

# **“Celebrating Science With Silliness: The 2016 Ig Nobel Prizes”** **Excerpt Transcript**

*Excerpt from November 25, 2016 episode of Science Friday.*

The Ig Nobel Awards are organized into a playlist, so each track has it’s own page in this document.

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## Ig Nobel Awards (Introduction)

**IRA FLATOW:** Here at Science Friday, the day after Thanksgiving is a special kind of holiday tradition-- highlights from this year's Ig Nobel awards ceremony. The awards are handed out each year by the editors of the science humor magazine, the Annals of Improbable Research, for work in science that first makes you laugh, and then makes you think. Like studying which insects are ouchiest when they sting you, or why a ponytail on a jogger sways the way it does. Think about it. This year's celebration is the 26th First Annual Awards. And the theme for this year is time. You'll hear the audience cheer whenever that word is mentioned. There's a lecture about different aspects of time.

So mark your calendars, set your watches, flip over your hourglass, and let us take you back to earlier this year at Harvard's Sanders Theater where the dignitaries and Ig-nitaries are taking the stage.

**KAREN HOPKIN:** May I introduce our Master of Ceremonies, the Editor of the Annals of Improbable Research, Chief Airhead Marc Abrahams.

**MARC ABRAHAMS:** We are gathered here tonight to honor some remarkable individuals and groups. Every winner has done something that first makes people laugh, then makes people think. The editors of the Annals of Improbable Research have chosen a theme for this year's ceremony, and that theme is time.

Tonight 10 prizes will be given. The achievements speak for themselves all too eloquently. And now let's get it over with. Ladies and gentlemen, the awarding of the 2016 Ig Nobel Prizes. We are giving out 10 prizes. The winners come from many nations. This year's winners have truly earned their prizes. Karen, tell them what they've won.

**KAREN:** Well, this year, each winner will receive---an Ig Nobel prize.

**MARC:** Ooh. What else?

**KAREN:** Uh, a piece of paper saying they've won an Ig Nobel prize.---Oh, it's signed by several Nobel laureates.

**MARC:** Do they get any money?

**KAREN:** Funny you should ask. Each winner will receive 10 trillion dollars.

**MARC:** 10 trillion dollars?

**KAREN:** 10 trillion dollars.

**MARC:** US dollars?

**KAREN:** No. Zimbabwean dollars. A Zimbabwean 10 trillion dollar bill.

**MARC:** That's all?

**KAREN:** That's it.

**MARC:** OK. How nice. Thank you, Karen. Ladies and gentlemen, this-- this is the Ig Nobel Prize. Now, as you can see, this year's prize is a traditional round clock in which the minute hand and the hour hand have each been replaced with a miniature hourglass filled with sand.

## Ig Nobel Awards (What is a Leap Second? How Do We Get It?)

**MARC:** Each year at this ceremony we present a new musical treat, a mini opera. This happens every year like clockwork. What doesn't happen every year is an adjustment to that clockwork-- a very small adjustment to that clockwork, a one second-long adjustment. It's called a leap second.

Here to explain what a leap second is and why scientists sometimes create a leap second is Harvard Physics Professor Jenny Hoffman. And while she's coming over, I want to mention you should please excuse Professor Hoffman if she seems a little out of breath. She's a long distance runner who last week won the USA National Championship 24-Hour Run by running 142 miles using each and every one of that day's 86,400 seconds.

Here's Professor Hoffman.

**JENNY HOFFMAN:** Thank you. Well, we all know that one earth day is the time it takes for the earth to rotate once around its own axis with respect to the sun. With 60 seconds per minute, 60 minutes per hour, and 24 hours per day, one earth second should simply be one part in 86,400 of a day. But the situation is not so simple, because the length of one earth day varies periodically by up to 20 seconds during the year due to the ellipticity of the earth's orbit and the tilt of its axis.

So the atomic physicists decided to tidy things up in 1958 by redefining "one second" as 9,192,631,770 hyperfine oscillations of a cesium atom, a so-called chronometer that is accurate to one second in 300 million years. But, for all its accuracy, we now have an even bigger problem-- the rotation period of the earth varies randomly on an even longer time scale due to tides, weather, motion of the earth's crust, and other unpredictable factors.

The Earth's rotation has slowed down since the cesium definition in 1958, so an average earth day is now longer than 86,400 cesium seconds. Radio broadcasts and cellular phones are all synchronized to cesium seconds, which will eventually drift away from the earth day. So without intervention, your favorite evening TV show could eventually be taking place in the middle of your work day.

Luckily, scientists are carefully tracking the earth's rotational speed so they can step in to insert an extra leap second whenever needed. Typically, once every few years. Since the definition of the cesium second, 26 leap seconds have been inserted, and the next one is due at midnight on December 31, 2016. So you all can look forward to one extra second to enjoy your New Year's Eve beverages.

**MARC:** When our clocks and our planet get more than a little out of sync, scientists decide to add a leap second. You know that now. How, though, do they make that decision? And how on earth do they create a leap second? One of those very scientists will explain it to us briefly. Please welcome the leader of the Time and Frequency Services Group of the Physical Measurement Laboratory of the National Institute of Standards and Technology, John Lowe.

**JOHN LOWE:** Thank you. Thank you very much. Yes, I am a time scientist. So let me prepare. I'm a metrologist. Specifically-- no, nothing about weather-- I measure things. How much is a kilogram? How long is a meter? How bright is the light?

More specifically. I am a horologist. No, not with a W. H-O-R-ologist. I measure time. How long--how long is a second? The accumulation of that, what time of day it is.

The International Earth Rotation Service has astronomers from around the world that constantly observe our true position. And when they decide it is time they add a leap second. A horologist, that's me, are the ones that implement this.

Now let me explain to you how we do this in great detail. Imagine, if you will, it is the 23 hour, universal coordinated time on the day of a leap second. It is the 59 minute, the 55 second, 56, 57, 58, 59, 60, 0, 1, 2. See what I did there? I just threw an extra second in.

Thank you for having me. No, wait, wait, wait. There's more to it.

By definition, the second is defined by-- as was explained to you earlier-- the atomic clock. Now, if we had decided that the atomic clock had a few more Hertz in its definition, we would actually have leap seconds that are negative. So far, we have only had positive leap seconds.

Let me explain, in great detail, how we would handle a negative lead second. I imagine, if you will, it is the 23 hour, universal coordinated time--the 59 minute, 55 second, 56, 57, 58, 0, 1, 2, 3. That's how we do.

## Ig Nobel Prize- Perception

**MARC:** The Perception Prize.

[TRUMPET BEING PLAYED POORLY]

The winners are from Japan. The Ig Nobel Prize for Perception is awarded to Atsuki Higashiyama and Kohei Adachi for investigating whether things look different when you bend over and view them between your legs.

Please welcome Atsuki Higashiyama.

**ATSUKI HIGASHIYAMA:** Yes. Good evening. First to I want to show the demonstration by myself.

In my paper awarded, we study the perceived size and the perceived distance of an object when the viewer is inverted, like peering through legs. When looking at an object from this inverted position, that depths between the objects appear more shrunk, and the objects themselves appear smaller compared to normal, upright posture. OK?

**MARC:** OK, thank you. Please don't forget to collect your 10 trillion dollar bill from the Nobel Laureates.

And now, having seen a professional scientist do it, if anybody here would like to stage your own personal demonstration of this, if you're seated near an aisle, can get to the aisle easily, please stand in the aisle and as safely as possible, perform your demonstration.

## Ig Nobel Prize- Reproduction

**MARC:** Now it's time.  
[CHEERING]

The Reproduction Prize.  
[TRUMPET BEING PLAYED POORLY]

The winner is from Egypt. The Ig Nobel Prize for Reproduction is awarded to the late Ahmed Shafik for studying the effects of wearing polyester, cotton, or wool trousers on the sex life of rats.

[LAUGHTER]  
And for then conducting similar tests with human males. The winner could not, or would not, join us this evening.

## Ig Nobel Prize- Physics

**MARC:** The Physics Prize.  
[TRUMPET BEING PLAYED POORLY]

The winners are from Hungary, Spain, Sweden, and Switzerland. The Ig Nobel Prize for Physics is awarded to Gabor Horvath, Miklos Blaho, Gyorgy Kriska, Ramon Hegedus, Balazs Gerics, Robert Farza-- Farkas, pardon-- Susanne Akesson, Peter Malik, and Hansruedi Wildermuth for discovering why white-haired horses are the most horsefly-proof horses, and for discovering why dragonflies are fatally attracted to black tombstones.

Please welcome Susanne Akesson.

**SUSANNE AKESSON:** Thank you. Thank you very much for this award. I feel very honored to represent our team of nine people. And it's been really exciting. Of course, I'm the biologist, and the rest are mainly in physics. But this is the way science goes.

And we have found, in fact, that you'd rather be a white horse than the black one if you'd like to avoid being bitten by horseflies. But, in fact, you can also dress either in stripes like a zebra, or, like myself, in a dotted coat. That will also help. And it's time to stop.

## Ig Nobel Prize- Chemistry

**MARC:** The Chemistry Prize.

[REALLY BAD TRUMPET PLAYING]

The winner is from Germany. The Ig Nobel Prize for Chemistry is awarded to Volkswagen for solving the problem of excessive automobile pollution emissions by automatically electromechanically producing fewer emissions whenever the cars are being tested.

[LAUGHTER]

[APPLAUSE]

The winner could not or would not join us this evening.

[LAUGHTER]



## Ig Nobel Prize- Medicine

**MARC:** The Medicine Prize.

[TRUMPET BEING PLAYED POORLY]

The winners are from Germany. The Ig Nobel Prize for Medicine is awarded to Christoph Helmchen, Carina Palzer, Thomas Munte, Silke Anders, and Andreas Sprenger for discovering that if you have an itch on the left side of your body, you can relieve it by looking into a mirror and scratching the right side of your body, and vice versa.

Please welcome Andreas Sprenger.

[APPLAUSE]

**ANDREAS SPRENGER:** Hello, everybody. Imagine you have an itch site on the right arm, and what you are doing? You scratch. Now after a certain time, itching comes again and you scratch and you scratch and you scratch. And at a certain time your skin bleeds, and you know you shouldn't scratch anymore.

What to do? You cheat your brain. You take a mirror, look into the mirror, and see your left arm by the mirror and your brain perceives it as the right arm. And if you scratch your left arm, you have an itch relief. That's it.

[LAUGHTER]

[APPLAUSE]

And now I want to thank you, all my previous teachers, who had made the basis for all this research possible and--

[PRESENTERS DINGING]

--and, yeah, OK. OK.

[PRESENTERS DINGING]

Thank you.

## Ig Nobel Prize- Biology

**MARC:** The Biology Prize.

[TRUMPET BEING PLAYED POORLY]

The winners are from the UK. The Ig Nobel Prize for Biology is awarded jointly to Charles Foster, for living in the wild as, at different times, a badger, an otter, a deer, a fox, and a bird; and jointly to Thomas Thwaites, for creating prosthetic extensions of his limbs that allowed him to move in the manner of, and spend time roaming hills in the company of goats.

[LAUGHTER]

Please welcome first, Charles Foster.

**CHARLES FOSTER:** We have five glorious senses. Normally, we use only one of them-- vision. It's a very distorting lens, because it's linked to our cognition. And that means that we get only about 20% of the information that we can squeeze out of this extraordinary world.

Animals, by and large, do a good deal better. And an attempt to see woods as they really are without that distorting lens of vision and cognition, I tried to follow five non-human species-- badgers, foxes, otters, red deer, and, ridiculously, swifts.

It increased my understanding of what their landscapes are really like rather than landscapes colored by all our colonial impressions of what those landscapes should be like. And it also generated in me a good deal of empathy for these animals, and we can do with a little more of that. Thank you very much.

**MARC:** And now welcome the co-recipient of the Prize, Thomas Thwaites.

[APPLAUSE]

**THOMAS THWAITES:** Hi, everyone. Yeah, this is a huge honor.

Thanks very much. And, yeah, so I got tired of all the worry and the pain of being a human, and so I decided I would take a holiday from it all and become a goat. And I was helped in this endeavor by lots of people. The Wellcome Trust, thanks very much. Professor John Hutchinson from the Royal Veterinary College; Dr. Glyn Heath from Salford University; Dr. Joe Devlin, a neuroscientist, from UCL; Dr. Alan McElligott, goat behavior expert, from Queensberry University; and, oh, god, I've forgotten.

[PRESENTERS MAKING DINGING NOISES]

OK. Thanks very much.

[PRESENTERS MAKING DINGING NOISES]

## Ig Nobel Prize- Economics

**MARC:** The Economics Prize.  
[TRUMPET BEING PLAYED POORLY]

The winners are from New Zealand and the UK. The Ig Nobel Prize for Economics is awarded to Mark Avis, Sarah Forbes, and Shelagh Ferguson for assessing the perceived personalities of rocks from a sales and marketing perspective.

Please welcome Mark Avis and Sarah Forbes.

**SARAH FORBES:** Well, thank you guys so much for this. This was actually a huge honor for us. And what can I say? The Ig Nobel rocks. But, yeah, so basically for us, we'd like to actually think Marketing Theory for actually publishing this. And Pauline McLaren is the editor there. Fantastic she actually, you know, took this on. But, yes, it was an amusing study, but we are very proud of it, and we hope you enjoy reading it. Thank you.  
[APPLAUSE]

## Ig Nobel Prize- Psychology

**MARC:** The Psychology Prize.  
[VERY SHORT TRUMPET PLAYING]

The winners are from Belgium, the Netherlands, Germany, Canada, and the USA. The Ig Nobel Prize for Psychology is awarded to Evelyne Debey, Maarten De Schryver, Gordon Logan, Kristina Suchotzki, and Bruno Verschuere for asking a thousand liars how often they lie, and for deciding whether to believe those answers.

Please welcome Bruno Verschuere.

[APPLAUSE]

**BRUNO VERSCHUERE:** Being a clinical psychologist, I really liked the US presidential elections.

[LAUGHTER]

I mean, both Clinton and Trump have been called pathological liars. But what does that mean? When does one become a pathological liar? In order to define lying as pathological, you first need to know the normal rate of lying, and so we've asked a thousand people to honestly tell us how often they lie.

People lie, on average, 2.2 times a day. Old people are the most honest of all, and I'm glad to see so many honest people here on the stage tonight.

[LAUGHTER]

So our study tells that if Clinton and Trump lie one to five times a day, they're just average liars like all of us. Thank you.

[APPLAUSE]

## Ig Nobel Prize- Literature

**MARC:** The Literature Prize.  
[TRUMPET BEING PLAYED POORLY]

The winner is from Sweden. The Ig Nobel Prize for Literature is awarded to Fredrik Sjoberg for his three-volume autobiographical work about the pleasures of collecting flies that are dead and flies that are not yet dead.

Please welcome Fredrik Sjoberg.

**FREDRIK SJOBERG:** Male entomologists all over the world know that it's impossible to make an impression on women with dead insects. Already Linnaeus knew about this. Charles Darwin definitely did. Even Edwin L. Wilson knew about this problem as a young man. But the very best thing about science is there is always a risk or possibility of being wrong. I wrote about collecting hoverflies knowing this won't impress anyone, especially not women.

And I was wrong.

Thank you. Thank you.

## Ig Nobel Awards (24/7 Lectures)

**MARC:** And now get set for something special-- the 24/7 Lecturers. We have invited several of the world's top thinkers to tell us very briefly what they're thinking about. Each 24/7 Lecturer will explain her or his topic twice-- first, a complete technical description in 24 seconds. And then, after a brief pause, a clearer summary-- that's a clearer summary-- that anyone can understand in seven words. The 24-second time limit will be enforced by our referee, Mr. John Barrett.

Mr. Barrett, do you have any advice for our 24/7 Lecturers?

[BEEPING]

That does not sound like advice. Do you have any advice for our--

**JOHN BARRETT:** Gentlemen, keep it clean.

**MARC:** Thank you, Mr. Barrett. The first 24/7 Lecture will be delivered by 1993 Nobel Laureate in Physiology or Medicine, Rich Roberts.

His topic, clock genes. First, a complete technical description of the subject in 24 seconds. On your mark, get set, go.

**RICH ROBERTS:** The original circadian locomotive output cycle's capital clock gene encodes a basic helix-loop-helix passed transcription factor called clock that is one of a family of genes that control circadian rhythm in mammals. More than 20 genes are involved, with such catchy names as "period" and cryptocom.

The products of many of them are activate on others--

[BEEPING]

**MARC:** And now a clear summary that anyone can understand in seven words. On your mark, get set, go.

**RICH ROBERTS:** Clock genes are responsible for jet lag.

**MARC:** The next 24/7 Lecture will be delivered by Professor Emeritus of Chemistry at Harvard University and winner of the 1986 Nobel Prize in Chemistry, Dudley Herschbach.

His topic, time.

First, a complete technical description of the subject in 24 seconds. On your mark, get set, go.

**DUDLEY HERSCHBACH:** Time is precisely the difference between now and then. Cosmologists assure us that it began in the Big Bang 13.7 billion years ago. The universe has been expanding ever since.

Recent discoveries show the expansion is accelerating. If that continues, the cosmos will become both infinite and eternal.

[BEEPING]

But within five billion years--  
[BEEPING]

**MARC:** And now a--

**DUDLEY HERSCHBACH:** --the sun will turn into a red giant--

**MARC:** --clear summary--

**DUDLEY HERSCHBACH:** --and swallow up earth.

**MARC:** --that anyone can understand-- in seven words. On your mark, get set, go.

**DUDLEY HERSCHBACH:** One and time and tide won't wait for us.

**MARC:** The final 24/7 Lecture-- seven words, was it? The final 24/7 Lecture will be delivered by the creator of FYFD, the world's most popular website about fluid dynamics, Nicole Sharp. Her topic, fluid dynamics.

First, a complete technical description of the subject in 24 seconds. On your mark, get set, go.

**NICOLE SHARP:** Fluid dynamics, the brand of classical mechanics derived from 19th century hydrodynamics and hydrology that recapitulates the locomotion of mutable substances. Governed by a series of unsteady nonlinear partial differential equations of the second order including continuity, energy, Navier-Stokes, and, in some cases, Maxwell's equations on multi-species reactions. Subdisciplines include reality, combustion, granular mechanics, air elasticity, magnetohydrodynamics, hemodynamics, lubrication theory, and quantum hydrodynamics.

**MARC:** And now a clear summary that anyone can understand in seven words. On your mark, get set, go.

**NICOLE SHARP:** If it can flow, we study it.

## Ig Nobel Awards (How Much Money Can a Trader Make With One Extra Second?)

**MARC:** As mental preparation for the final act of tonight's opera, "The Last Second," here to tell us about the kinds of financial mischief that could be done during an unannounced extra leap second is Nobel Laureate in Economics Eric Maskin.

**ERIC MASKIN:** How much money can a stock market trader make with an extra second of time?

A lot.

The secret is front running, getting in front of other traders, buying the stock they were about to buy, and then selling it to them for a profit.

Suppose you see that I want to buy a million shares of Ig Nobel Enterprises. And who wouldn't? Well, that's a large order. And we both know that it's going to drive up the stock price. But the second before my order clears, you jump in and buy it up yourself.

You pay  $x$  dollars a share and immediately turn around and sell the shares to me for  $x$  plus 1. You've just made a big profit, and this is only one transaction. A second is plenty of time to make many, many others.

They say a trillion dollars isn't what it used to be. Even US dollars. But you're not having second thoughts.