

**Source:**

## **1 | his intro / background**

**1.1 | used to be very into econ**

**1.2 | worked at world bank bc he thought it was a good place to meet people who were interested in math and econ and help the world**

**1.3 | was sent to a country (forgot) during communism->capitalism transition and saw that the forced capitalist policies were not working**

**1.4 | went into management because that allowed him to actually help**

**1.5 | sante fe institute**

**1.5.1 | centeripece for a global movement to involve complexity in sciences accross disciplines**

**1.5.2 | from los alamos national labs**

**1.5.3 | 'universal relationships'**

**1.5.4 | lots of nobel prizes**

**1.5.5 | applications of graph theory and network theory, and lots of econ**

**1. understanding when societies are going to have a revolution, finiance, energy grid**

## 2 | other related areas

### 2.1 | do individuals matter in history

### 2.2 | impacts on marketing based on faith studies?

## 3 | Overview

### 3.1 | this intersession is "interdisciplinary fixing of economics"

## 4 | Warmup

### 4.1 | insectivora, macroscelidea avg mass vs avg BMR, guess avg bmr for pholidota given avg mass

#### 4.1.1 | I just took the ratios and took a high and low

#### 4.1.2 | a few strategies for solving the problem

1. look for a common ratio (assume 0 mass = 0 BMR)
2. fit a line
3. it's actually not a linear relation, and the answer is relatively unexpected (much lower ratio)

### 4.2 | the monkey business illusion (ball passing -> miss other stuff)

#### 4.2.1 | when you get attached to a tool, you miss loads of other things

## 5 | universality

### 5.1 | examples

#### 5.1.1 | common limit theorem

1. lots of common processes produce gaussian distributions  
(a) thus, there is a "universality" in the normal distribution

#### 5.1.2 | other theorem? (something with gauss)

1. if things are often normal distributions, then statistics kind of works (because that's what it's all based on)

#### 5.1.3 | all mamals average the same number of heartbeats

1. small animals have fast hearts and die sooner, vice versa

#### 5.1.4 | **metabolic rate (first warm up problem)**

1. log log linear → constant rate of savings? SUBLINEAR SCALING
2. constant increase in efficiency
3. roughly 3/4 or 2/3 exponent
4. exponent can be derived by networks (circulatory system)
  - (a) where can this be applied?
    - i. many city statistics
      - A. 15% boost/saving for every size double for amount of gas stations, boost in gdp, # of patents, new AIDS cases, etc

### 6 | **complexity**

#### 6.1 | **core**

##### 6.1.1 | **taking a general tool and applying it elsewhere**

#### 6.2 | **methodology**

##### 6.2.1 | **start with a data rich domain and find the generative mechanism, then apply to the data sparse**