

Welcome to the Physics portion of the Science Contest for the 2014-2015 season!

The structure of the Physics portion of the contest will be the same as used last season. With the directed reading questions appearing first and then the remaining questions appearing in roughly standard textbook order. As always I will strive to have problems on each contest that go from basic knowledge and/or simple calculations to more specialized knowledge and complex calculations (now including Calculus). As we progress through the contest season the average level of difficulty of the questions on each contest will increase. I will utilize several different types of problems on the contests that will test for knowledge of definitions and concepts, as well as test for ability to perform calculations and symbolic manipulations. The quantity of these various types of questions will fluctuate on each contest and will be used to increase the level of difficulty of the contests throughout the season. Again the number of answer options will not be restricted to just 5! This will allow questions where the answer options are greater than, equal to, or less than a particular quantity. Also as with last season numeric answers will not need to be separated by $\pm 5\%$. This will allow for additional wrong answers that follow from common mistakes to be included as answer choices. On the Physics portion of the contest there will be no restriction on the topics that can be asked. This will allow problems that require Calculus, phasor techniques for reactive ac circuits, or vector operations expressed in unit vector notation to be asked on the contests. I plan to include a few questions that require Calculus throughout the contests this season. This will better model the introductory Physics classes taken by science majors at most universities, and will also serve to help differentiate the scores for the top students.

This year the directed reading will be from the book *The Pluto Files* by Neil deGrasse Tyson. This text was selected due to the somewhat recent International Astronomical Union (IAU) definition of a planet http://en.wikipedia.org/wiki/IAU_definition_of_planet. The questions for each contest will be based on the chapters of the book as follows:

Invitational A & B:

Chapter 1: Pluto in Culture

Chapter 2: Pluto in History

District 1 & 2:

Chapter 3: Pluto in Science

Chapter 4: Pluto's Fall from Grace

Regional:

Chapter 5: Pluto Divides the Nation

Chapter 6: Pluto's Judgment Day

State:

Chapter 7: Pluto the Dwarf Planet

Chapter 8: Pluto in the Elementary School Classroom

Chapter 9: Plutologue

Good luck with the studying and I hope to see you at the state meet this year.

Dr. James Friedrichsen