

COSMOLOGY

Get to Know

Albert Einstein

Conversation Topics to
Make Your Next Date
Out of This World

Wanna Get in Shape?

We'll Show You How

*How to Bounce Back
from Being Plutoed*

Test Your
Cosmic
Competence
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The Sun Still Hot in '07

Extraterrestrial
Events

*A Vacation
Spot You'll
Never Be
Able to Leave*

RULES OF ATTRACTION:
Relativity in Action

By Dale Blem, PJ Griess, & Lindsey Mullens

Extraterrestrial Events

Get out of your house and take advantage of the cool cosmic opportunities that await you!

OMSI

Kendall Planetarium

The largest and most technologically advanced planetarium in the Pacific Northwest. The 52-foot domed theater features educational astronomy shows with state-of-the-art visuals and special effects.

CURRENT ATTRACTIONS PLAYING DAILY:

Black Holes: The Other Side of Infinity

Explore one of the great mysteries of the Universe. Narrated by the great Liam Neeson (who can ask for anything more?)

Secrets of the Sun

Trace the lifecycle of the hottest thing around.

Pacific Northwest Skies

Learn about what you can see in your own backyard.

Astronomy Family Weekend August 10-12, 2007

"Join the Hancock Field Station staff and Rose City Astronomers for a weekend of outdoor fun and discovery. View the planets, stars, nebulae, other galaxies and constellations visible in the clear skies above Central Oregon. Spend the evenings studying the sky with telescopes. During the day, learn about the sun, space flight and gravity, and tour the cosmos in virtual darkness. Accompany Hancock natural science instructors on hikes through nearby canyons to learn more about this planet called Earth. Search for fossils, investigate the geology of the John Day Fossil Beds National Monument, and discover the adaptations that allow plants and animals to survive in this arid climate. Cool off with a swim in the John Day River and end the day around the campfire."

\$170/person or \$125/OMSI member

The

Vacation Spot

You Will Never Be Able to Leave

A BLACK HOLE!

What they are: "Objects whose gravity is so strong that not even light can escape." Their mass is so large that they curve space to an extreme (harsh, compared to the polite curving of space that makes objects fall to the ground here on Earth.) This extreme, known as a singularity, has no depth, width, or height. It even bends time enough to make it STOP. How fabulous is that for a vacation?

Location: Many scientists believe that Supermassive Black Holes exist at the centers of most galaxies. (Others can be found anywhere where a large star has died & collapsed in on itself.)

How to find one: Look for areas where stars seem to be orbiting around nothing in particular.

Fun fact: The edge at which light can no longer escape a black hole is known as the **EVENT HORIZON**.

Test Your

COSMIC COMPETENCE

See how much you know about the universe!

- 1** How old is the universe?
- a. 13.7 million years
 - b. 150.87 million years
 - c. 4.1 billion years
 - d. 13.7 billion years

- 2** What is the center of the universe?
- a. The sun
 - b. It has no center
 - c. The Milky Way
 - d. The Earth

- 3** What fraction of the universe is made up of normal matter, and not dark matter?
- a. 70-80%
 - b. 30-40%
 - c. 2-3%
 - d. 0-0.2%

- 4** How many stars are in a typical galaxy?
- a. 10 million
 - b. 1 billion
 - c. 100 billion
 - d. 100 trillion

- 5** The universe is filled with remnant radiation. What is its temperature?
- a. 0.3 Kelvin
 - b. 3 Kelvin
 - c. 30 Kelvin
 - d. 300 Kelvin

- 6** Who discovered that most galaxies in our universe are moving away from us?
- a. Albert Einstein
 - b. Fritz Zwicky
 - c. Edwin Hubble
 - d. Johannes Kepler

- 7** According to Hubble Law, what does the Hubble Constant stand for?
- a. The amount of dark energy
 - b. The expansion rate of the universe
 - c. The mass of galaxies
 - d. The rotation rate of galaxies

8 Quasars are the brightest objects in the sky, where does their energy come from?

- a. Nuclear burning
- b. Matter falling into a black hole
- c. Collisions of stars
- d. Gravitational collapse

9 How many galaxies are in a typical cluster?

- a. 10
- b. 1000
- c. 1 million
- d. 1 billion

10 How old was the universe when light from the most distant quasar reached us?

- a. 100 million years
- b. 500 million years
- c. 2 billion years
- d. 10 billion years

Answers: 1-d, 2-b, 3-c, 4-c, 5-b, 6-c, 7-b, 8-b, 9-b, 10-c (give yourself one point per correct answer.)

0 to 3 points

WELCOME TO EARTH

You don't know the difference between a planet and a star. You are the typical everyday person, who believes that the Big Bang Theory actually involved an explosion. You need to put down this magazine and pick up a dictionary to beat the stupid out of your head.

4 to 6 points

DWARF PLANET

You seem to know enough about the universe, yet according to the big wigs that are in charge of everything, lack just the right amount of requirements to be considered cool.

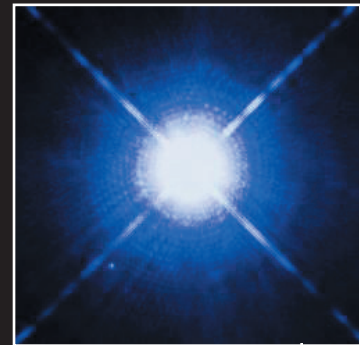
7 to 10 points

UNIVERSAL STUD

You are the summary of what a universal stud, a.k.a. a nerd, should be. You like to research any and everything related to the universe. Einstein would be proud of you.

THE SUN

STILL HOT IN 2007



4.6 billion years ago

At this time the sun's mother/father, a nebula in an arm of the milky way was combining elements and giving birth to the center of our solar system, the sun.

Present day

As it is today our sun is reaching its mid-life crisis, having been alive for almost five billion years and forseeing that many more years to come. Soon it will just by a sports car and start dating stars that are way too young for it.

In about 5 billion years

Now is when the sun's almost ten billion years of hottness come to an end, here things start to get a little rocky. At the end of its life the sun will fuse helium into heavier elements and swell up, growing large enough to swallow the earth. Not a pretty sight, just be glad you won't be there to see it.

In about 6 billion years

After spending the last billion years as a red giant, our sun has had enough and collapses into a white dwarf. Don't worry though, eventually the sun calms down, about a trillion years later. Don't get on its bad side, it holds a grudge.



Conversation topics to make your next date *Out of this World*

These conversation topics have been researched for countless years by nerds all over the universe to ensure that your next date will go off like a rocket. Simply follow these five conversation topics and you and your date will be on your way to the bedroom faster than light travels in a vacuum.

1

Always a popular one, when interested in striking up a long conversation mention how unfair it is **what they did to Pluto**. The insult of downgrading Pluto from a planet to a dwarf planet has offended many people since the announcement last year.

2

Everyone knows women love talking about **expansion**, so why not discuss our universe to get your date all heated up. Space has been expanding every since the beginning of time, according to scientific studies.

3

Interested in a little more than just talking? Bring up **black holes** and have your date gravitating towards you in minutes. Black holes are the remains of giant stars that have died out; black holes have such strong gravitational fields that not even light can escape from them.

4

Found a perfect catch that's obsessed with rings? Give her the biggest and brightest one by discussing what **Saturn's rings** are made of. The beautiful rings that surround Saturn are made up of thousands of rocks and ice chunks.

5

If your date likes the darker things in life, why not talk about **dark matter** to get her sweating and breathing heavily in no time. Dark matter is what most of our universe is made up of, yet scientists do not know much about it, in fact we cannot even see it, talk about scary!

A woman with brown hair tied back, wearing a maroon sports bra and green leggings, is walking on a treadmill. The background is a blurred, dark grey and black circular pattern, suggesting motion. The text is overlaid on the right side of the image.

Fight the Flab:

Walk the Way to Success

We here at Cosmo magazine often find it hard to take time off from our stressful jobs and devote it to keeping our bodies in peak performance. Therefore, we decided to put down the Twinkies and Ding Dongs and put on our running shoes. Now most people hate running, even if it is one of the best ways to get in shape, so we decided to come up with

some great walking workouts. These can be anywhere from workouts for people who just want to walk and talk with friends, to those of us who want to shed some serious poundage.

For starters, we suggest starting small and working your way up, so we will list the workouts from easiest all the way up to extreme. Remember if you want to burn more fat during your workout, you could always run some of these workouts instead of walking them. Each workout comes with an estimated completion time, which is only accurate if you are walking at a steady pace.

Easy

Start at one end of the United States and walk all the way to the other end.

Estimated Completion Time: 1,000 hours



Medium

Pick a starting point anywhere on Earth and walk to the Moon.

Estimated Completion Time: 11 years



Hard

Due to the controversy this year over this former planet this workout has become hugely popular. Pick any starting point on Earth and start walking toward Pluto, stopping to enjoy whatever sights you might have on the way.

Estimated Completion Time: 167,000 years



Very Hard

Once again, start anywhere on Earth and begin walking. This time your destination is the nearest star to our solar system, Proxima Centauri.

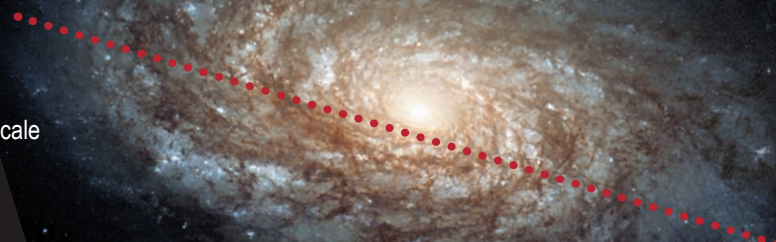
Estimated Completion Time: 1,118,900,000 years



Extreme

Once again start anywhere on Earth and begin walking. For our final workout we are going to walk all the way across our galaxy, the Milky Way Galaxy.

Estimated Completion Time: 22,378,000,000,000 years



*Graphic representations are in no way accurate in distance or scale

How to Bounce Back from Being “Plutoed”

After being demoted, the legendary orbiting body carries on with class. Learn how Pluto did it and how you can get your life back into orbit.

Get a new title

Pluto may not be officially classified as a planet anymore, but it's still orbiting in style. A key to its success is its having a new title: “dwarf planet.” What's the difference? Not much. According to the International Astronomical Union, a “dwarf planet” is a “celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape², (c) has not cleared the neighbourhood around its orbit, and (d) is not a satellite,” while a bona-fide planet has “cleared the neighbourhood around its orbit.” The point is that Pluto has not given up and dropped out of orbit altogether. It's still continuing its dream of orbiting around our Sun at a distance of about 39.5 Astronomical Units (one AU is about the distance from the Earth to the Sun.) So, if you've been demoted at work, don't give up. Look at what your new job has to offer you and put effort into it. Just because it has a different name doesn't mean that you can't wow the people around you with the skills and characteristics you maintain.

Get a posse

In a difficult time, a good support system is invaluable. Pluto recognizes this and has many friends across the Universe. Here on Earth, Pluto has many a posse on Facebook.com. The groups range include (but are not limited to): “Add Pluto Back to Planet Status” (with 757 members,) “Association of People Who Are Pissed Because Pluto Is No Longer A Planet!” (1,191 members,) “Back in my day, pluto was still a planet” (1,178 members,) and “aah, wtf? Pluto's going 2b crushed whn it gets the news in 4,000 light yrs!” (968 members.) What's obvious is that Pluto is not alone in this challenging time. If you've been demoted from “best fried forever” to “who?” don't fret, but rather allow those in your life who care to comfort you. Pluto knows how beneficial a good friend can be.

Coin a hip word

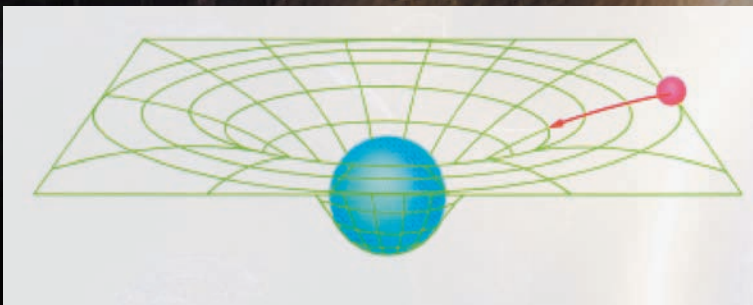
Keeping its buzz going, Pluto scored big when the American Dialect Society named the word “Plutoed” its “Word of the Year” on January 7*. The term “to Pluto” is “to demote or devalue someone or something, as happened to the former planet Pluto when the General Assembly of the International Astronomical Union decided Pluto no longer met its definition of a planet.” You can make a similar move by defining your life on your terms. Been dumped? Own it by claiming the term “reevaluation.” Been kicked out of your apartment? Tell everyone you're “investigating” the benefits of living in nature. No matter what your situation is, you can remain strong if you make active choices on your behalf, instead of letting others label your situation.

* Source: “Pluto's revenge: 'word of the year' award.” www.cnn.com/2007/US/01/07/word.of.the.year/index.html

Rules of Attraction

Einstein's Special Theory of Relativity:

Space can be thought of as a rubber sheet suspending masses in the form of planets and stars. Massive objects tell space how to bend, space tells objects how to move.



The more massive an object is, the more it attracts other objects.

This means, when you're ready to attract that special man or woman of your dreams, it's time to put on the pounds.

Relativity in Action

CELEBRITY MYSPACE

The greatest physicist of all time...who knew he was so cool?

www.myspace.com/28037909

http://profile.myspace.com/e=mc2

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Al



“Imagination is more important than knowledge.”

 Online Now!

Male
128
Ulm, Württemberg
Germany

Al's Interests

Movies:	Star Wars, The One, Divine Secrets of the Ya-Ya Sisterhood
Music:	Rammstein, Johann Sebastian Bach, Enya
Books:	Fourier Optics, The DiVinci Code, Harry Potter series
Heroes:	dUd3, Newton iz the ballz; also Oprah rul3z!

Al's Details

Status:	Married, times 2. Sup cuz.
Zodiac sign:	Pisces
Children:	Lieserl, Hans, Eduard
Body type:	Soft
Occupation:	Revolutionary Genius

About Me

I brought y'all relativity, general and special. How bout brownian motion and the photoelectric effect, bet you don't even know what that is. Leave me a comment and find out.

Who I'd Like to Meet

Anyone up for medal swapping, I got some good ones. Nobel, Copley, Max Planc, nothin' but the best. Bring it!! No n00bs, y'hear!!!

Al's Friend Space

Al has 34 Friends.

Max Born Ghandi Bill The Hoff



[View All of Sean's Friends.](#)

Al's Friends' Comments

Displaying 1 of 7 comments [View/Edit All](#)

	3/14/2006 5:36 PM Happy Birthday Steiny! Call me sometime, we'll hang out.
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