

# PHYSICS GRADs vs. PROFs CHALLENGE

For Physics Block Party on 11 September 2015:

## ***ROUND 1:***

This round has short answers of one-or-two words. The panelists are to just speak the answer out loudly, with the points going to the first person on either side to state the answer correctly. I instruct the audience to keep quiet, as your time will come later. The first correct answer is worth +2 points.

- (1) (2 points) What *branch of physics* is the specialty of the 'Bond Girl' Christmas Jones?
- (2) (2 points) Who was named as the Person of the Century by Time magazine in 2000?
- (3) (2 points) Suppose that we have a simple pendulum 10 meters long and give it a small push. To within 10%, what is its period of oscillation?
- (4) (2 points) What is the only element in the Periodic Table that is pronounced as six syllables?
- (5) (2 points) The very popular television show Bonanza, set in Silver City Nevada around the 1870s had one episode covering the early life of what famous US physicist?
- (6) (2 points) How many editions has the book Classical Electrodynamics by Jackson gone through?
- (7) (2 points) What physicist has won the Nobel Peace Prize?
- (8) (2 points) Who is the other physicist that has won the Nobel Peace Prize?
- (9) (2 points) What movie had Kip Thorne as a scientific consultant and executive producer?
- (10) (2 points) Here, I am wanting the exponent of a dimensionless number, that is the nearest power of ten to within one order of magnitude. How many electrons are there in my brain?
- (11) (2 points) Which signer of the US Declaration of Independence was known in Europe primarily as a physicist?
- (12) (2 points) For the current semester, what professor is teaching PHYS 7398?
- (13) (2 points) What is the element in the Periodic Table that is immediately after Uranium?
- (14) (2 points) What is the element in the Periodic Table that is immediately after Neptunium?
- (15) (2 points) How many planets are displayed on the Physics Department logo?

## **ROUND 2:**

For this round, both teams are to consult together, write out their answers on a page, and then reveal their answers together. Each correct answer is worth 3 points.

- (15) (3 points) To within two orders of magnitude, what is the Schwarzschild radius for an electron?
- (16) (3 points) Reportedly, Lady Stacy Bright made a fabulous and unexpected discovery that earned her the Nobel Prize in Physics in the year 2058. What was that discovery?
- (17) (3 points) What is the critical mass for U-235? (Here, I'm looking for the critical mass with no tamper for a spherical shape at normal density with no moderator.)
- (18) (3 points) This Cadbury Easter Egg has 150 calories. If you are 100 kilograms in mass, how high would you have to climb to work off these calories?
- (19) (3 points) Riddle-me-this:  
Newton used me to make attractive bodies  
Newton also used me to make opposing forces  
And in Lenz's Law, I make the currents run counter  
In the Laws of Physics, I am the smallest part

### **ROUND 3:**

For the third round, I will give a series of questions, often related, and I will alternate back and forth between teams. Each correct answer is worth +4 points.

For the third round, we will have 3 'lifelines', where a panel can try to get further help; **(1)** getting the audience to shout out answers for them, or **(2)** by explicitly asking one person in the audience, with this person being instructed to give their best possible answer, or **(3)** by asking for a hint from me. Each team gets to use each type of lifeline just once.

\*\*\* **(4 points each)** Name a physicist who has won \*TWO\* Nobel Prizes. (Three answers.)

\*\*\* **(4 points)** Xiaoyao Ma just earned his PhD in Physics in our Department. What was his thesis topic?

\*\*\* **(4 points)** Who was his advisor?

\*\*\* **(4 points)** Out of all the planets, dwarf planets, the Sun, and our Moon inside out Solar System, which one does not have an element named after it?

\*\*\* **(4 points)** What exoplanet has the same name as an element?

\*\*\* **(4 points)** Our department has an active group working on the Pierre Auger Observatory in Argentina, for detecting the very highest energy cosmic rays. But what is the Auger Effect?

\*\*\* **(4 points)** In the famous Alpher-Bethe-and-Gamow paper of 1948, who was the third person gratuitously added?

\*\*\* **(4 points)** What was the subject of the  $\alpha$ - $\beta$ - $\gamma$  paper?

\*\*\* **(4 points)** What is the largest European nation to not have an element named after it?