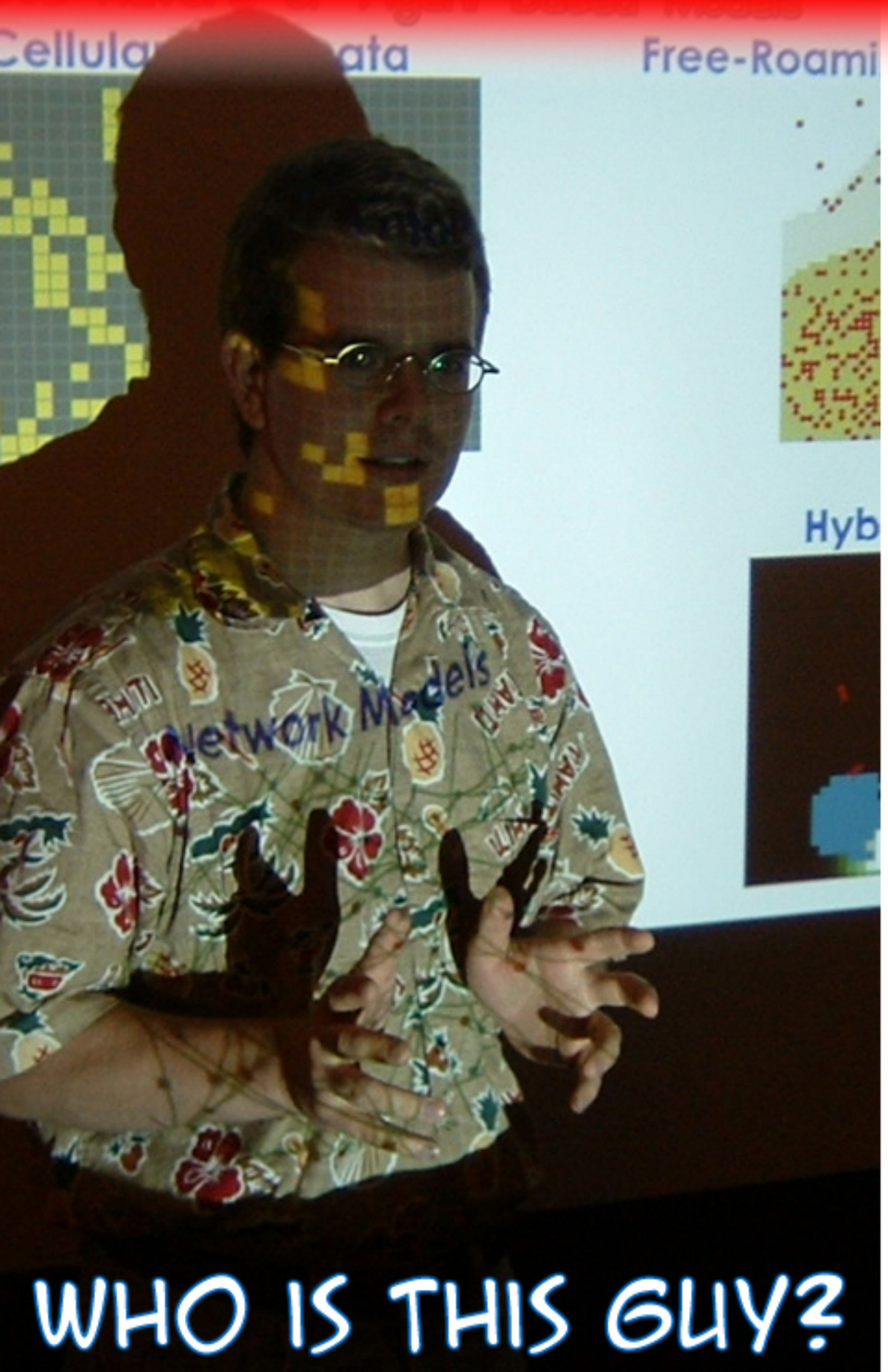
ICPSR 2009 Workshop on Agent-Based Modeling

with your hosts:

Aaron L Bramson

& Jon Zelner

INTRODUCTION TO AGENT-BASED MODELING



WHO IS THIS GUY?

Aaron Bramson

Perpetual Student

- Undergrad at University of Florida
  - -B.A. Philosophy
  - -B.S. Economics: Business School
- 2 Years in Econ PhD at Boston Univ
- M.S. in Mathematics from Northeastern
- Joint PhD at Univeristy of Michigan
  - -Complex Systems Certificate
  - -Political Science
  - -Philosophy

Gainfully Employed

- Research Scientist at Lockheed Martin
- Importer of Traditional Japanese Shoes
- Worked as consultant in AI
- Occasional Musician and Photographer

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Before you Begin Building a Model...

- Can it be done in NetLogo?
- Find Code to Steal
- Locate Sources of Help (Internet and Human)

Practical Guide to Building NetLogo Models

- Simplicity or Speed
- Planning Algorithms before Writing Them
- Reuse as much code as possible (but not more)
- Tons of Examples and Explanations

Exercises and Applications

- Students will build models to develop skill and comfort
- Guided contruction of a chosen model

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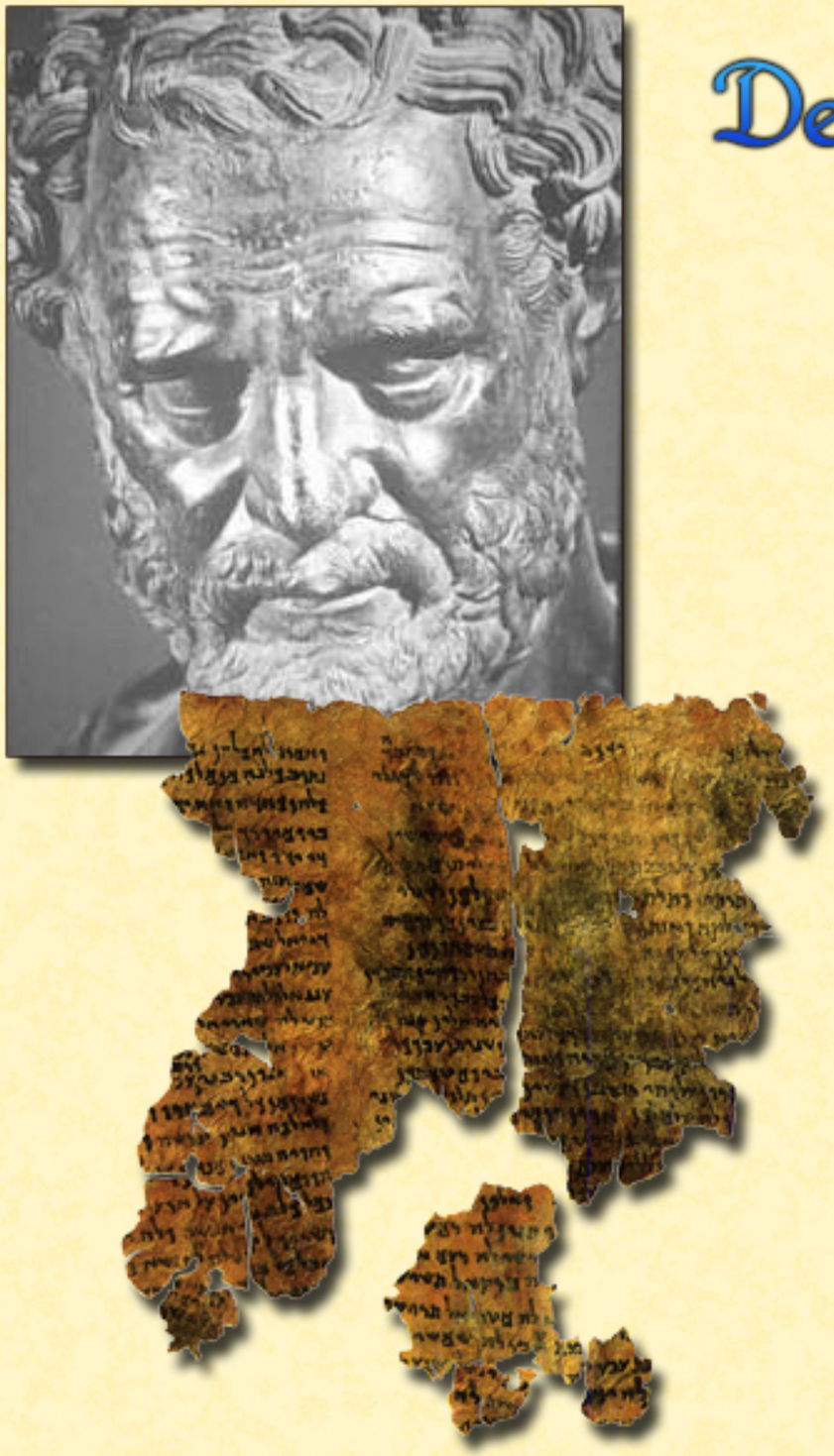
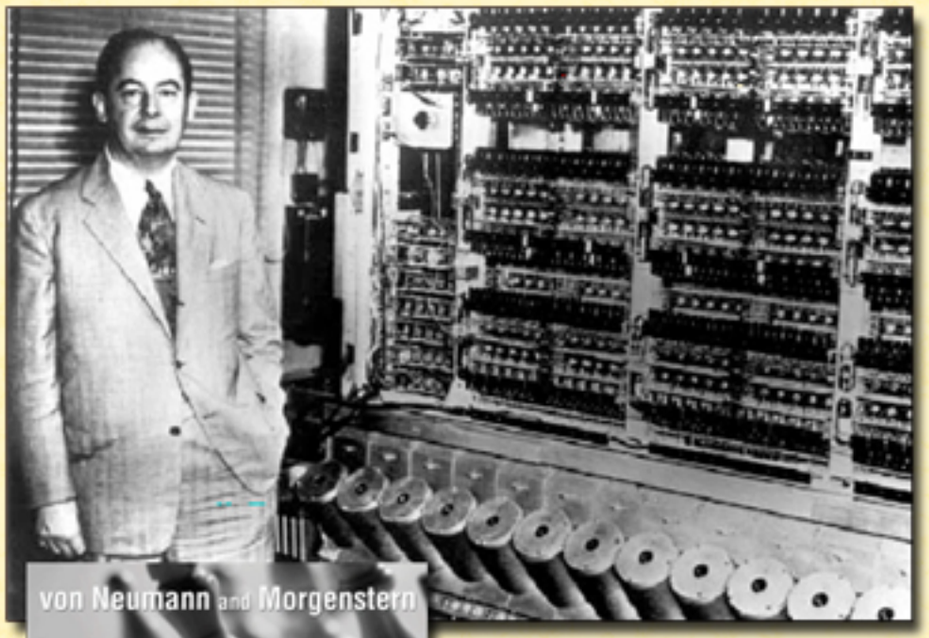
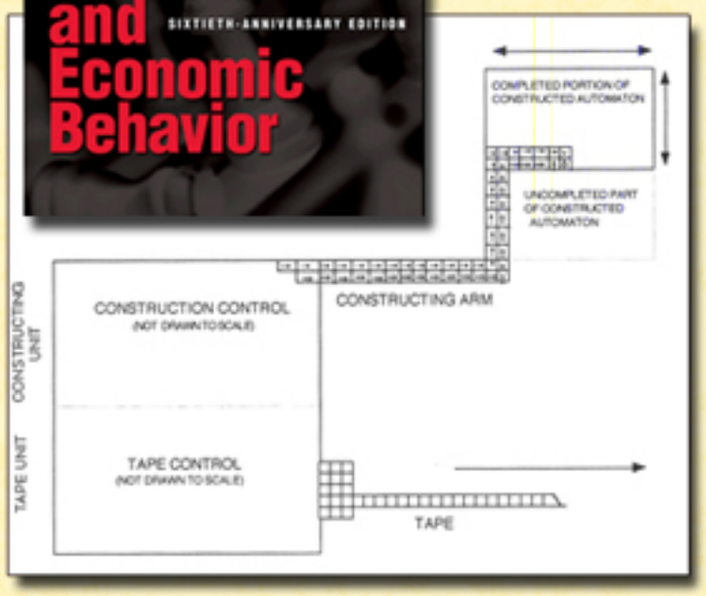


Democritus

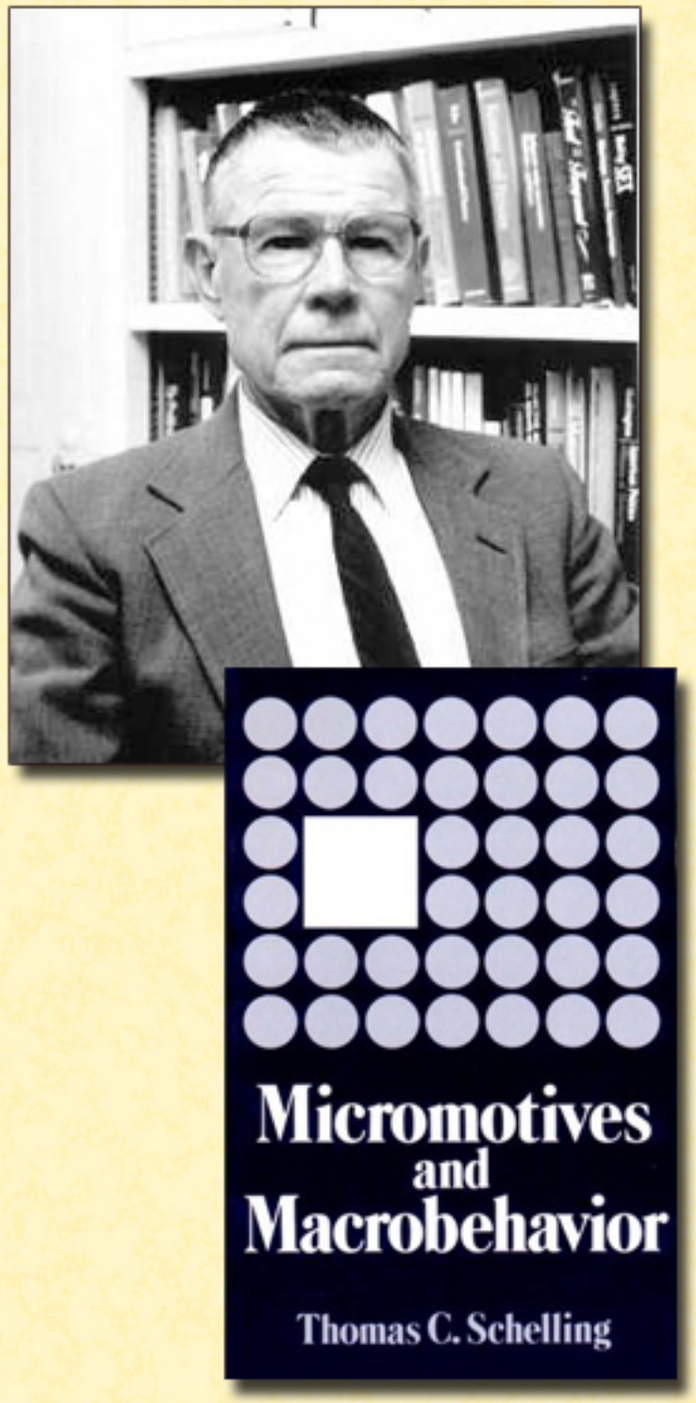
- Grandfather of Complex Systems
- Natural Philosopher 460-370 B.C.E.
- Co-Founder of Atomist Theory
- Very little first-hand work is known; most information is from second-hand accounts and may be bunk





John von Neumann

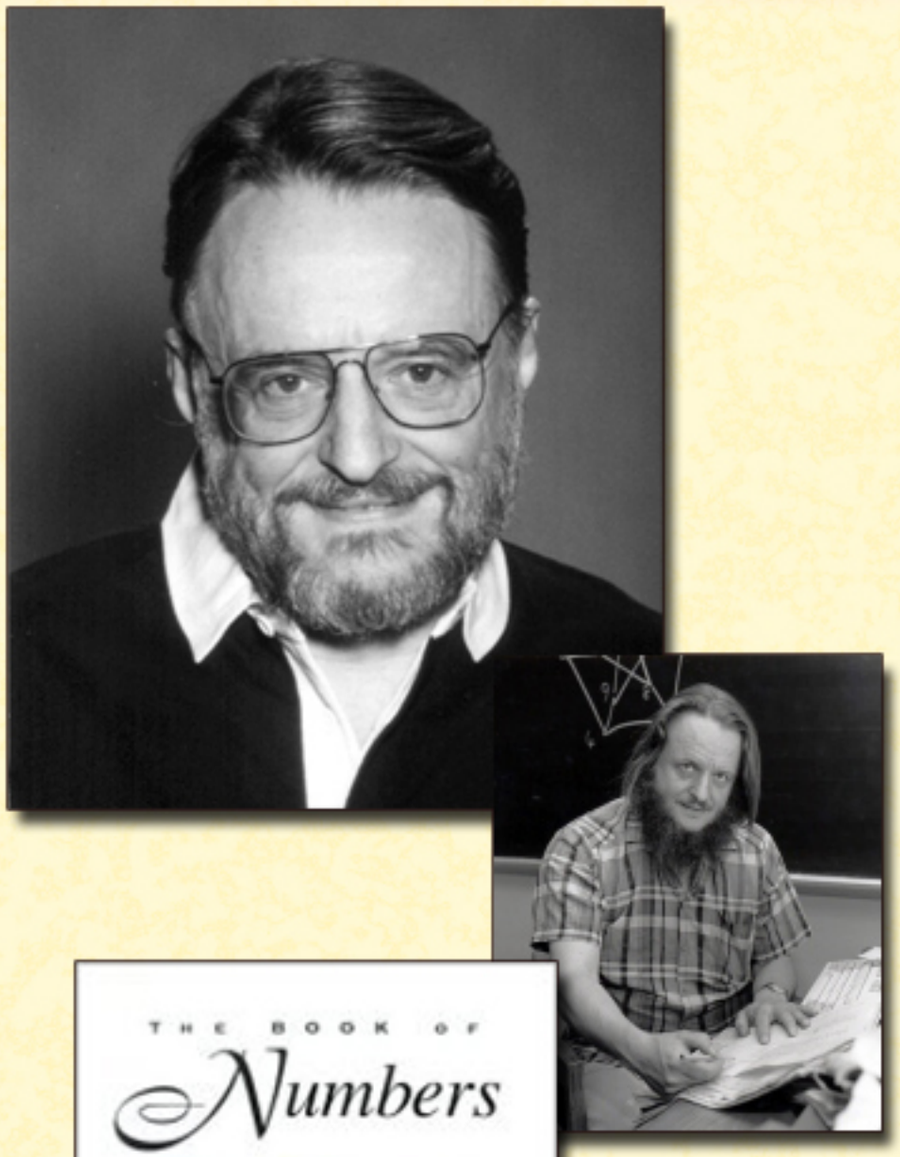
- Grandfather of Agent-Based Modeling
- Hungarian born Mathematician, 1903-1957 (died of cancer)
- Invented Game Theory
- Helped Develop Atomic Bomb
- Invented the Computer
- Invented Cellular Automata
- Figured out Godel's Incompleteness Theorem before Godel (but was nice)

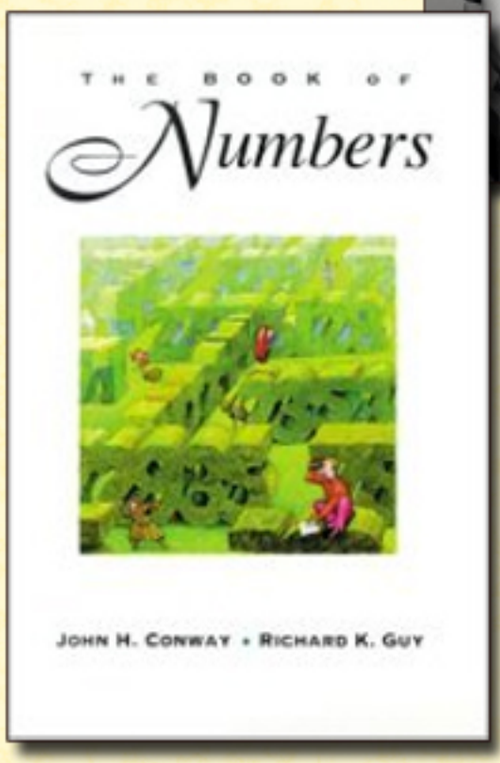


Thomas C. Schelling

- Father of Agent-Based Modeling
- 2005 Nobel Prize Winner in Economics for work in Game Theory
- Clearly explained and motivated bottoms-ups approach in his 1978 book *Micromotives and Macrobehavior*
- Famous Segregation (aka "Tipping") model is the first modern agent-based model

Show Model





John H. Conway

- Mathematician and early adopter
- Created cellular automata model called "The Game of Life"
- Provoked strong reactions and garnered interest in ABMs
- Complex behavior from simple rules

ShowModel