

“Responsibility, n. A detachable burden easily shifted to the shoulders of God, Fate, Fortune, Luck or one's neighbor. In the days of astrology it was customary to unload it upon a star.”

--Ambrose Bierce

“So you see, astrology's nothing to do with astronomy. It's just to do with people thinking about people.”

--Douglas Adams, “Mostly Harmless”

Astrology (Part 2)

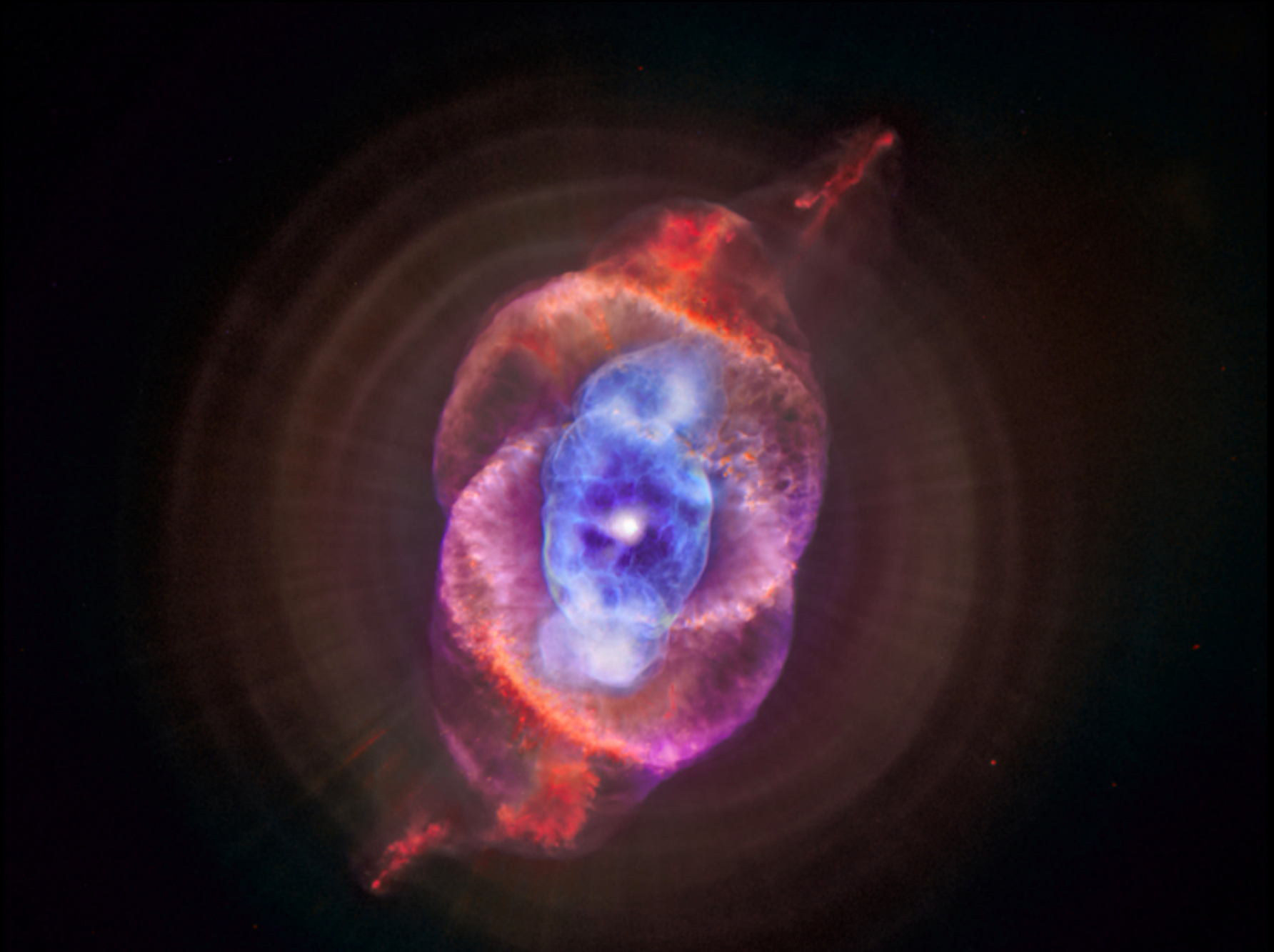
Supplementary Material for CFB3333/PHY3333
Professors John Cotton and Stephen Sekula
February 24, 2012

Based on the following information on the web:
<http://www.physics.smu.edu/pseudo/Astrology>

Astrology and Astronomy

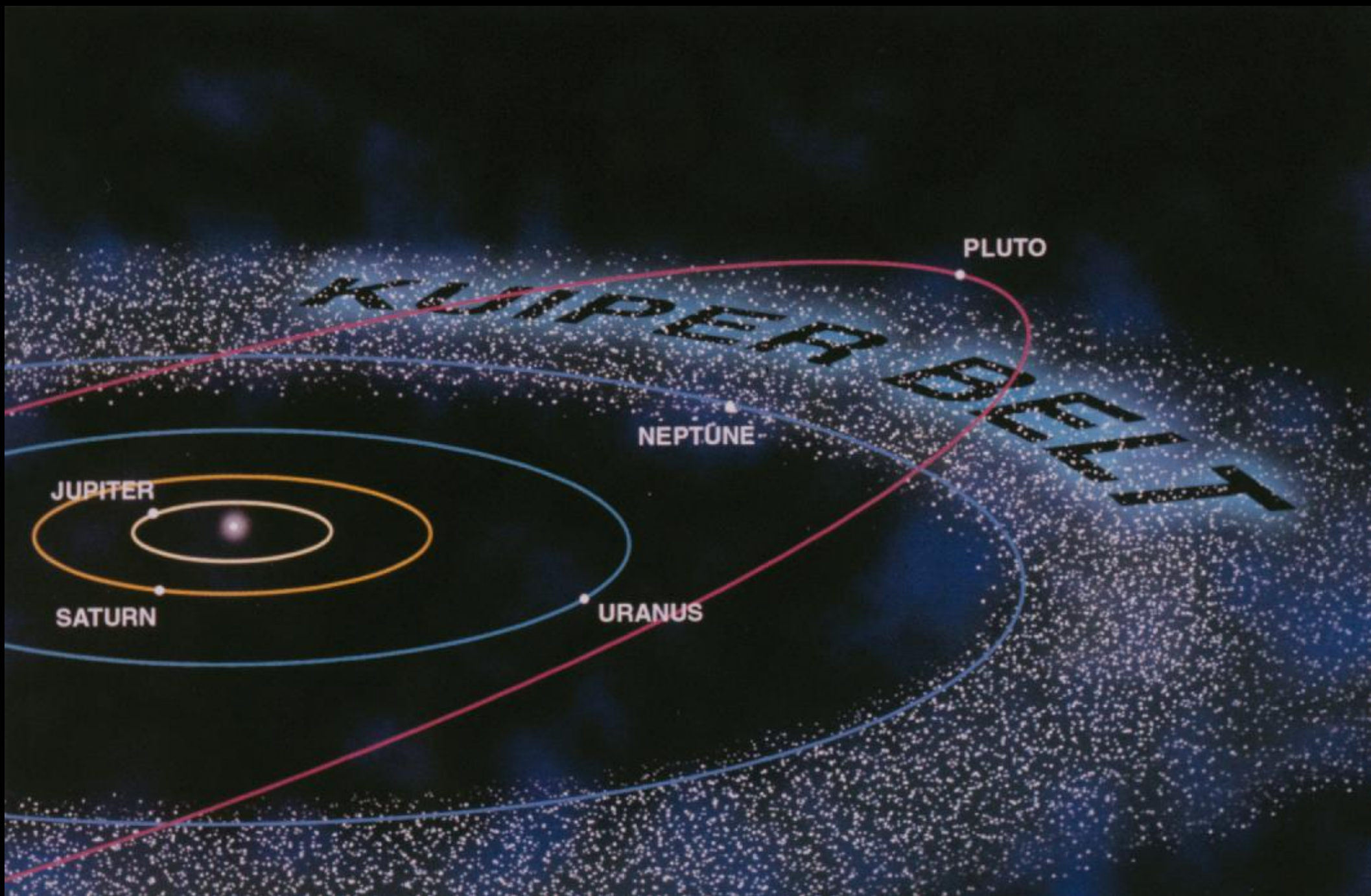
- These two disciplines have common roots
- They diverged . . .
 - astronomy became interested in trying to figure out what was actually going on
 - for astronomy, this marked the beginning of a long period of progress in human knowledge, which you and I know as “science”





This composite of data from NASA's Chandra X-ray Observatory and Hubble Space Telescope is a new look for NGC 6543, better known as the Cat's Eye nebula.





Astrology

- The claim that the position/location of specific astronomical bodies affects your personality and/or the events in your life.
 - essentially unchanged as a discipline for 2,000 years
 - no real progress of knowledge
- We can now ask some critical questions of Astrology...

Let's ask some critical questions of astrology

The Heavenly Bodies

- The Greeks established the basic rules for astrology
 - but . . . they were unaware at the time of Uranus, Neptune, or Pluto, or the asteroid belt, or the Kuiper belt . . .
 - Uranus: discovered in 1781
 - Neptune: discovered in 1846
 - Pluto: discovered in 1930
 - Pluto: demoted to “Dwarf Planet” 2006, because other bodies (e.g. Eris) in the Kuiper belt were found to be just as big or bigger.
- Does the existence of these other bodies mean horoscopes cast before their discovery are wrong?

Quality of Predictions

- Why don't different astrologers' predictions agree?
 - if astrology is rigorous, the outcomes shouldn't vary too much.
 - Let's look at an example

My Horoscope from 2 sources

<http://seattletimes.nwsources.com/html/horoscopes/>

Cancer (June 22-July 22): Today is a 6 -- Travel and romance both look good for the next two days. Expand your options. There's no shortage of information. Learn quickly from a loved one.

<http://www.dailynews.com/horoscopes>

It's time to make changes with regard to your convictions or beliefs. You may have something of an epiphany. Strange or mysterious communications and developments with regard to overseas connections or legal matters may mean you decide to travel. In any case you'll be excited by a new perspective.

Even more...

<http://www.latimes.com/features/horoscopes/>

You're even more deeply in touch with your emotional side today than usual. That's saying a lot, since you're a feeling person by nature. But life becomes extra subjective now. An embrace warms you to the depths of your soul. A beautiful song brings tears to your eyes. This is a very special state to be in. It reminds you of what's most important in life.

Can astrologers work backward?

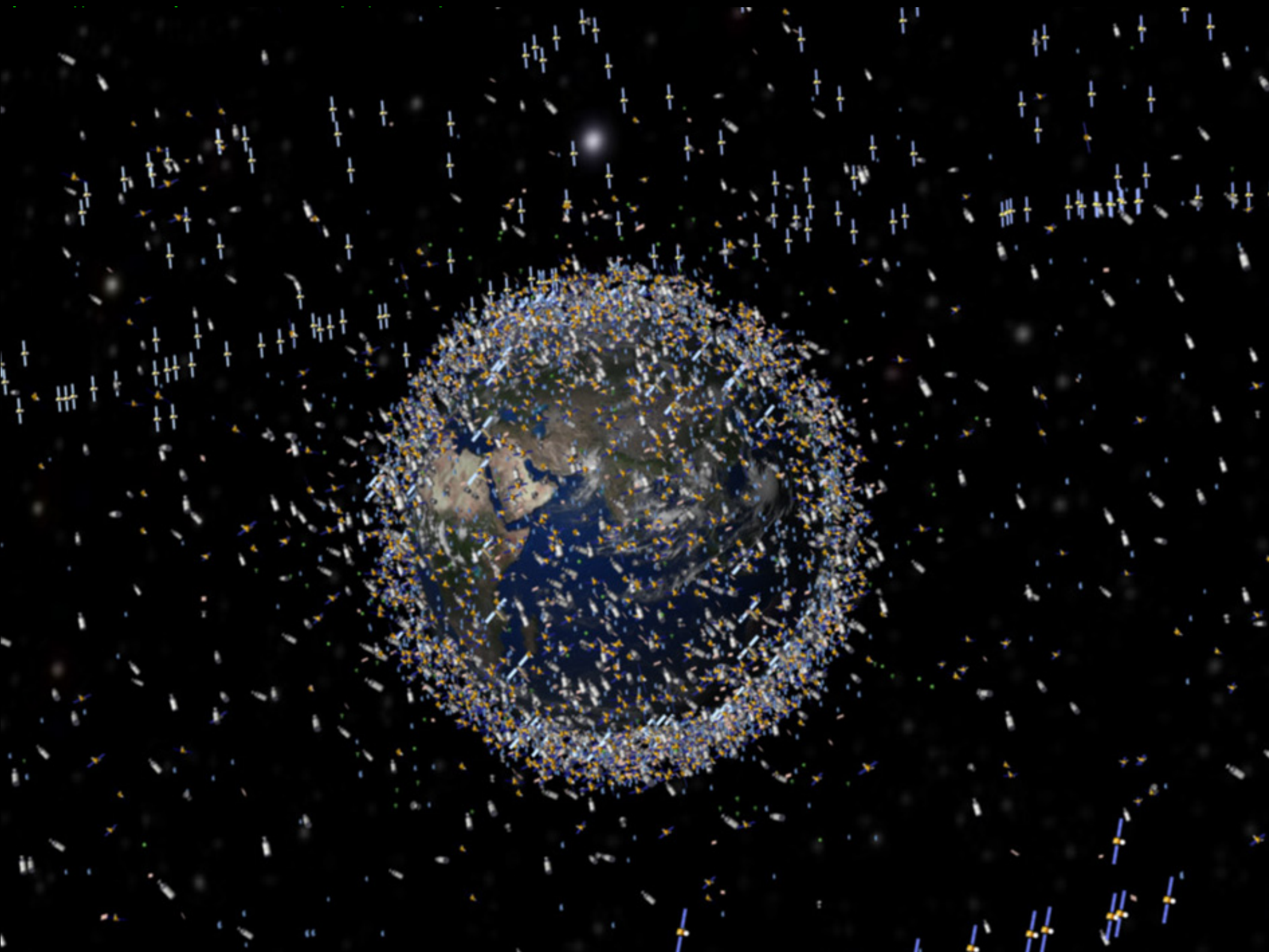
- Given the state of your life now, can an astrologer figure out under what sign you were born?

What is the cause?

- What is the source of the influence of Heavenly bodies over your life?
 - Electromagnetism?
 - Gravitation?
- Fun fact:
 - the obstetrician present at my birth had more electromagnetic and gravitational influence on me than does Mars. Do the math.
- More fun facts:
 - Electric and magnetic forces tend, overall, to cancel, due to the presence of equal numbers of opposite electric charges
 - Electromagnetic radiation (light) from Mars is blocked by walls.
 - Are there other known forces? Yes! The Weak and Strong Nuclear Forces! But, as their names imply, they are weak and strong only inside the atomic nucleus and non-existence outside of such short ranges.
- OK, then there must be some new force... why can't it be detected?

Can the cause be explored?

- If there is a new force...
 - why haven't we detected it?
 - how does it vary with range (inverse square, linear, what?)
- If it's not some new force, what about all these new astronomical bodies that weren't even known about when the rules of astrology were written down?
 - Extra-solar planets, supernovae, asteroids, comets, Kuiper-belt objects (like dwarf planets), the objects in the Oort Cloud? What about natural and artificial satellites in orbit around the earth?



Other Problems for Astrology

- Twins, triplets, etc.
 - born at nearly the same time in the same place
 - often their lives diverge (twins are not the same people!)
- How important is the following information to astrology:
 - the time (to the millisecond?) between births
 - Parturition (childbirth) is not an instantaneous process! It takes time (10-15 hours for first-time mothers). Why does the end of it matter more than the beginning, or the preceding 9 months of development?

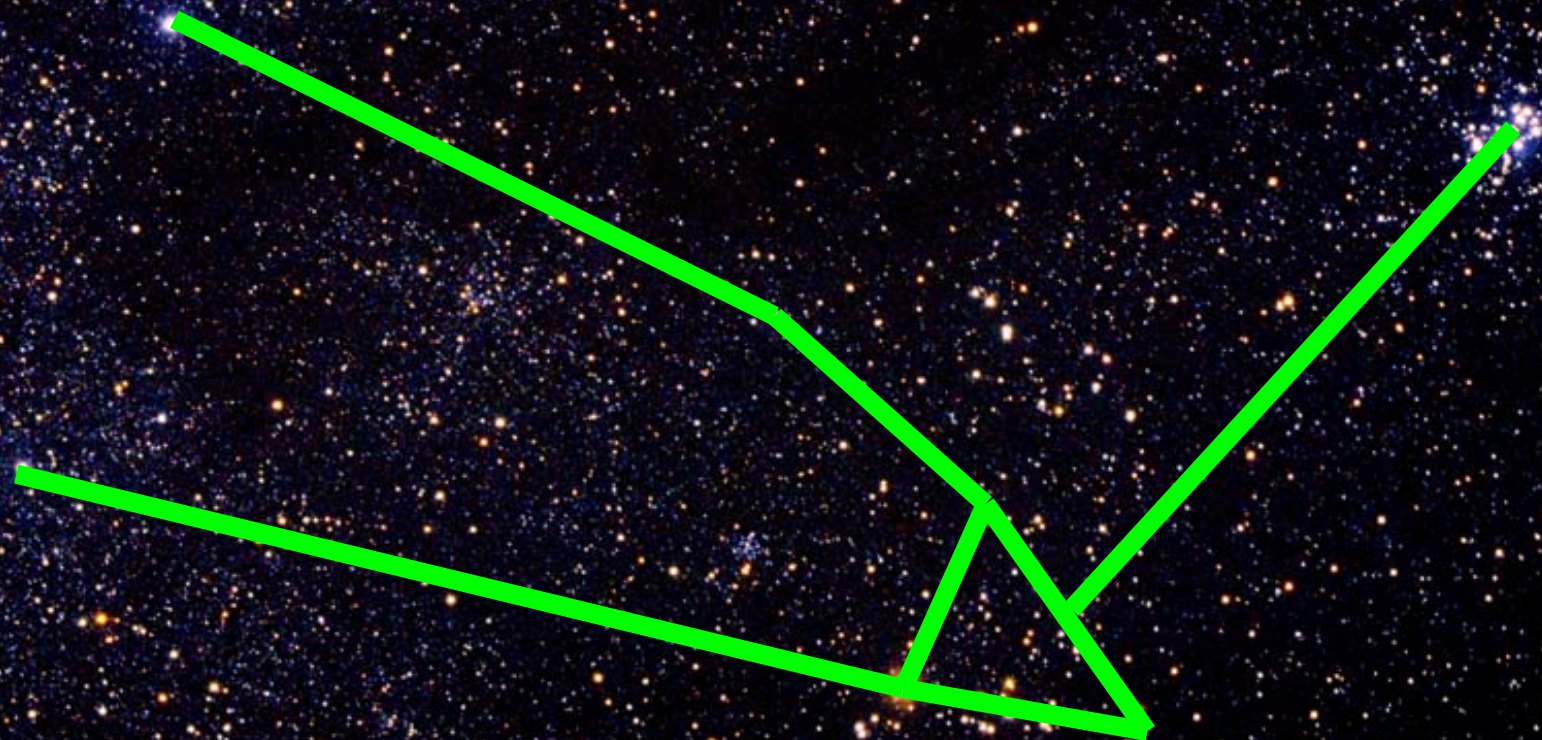


More problems

- Astrological signs are supposed to imply the personalities of the people born under those signs
 - those born under Taurus (the bull) are “bullish” (obstinate)
 - But wait . . .

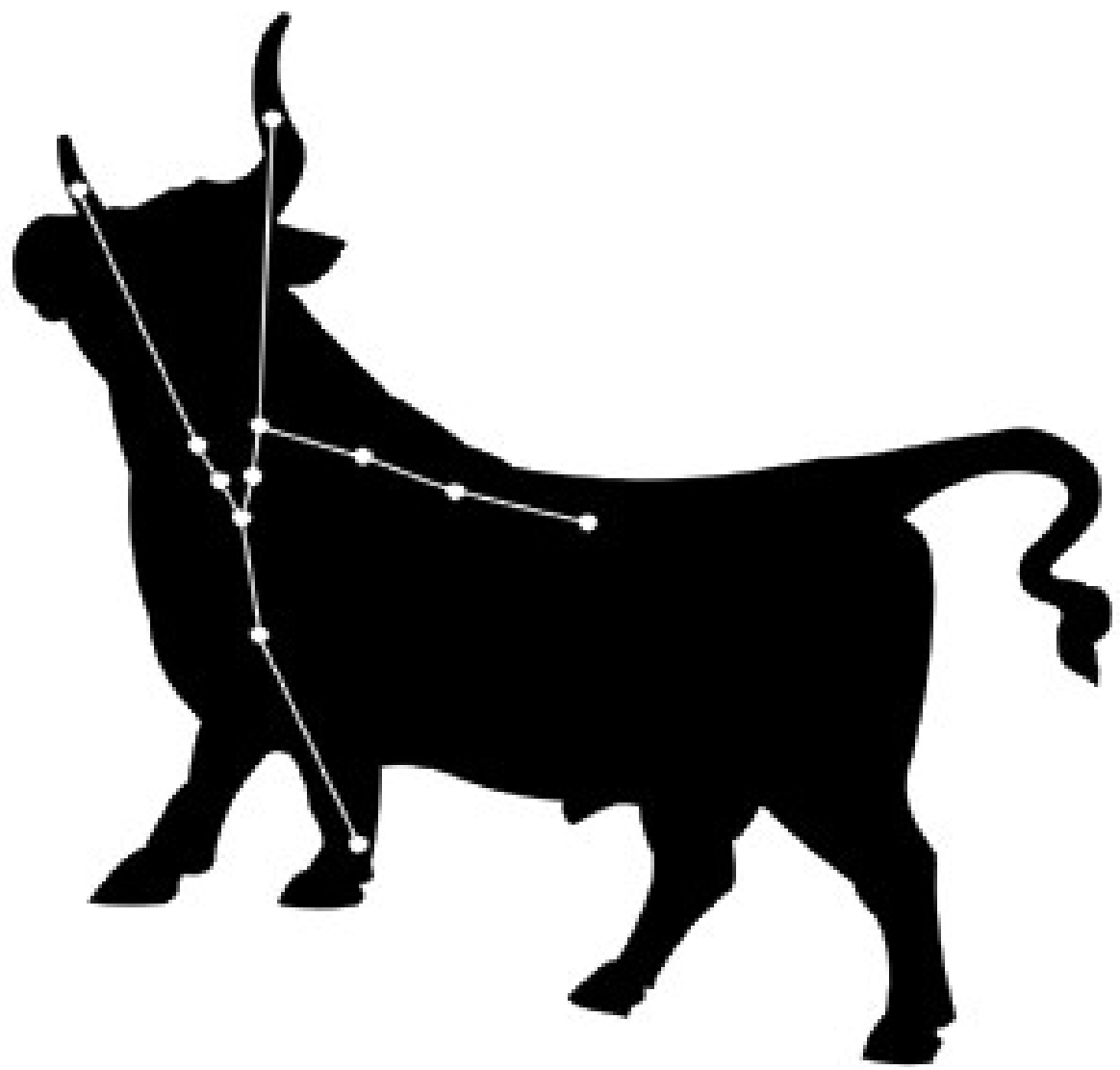


Do you see “Taurus” . . . the bull?



Do you see "Taurus" ... the bull?



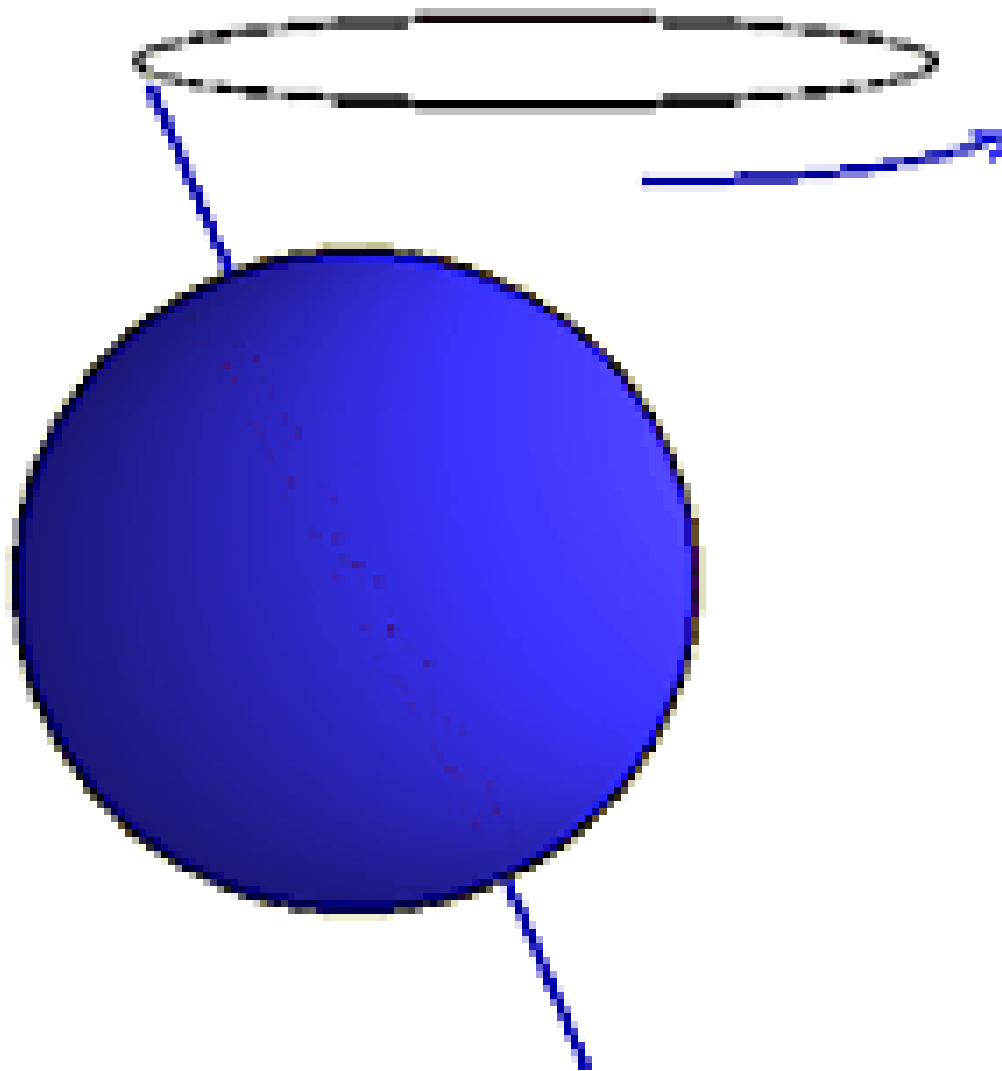




Oh . . . and a Big Whoops...

- The Earth's axis of rotation itself wobbles
 - this is called "precession"
 - this precession takes 26,000 years
 - The sun as seen is NO LONGER in your astrological sign on the date of your birth

Precession of Earth's spin axis traces out a pattern every 26,000 years.



Barnum Statements and the Forer Effect

Barnum Statements: Statements that can apply equally well to any individual (named after P.T. Barnum)

The Forer Effect: grading as “highly accurate” statements that are in fact vague and general; you perceive them as as meant specifically for you.

We delivered the personal horoscopes made for you by our astrologer. Each one read their horoscope and rated it on a scale of 1 to 5, where 1 meant no match and 5 meant excellent match. We then counted hands to see how the astrologer did.

1 - 3 people

2 - 13 people

3 - 20 people

4 - 15 people

5 - 2 people

The mean was 3.125; the median was 3 and the mode was 4. See how the Forer effect or Barnum statements work? They are not predictions at all. They are vague statements that could apply to almost everyone. Your mind will accommodate the information in the horoscope by searching for an interpretation that makes the horoscope relevant to you. You will see this technique again when we look at psychics and mediums talking to the dead.