# God's Faithfulness as Seen in Our Universe

**Robert C. Newman**

# Introduction

- God is faithful:  He keeps His promises, He shows us mercy.
- 19 I remember my affliction and my wandering,
  the bitterness and the gall. 20 I well remember
  them, and my soul is downcast within me. 21
  Yet this I call to mind and therefore I have hope:
  22 Because of the LORD's great love we are
  not consumed, for his compassions never fail.
  23 They are new every morning; great is your
  faithfulness. (Lam 3:19-23, NIV)

# Introduction

- One of the most impressive ways in which God shows us His faithfulness and mercy is in the way He has made our universe so that we can survive in it and enjoy it.
- Let us look at some of the features of this universe God has made for us.

# Right Kind of Galaxy

- We live in the right sort of galaxy.
- 20% of galaxies are ellipticals, like the bright ones shown at right.
- These galaxies form all their stars in a very short time.
- As a result, the stars have too few heavy elements to support life.

# Right Kind of Galaxy

- 77% of galaxies are spirals, like the one we live in.
- These form stars over much of their history, so some of the stars have the heavy elements needed for life.

# Right Kind of Galaxy

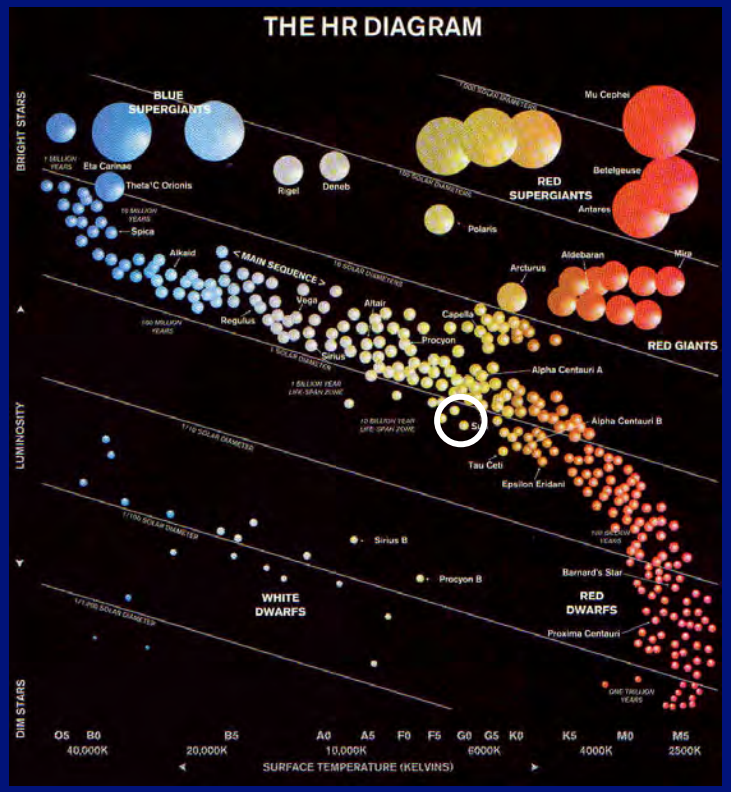
- 2% of galaxies are irregulars, like this one in Ursa Major.
- These have dangerous levels of radiation, but we don't live in one of these.
- We live in the right sort of galaxy.

# Right Location in Galaxy

- Our galaxy looks something like this.
- We live about 2/3 of the way out from the center.
- Closer in, there is too much radiation, plus gravitational disruption.
- Further out, there are not enough heavy elements.
- We live in the right place in our galaxy.

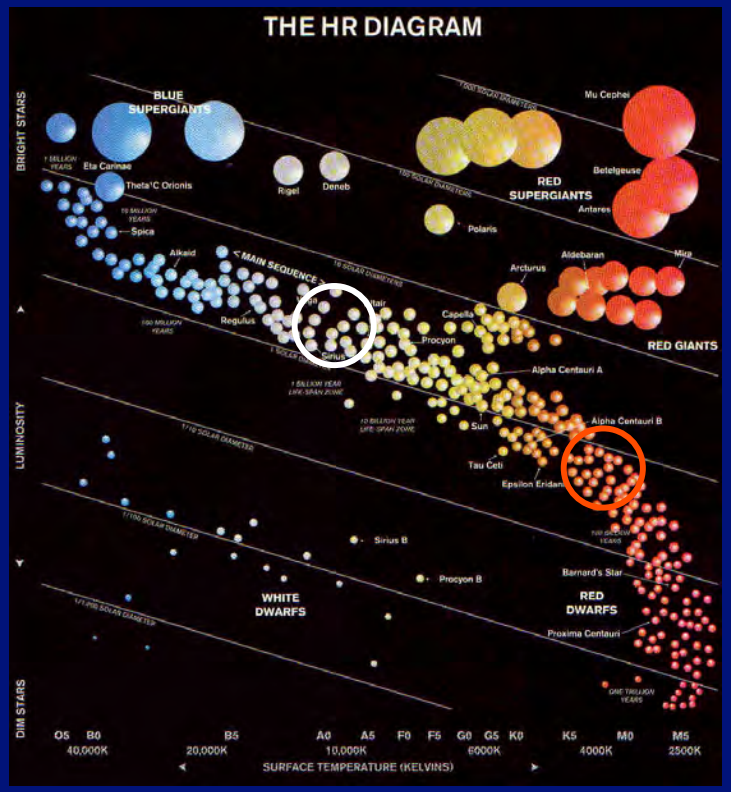
# Right Kind of Star

- There is a great variety of stars in our universe:
  - Large and small
  - Hot and cool
  - Fast-burning and slow-burning
- Our star (the sun) is an average, middle-aged star.



# Right Kind of Star

- A larger star would burn too fast & too erratically.
- A smaller star would burn slowly & evenly, but our planet would need to be much closer to the star, and the large tidal effect would lengthen the days too much.

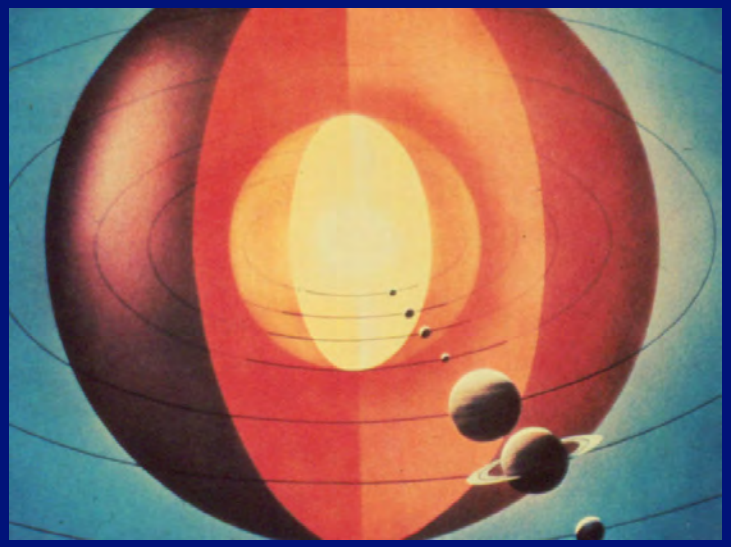


# Right Kind of Star

- We have the right number of suns in our system also, namely one.
- Without a sun, our planet would freeze.
- With more than one sun, the orbits of planets would be unstable, producing large temperature variations or even throwing planets out of the system.

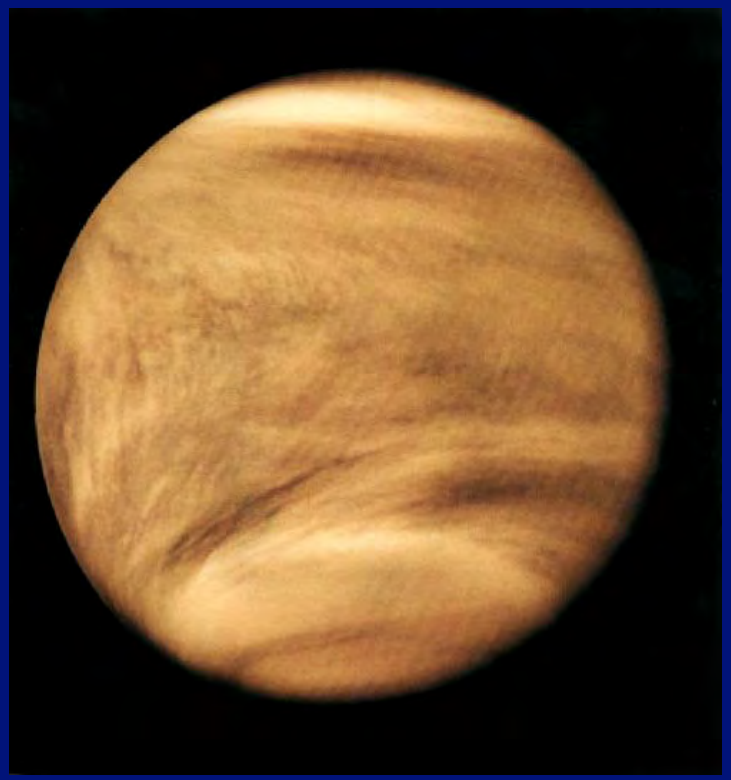
# Right Location around Star

- Astronomers define the "life zone" around a star as the region within which the temperature on a planet's surface would be between the freezing & boiling point of water.
- For our solar system, the life zone is actually much narrower than shown here.



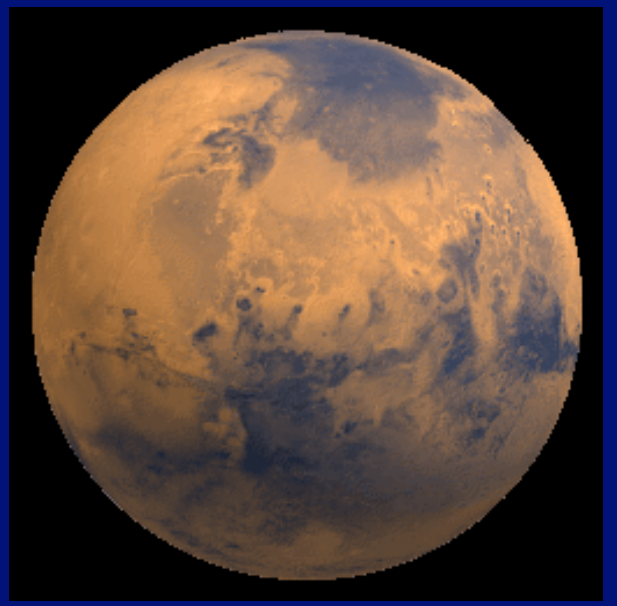
# Right Location around Star

- Venus, the next closer planet to our sun, lies outside the life zone, on the hot side.
- With its thick atmosphere, the temperature at its surface is about 900 degrees Fahrenheit.



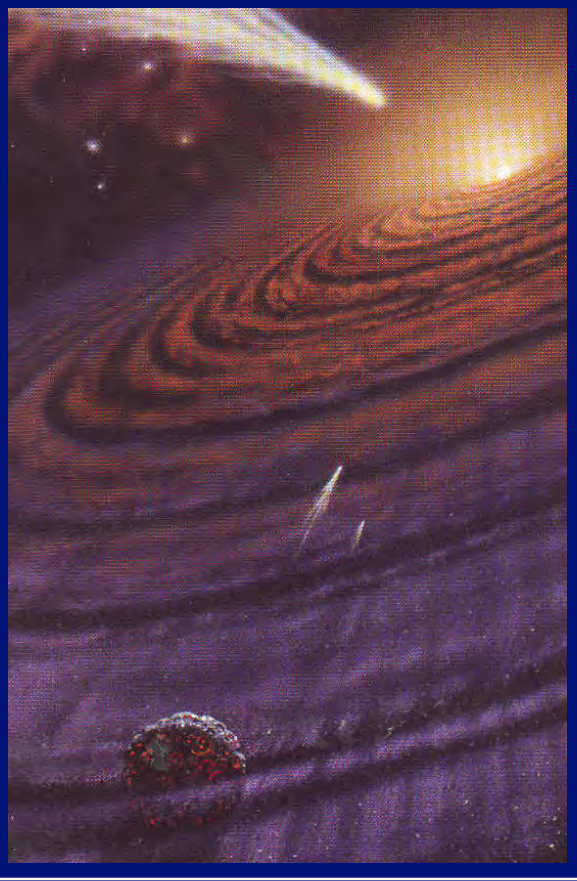
# Right Location around Star

- Mars, the next further planet from our sun, also lies outside the life zone, on the cold side.
- With a very thin atmosphere, the temperature on Mars barely reaches freezing at the equator in mid-summer.
- Our Earth has just the right temperatures for life.



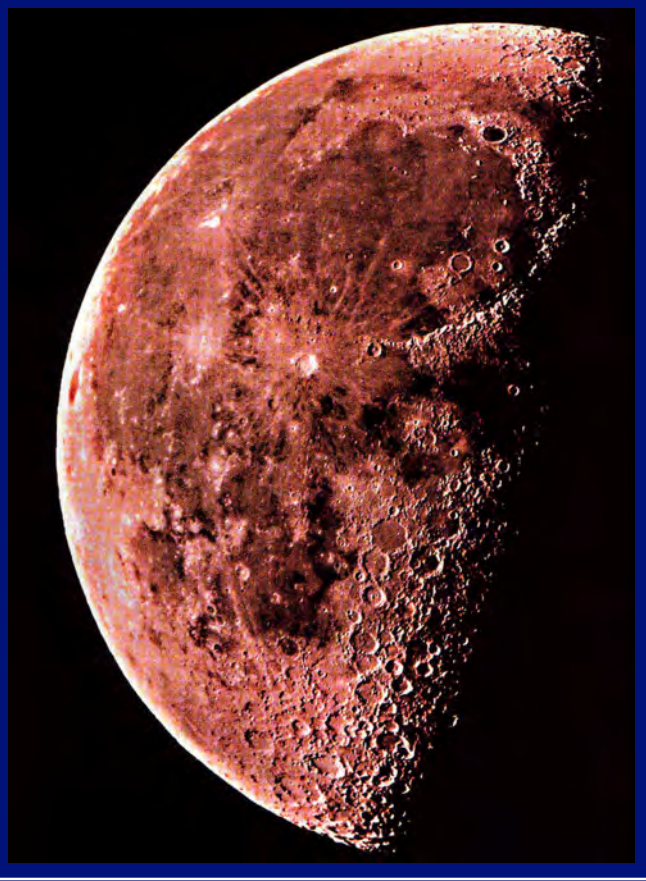
# Protection from Collisions

- The neighborhood of a star can be a dangerous place for planets, or at least, for life on them.
- Comets, asteroids and other debris in orbit around the star, or just passing thru, can strike the planet with violent collisions.
- We have substantial evidence for many such collisions early in the history of the solar system.



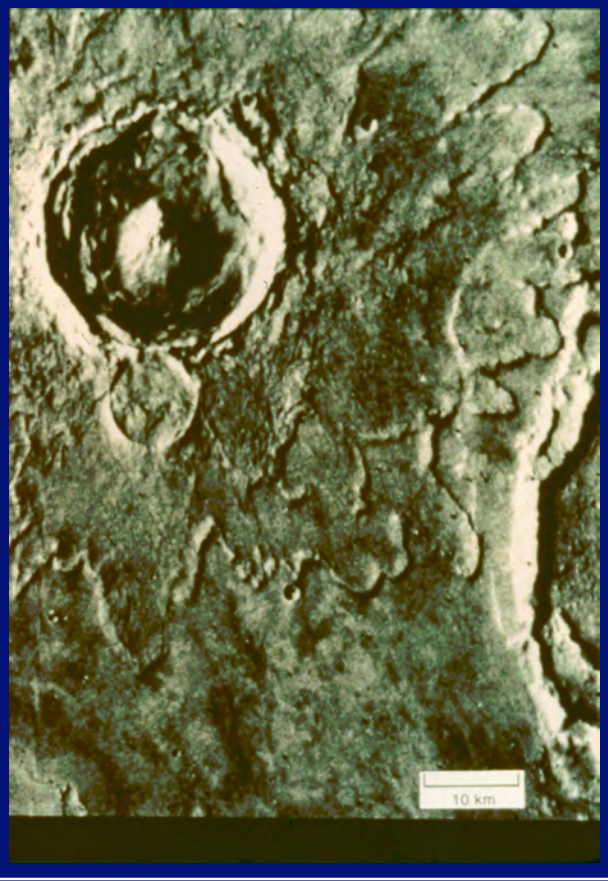
# The Moon's Surface

- The moon, with virtually no atmosphere, has preserved many of these collisions from early in its history.
- Some of these collision scars, or craters, are over 100 miles in diameter.



# The Surface of Mars

- Mars has a much thicker atmosphere than the Moon, so most of its craters have eroded away.
- This crater, Yuti, is over ten miles across.



# Craters on Earth

- Probably the most famous meteor crater on Earth is this one in Arizona.
- It is nearly a mile across and 570 feet deep.
- It is thought to have formed some 25,000 years ago.

# Craters on Earth

- In spite of the fact that craters erode rapidly on Earth, some 120 are known.
- Manicouagan crater, in Quebec, is one of the largest still preserved, about 60 miles across.

# Demise of the Dinosaurs

- It is believed a meteor some ten miles in diameter so disrupted Earth's climate that the dinosaurs were killed off.
- A huge firestorm, followed by a multi-year winter and then years of drought, did the job.

# Protection from Collisions

- Recent computer simulations suggest that having a large planet like Jupiter in our solar system has protected Earth from many more such catastrophes.
- Apparently, we live in a solar system designed to protect the Earth!

# Right Moon: Climate Protection

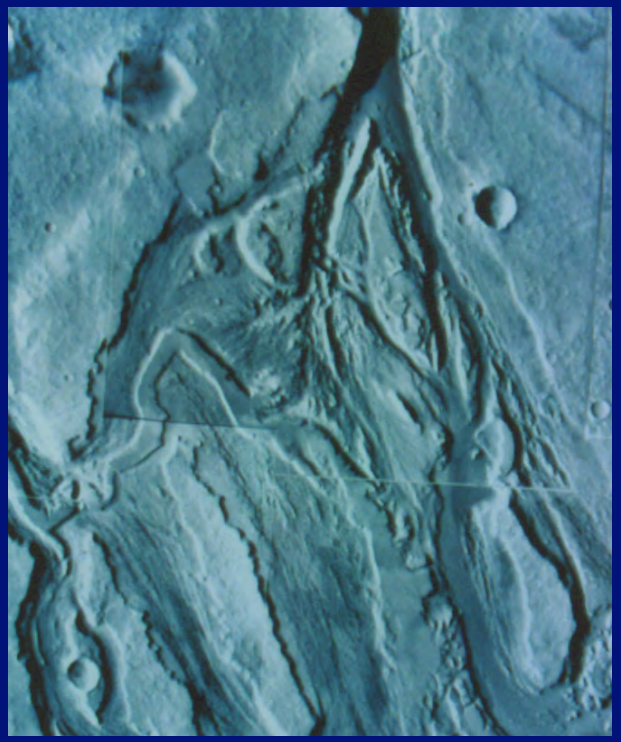
- The Earth's Moon is unusually large, one of the largest moons in our solar system.
- It is by far the largest of the moons in comparison to its planet.
- This turns out to be quite important for life on Earth.

# Right Moon: Climate Protection

- Recent computer simulations have shown that the presence of our Moon acts as a stabilizer on the Earth's rotational axis.
- Mars' axis, by contrast, with no large moons, tends to flop back and forth over long periods, producing drastic changes in climate.

# Right Moon: Climate Protection

- We now have evidence that Mars' climate was once much more pleasant than it is now.
- It appears that Mars once had flowing waters, a thicker atmosphere, and even seas.
- Our Moon acts as a protection for Earth's climate.



# Right Planet: Earth

Our planet itself is just right in many ways:

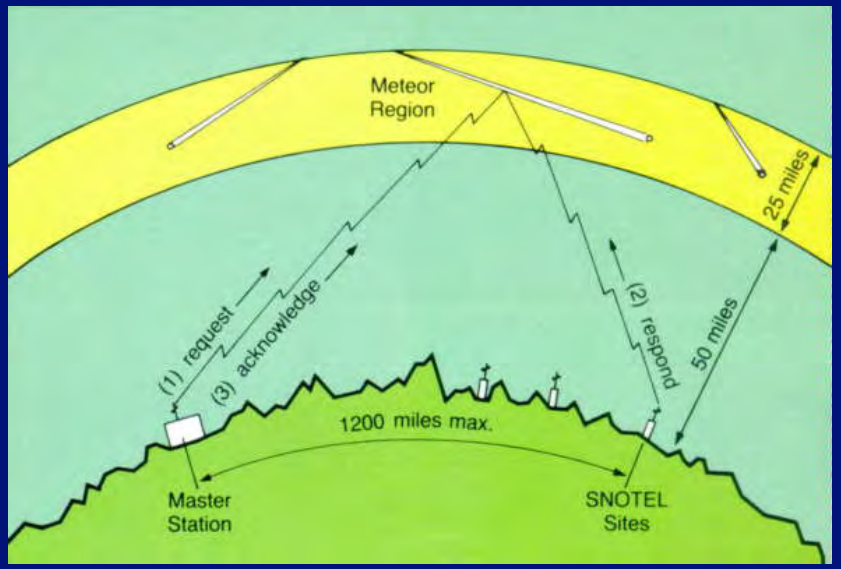
- Size
- Atmosphere
- Water
- Rotation speed
- Axial tilt
- Orbital shape
- Thickness of crust

# Earth's Size

- The mass of the Earth is just right:
- If it were much less, the Earth would not have enough atmosphere to support life.
- If it were much more, Earth's temperature would be too high for life.

# Earth's Atmosphere

- Not only is the Earth's atmosphere just right to support life, it is also helpful in stopping harmful radiation and small meteors from reaching the surface.

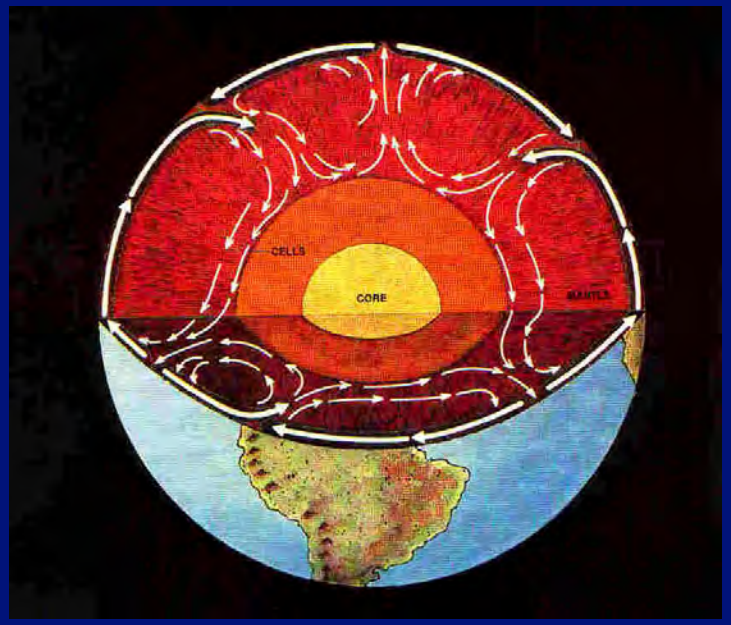


# Earth's Atmosphere

- Amount of oxygen:
  - Less – animals in trouble
  - More – plants in trouble
- Amount of carbon dioxide:
  - Less – plants in trouble
  - More – greenhouse effect
- Amount of water vapor:
  - Less – too little rain
  - More – greenhouse effect

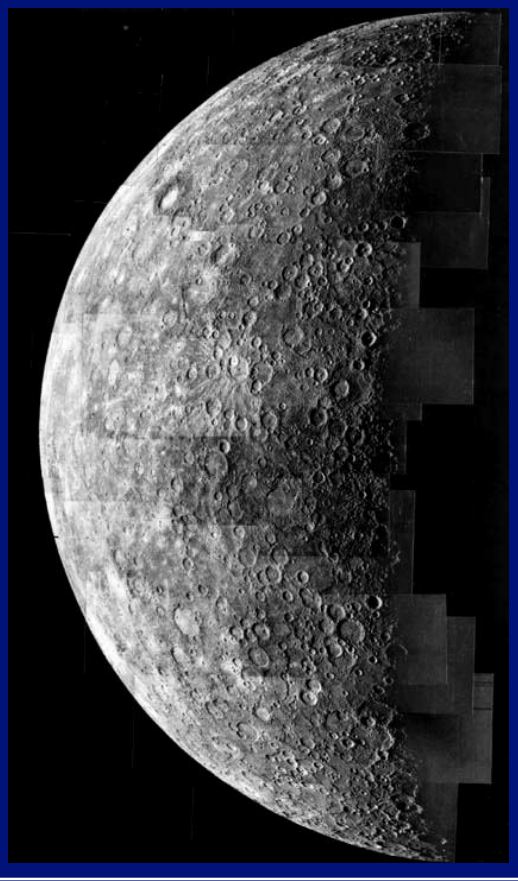
# Earth's Water

- Earth has an enormous amount of water compared to Mars and Venus.
- Earth's water is all concentrated at the surface of the planet.
- Earth's water is right where it is needed for life.



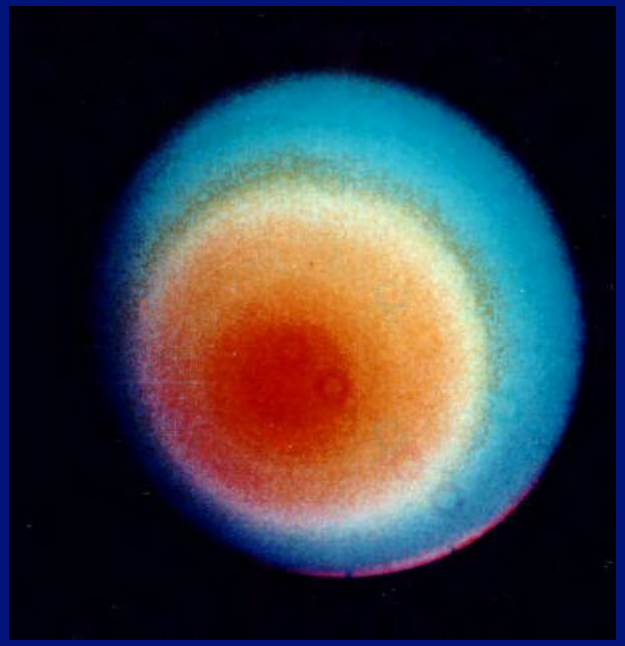
# Earth's Rotation Speed

- Higher – too much wind
  - Compare Jupiter
- Lower – days too long, too much diurnal temperature variation
  - Compare Mercury



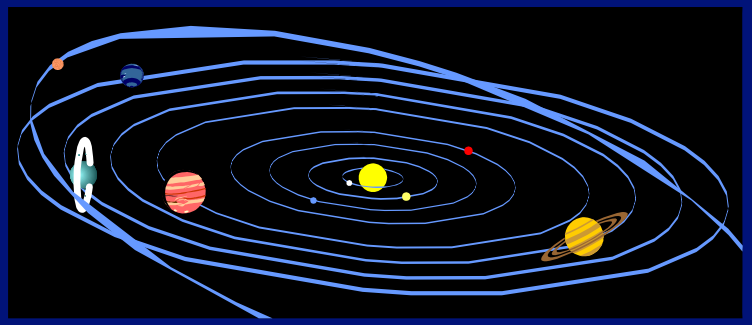
# Earth's Axial Tilt

- Contrast Uranus, where its axial tilt is so large that parts of the planet have days and nights that last for many Earth years
- Much more or less axial tilt means too much temperature variation.



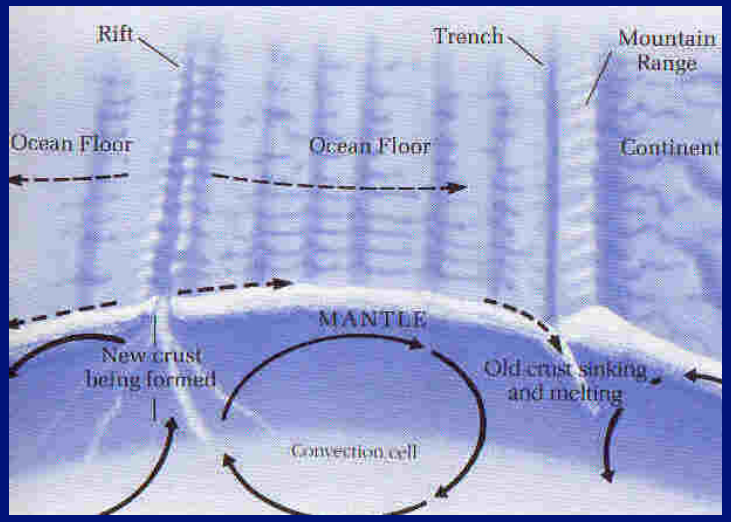
# Earth's Orbital Shape

- Earth has a very nearly circular orbit as it moves around the sun.
- This is true of most of our planets, with the exceptions of Mars and especially Pluto.
- If our orbit was more elongated, there would be too much temperature variation.



# Earth's Crust

- The Earth's crust is just the right thickness.
- If it were thinner, there would be too many earthquakes and too much volcanism for life to function well.
- If it were thicker, the crust would eat up too much of the atmospheric oxygen.



# Earth's Crust

- Strangely enough, we now have evidence that the Earth was struck early in its history by a Mars-size planet.
- This collision stripped off most of the crust, making it into the Moon!

# Conclusions

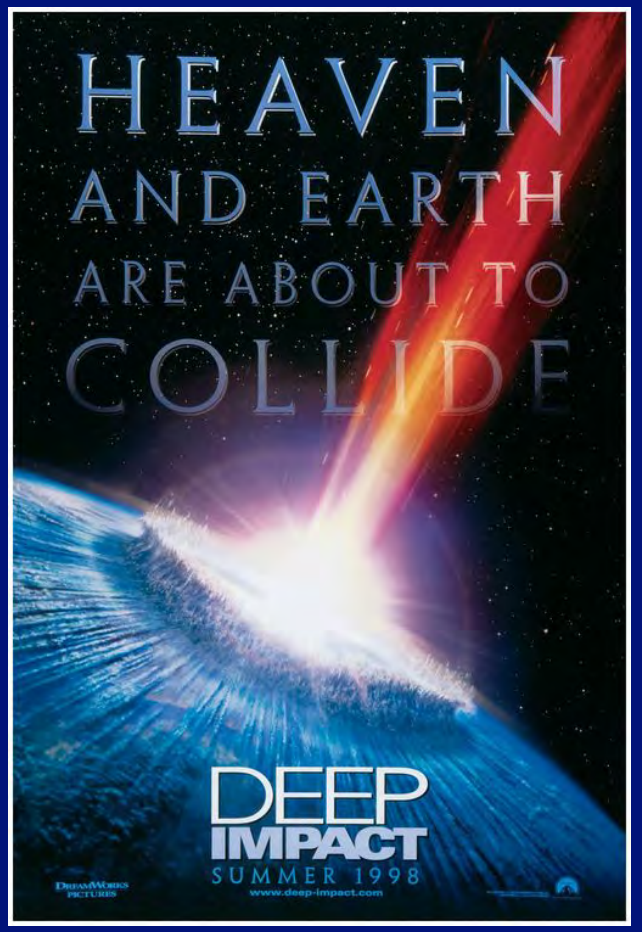
- Taken singly, these things may look like accidents, but in combination they point to a design and purpose.
- We suggest they are manifestations of God's mercy to us, which He does not owe us.

# Conclusions

- In fact, God has revealed that He will withdraw some of these things at the end of the age.
- The sun will be darkened:  Matt 24:29 (NIV) Immediately after the distress of those days 'the sun will be darkened, and the moon will not give its light; the stars will fall from the sky, and the heavenly bodies will be shaken.'

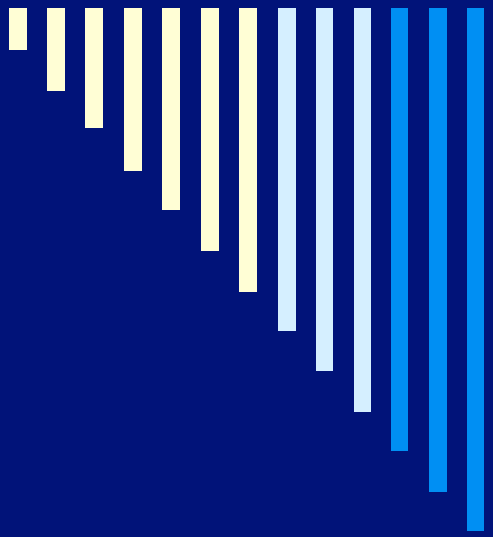
# Conclusions

Revelation chapter 8 speaks of a series of judgments (trumpets 1-4) that sound very much like a massive meteor strike such as described in the two films *Deep Impact* and *Armageddon*.



# Conclusions

- We need to realize that God holds our destiny and that of all living things in His hand.
- 2Pet 3:11-12 (NIV) Since everything will be destroyed in this way, what kind of people ought you to be? You ought to live holy and godly lives 12 as you look forward to the day of God and speed its coming. That day will bring about the destruction of the heavens by fire, and the elements will melt in the heat.



# The End

**Don't let it catch you by surprise.**