

Welcome to Physics 102

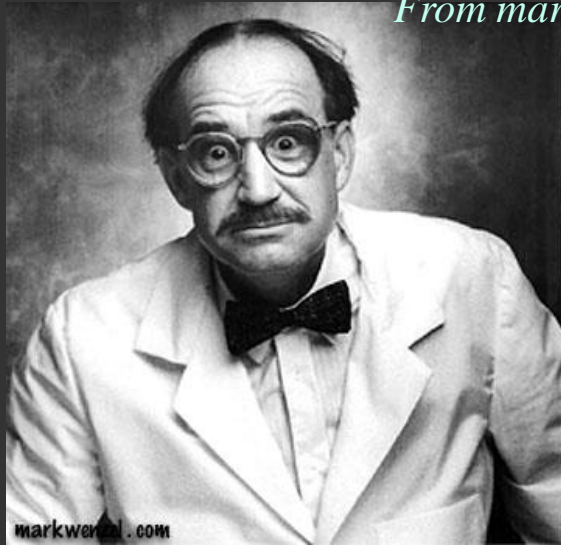
This class is a survey of our universe as seen by modern science and an exploration of concepts of a multiple universe reality. Physics 102 is designed for non-science majors. The course is conceptual and the use of mathematics will be limited.

- motion
 - String theory
 - Energy
 - Gravitation
 - Rotational motion
 - Waves
 - light
 - electricity and magnetism
 - nuclear forces
 - Standard Model of particle physics
 - The Big Bang
 - Dark matter
 - stellar evolution
 - Special Theory of Relativity
 - General Theory of Relativity
 - Quarks, leptons, gluons, baryons, mesons, etc.
 - cosmic microwave background
 - quantum mechanics
 - Heisenberg's Uncertainty Principle
 - radiation
 - nuclear bombs
 - **at least 11 different multiple universe concepts**
- No previous physics instruction is assumed.

**Physics 102 – Visions of the Multiverse
Spring term 2011, University of Rochester**

This is an introductory course designed especially for students in the humanities and other non-scientific fields who are interested in learning about science, physics and concepts of a multiple universe reality. Topics include the nature of science, Newton's laws, relativity, light, quantum mechanics, the nature of particles and forces, and cosmology. In the course of surveying the modern scientific view of the universe, a number of serious concepts of a multi-universe reality will be examined, including the many-worlds view of quantum mechanics, inflationary and string-based cosmologies. There are no prerequisites, no background knowledge is required and the material will be presented with very little mathematics. Substantial use will be made of demonstrations. This course is intended to be equivalent to our Physics 100 course in terms of satisfying cluster requirements.

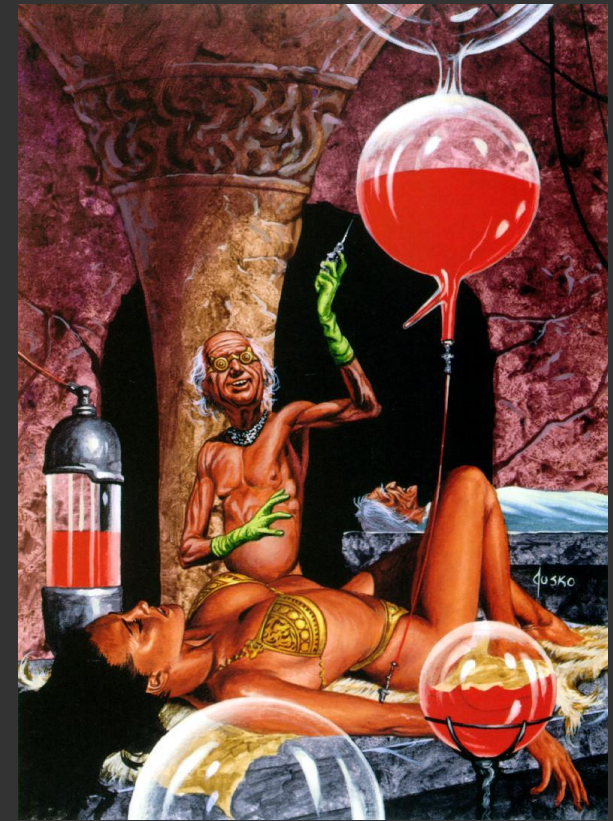
From markwenzel.com



The nature of science



From scientifica.eu

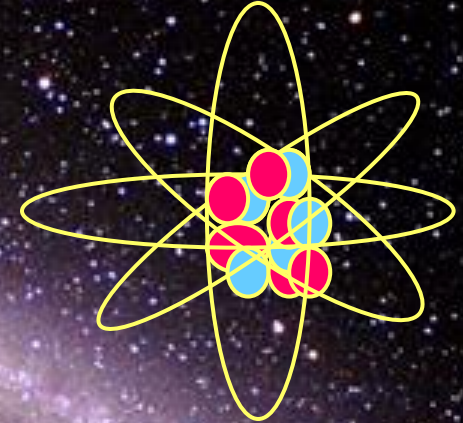


From theduogroup.com

From www.robertocampus.com



Confronting Human bias



**The intimate relationship
between the very big and the
very small**



J. Baum/SPL, from nature .com

**Concepts of the a multiple
universe reality**

Evaluation:

Scheme	Exam 1	Exam 2	Final exam	Recitation
1	---	25%	35%	40%
2	25%	---	35%	40%
3	17%	17%	26%	40%

Each scheme calculated, best average sets
your place on the numerical curve

Possible inter-exam normalization

I place grade boundaries on numerical curve

Reading, recitations, lecture

Note : no class this Monday

No recitations until I send class announcement
via email

Professor Steven Manly

B&L 203E

5-8473

steven.manly@rochester.edu

http://web.pas.rochester.edu/~manly/class/P102_2011S/

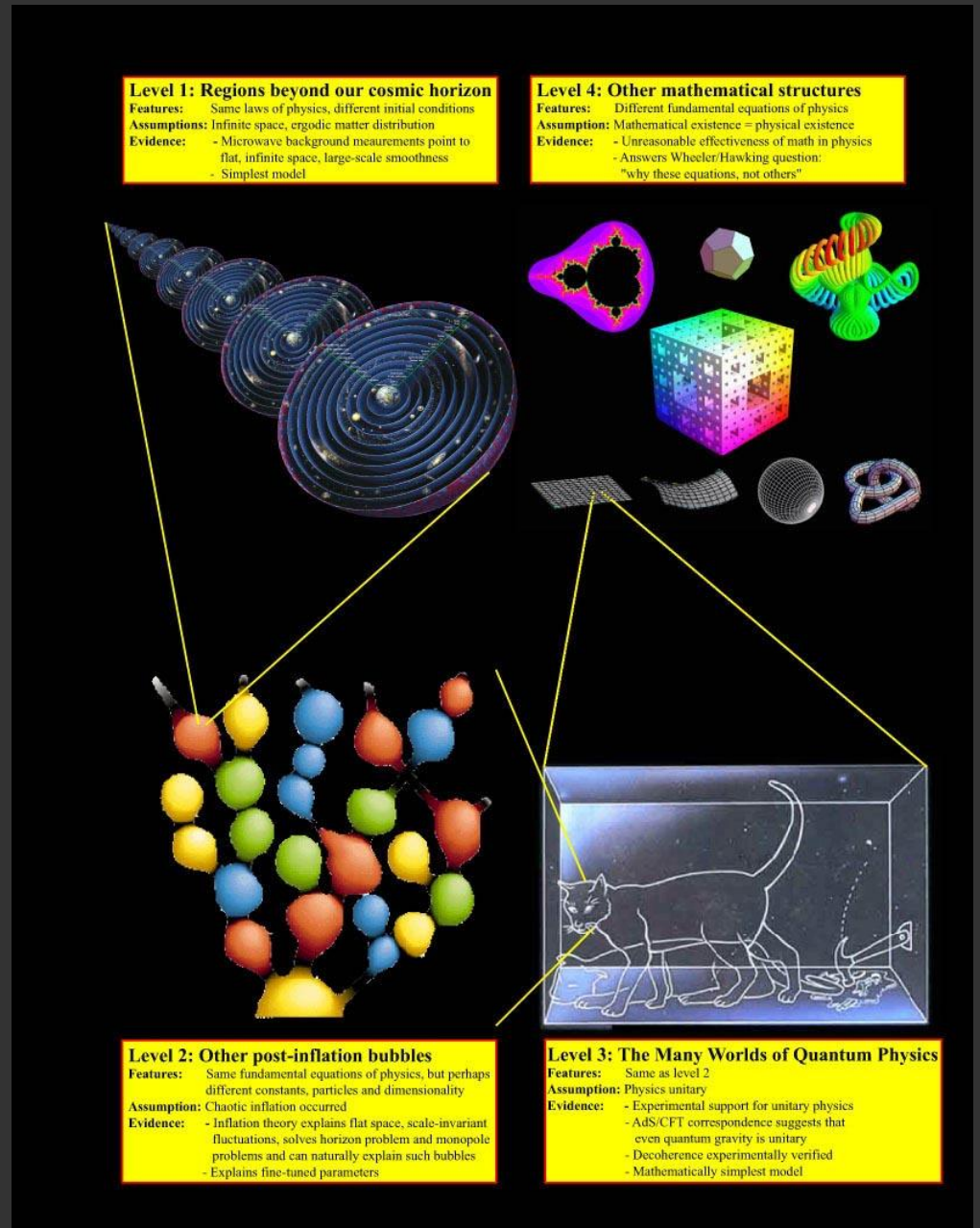
What is a universe?

Max Tegmark's multiverse taxonomy

Classified by level of abstraction/complexity

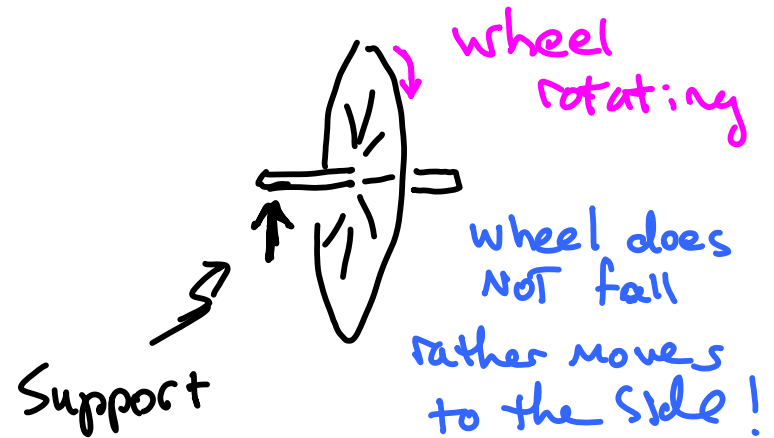
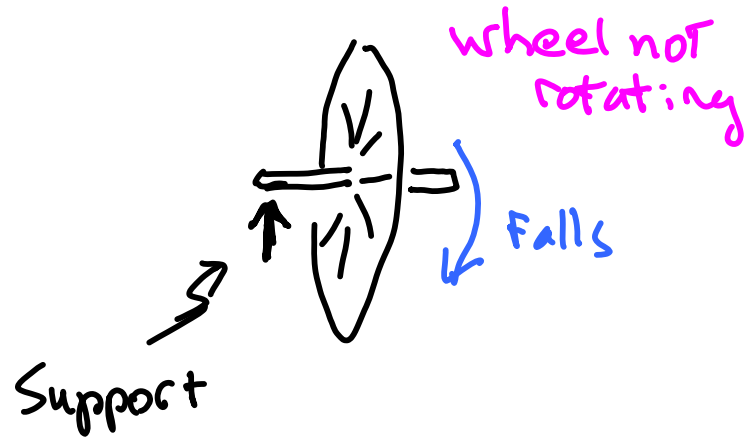


Cosmologist
at MIT



However if you do careful observations... even at "human" scales nature has some surprises

bicycle wheel demo



Surprise!