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Patricia Burchat: Shedding light on dark matter | TED

Talk

https://www.ted.com/talks/patricia_burchat_shedding _light_on_dark_matter



Advanced Words Only

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Session 1: Word List

physicist

- n. a scientist who specializes in the field of physics
- (1) talented **physicist**, (2) theoretical **physicist**Einstein was an outstanding and famous **physicist** of the 20th century.

emit

v. to give off or send out something such as light, heat, sound, gas, etc.

synonym: give off, radiate, expel

(1) **emit** a gamma ray, (2) **emit** air pollution

During the unloading, the container box **emits** a clicking sound.

gravitational

adj. relating to or caused by gravity (= the force that attracts objects towards one another)

synonym: weighty, heavy, earthbound

(1) gravitational energy, (2) gravitational waves

The **gravitational** force of the black hole was so strong that nothing, not even light, could escape.

rot

v. to decay, or cause something to decay, naturally and gradually

synonym: perish, decay, corrode

(1) begin to rot, (2) rot with age

Please refrigerate the meat, or it will rot.

spherical

adj. having the shape of a sphere; round, spherical, or ball-shaped in appearance

synonym: round, orbicular, globular

(1) **spherical** shape, (2) **spherical** object

The Earth is a nearly **spherical** planet.

fixate

v. to focus one's attention or become overly obsessed with someone or something; to become mentally obsessed or preoccupied with a particular idea, thought, or image

synonym: obsess, fix, concentrate

- (1) **fixate** on a problem, (2) **fixate** on a picture She tends to **fixate** on small details, often losing sight of the bigger picture.
- v. to scatter or spread things over an area; to scatter something in an untidy way

synonym: scatter, sprinkle, disperse

(1) **strew** the room with balloons, (2) **strew** garbage The wind **strew** the leaves all over the lawn.

coma

strew

 a state of prolonged unconsciousness, typically caused by severe injury or illness, during which a person is unresponsive and lacks awareness of their surroundings

synonym: unconsciousness, stupor, sleep

(1) medical **coma**, (2) medically-induced **coma**Unfortunately, the accident left him in a deep **coma**.

elliptical

adj. having the shape of an oval (= a closed plane curve);
 using a word or expression that is ambiguous or vague,
 especially to mislead or avoid committing oneself

synonym: oval, egg-shaped, oblong

(1) an **elliptical** motion, (2) an **elliptical** galaxies

The satellite's **elliptical** orbit made it appear to change its distance from earth.

blob

 a small amount or drop of a thick liquid or sticky substance

synonym: chunk, lump, hunk

(1) a big **blob** of yellow, (2) a **blob** of jelly

A **blob** of ink fell on the floor.

deduce

v. to arrive at an answer, a conclusion, or a decision by reasoning

synonym: conclude, infer, suppose

(1) **deduce** facts from the evidence, (2) **deduce** the meaning of a word

The researcher **deduced** the momentum of the particles from meteoritic velocities.

deflect

v. to cause something, especially a criticism or attack, to be directed away from someone

synonym: deter, redirect, sidetrack

(1) **deflect** a blow, (2) **deflect** his criticism

The soccer player was able to **deflect** the ball away from the goal.

trajectory

n. the curved path followed by an object moving through space

synonym: course, curve, orbit

(1) career trajectory, (2) a trajectory missile

The company has shown an excellent growth **trajectory** over the years.

extrapolate

v. to guess or think about what might happen or estimate something using the facts that you have now

synonym: deduce, reason, infer

(1) extrapolate the results, (2) extrapolate animal dose

This predictive model mechanically **extrapolates** past trends into the future.

eyeball

 the round part of the eye of a vertebrate that is usually inside the head and, therefore, cannot be seen (1) **eyeball** motion, (2) redness of the **eyeball** Increased **eyeball** pressure leads to the development of glaucoma.

skew

v. to turn or place at an angle; to make biased or distorted with the result that it is not accurate, fair, normal, etc.

synonym: slant, tilt, distort

(1) **skew** the message, (2) **skew** social values

The results of the poll are **skewed** because it only surveyed a small group of people.

devise

v. to come up with an idea, plan, theory, etc., using your intelligence or imagination

synonym: create, concoct, invent

(1) **devise** a plan, (2) **devise** a literary plot

They had to **devise** a system that did not depend on fossil fuels.

shave

v. to remove body hair with a razor; to cut the price of something

synonym: trim, cut down, prune

(1) **shave** my head, (2) **shave** cheese

That supermarket tried to **shave** certain costs by saving electricity.

napkin

 a small piece of cloth or paper used for wiping one's mouth and hands while eating; a decorative cloth placed on a table for formal occasions

synonym: serviette, handkerchief, cloth

(1) paper napkin, (2) linen napkin

I always keep a stack of **napkins** on my desk while I eat to prevent any messes.

distort

v. to change something's shape, appearance, or sound so that it appears weird or unclear

synonym: fudge, deform, contort

(1) distort the facts, (2) distort the economy

Economists contend that taxes **distort** consumer behavior in general.

mirage

an optical phenomenon caused by the refraction of light in the Earth's atmosphere, creating a false or distorted image of distant objects or landscapes, often appears as a shimmering or floating appearance, typically seen in deserts or over hot surfaces

synonym: illusion, hallucination, phantasm

(1) mirage illusion, (2) mirage oasis

The shimmering heat created a **mirage** in the distance, fooling our eyes into seeing an oasis.

hawk

 a bird of prey typically having short rounded wings and a long tail; an advocate of an aggressive policy on foreign relations

synonym: militarist, jingo, aggressor

(1) cast off a hawk, (2) congressional hawk

That team signed a center forward who was a ball- hawk.

sect

 a group of people who follow a particular religious or philosophical belief system, especially one that is regarded as outside the norm or mainstream

synonym: group, faction, cult

(1) **sect** beliefs, (2) secret **sect**

The minority **sect** believed in a set of unconventional religious practices.

passe

adj. no longer fashionable or current; outdated; considered to be old-fashioned or out of date

synonym: outdated, old-fashioned, antique

(1) passe entertainment, (2) passe trend

Bell-bottom jeans, once considered **passe** fashion, have made a surprising comeback in recent years.

asymptotic

adj. having a line or curve that approaches another without ever meeting or intersecting used to describe mathematical functions or relationships that approach a limit without ever reaching it

synonym: approaching, near, parallel

(1) **asymptotic** growth, (2) **asymptotic** analysis

The curve of the graph approaches but never quite reaches an **asymptotic** line.

astronomer

n. a physicist who studies astronomy

synonym: stargazer, cosmologist, astrophysicist

(1) amateur **astronomer**, (2) solar **astronomer**

This question has fascinated solar **astronomers** for decades.

startling

adj. extremely surprising, astonishing, and sometimes worrying

synonym: alarming, astonishing, shocking

(1) **startling** earthquake shocks, (2) **startling** discovery He describes the story with **startling** reality.

persuasive

adj. tending to make you want to do or believe a particular thing; convincing

synonym: convincing, compelling, influential

(1) **persuasive** advertising, (2) **persuasive** speaker He made a **persuasive** argument for the new policy.

unexplained

 adj. not able to be explained or understood, lacking explanation or justification for something unknown or mysterious

synonym: mysterious, inexplicable, enigmatic

(1) **unexplained** phenomenon, (2) **unexplained** disappearance

There was an **unexplained** noise coming from the attic that frightened us all.

imp

 a mischievous or misbehaving child; a small and mischievous demon or sprite in folklore synonym: demon, sprite, mischievous child

(1) a little imp, (2) behave like an imp

The mischievous **imp** caused trouble wherever it went.

motto

 a phrase or slogan that expresses a guiding principle or goal

synonym: slogan, catchphrase, phrase

(1) the **motto** for safe traffic, (2) company **motto**The company's **motto** is "Innovation and Service," which is reflected in its products and customer support.

annihilate

v. to destroy completely; to cause something to cease to exist

synonym: destroy, obliterate, eradicate

(1) **annihilate** the enemy, (2) **annihilate** all doubts

The virus had the potential to **annihilate** entire populations if left unchecked.

collide

- v. to hit something violently when moving synonym: clash, slam, contradict
- (1) **collide** head-on, (2) **collide** in midair The interests of the two countries **collide**.

Session 2: Spelling

1. an ell____al motion

2. de___e facts from the evidence

3. secret s__t

4. gra____nal energy

5. st____ng discovery

6. a little i p

7. a big b b of yellow

8. mi___e oasis

adj. having the shape of an oval (= a closed plane curve); using a word or expression that is ambiguous or vague, especially to mislead or avoid committing oneself

v. to arrive at an answer, a conclusion, or a decision by reasoning

 a group of people who follow a particular religious or philosophical belief system, especially one that is regarded as outside the norm or mainstream

adj. relating to or caused by gravity (= the force that attracts objects towards one another)

adj. extremely surprising, astonishing, and sometimes worrying

 a mischievous or misbehaving child; a small and mischievous demon or sprite in folklore

a small amount or drop of a thick liquid or sticky substance

n. an optical phenomenon caused by the refraction of light in the Earth's atmosphere, creating a false or distorted image of distant objects or landscapes, often appears as a shimmering or floating appearance, typically seen in deserts or over hot surfaces

ANSWERS: 1. elliptical, 2. deduce, 3. sect, 4. gravitational, 5. startling, 6. imp, 7. blob, 8. mirage

a bird of prey typically having short 9. cast off a h k n. rounded wings and a long tail; an advocate of an aggressive policy on foreign relations to remove body hair with a razor; to cut 10. sh e cheese ν. the price of something a bird of prey typically having short 11. congressional h k n. rounded wings and a long tail; an advocate of an aggressive policy on foreign relations 12. an ell____al galaxies adj. having the shape of an oval (= a closed plane curve); using a word or expression that is ambiguous or vague, especially to mislead or avoid committing oneself to turn or place at an angle; to make 13. s w the message ν. biased or distorted with the result that it is not accurate, fair, normal, etc. to turn or place at an angle; to make 14. s w social values ν. biased or distorted with the result that it is not accurate, fair, normal, etc. 15. linen na___n a small piece of cloth or paper used for n. wiping one's mouth and hands while eating; a decorative cloth placed on a table for formal occasions 16. de___t his criticism to cause something, especially a criticism or attack, to be directed away from someone 17. di___t the facts to change something's shape, appearance, or sound so that it appears weird or unclear

ANSWERS: 9. hawk, 10. shave, 11. hawk, 12. elliptical, 13. skew, 14. skew, 15. napkin, 16. deflect, 17. distort

18.	annte the enemy	<i>v</i> .	to destroy completely; to cause something to cease to exist
19.	perve advertising	adj.	tending to make you want to do or believe a particular thing; convincing
20.	extte the results	v.	to guess or think about what might happen or estimate something using the facts that you have now
21.	a bb of jelly	n.	a small amount or drop of a thick liquid or sticky substance
22.	talented phst	n.	a scientist who specializes in the field of physics
23.	medically-induced ca	n.	a state of prolonged unconsciousness, typically caused by severe injury or illness, during which a person is unresponsive and lacks awareness of their surroundings
24.	amateur aster	n.	a physicist who studies astronomy
25.	et a gamma ray	ν.	to give off or send out something such as light, heat, sound, gas, etc.
26.	career trary	n.	the curved path followed by an object moving through space
27.	asyic analysis	adj.	having a line or curve that approaches another without ever meeting or intersecting used to describe mathematical functions or relationships that approach a limit without ever reaching it
28.	a trary missile	n.	the curved path followed by an object moving through space

ANSWERS: 18. annihilate, 19. persuasive, 20. extrapolate, 21. blob, 22. physicist, 23. coma, 24. astronomer, 25. emit, 26. trajectory, 27. asymptotic, 28. trajectory

29.	stw the room with balloons	<i>v</i> .	to scatter or spread things over an area; to scatter something in an untidy way
30.	asyic growth	adj.	having a line or curve that approaches another without ever meeting or intersecting used to describe mathematical functions or relationships that approach a limit without ever reaching it
31.	perve speaker	adj.	tending to make you want to do or believe a particular thing; convincing
32.	dee the meaning of a word	<i>v</i> .	to arrive at an answer, a conclusion, or a decision by reasoning
33.	eyI motion	n.	the round part of the eye of a vertebrate that is usually inside the head and, therefore, cannot be seen
34.	she my head	<i>v</i> .	to remove body hair with a razor; to cut the price of something
35.	det a blow	ν.	to cause something, especially a criticism or attack, to be directed away from someone
36.	spal object	adj.	having the shape of a sphere; round, spherical, or ball-shaped in appearance
37.	coe head-on	<i>v</i> .	to hit something violently when moving
38.	company moo	n.	a phrase or slogan that expresses a guiding principle or goal
39.	extte animal dose	<i>v</i> .	to guess or think about what might happen or estimate something using the facts that you have now

ANSWERS: 29. strew, 30. asymptotic, 31. persuasive, 32. deduce, 33. eyeball, 34. shave, 35. deflect, 36. spherical, 37. collide, 38. motto, 39. extrapolate

40.	solar aster	n.	a physicist who studies astronomy
41.	paper nan	n.	a small piece of cloth or paper used for wiping one's mouth and hands while eating; a decorative cloth placed on a table for formal occasions
42.	pae entertainment	adj.	no longer fashionable or current; outdated; considered to be old-fashioned or out of date
43.	dee a literary plot	<i>v</i> .	to come up with an idea, plan, theory, etc., using your intelligence or imagination
44.	dee a plan	ν.	to come up with an idea, plan, theory, etc., using your intelligence or imagination
45.	medical ca	n.	a state of prolonged unconsciousness, typically caused by severe injury or illness, during which a person is unresponsive and lacks awareness of their surroundings
46.	uneed phenomenon	adj.	not able to be explained or understood, lacking explanation or justification for something unknown or mysterious
47.	fie on a problem	v.	to focus one's attention or become overly obsessed with someone or something; to become mentally obsessed or preoccupied with a particular idea, thought, or image
48.	the moo for safe traffic	n.	a phrase or slogan that expresses a guiding principle or goal

ANSWERS: 40. astronomer, 41. napkin, 42. passe, 43. devise, 44. devise, 45. coma, 46. unexplained, 47. fixate, 48. motto

49.	theoretical phst	n.	a scientist who specializes in the field of physics
50.	pae trend	adj.	no longer fashionable or current; outdated; considered to be old-fashioned or out of date
51.	coe in midair	<i>v</i> .	to hit something violently when moving
52.	r_t with age	<i>v</i> .	to decay, or cause something to decay, naturally and gradually
53.	behave like an i_p	n.	a mischievous or misbehaving child; a small and mischievous demon or sprite in folklore
54.	spal shape	adj.	having the shape of a sphere; round, spherical, or ball-shaped in appearance
55.	et air pollution	<i>v</i> .	to give off or send out something such as light, heat, sound, gas, etc.
56.	mie illusion	n.	an optical phenomenon caused by the refraction of light in the Earth's atmosphere, creating a false or distorted image of distant objects or landscapes, often appears as a shimmering or floating appearance, typically seen in deserts or over hot surfaces
57.	granal waves	adj.	relating to or caused by gravity (= the force that attracts objects towards one another)
58.	redness of the eyI	n.	the round part of the eye of a vertebrate that is usually inside the head and, therefore, cannot be seen

ANSWERS: 49. physicist, 50. passe, 51. collide, 52. rot, 53. imp, 54. spherical, 55. emit, 56. mirage, 57. gravitational, 58. eyeball

59.	annte all doubts	ν.	to destroy completely; to cause something to cease to exist
60.	s_t beliefs	n.	a group of people who follow a particular religious or philosophical belief system, especially one that is regarded as outside the norm or mainstream
61.	uneed disappearance	adj.	not able to be explained or understood, lacking explanation or justification for something unknown or mysterious
62.	begin to r_t	<i>v</i> .	to decay, or cause something to decay, naturally and gradually
63.	stng earthquake shocks	adj.	extremely surprising, astonishing, and sometimes worrying
64.	fie on a picture	v.	to focus one's attention or become overly obsessed with someone or something; to become mentally obsessed or preoccupied with a particular idea, thought, or image
65.	stw garbage	ν.	to scatter or spread things over an area to scatter something in an untidy way
66.	dit the economy	<i>v</i> .	to change something's shape, appearance, or sound so that it appears weird or unclear

ANSWERS: 59. annihilate, 60. sect, 61. unexplained, 62. rot, 63. startling, 64. fixate, 65. strew, 66. distort

Session 3: Fill in the Blanks

 The company has shown an excellent growth over the years. the curved path followed by an object moving through space 	
 There was an noise coming from the attic that frightened us all. adj. not able to be explained or understood, lacking explanation or justification for something unknown or mysterious 	
3. That team signed a center forward who was a balln. a bird of prey typically having short rounded wings and a long tail; an advocat of an aggressive policy on foreign relations	e
4. Please refrigerate the meat, or it willν. to decay, or cause something to decay, naturally and gradually	
5. This predictive model mechanically past trends into the future. v. to guess or think about what might happen or estimate something using the facts that you have now	
6. The curve of the graph approaches but never quite reaches an lin adj. having a line or curve that approaches another without ever meeting or intersecting used to describe mathematical functions or relationships that approach a limit without ever reaching it	e.
 7. I always keep a stack of on my desk while I eat to prevent any messe n. a small piece of cloth or paper used for wiping one's mouth and hands while eating; a decorative cloth placed on a table for formal occasions 	s.
ANSWERS: 1. trajectory, 2. unexplained, 3. hawk, 4. rot, 5. extrapolates, 6. asymptotic, 7. napkins	

ANSWERS: 8. gravitational, 9. mirage, 10. devise, 11. passe, 12. fixate, 13. emits, 14.

persuasive

15.	The company's is "Innovation and Service," which is reflected in its products and customer support.
n.	a phrase or slogan that expresses a guiding principle or goal
16.	The minority believed in a set of unconventional religious practices.
n.	a group of people who follow a particular religious or philosophical belief system, especially one that is regarded as outside the norm or mainstream
17.	The soccer player was able to the ball away from the goal.
v.	to cause something, especially a criticism or attack, to be directed away from someone
18.	Einstein was an outstanding and famous of the 20th century.
n.	a scientist who specializes in the field of physics
19.	The researcher the momentum of the particles from meteoritic velocities.
<i>v</i> .	to arrive at an answer, a conclusion, or a decision by reasoning
20.	Economists contend that taxes consumer behavior in general.
v.	to change something's shape, appearance, or sound so that it appears weird or unclear
21.	Increased pressure leads to the development of glaucoma.
n.	the round part of the eye of a vertebrate that is usually inside the head and, therefore, cannot be seen
22.	The mischievous caused trouble wherever it went.
n.	a mischievous or misbehaving child; a small and mischievous demon or sprite in folklore
	SWERS: 15. motto, 16. sect, 17. deflect, 18. physicist, 19. deduced, 20. distort, 21 ball, 22. imp

23. The virus had the potential to entire populations if left unchecked.
v. to destroy completely; to cause something to cease to exist
24. That supermarket tried to certain costs by saving electricity.
v. to remove body hair with a razor; to cut the price of something
25. A of ink fell on the floor.
n. a small amount or drop of a thick liquid or sticky substance
26. The interests of the two countries
v. to hit something violently when moving
27. The satellite's orbit made it appear to change its distance from earth.
adj. having the shape of an oval (= a closed plane curve); using a word or expression that is ambiguous or vague, especially to mislead or avoid committing oneself
28. He describes the story with reality.
adj. extremely surprising, astonishing, and sometimes worrying
29. The results of the poll are because it only surveyed a small group of people.
v. to turn or place at an angle; to make biased or distorted with the result that it is not accurate, fair, normal, etc.
30. This question has fascinated solar for decades.
n. a physicist who studies astronomy
ANSWERS: 23. annihilate, 24. shave, 25. blob, 26. collide, 27. elliptical, 28. startling 29. skewed, 30. astronomers

31. v.	The wind the leaves all over the lawn. to scatter or spread things over an area; to scatter something in an untidy way
32.	Unfortunately, the accident left him in a deep
n.	a state of prolonged unconsciousness, typically caused by severe injury or illness, during which a person is unresponsive and lacks awareness of their surroundings
	The Earth is a nearly planet. having the shape of a sphere; round, spherical, or ball-shaped in appearance

ANSWERS: 31. strew, 32. coma, 33. spherical