**General Chemistry 1114 Lab #1: Modeling Atomic Dimensions**

**Alfred State College Fall 2013**

**1.1 Purpose**

During the first week of lecture several `homespun’ analogies were used to illustrate the relative size of a typical atom’s nuclear radius versus its’ electronic radius. Metaphor and analogy are common tricks chemists use to get a meaningful `gut feel’ for the dimensions and magnitudes of molecular quantities since as human beings we have no direct, visceral experience with things at the atomic level.

Your mission (with your lab partner) in lab for the week of Sept 2 – September 6 is to present your own attempt to get a `human’ scale handle on these dimensions to your lab class. To make things simple, you can assume the following magnitudes:

**Typical Atomic Dimensions**

**Nuclear radius 1\*10-15 meters**

**Electron orbital radius 1\*10-10 meters**

**Absolute nuclear volume 4\*10-45 cubic meters Relative nuclear volume 1**

**Absolute electronic volume 4\*10-30 cubic meters Relative electronic volume 1\*1015**

**Absolute nuclear mass 2\*10-30 grams relative nuclear mass 1**

**Absolute electronic mass 1\*10-33 grams relative electronic mass 0.0005**

**The ground rules for this exercise are as follows:**

1. Use some kind of tactile or visual analogy that you can bring to lab and demonstrate. (Recall how your instructor did this in lecture and use that as a model for how you might proceed.)

Creativity is encouraged and expected.

1. Pick just one comparison of magnitudes, e.g. radius of electron orbit vs nuclear radius or

mass of electron vs mass of nucleus.

1. Be prepared to verify that the analogy you use *accurately* reflects the actual magnitude differences in the table above. This will likely require that you use the blackboard to `prove’ your case.
2. Spend no more than 5-8 minutes illustrating your analogy.

A laptop and projector capable of displaying whatever you might want to show (e.g. Powerpoint) will be available, so you can bring in a presentation on a flash drive and upload it for your show.

It should go without saying (but I’ll say it) that you should come to lab prepared with a analogy and demonstration comparing atomic magnitudes. **If you are clearly unprepared, you will receive a 0 (zero) for this lab.**

Finally, have fun with this. Stretch your imagination , use humor and knowledge drawn from your own personal backgrounds if you can, to make your point.