

## Crash Course Astronomy

### #1 - Introduction to Astronomy

Video Duration: 12:11

22 Questions

Welcome to the first episode of Crash Course Astronomy. Your host for this intergalactic adventure is the Bad Astronomer himself, Phil Plait.

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## Crash Course Astronomy

### #2 - Naked Eye Observations

Video Duration: 11:16

20 Questions

Phil invites you to head outside and take a look at all the incredible things you can see with your naked eye.

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## Crash Course Astronomy

### #3 - Cycles in the Sky

Video Duration: 9:28

20 Questions

We build on our naked eye observations and take a look at the cyclical phenomena that we can see at work in the universe.

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## Crash Course Astronomy

### #4 - Moon Phases

Video Duration: 9:45

22 Questions

In this episode of Crash Course Astronomy, Phil takes you through the cause and name of the Moon's phases.

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## Crash Course Astronomy

### #5 - Eclipses

Video Duration: 10:31

22 Questions

A solar eclipse is when the Moon blocks the Sun so its shadow falls on the Earth, and a lunar eclipse is when the Earth's shadow falls on the Moon.

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## Crash Course Astronomy

### #6 - Telescopes

Video Duration: 11:59

20 Questions

Phil explains how telescopes work and offers up some astronomical shopping advice.

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## Crash Course Astronomy

### #7 - The Gravity of the Situation

Video Duration: 10:02

20 Questions

Phil looks at how gravity plays out across the universe.  
Gravity is a force, and everything with mass has gravity.

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## Crash Course Astronomy

### #8 - Tides

Video Duration: 9:46

21 Questions

Phil explores the world of tides! What is the relationship between tides and gravity? How do planets and their moons become tidally locked?

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## Crash Course Astronomy

### #9 - Introduction to the Solar System

Video Duration: 10:16

22 Questions

We explore how we went from a giant ball of gas to the system of planets and other celestial objects we have today.

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## Crash Course Astronomy

### #10 - The Sun

Video Duration: 12:03

21 Questions

We look at the Sun's core, plasma, magnetic fields, sunspots, solar flares, and what all of that means for our planet.

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## Crash Course Astronomy

### #11 - The Earth

Video Duration: 10:13

21 Questions

Phil starts the planet-by-planet tour of the solar system right here at home, Earth.

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## Crash Course Astronomy

### #12 - The Moon

Video Duration: 9:51

20 Questions

Join Phil for a tour of our Moon, from surface features, inside to the core, and back in time to theories about its formation.

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## Crash Course Astronomy

### #13 - Mercury

Video Duration: 10:17

22 Questions

Mercury is the closest planet to the sun. It's incredibly hot but, surprisingly, has water ice hiding beneath its surface.

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## Crash Course Astronomy

### #14 - Venus

Video Duration: 10:49

22 Questions

Venus is a gorgeous naked-eye planet, hanging like a diamond in the twilight -- but it's beauty is best looked at from afar.

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## Crash Course Astronomy

### #15 - Mars

Video Duration: 10:11

21 Questions

The fourth planet from the sun and the outermost of the terrestrial planets, Mars has long been a popular spot for missions and imagination.

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## Crash Course Astronomy

### #16 - Jupiter

Video Duration: 10:42

21 Questions

Jupiter is the biggest planet in our solar system. The gas giant is NOT a failed star, but a really successful planet!

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## Crash Course Astronomy

### #17 - Jupiter's Moons

Video Duration: 10:29

20 Questions

Before moving on from Jupiter to Saturn, we're going to linger for a moment on Jupiter's moons.

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## Crash Course Astronomy

### #18 - Saturn

Video Duration: 12:15

22 Questions

Saturn is the crown jewel of the solar system, beautiful and fascinating. It is a gas giant, and has a broad set of rings made of ice particles.

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## Crash Course Astronomy #19 - Uranus & Neptune

Video Duration: 12:18      23 Questions

We're rounding out our planetary tour with ice giants Uranus and Neptune. Both have small rocky cores and atmospheres that make them look greenish and blue.

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## Crash Course Astronomy #20 - Asteroids

Video Duration: 11:33      22 Questions

Asteroids are chunks of rock, metal, or both that were once part of smallish planets but were destroyed after collisions.

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## Crash Course Astronomy #21 - Comets

Video Duration: 11:54      22 Questions

Comets are chunks of ice and rock that orbit the Sun. When they get near the Sun the ice turns into gas, forming the long tail, and also releases dust that forms a different tail.

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## Crash Course Astronomy

### #22 - The Oort Cloud

Video Duration: 11:41

22 Questions

We're heading to the outskirts of the solar system. Out past Neptune are vast reservoirs of icy bodies that can become comets if they get poked into the inner solar system.

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## Crash Course Astronomy

### #23 - Meteors

Video Duration: 11:22

23 Questions

Phil helps keep you from ticking off an astronomer in your life by making sure you know the difference between a meteor, meteorite, and meteoroid.

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## Crash Course Astronomy

### #24 - Light

Video Duration: 10:34

23 Questions

In order to understand how we study the universe, we need to talk a little bit about light. Light is a form of energy.

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## Crash Course Astronomy

### #25 - Distances

Video Duration: 11:21

20 Questions

How do astronomers make sense out of the vastness of space? How do they study things so far away? Today Phil talks about distances, going back to early astronomy.

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## Crash Course Astronomy

### #26 - Stars

Video Duration: 10:41

21 Questions

Phil explains the stars and how they can be categorized using their spectra. Together with their distance, this provides a wealth of information about them.

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## Crash Course Astronomy

### #27 - Exoplanets

Video Duration: 11:49

20 Questions

There are other planets out there and astronomers have a lot of methods for detecting them.

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## Crash Course Astronomy

### #28 - Brown Dwarfs

Video Duration: 11:06

20 Questions

Brown dwarfs, have a mass that places them between giant planets and small stars. They were only recently discovered in the 1990's, but thousands are now known.

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## Crash Course Astronomy

### #29 - Low Mass Stars

Video Duration: 12:03

20 Questions

Today we are talking about the life -- and death -- of stars. Low mass stars live a long time, fusing all their hydrogen into helium over a trillion years.

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## Crash Course Astronomy

### #30 - White Dwarfs & Planetary Nebulae

Video Duration: 11:10

20 Questions

White dwarfs are incredibly hot and dense objects roughly the size of Earth. They also can form planetary nebulae.

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## Crash Course Astronomy

### #31 - High Mass Stars

Video Duration: 12:17

21 Questions

Massive stars fuse heavier elements in their cores than lower mass stars. This leads to the creation of heavier elements up to iron.

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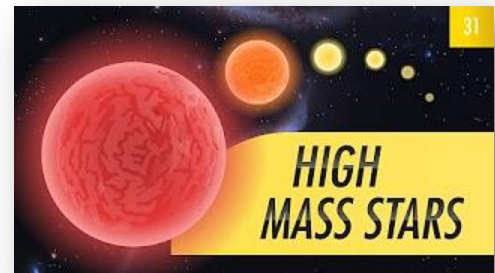
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## Crash Course Astronomy

### #32 - Neutron Stars

Video Duration: 12:57

20 Questions

Neutrons stars are incredibly dense, spin rapidly, and have very strong magnetic fields. Some of them we see as pulsars, flashing in brightness as they spin.

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## Crash Course Astronomy

### #33 - Black Holes

Video Duration: 12:26

20 Questions

We've covered a lot of incredible stuff, but this week we're talking about the weirdest objects in space: Black Holes.

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## Crash Course Astronomy

### #34 - Binary and Multiple Stars

Video Duration: 12:01

21 Questions

Many stars are actually part of binary or multiple systems. If they are close enough together they can actually touch other, merging into one peanut-shaped star.

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## Crash Course Astronomy

### #35 - Star Clusters

Video Duration: 10:36

20 Questions

Last week we covered multiple star systems, but what if we added thousands or even millions of stars to the mix? A star cluster.

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## Crash Course Astronomy

### #36 - Nebulae

Video Duration: 12:16

21 Questions

Nebulae are clouds of gas and dust in space. They can glow on their own or reflect light from nearby stars.

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## Crash Course Astronomy

### #37 - The Milky Way

Video Duration: 11:14

20 Questions

Today we're talking about our galactic neighborhood: The Milky Way. It's a disk galaxy, a collection of dust, gas, and hundreds of billions of stars.

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## Crash Course Astronomy

### #38 - Galaxies, part 1

Video Duration: 12:06

25 Questions

Galaxies contain gas, dust, and billions of stars or more. They come in four main shapes: elliptical, spiral, peculiar, and irregular.

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## Crash Course Astronomy

### #39 - Galaxies, part 2

Video Duration: 15:34

22 Questions

Galaxies tend not to be loners, but instead exist in smaller groups and larger clusters.

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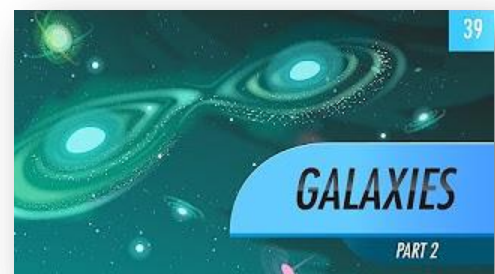
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## Crash Course Astronomy

### #40 - Gamma-Ray Bursts

Video Duration: 14:05

22 Questions

Gamma-ray bursts are not only incredible to study, but their discovery has an epic story in Cold War history.

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## Crash Course Astronomy

### #41 - Dark Matter

Video Duration: 12:00

18 Questions

The stuff we can actually observe in the universe isn't all there is. Galaxies are created and shifted by a force we detect mostly indirectly.

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## Crash Course Astronomy

### #42 - The Big Bang, Cosmology part 1

Video Duration: 13:23

22 Questions

Knowing that the universe is expanding and how quickly its expanding allows us to run the clock backwards 14 billion years to the way the universe began - with a bang.

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## Crash Course Astronomy

### #43 - Dark Energy, Cosmology part 2

Video Duration: 11:23

20 Questions

We don't know exactly what it is, but we do know that dark energy accelerates the expansion of space.

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## Crash Course Astronomy

### #44 - A Brief History of the Universe

Video Duration: 12:36

23 Questions

Thanks to the wonders of physics, astronomers can map a timeline of the universe's history. Phil gives you an overview of those first few minutes of the universe's life.

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## Crash Course Astronomy

### #45 - Deep Time

Video Duration: 15:15

21 Questions

As we approach the end of Crash Course Astronomy, it's time now to acknowledge that our Universe's days are numbered.

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## Crash Course Astronomy

### #46 - Everything, The Universe...And Life

Video Duration: 11:23

16 Questions

Phil gives the course a send-off with a look at some of his favorite topics and the big questions that Astronomy allows us to ask.

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