Predictions of upcoming winners for Nobel Prize in physics

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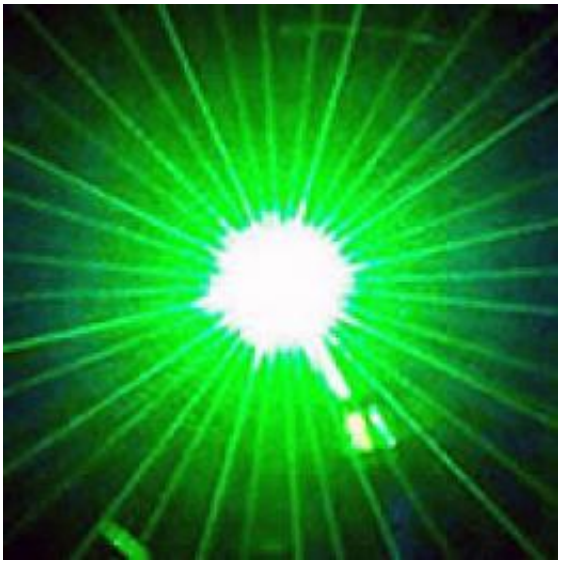

The announcement of the winners of the next Nobel Prize in Physics on Tuesday morning will bring to an end the very private deliberations within the Swedish Academy, which selects the winner. It will also end the rampant public speculation about who will win the prize -- at least until next year.

In anticipation of that announcement, generally recognized as the highest achievement in the field of physics, the American Institute of Physics conducted a poll last week to tap into some of the speculation about who

ought to win.

Posted to several websites frequented by physicists, the anonymous poll asked respondents to choose which noteworthy discovery in physics was likely to win the next prize. The list included 15 Nobel-worthy topics, along with the names of scientists associated with those topics. Respondents were also able to write in a discovery that was not on the list.

While the results are not scientific, they are revealing. Of the 320 people casting votes, most voted for experimental rather than for theoretical work.

The top discoveries were as follows:

• **For the development of the LED laser**, Nick Holonyak; Shuji Nakamura, blue laser; Robert Hall, first semiconductor laser. These technical developments all have had enormous practical value. LED lasers, for instance, are mounted in most grocery scanners and CD players. (15.9% of the vote).

• **For studies of weird quantum properties, such as nonlocality, entanglement, decoherence, and atom optics** (Alan Aspect, Serge Harouche, Anton Zeilinger, Charles Bennett, Anton Zurek, David Pritchard, Joerg Schmiedmayer, David Wineland, Peter Zoller). Experiments by these scientists tend to uphold all the counter-intuitive predictions of quantum mechanics, such as the idea that an atom can be in two places at the same time. (11.6% of the vote).

• **For discovering graphene** (Andre Geim and Kostya Novoselov). Discovered only a few years ago, graphene is a form of carbon consisting of one-atom-thick sheets. Already the subject is one of the most active in all of condensed matter physics because of graphene's

properties, such as its high conductivity and its great mechanical strength. Many scientists expect graphene to play a large role in electronics. (11.3% of the vote).

• **For discovering and developing carbon nanotubes** (Sumio Iijima, Cees Dekker, Phaeton Avouris, Charles Lieber, Thomas Ebbeson). Still another form of carbon list makes it onto the list. Carbon nanotubes are soda-straw-shaped tubes of carbon, sometimes only a billionth of a meter wide and a few thousandths of a meter in length. Like their flat-sheet cousin graphene, they too have useful properties. Carbon nanotubes can be made to be conducting of electricity or semi-conducting, and are excellent conductors of heat. They too are strong and might one day be used to make components for electrical devices. (10% of the vote).

• **For predicting, discovering, and developing negative-index metamaterials** (Victor Veselago, John Pendry, David Smith, Xiang Zhang, Sheldon Schultz, Ulf Leonhardt). Metamaterials are often structured from tiny components, such as tiny rings and rods. They produce novel optical effects. They are expected to find applications as lenses, in microscopy, and even in rendering some objects invisible, a process called “cloaking.” (8.8% of the vote).

• **For developing chaos theory** (Mitch Feigenbaum, Edward Ott, James Yorke, Celso Grebogi, Harry Swinney, Benoit Mandelbrot). Chaos is the science that describes how our knowledge of some systems in nature quickly degrades. The weather is a classic example of a chaotic system. Even when we measure atmospheric conditions accuracy in many places, our ability to predict future weather remains poor. (8.4% of the vote).

• **For discovering and developing photonic crystals** (Eli Yablonovitch, Shawn Lin, John Joannopoulis). A photonic crystal is to optics what a semiconductor is to electronics. A photonic crystal allows only light of certain energies to propagate. (5.9% of the vote).

• **For detecting the accelerating cosmic expansion** (Adam Riess, Saul Perlmutter, Brian Schmitt). Measurements of distant supernovas has led astronomers to believe that the cosmic expansion of the universe is not slowing or reversing, but actually accelerating. (5.6% of the vote).

• **For discovering extrasolar planets** (Alexsander Wolszczan, Dale Frail, Paul Butler, Geoffrey Marcy, Michael Mayor, Didier Queloz, David Lathan). The development of a supremely sensitive form of spectroscopy allowed astronomers to detect (at first indirectly and later directly) the presence of planets around nearby stars. (4.7% of the vote).

• **For the discovery of the top quark** (Paul Grannis, Mel Schocket, William Carruthers). Nobels have been awarded for the discoveries of some other quarks, so why not also the top? (4.4% of the vote).

More information: View Poll Results Here: www.surveymonkey.com/sr.aspx?s … 2zxA8K63ESQDnPbeI_3d

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