ANNOUNCEMENTS

- Homework 8, Reading Quiz 9:
  - Not due until Sunday at 11pm
- Next Quiz
  - Friday, in-class, starts at 9:00am
  - 25-minutes
- Office Hours Cancelled tomorrow
  - Dr. Tyson's Student Forum
- Special Anniversary today!

2011-12

SMU TATE LECTURE SERIES

30TH SEASON

Neil deGrasse Tyson

Neil deGrasse Tyson was born and raised in New York City where he was educated in the public schools clear through his graduation from the Bronx High School of Science. Tyson went on to earn his BA in Physics from Harvard and his PhD in Astrophysics from Columbia.

Tyson's professional research interests are broad, but include star formation, exploding stars, dwarf galaxies, and the structure of our Milky Way. Tyson obtains his data from the Hubble Space Telescope, as well as from telescopes in California, New Mexico, Arizona, and in the Andes Mountains of Chile.

In 2001, Tyson was appointed by President Bush to serve on a 12-member commission that studied the Future of the US Aerospace Industry. The final report was published in 2002 and contained recommendations (for Congress and for the major agencies of the

2011-2012 SEASON

- James A. Baker, III
- Katie Couric
- Dr. Robert M. Gates
- Fareed Zakaria
- David Gergen
- **Neil deGrasse Tyson**
- Dambisa Moyo
- Michael Pollan
- Walter Isaacson
- Charles Krauthammer
- Bill Moyers

Student Forum at 4:30 pm, tomorrow, Hughes-Trigg Ballroom!

Photo from the first Solvay Conference, 1911 (late October to early November)

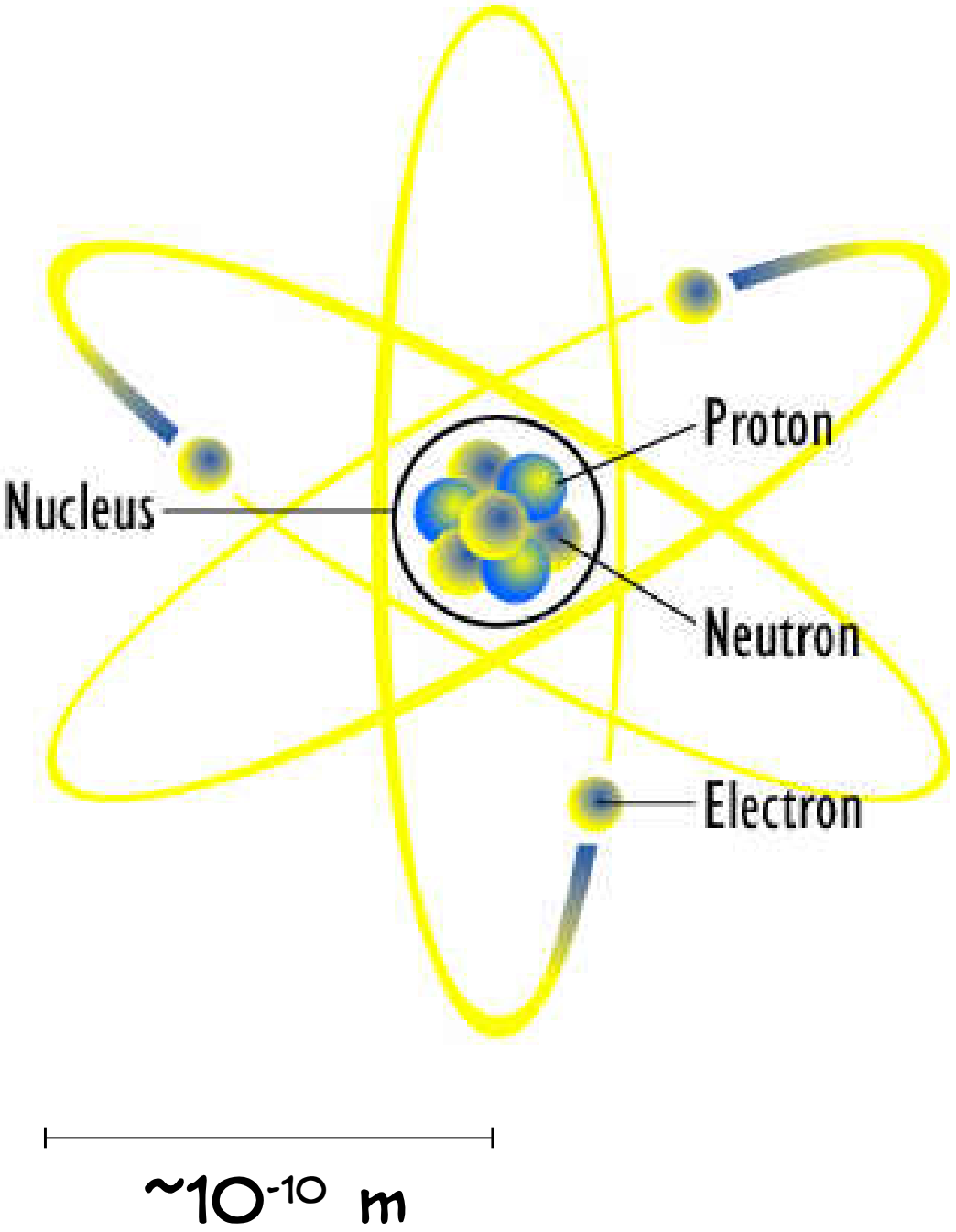
USING BIOT-SAVART: MODEL THE ATOM

Prof. Stephen Sekula

10/31/2011

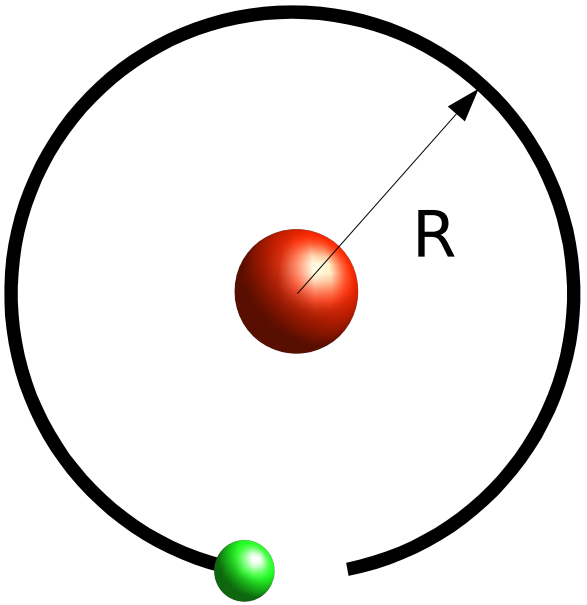
Supplementary Material for PHY1308 (General Physics - Electricity and Magnetism)

Bohr Model of the Atom (not to scale!)



- Introduced in 1913.
- Somewhat successful at explaining atomic properties.
- Replaced by full quantum mechanical model in 1920s.

Treat the atom like a "planetary system" - electrons in orbit around nucleus, maintained by electric force.



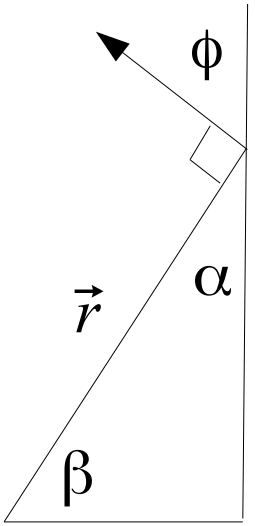
Electron: held in orbit by Coulomb Force

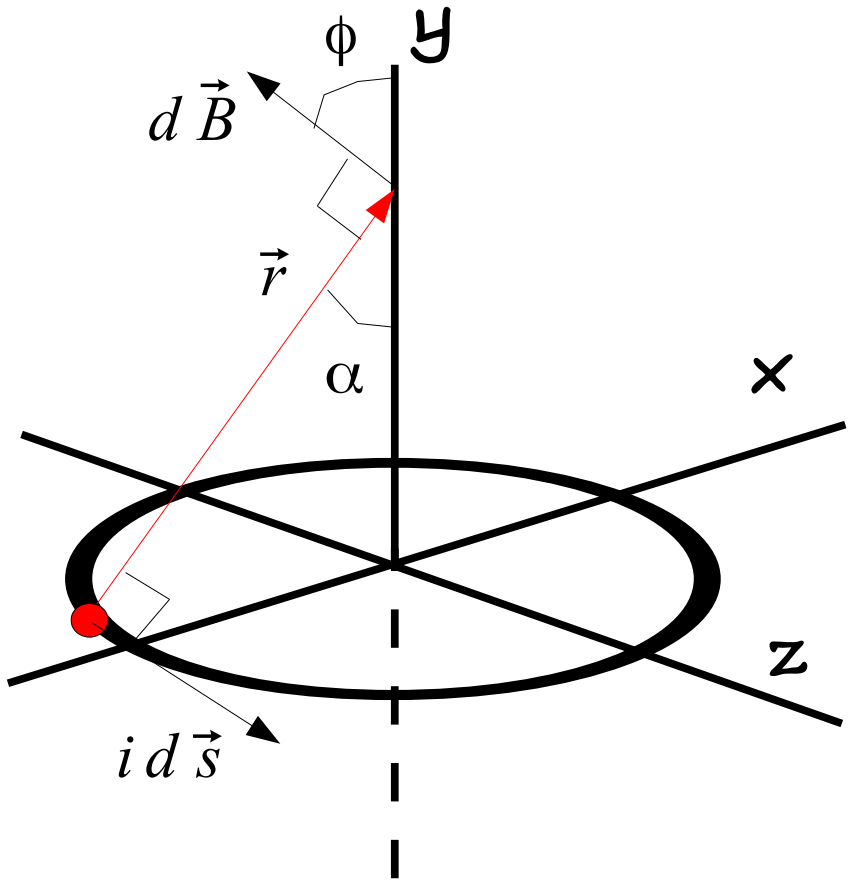
$$R = 1.0 \times 10^{-10}\,\mathrm{m}$$

$$m_e = 9.11 \times 10^{-31}\,\mathrm{kg}$$

$$|q_e| = |q_p| = 1.60 \times 10^{-19}\,\mathrm{C}$$

$$k = 8.99 \times 10^{9}\,\mathrm{N \cdot m^2/C^2}$$





TERRESTRIAL MAGNETISM

Refrigerator magnets:
~0.01 T

Rare earth magnets:
~0.5-1.0 T

So, the scale of terrestrial magnetism is about 1 T.