativism.

# No Need to Beat a Dead Horse

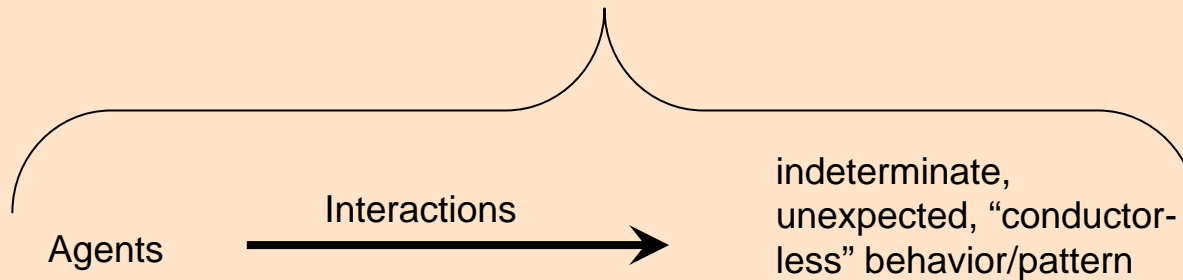
My understanding of the key components:

- Emergence has something to do with:
  - Agents = entities/bodies/configurations of matter that interact. They need to be many and diverse. Diverse in this case means “agents possess differential rules of interaction”.
  - Interactions = rules for coding and decoding resulting in a change in the current state of agents
    - Rules are indeterminate, often non-linear(?) and therefore *can* result in unexpected behavior/pattern.
  - Behavior/patterns/phenomena/outcomes = resultant of interactions between agents
    - Behavior/pattern if emergent is unexpected, irreversible and irreducible = untraceable to original state.
- By Arshiya Bose ([A Pilgrimage to the End of Story Telling](#))
  - Emergence is the current way of making sense of the world as it exists today and has existed so far. It is an undirected, unintentional engaging of entities that become parts of larger entities which in turn become parts of even larger entities. Over time, the emergent process develops entities that create a stream of generative stories that are born from an effort to ask questions and wonder about the processes of the world and the process itself.

# Emergence: Process or Pattern?

EMERGENCE = a special case of  
Agents, Interactions and Behavior?

Do unexpected  
patterns  
necessarily  
follow under  
the “right”  
conditions of  
agents and  
interactions?



EMERGENCE?

As a process?

An emergent  
process?

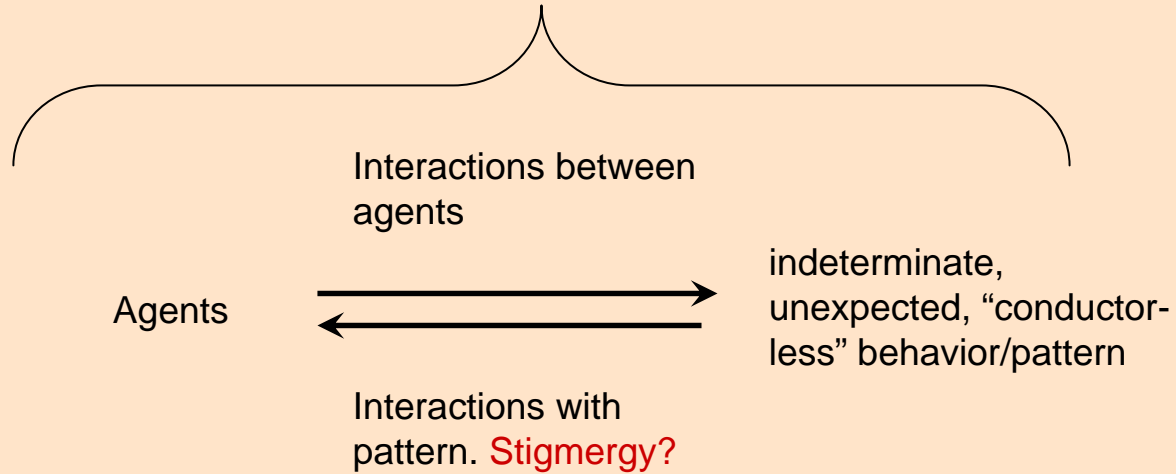
EMERGENCE?

As a pattern?

An emergent  
pattern?

# Dynamic/Open vs Static/Closed Emergence.

Interesting Emergence?

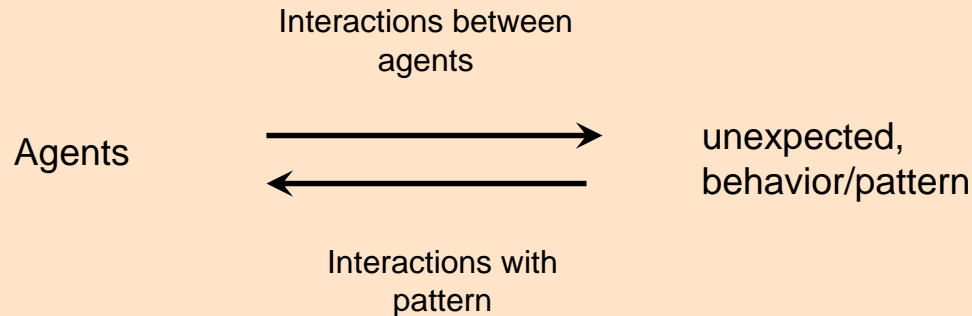


## Static/Closed Emergence?



Ex: Oil in slowly heated pan. Weather? AI? Purely physical, temporary, short-lived, non-iterative.

## Dynamic/Open Emergence?



Ex: quantum particles → atom → molecules → cells → tissues → organs, individuals, species, communities, culture, technology(?)

# Open vs Closed?

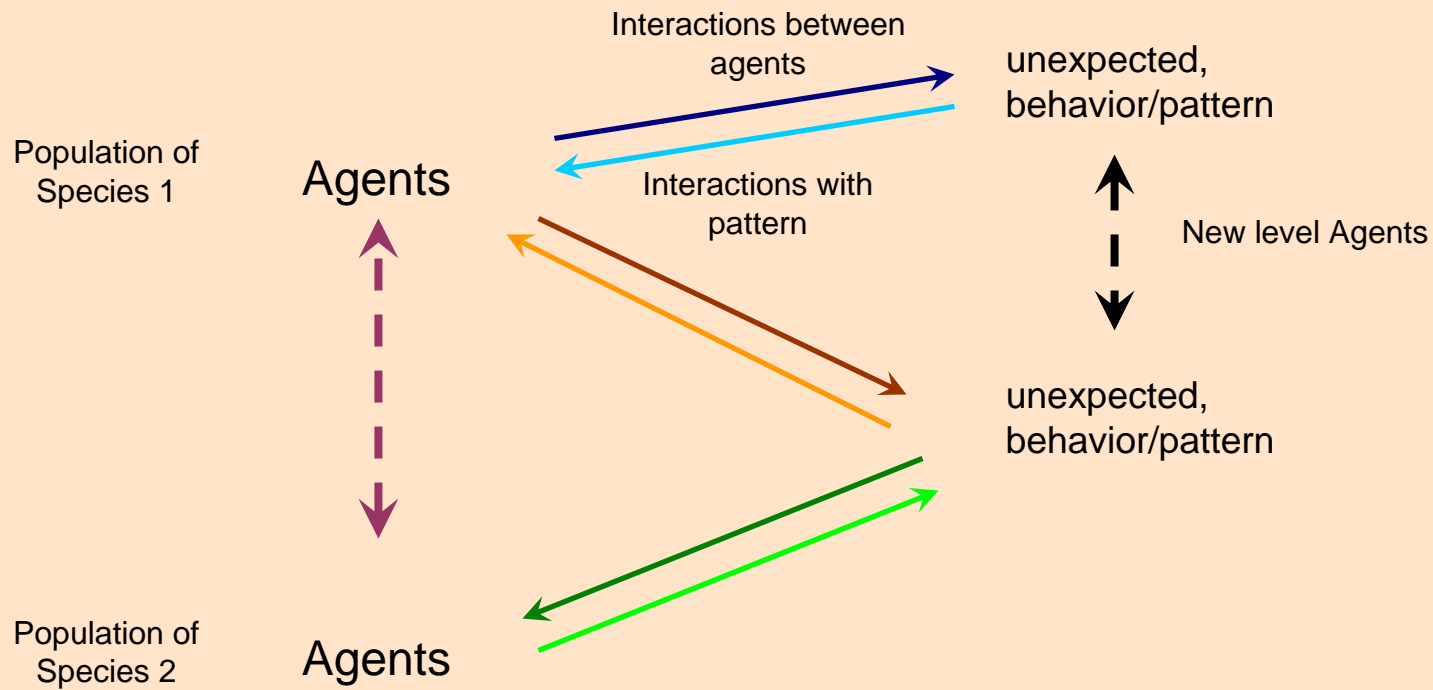
## Reiterative vs Non-Reiterative?

- What is the difference between open and closed emergence? I use the terms open/closed to suggest that there is nothing fundamentally different. Rather it is only a matter of “enough” time and space before static becomes dynamic and reiterative.
- Problems:
  - But life is bounded as are living systems.
    - You do not find life at every scale/order of magnitude
    - There is a lower and upper limit of... complexity(?) that supports life.
  - Therefore, too much time and space may lead either to singularity (a collapse) or non-patterned chaos (an explosion).
  - Likewise, not enough diversity in agents and interactions lead to predictable simplicity that stagnates.

Ex? [Conway's Game of Life](#)

# Living Systems: Not too much, not too little....Just Right?

**Self-similar and reiterative.**



# Types of interactions between species

		Species 1		
		+	0	-
Species 2	+	Mutualism	Commensalism	Predation Herbivory <b>Disease</b>
	0	Commensalism	No interaction	Ammensalism
	-	Predation Herbivory Disease	Ammensalism	Competition

# Towards General Emergence: Defining Interactions that link the Inanimate to the Animate

## Biological Interactions:

- Competition (-/-)
- Disease (+/-)
- Neutral (each agent unchanged)
- Random (+ or - / + or -)
- Commensual (+/ unchanged)
- Mutualistic (+/+)

## Wave Function Interactions:

- Dissonance (-/-)
- Neutral
- Random?...Unpredictable?
- Resonance (+/+)

## Biological Definition.

+ = a change that increase the fitness of a participating agent

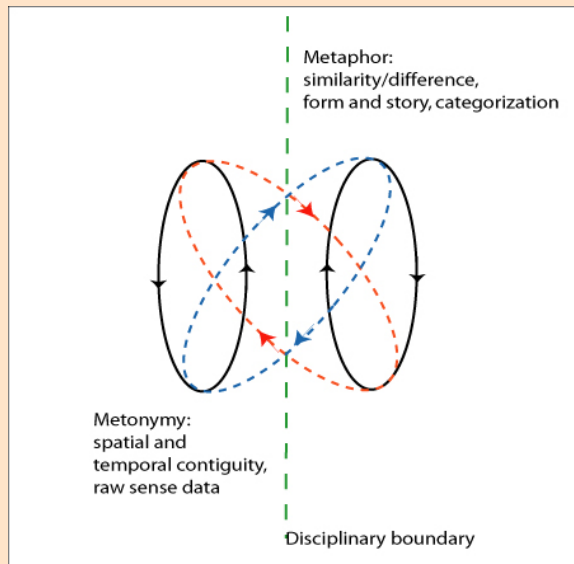
## Literary, Cultural and Physical Definitions?

+ = a change that increases resistance to perturbation, increases stability, durability, robustness of an agent

Signals?... Long distance interactions?

# What does it all mean?

- Is meaning generated by emergent processes? (see Dalke's presentation to the emergence group). <http://serendip.brynmawr.edu/local/scisoc/emergence/emergeaprilfool.html>



<http://serendip.brynmawr.edu/local/scisoc/DalkeGrobsteinMcCormack.html>

Figure 1. Schematic illustrating the intellectual exchange between two individuals in a cross-disciplinary conversation. Solid lines depict individuals constructing knowledge by traversing their own metaphoric and metonymic levels. Dashed lines represent the interaction between the metaphor level of one individual and the metonymic level of another.

- Do the same interaction rules apply?
- What does this mean for Relativism?
  - There is no way to distinguish between intentional design and emergent creation (and change over time – evolution), but emergence demonstrates that intentional design is not necessary.

