Studying randomness in nature.

Scott Hottovy
shottovy@math.arizona.edu

University of Arizona Program in Applied Mathematics

June 4, 2012

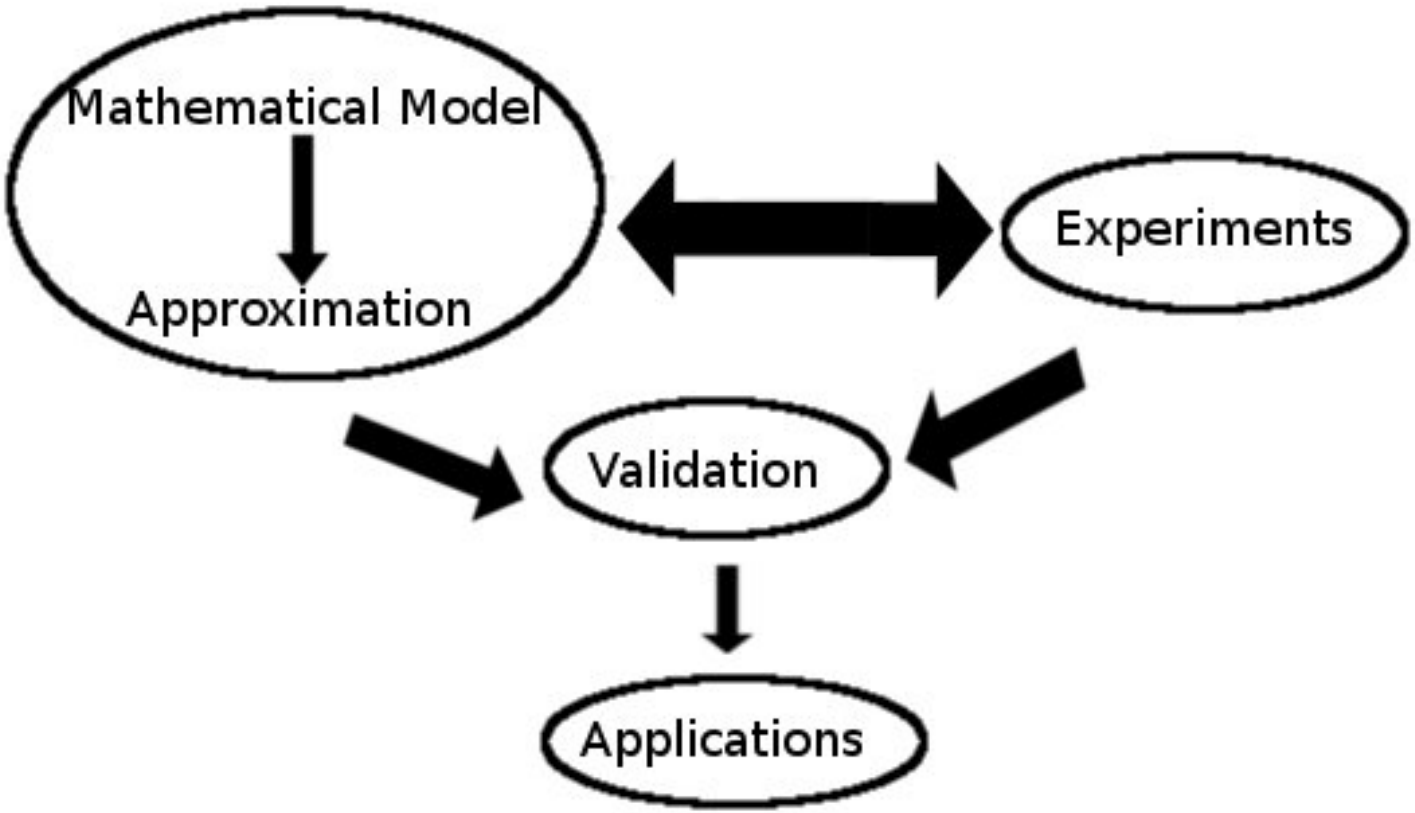
About me

- I grew up in Lincoln, NE.
- Best piece of advice given to me:

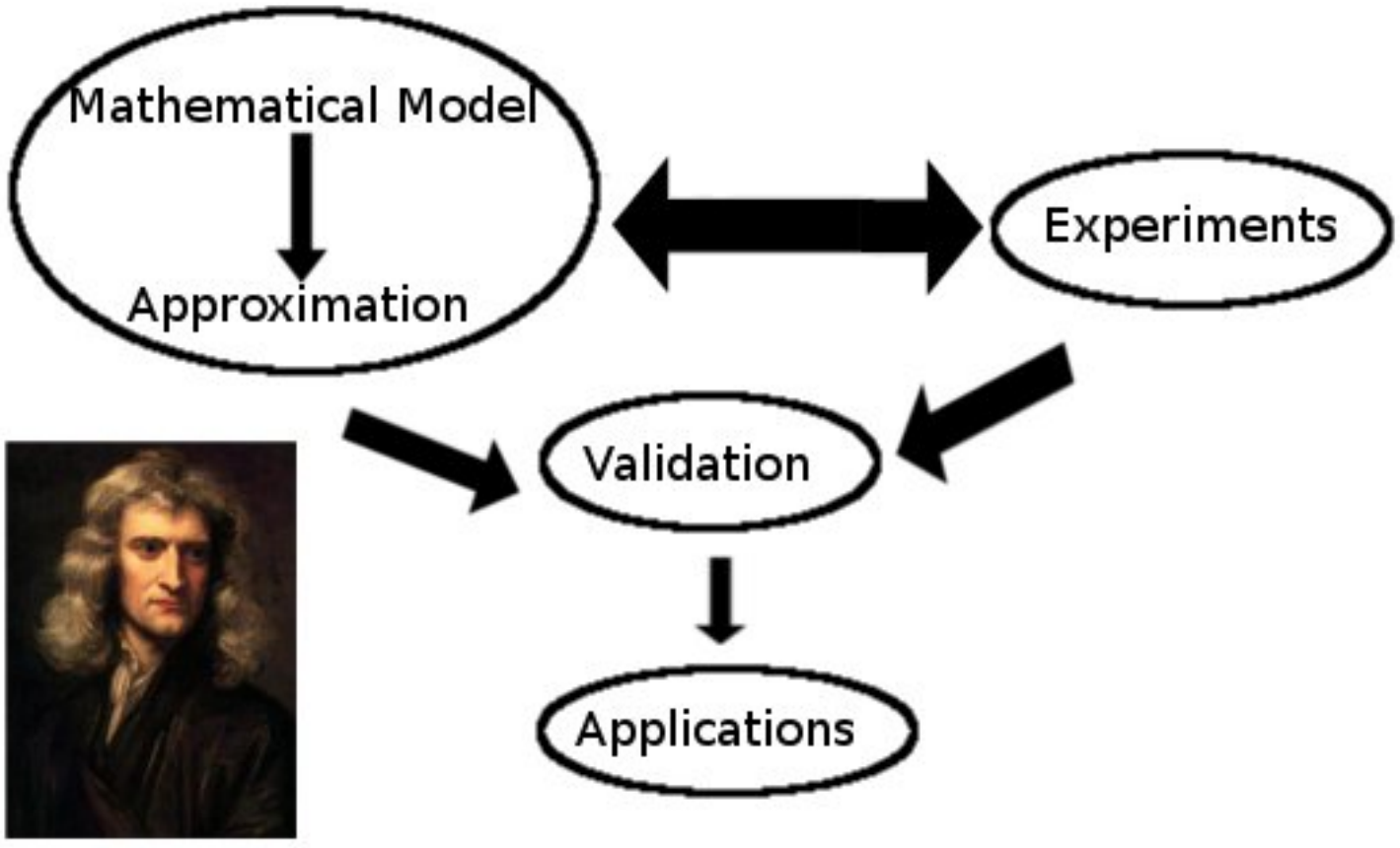
  "If you're not sure what branch of science to go into, go into mathematics and decide later." - Paul Crittenden (Now Assistant Professor of Mathematics at Jacksonville University)

- Bachelors of science in Mathematics from the University of Nebraska.
- Goals: To be a professor that researches and teaches material well for understanding, but also projects my enthusiasm for math and science as well as be an advocate.

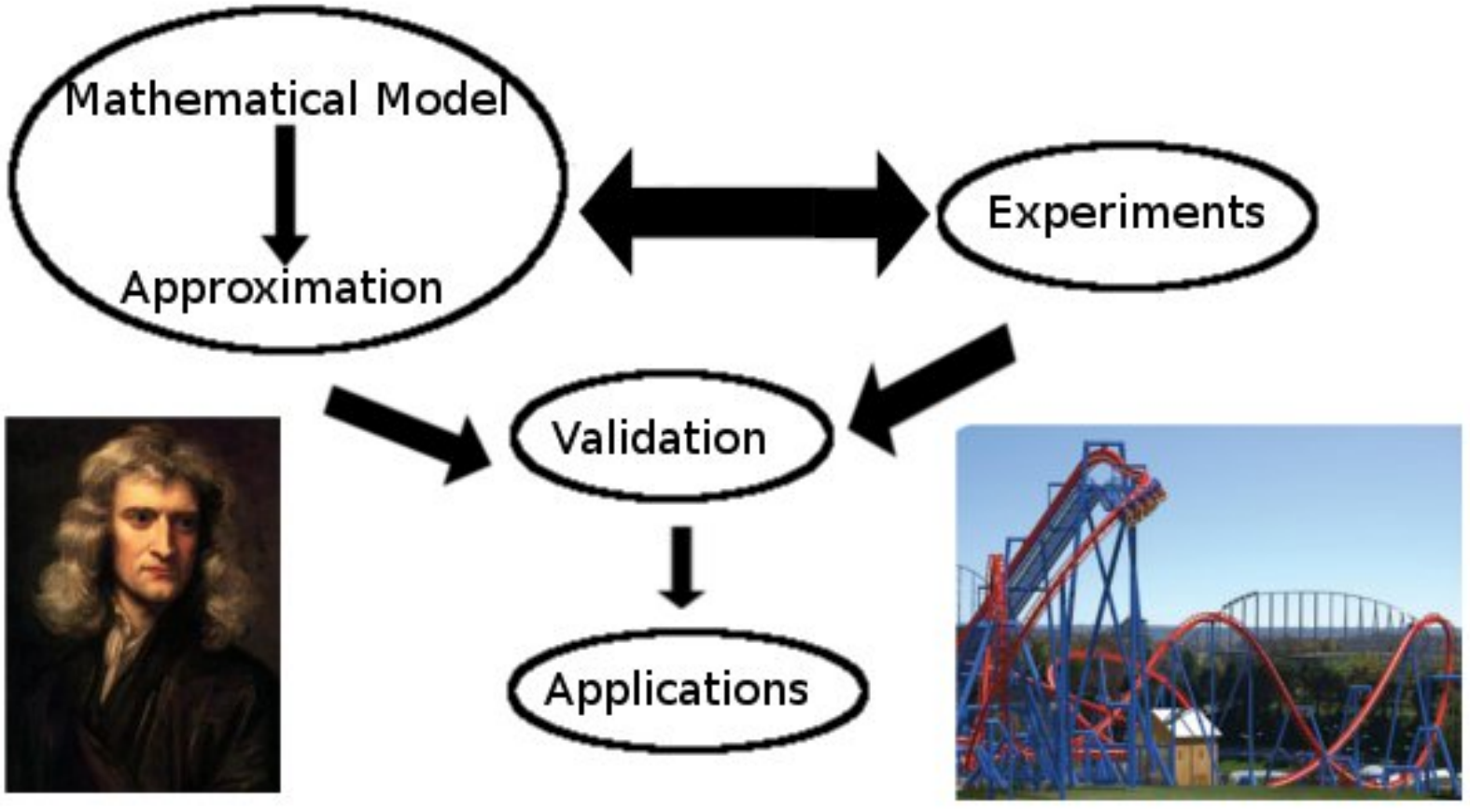
Modeling Physics



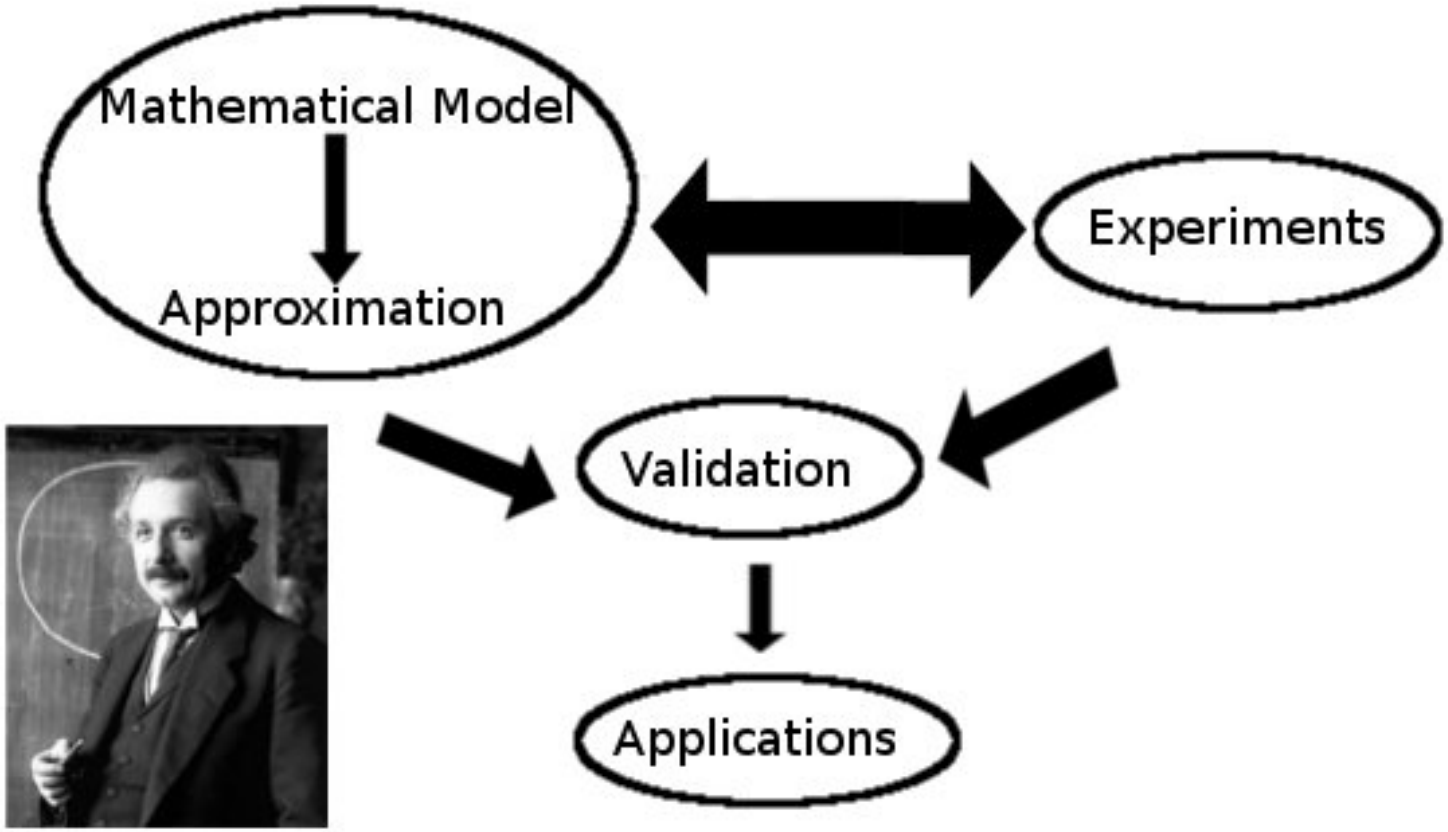
Modeling Physics



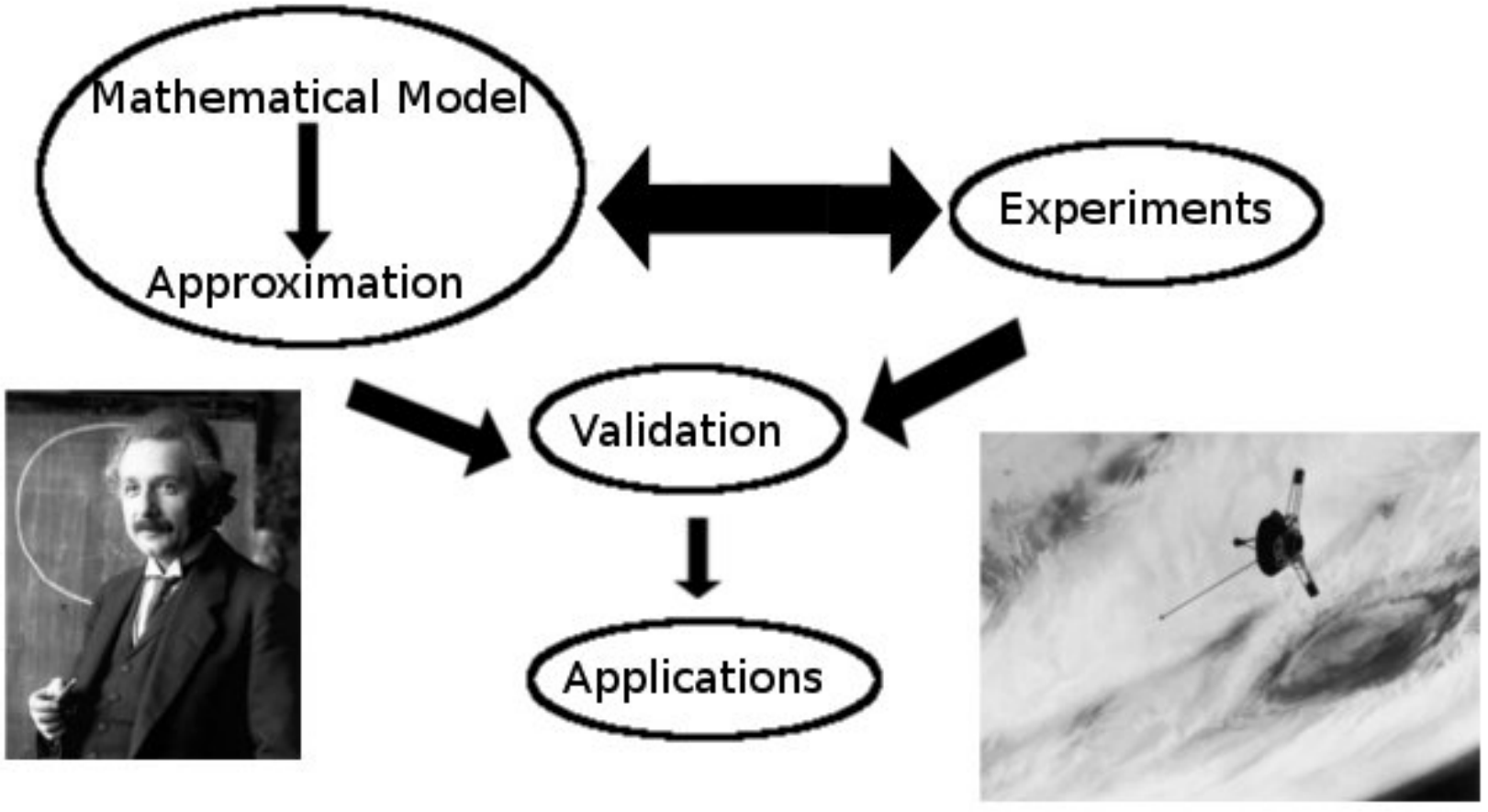
Modeling Physics



Modeling Physics

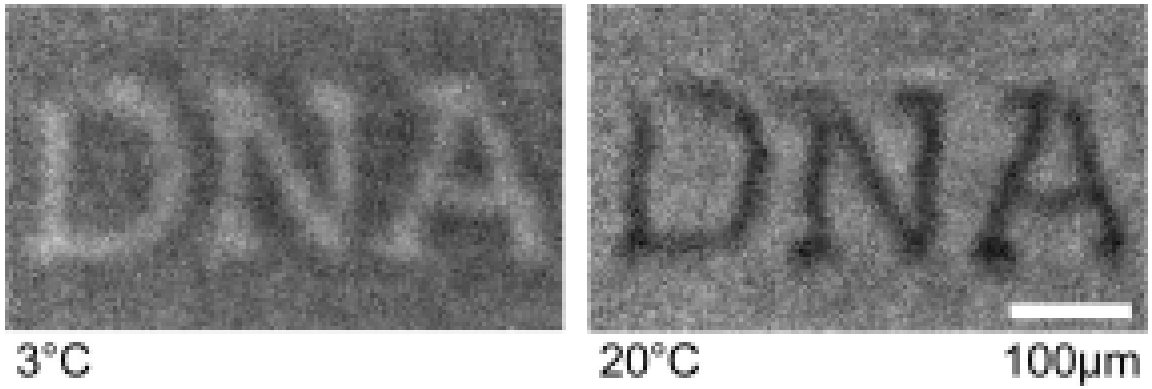


Modeling Physics



My problem

video
http://www.youtube.com/watch?v=Scykhj1V41s



Duhr and Braun PNAS (2006)

- 1,000 bp DNA, fluorescently tagged.
- Size of each DNA $\approx$ 50nm.
- The letters "DNA" heated with a laser by 2 K.
- DNA move into "DNA" when water temp is 20 C and out when 3 C.

- Want to systematically find small mass approximations
- Find other applications to these problems.
- Mathematically prove these results.
- These approximations are useful for small scale problems in biology (movement of viruses), physics (self assembly of small beads), and pharmaceuticals.