Systems Theory

{ Review

- "A science of wholeness"
  - -Ludwig von Bertalanffy

Systems Theory

- As a theory, it emerged in the latter half of the 20th century as a response to the world becoming more complex, technology becoming more advanced, and science running into its reductive limitations.

Systems Theory

- "Classical science in its diverse disciplines, be it chemistry, biology, psychology, or the social sciences tried to isolate the elements of the observed universe . . . expecting that, by putting them together again, conceptually or experimentally, the whole or system would result once again & be intelligible"
- "Now we have learned that for an understanding not only the elements, but their interrelations are required."
  - -Ludwig von Betalanffy

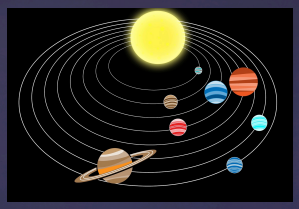
- "In one way or another, we are forced to deal with complexities, with "wholes" or "systems" in all fields of knowledge. This implies a basic re-orientation in scientific thinking"
  - Ludwig von Bertalanffy

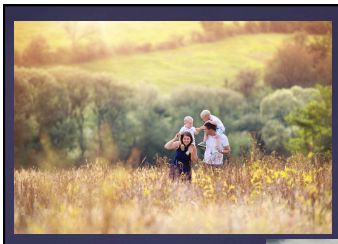
Basic ideas

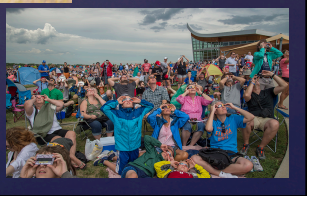
{ Systems Theory

System

- A set of elements standing in interrelations
- "The whole is greater than the sum of its parts"







Open & Closed Systems

- An "open" system interacts and has exchange with its environment
- A "closed" system does not
- Open and closed systems behave differently
- Science tends to create and investigate closed systems
- Complex systems, including humans, are open systems – which allows for evolution and transformation and novelty rather than straight homeostasis

Relationships

- The relationships between elements is as important as the elements themselves.

Irreducibility

- Some things can only be described by the relationships between the parts
- They are "not reducible"
- To reduce further loses the very meaning trying to be described

Other Qualities

- Synergy
- Emergence

Systems can be:

1. Simple
2. Periodic
3. Chaotic
4. Complex

Checkpoint

- Go find a system in nature.
- Describe what a system is to someone else.
- Why is the study of relationships an important part of system's theory?
- Food for thought: systems theory, in itself, is an emergent theory which arose out of systems complexity . . .