

In association with *Holy Trinity Anglican Church*

Raymond Historical Publications presents



Are We Alone in the Universe?

(Depends on the definition of Universe)

“The Search for Spock” – Part I

One in a series of historical perspectives
on the Christian Church in America

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Ver. 1.0

Thank you, Lord, for your Word, for your wisdom and guidance through the Holy Spirit. Open our minds, our eyes and ears this morning for reflections, both old and new, on the magnificence and power of your Universe and our very presence in it.

Thank you for your historic gift of the questioners, from Einstein and Hubble, back to Galileo, Kepler, Newton, to Plato and Aristotle, and the host of others. May the products of their insights begin to burn just a little brighter in each of us this day.

In Jesus' name. Amen

NOTE 1

“Humanity resides not in one universe but two, one physical, one spiritual, not parallel but intersecting; and where they intersect is called truth: human truth, natural truth, divine truth.” - Anon

How did the Universe begin?

How did life arise on Earth?

These are among mankind's most important questions throughout the ages

- **In the last century** we've learned more about science and the creation of the Universe than everything known before the 20th century.
 - **In the last two decades** new discoveries have led to new theories that give us unique hypotheses about the nature of the Universe and the presence of God.
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Presentation Overview

PART I (today)

- **Resources and Inspirations**
- **Literary Choices: Fact and Fiction**
- **Definitions; Scales for Reference**
- **Components of our Universe(s)**

PART II (next week)

- **Genesis**
 - **Contact**
 - **Souls**
 - **Q&A and Take Away**
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Resources

- Holy Scripture (KJV): Genesis, Job, Matthew, Revelation
- The Book of Common Prayer
- The literature and media, including:
 - ✓ ***Phenomenal Physics***, “A totally non-scary guide to physics and why it matters”, Isaac McPhee, 2016
 - ✓ ***The Physics of Star Trek***, Lawrence M. Krauss, 1995
 - ✓ ***How the Universe Works***
SCI Channel, 2015-17
Comcast Cable TV

Recent inspirations for this work

- ❖ Passing comments from Fr. Brad
 - Bible college - cosmic string theory
 - Email ref. a planet and three moons – signs of liquid water, possible microbes!
- ❖ Richard Doster, religion columnist,
Fernandina Beach News Leader
- ❖ 100th anniversary – 1916 – Einstein's theory of **General Relativity**, i.e. gravity and time
 - Proof positive beginning in 1919
 - Ref. also 1905, **Special Relativity**, i. e. the speed of light

Other inspirations

- ❖ Four recent **major scientific milestones** in humanity's view of the Universe
 - 1) 2012, **Higgs Boson** detected, long-theorized but elusive subatomic particle; explains how matter gains mass (not why)
 - 2) 2015, Voyager 1 (1977 launch) reached **interstellar space**; we escaped our Solar System!
 - 3) 2015 and 2016, **Gravitational waves** detected, long-theorized; the 4th force?
 - 4) August 2016, **Earthlike exoplanet** detected nearby (4.3 LY); first one inferred in 1995, > 3000. Analog: “moth next to a searchlight”
- ❖ 50th Anniversary of *Star Trek*

Book of Common Prayer

BCP 1928

I believe in one God the Father Almighty, Maker of heaven and earth. And of all things visible and invisible

BCP 1976 - Eucharistic Prayer C

God of all power, **Ruler of the Universe**, you are worthy of glory and praise.

Glory to you for ever and ever.

At your command all things came to be: **the vast expanse of interstellar space, galaxies, suns, the planets in their courses, and this fragile earth, our island home.**

By your will they were created and have their being.

Playfully called the “Star Trek” canon

Literary choices

- Maybe our preference is the biography of Abraham Lincoln or *A Year in Provence*.
- Yet modern Sci-Fi writers – e.g. the “ABC” trio of Isaac **Asimov**, Ray **Bradbury**, Arthur C. **Clarke** – give us not just high adventure but weave lessons for us through technology and the host of possibilities
- They examine society and human values, to guide and inspire us with morality plays often lifted from Holy Scripture.
- Historical highlights ...

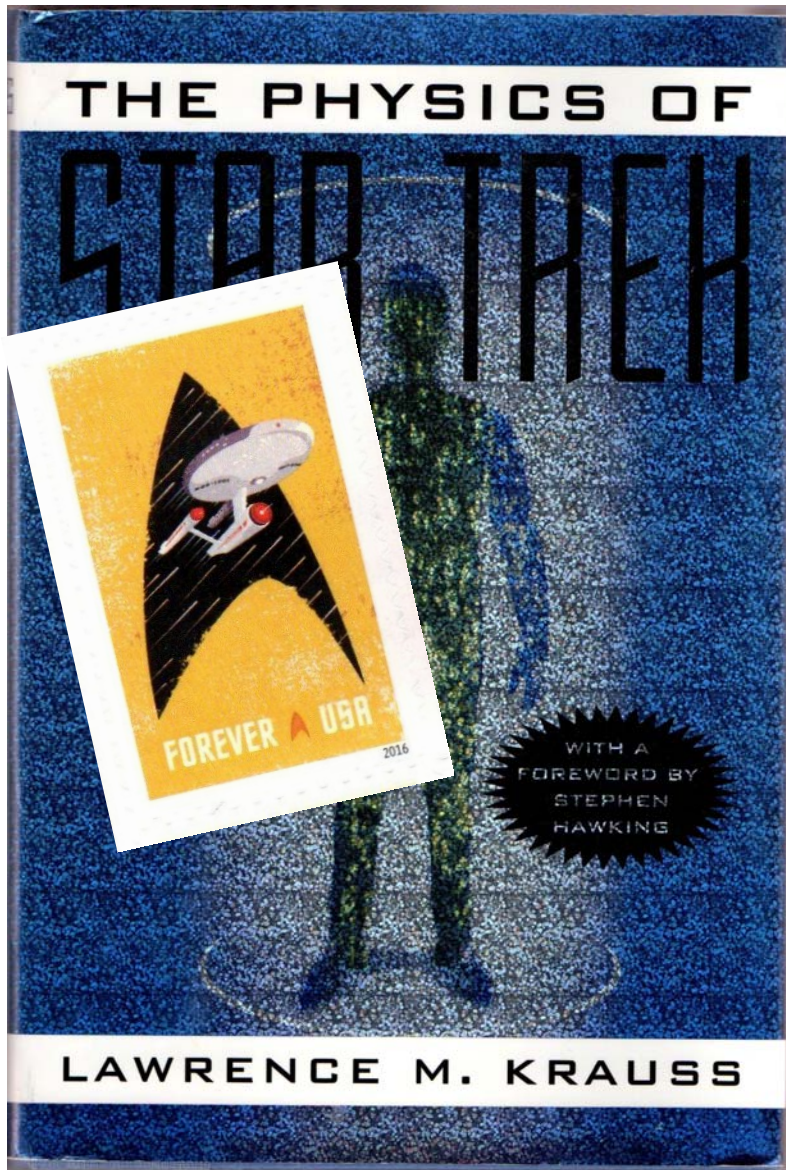
NOTE 2

NOTE 2 Sci-Fi genre, love it or leave it

- **1865:** Jules Verne, *From the Earth to the Moon*
- **1897:** Six years before Kitty Hawk, the *Dallas Morning News* runs the very first account of “extraterrestrials”: the crash of an “aircraft” with “alien pilot” aboard, west of Ft. Worth.
- **1898:** HG Well’s novel *The War of the Worlds* inspires Orson Welles’ **1938** radio drama of invading Martians in NJ, panic in the streets!
- **1947:** Roswell (NM) UFO incident triggers a new cult featuring little green men, flying saucers, tinfoil hats and Men in Black.
- **1952-1970:** USAF Project Blue Book.
- **Mid-1960s:** Star Trek launched
- **Mid-1970s:** Star Wars begins to compete

Technical feasibilities and technical errors

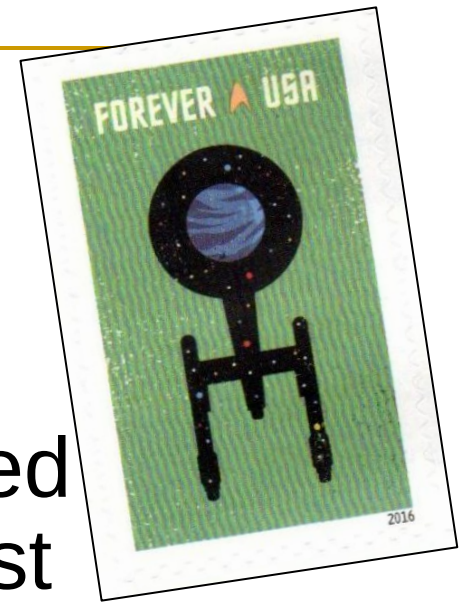
1. Human time travel? No.
Illogical, defies life cycle
2. Visible beams of light,
even if you split the
beams ... no, no, no!
3. This one's most grievous:
"To boldly go"
The writers consistently
split the infinitive!



1995 book

2016 US First Class Postage series

Sci-Fi out-takes



- Star Trek isn't just about stun guns, warp drives, beaming up.
- It's 50 years of story lines wrapped around the human spirit, the quest to reach beyond, to the stars or deep within, into the **human soul**, to fully embrace, appreciate, and nurture it.
- Stories of faith, hope and charity, of love as practiced through our Judeo-Christian tradition.
- The search for truth.

What is truth?

- Capt. Jean-Luc Picard, *Star Trek Next Generation*, sternly addressing Wesley Crusher:
“Ensign, there are three kinds of truth: **historical truth, scientific truth, and personal truth!**”
- *And Jesus answered Pontius Pilate, “... I have come into the world to bear witness to the truth.” (John 8:37)*
Yet Pilate skeptically replied, “*What is truth?*”
- Like today’s culture, main media, college campuses, Hollywood, which see truth as unknowable, or flexible and relative, rejecting absolute moral truth.
- Yet we’re given today’s easy answer (common refs.)
Truth: “... **the true or actual state of a matter; conformity with fact or reality; verity.**”

Reference: R. Doster, FB News-Leader, 9-30-16

Star Trek vs. Star Wars

- More than Chevy vs. Ford, Beatles vs. Rolling Stones, Gators vs. Seminoles ... OK, Tigers vs. the Tide.
- Good analogy for *Trek* vs. *Wars*:
O.T. WAR vs. N.T. PEACE.
- *Star Wars*: despotism vs. freedom, revolts, battles, War Stories
- *Star Trek*: Capt. James T. Kirk:
“We come in peace”



NOTE 3

NOTE 3 *More Star Trek vs. Star Wars*

- *Star Wars*: **No teleporter**, no “beaming up.”
- *Star Trek* only. Q. Why?
- A: Mid-’60s: Roddenberry approached Desilu with minimal budget, **no \$\$ for artwork or props for planet-based spaceports** like mid-’70s *Star Wars*.
- Thus he “invented” the need for *Star Trek*’s teleportation.
- This technical point will be revealed shortly as key to our physical-spiritual Universe.

Working Definitions

NOTE 4

Scales for Reference

NOTE 4 **Working definitions**

- **EVIDENCE**, direct and circumstantial
Both have equal weight in law & science
- **THEORY**, Careful, ambiguous word!
Three levels of theory:
 - ✓ **Possible**: Intelligent life found elsewhere in the Universe
 - ✓ **Probable**: Basic life components found in our Solar System
 - ✓ **Proven**: **Direct evidence**: E-M radiation
Circumstantial: Evolution
- **PROOF**, prove a theory w/ Scientific Method
Thesis, test, results ... “wash, rinse, repeat”

Scales for Reference

SPACE

- A Solar System parable:
 - ✓ If the Sun were a basketball on this table, the Earth would be a pea in downtown JAX; Jupiter would be a grapefruit in Orlando
 - Common units of distance measurement
 - ✓ **Astronomical unit, AU:** 93 **million** miles
 - ✓ **Light year:** ~ 6 **trillion** miles / ~ 10 trillion km
 - ✓ **Parsec:** ~ 3 ¼ light years
- 1 AU over an angle of 1 arcsecond (not on the test)

Space, “The Last Frontier”

■ Solar System

- ✓ a) Sun, 8 planets w/~150 moons, asteroid belt, a near disk
- ✓ b) 50 AU, **Kuiper belt**: dwarf planets, asteroids, near-period comets
- ✓ c) 50K AU (30 years), **Oort cloud**: icy, long-period comets; spherical

■ Milky Way Galaxy

- ✓ Nearest other star:
Proxima Centauri, 4.2 LY
- ✓ At 15,000 mi/hr, 40,000 years to get there!

Galaxies

■ Milky Way Galaxy

- ✓ 100 billion stars, **20% likely w/ an Earth-like planet** (Drake equation)
- ✓ That is, rocky, some probably in “Goldilocks Zone” with liquid water, atmosphere w/ O_2 for animals, CO_2 for plants

■ Closest other spiral galaxy: Andromeda, 2.5 million LY (minor cluster gal's closer)

■ Farthest / oldest detected, 2016 Hubble: 13.4 billion LY; 400 mil. yrs after Big Bang

Time scales ...

- The Universe: 14.7 billion years old
Evidence: Cosmic Microwave Background (CMB) equally distributed surrounding glow of ancient photons
- The Solar System: 4.6 billion yrs
- Earth: 4.5 billion yrs
- *Allegorically – O.T.: 5-6K years old*

Our Physical Scales thru History

Classical

Greeks to Newton, thru ~1600 AD

Separate ideas:

space & time, energy & matter

Measurement:

linear, geometric (pre-calculus)

Detected by:

unaided eye, all five senses

There was a time

- 1000 years ago Chinese astronomers witnessed and recorded a supernova that lighted the daytime sky; today we know it as the Crab Nebula
- Heaven-gazing European monks remained mum; easier than burning at the stake!

Yet ...

- 800 years ago Christians began to come out of the “darkroom”:
Monks observing a new crescent moon witnessed a huge meteor impact explosion bisecting the crescent like a third fiery dagger, likened it to a “snorting bull.”
They told us about it ... and lived!
- Then there was all that Church drama wrapped around Copernicus, Galileo, et al: **Earth-centric vs. heliocentric**

Modern Physical Scales

Macro Scale: Space-time is curved

- * Idea seeded beginning w/ Galileo's telescope, 1610
- * Advanced w/ Einstein's Special Relativity, 1905, speed of light, 1880s
- * Expanded w/ General Relativity, 1916, gravity & time

Micro Scale: Sub-atomic world, 1920s

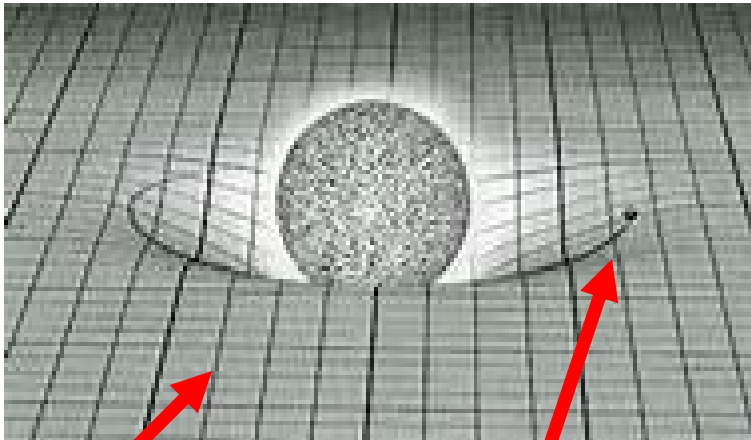
- * Microscopes, particle accelerators
- * Quantum physics / quantum mechanics

Warped space-time

Einstein's General Relativity (1916):

Gravity is not an ordinary **force**

but a **property** of space-time **geometry**



Sun Mercury in its orbit



Components of the Physical and Spiritual Universes

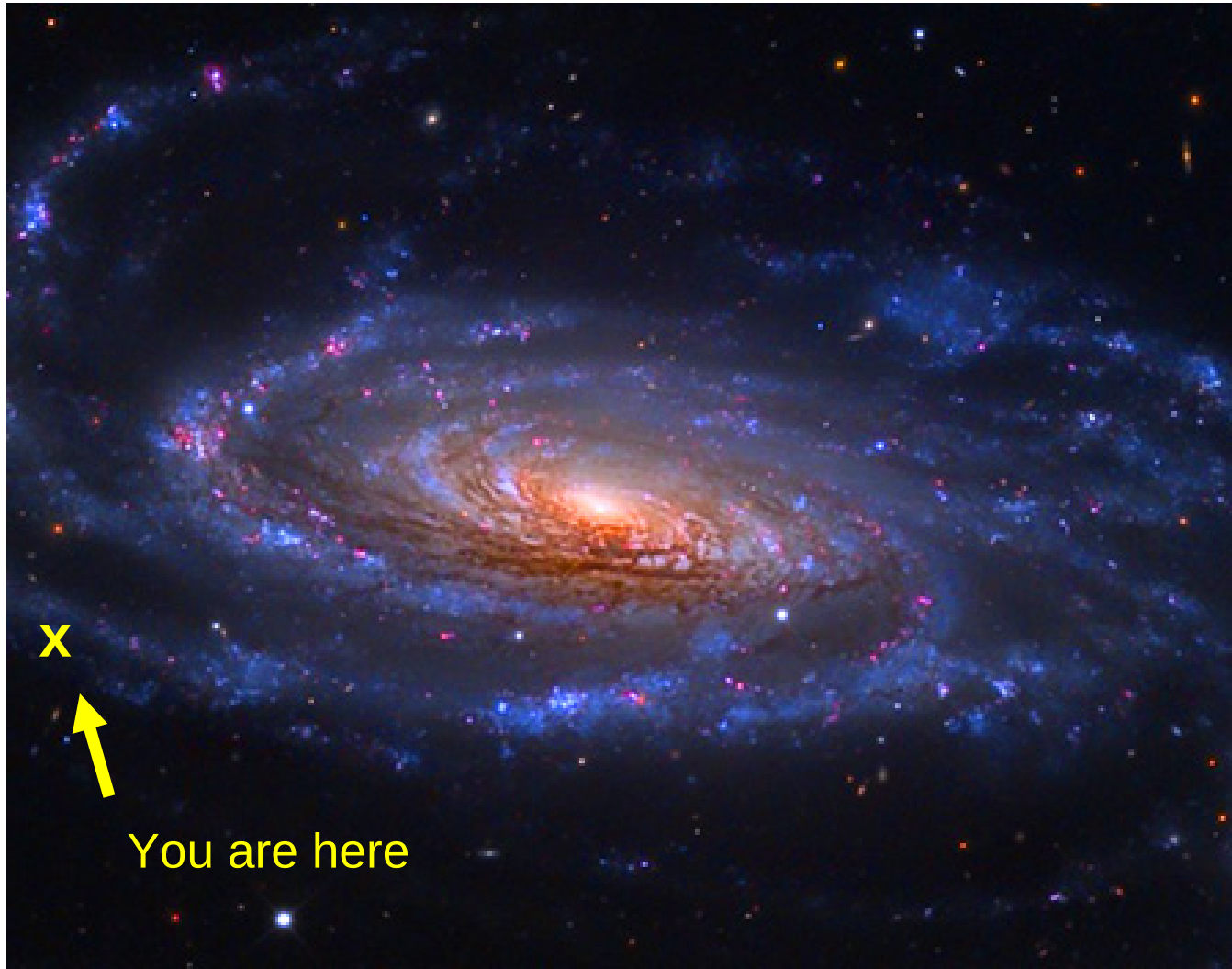
Topography of the Universe

- The Universe has no center, no edge; increasingly expanding like the surface of an inflating balloon; 1929, Edwin Hubble
- 1960s: Cosmic Microwave Background first discovered, photons from Big Bang
- Late 1990s: Expanding even faster than Hubble had detected
- Counterintuitive to the Universe slowing, reversing expansion due to collective gravity of observable matter

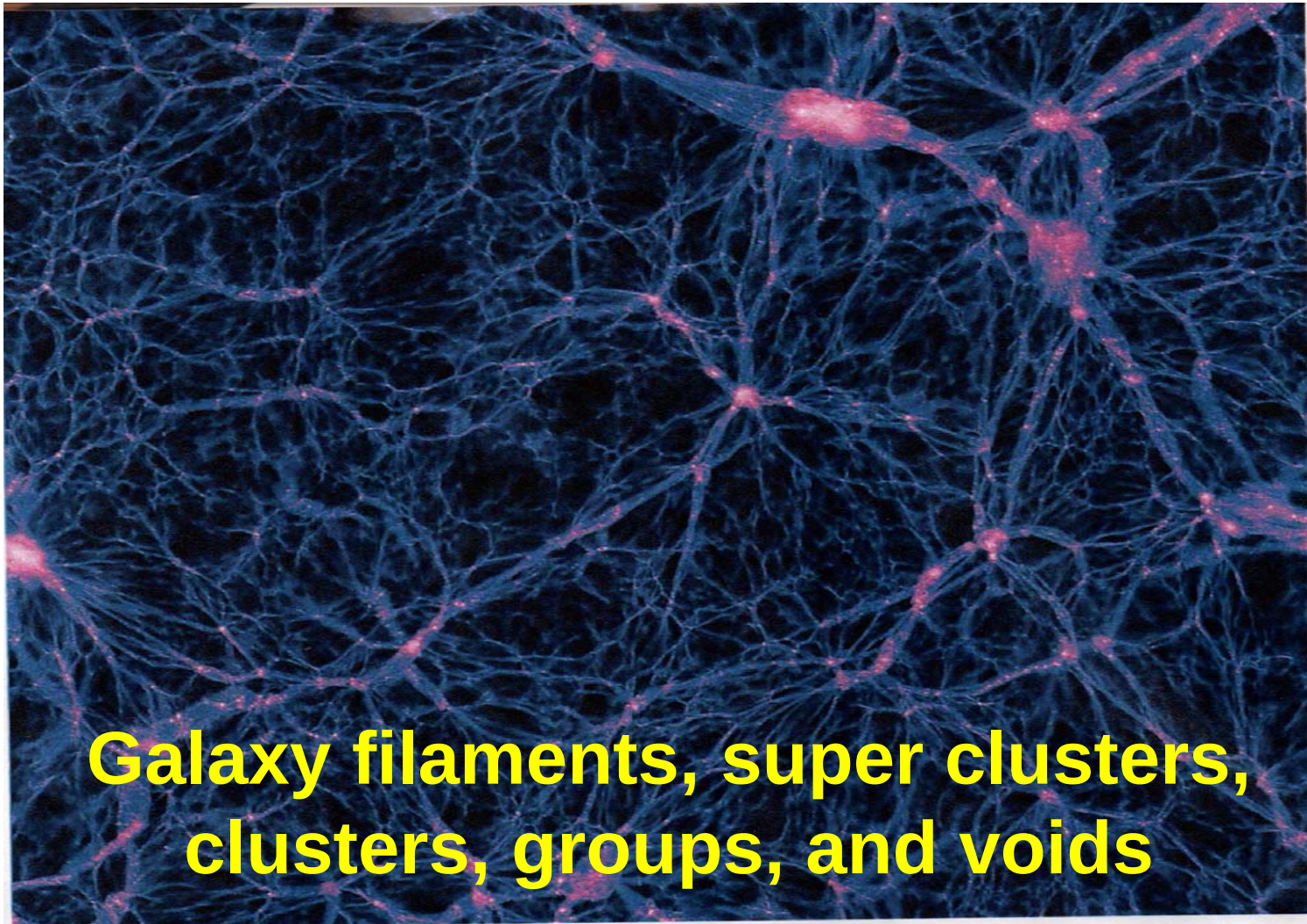
Topography – greater to lesser objects

- Interstellar Voids and clouds of dust, gas, primarily H - lack of visual matter - may explain **Dark Energy** and rapidly expanding Universe
- 100 billion observable galaxies, spiral and globular type, with heavy and light elements
 - Seen in galaxy filaments, galaxy clusters, galaxy groups – ref following illustrations
- Also, lone galaxies inside otherwise interstellar voids

A single spiral galaxy



The Cosmic Web



Galaxy filaments, super clusters, clusters, groups, and voids

Topography, continued

- Spiral galaxies – 70% of all galaxies – should spin apart, yet an unseen mass, **Dark Matter**, apparently binds them together
 - Dark energy and dark matter collectively comprise >90% of the detectable Universe, unseen and as yet unknowable
- Messier objects: 1777 catalog of 109 **deep-space** non-stellar objects, nebulae, galaxies
- Individual stars, planets, moons, asteroids, meteors, comets
- **You and me**: H^2O , C, Fe, heavy metal including my Au tooth

Our Sun, average yellow star

- Average **mass** and **age**, **composition** and **activity**: thermonuclear, $H \rightarrow He$
- 5-6 Billion Years old, almost half way through its life (~13 BY); Universe 14.7 BY
- Most stars we see are actually binaries, two circling each other
- Jupiter, failed star – minimal radiation – **we are almost a binary system**

Other star, universal body types

- Red giant, white dwarf, near end of life cycles
- Brown dwarf: failed star, not enough mass for thermonuclear reaction
- Black hole / frozen star, center of many galaxies
- Neutron star: super dense, 1-2 solar masses, size of Amelia Island!

God's most remarkable star of all

- Pulsar (neutron): hi energy radio beams fm poles
 - ✓ super magnetic field, tilted on axis, blink at us from across cosmos, thousands in each galaxy
 - ✓ spin 1000 rev/sec, radial velocity half speed of light!

Further exotica, possibilities

- Cosmic superstring theory – streaming packets of particles, packets of time
- Increasingly expanding Universe: Is gravity “leaking” into other dimensions? 10, 24 or more:
May be where this All Star team now resides:
 - Jimmy Hoffa
 - Judge Crater
 - Amelia Earhart
 - DB Cooper
 - Elvis

Components of the Spiritual Universe

- Holy Trinity, Holy Scripture – The Word of God
 - The peace of God which passeth all understanding
 - Heaven – the presence of God
 - **Earth, possible other Earths**
 - Apostles and the other Saints
 - Angels and **Humans**
 - Faith, hope and charity; the seven virtues
 - Satan and the fallen angels
 - Deceit, delusion; the seven vices
 - Hell – the absence of God
-

Next Week

- **Genesis**
- **Contact**
- **Souls**
- **Q&A and Take Away**