Welcome to the future.

“We can never know about the days to come.
But we think about them anyway.”

— Carly Simon

opening lines of “Anticipation”

(photo by Alyssa Goodman
Is time like space?
What is pre-determined?

The Prediction Project

PredictionX

PredictionX: The Past & Present of the Future

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Predictive Systems Framework

The "Padua Rainbow"

Understanding Uncertainty

Study Design

Timelines

Why predict?

Omens, Oracles & Prophecies

Mesopotamian Haruspicy
Egyptian Priests
Yoruba Ifa
Tarot
Roman Augury
Casting Lots
The Diviner's Guide
Chinese Oracle Bones
Greek Astronomy
Oracle of Delphi
Turkish Tasseography
Astrology
Aztec Rituals
Maya Spacetime
Comets of Doom

cross-cultural conversations

The Rise of Theory

Ancient Mesopotamia, Egypt, Greece & Rome

Islamic Science

The Path to Newton

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Space

Futures of our Universe

SETI

Interactive Resource ▶ video(s) Coming Soon

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edX HarvardX

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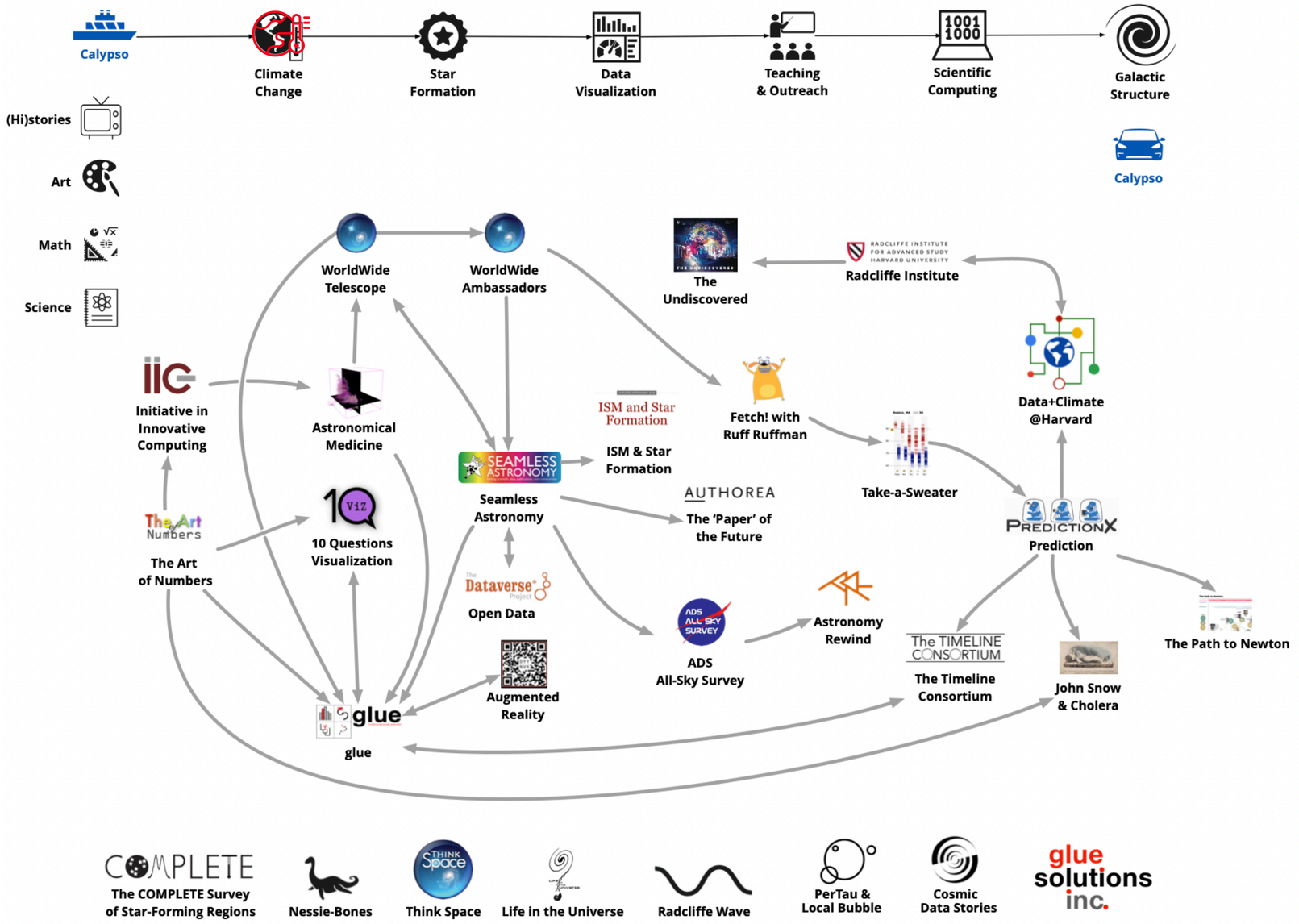
Why & how is a physicist interested in Cuneiform tablets?

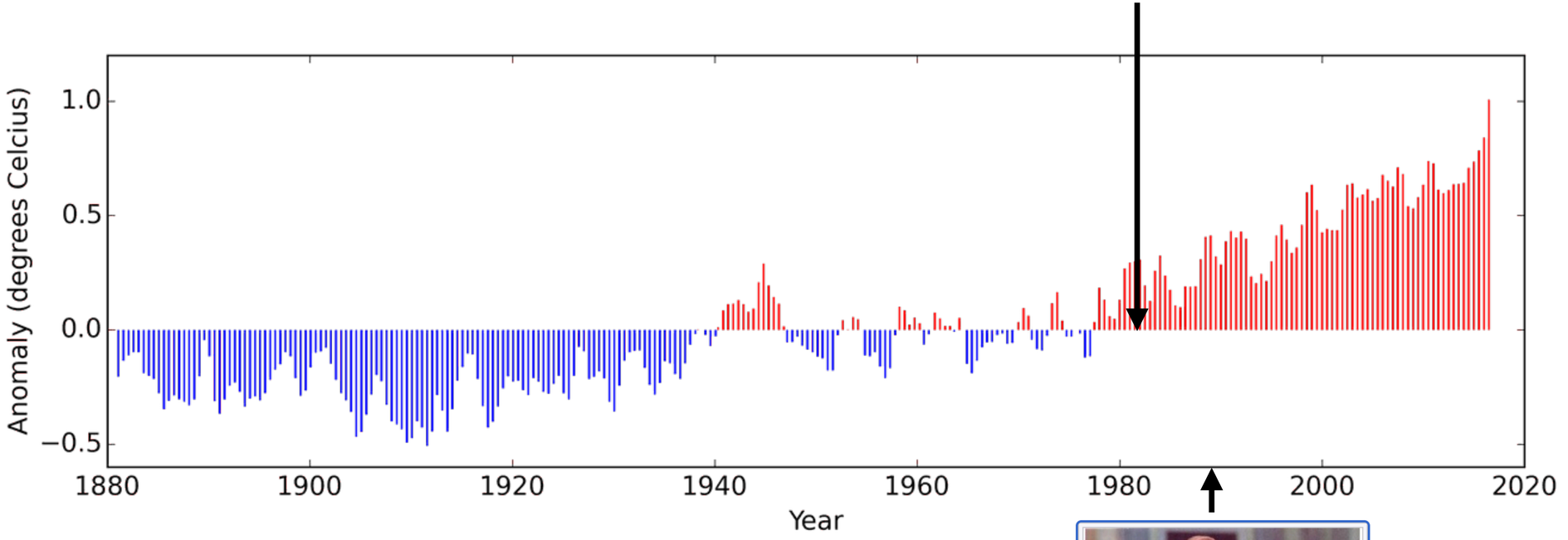
Alyssa's Life, So Far



scholar.harvard.edu/agoodman/alyssas-life

ORIGINS

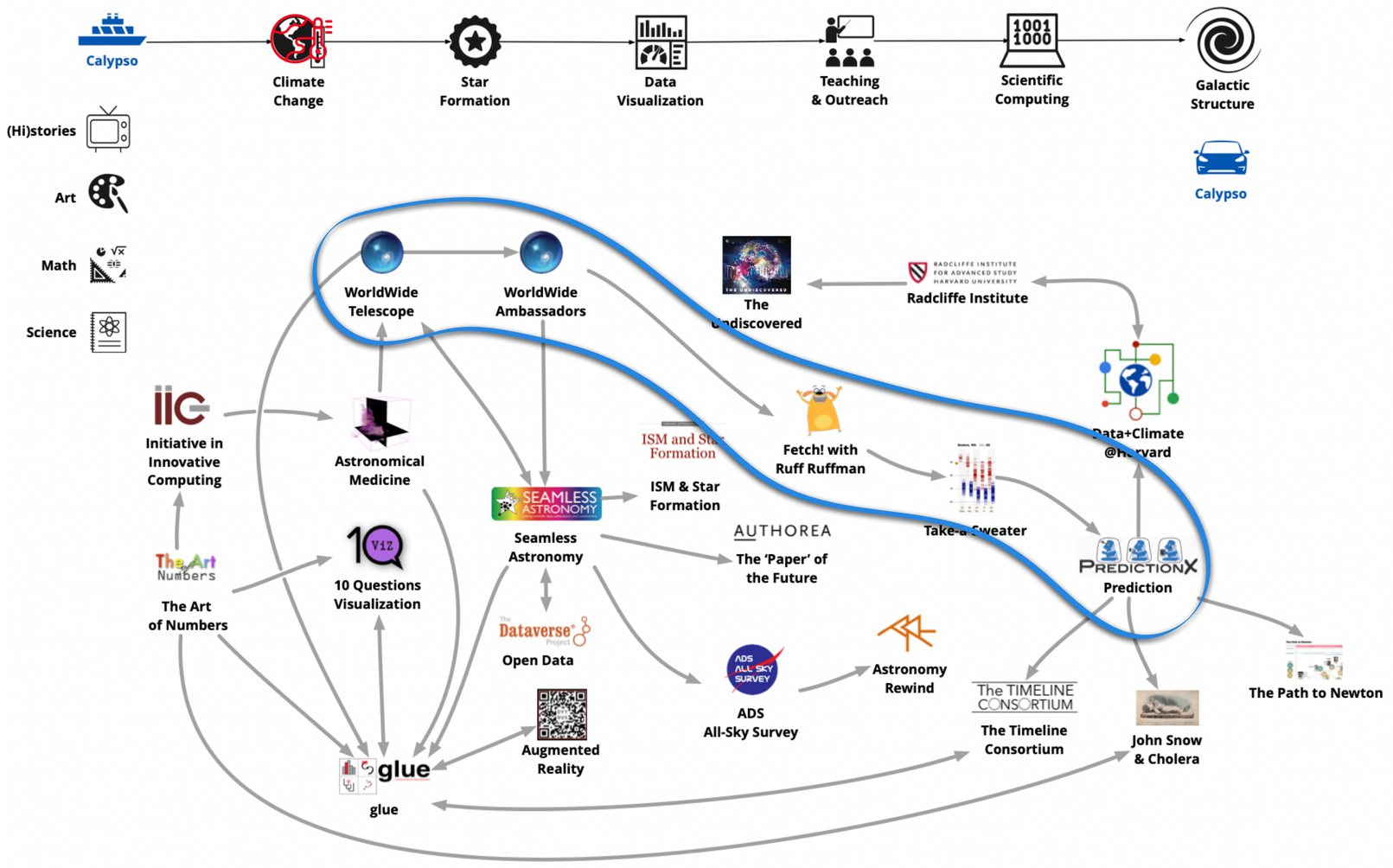
1983 NASA/GISS INTERNSHIP WITH JAMES HANSEN



Hansen giving testimony before the United States Congress in 1988

graph reproduced from: https://electricitymap.org/blog/clean-electricity-production-whos-ahead/, citing NASA GISS; image reproduced from James Hansen's Wikipedia page

Alyssa's Life, So Far



The COMPLETE Survey of Star-Forming Regions · Nessie-Bones · Think Space · Life in the Universe · Radcliffe Wave · PerTau & Local Bubble · Cosmic Data Stories · glue solutions inc.

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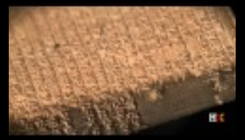
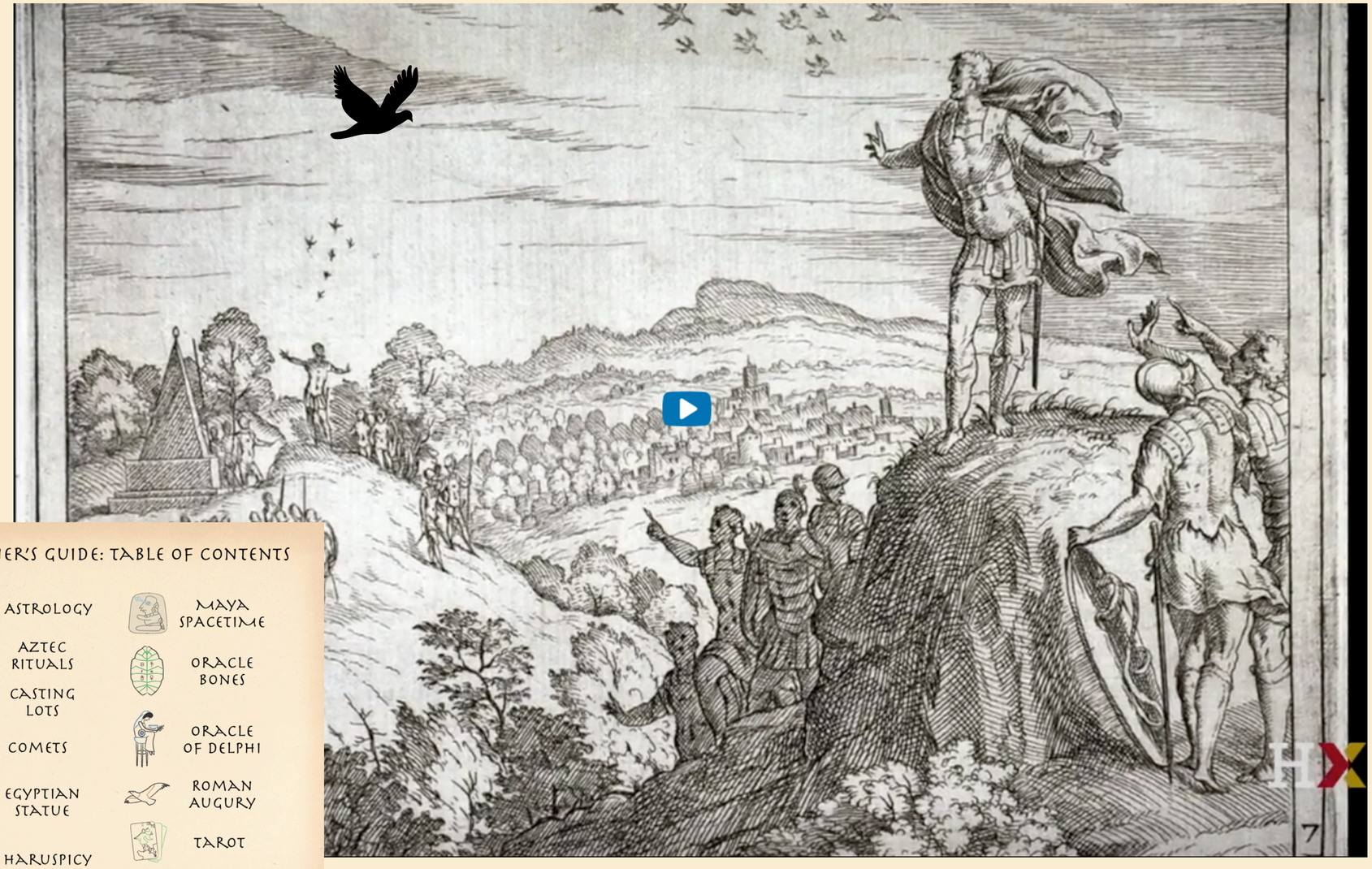
income
housing
water

ROMAN
AUGURY



ROMAN AUGURY

"Senior political officials of the Roman state had to take auspices before any major political event like elections." —Emma Dench



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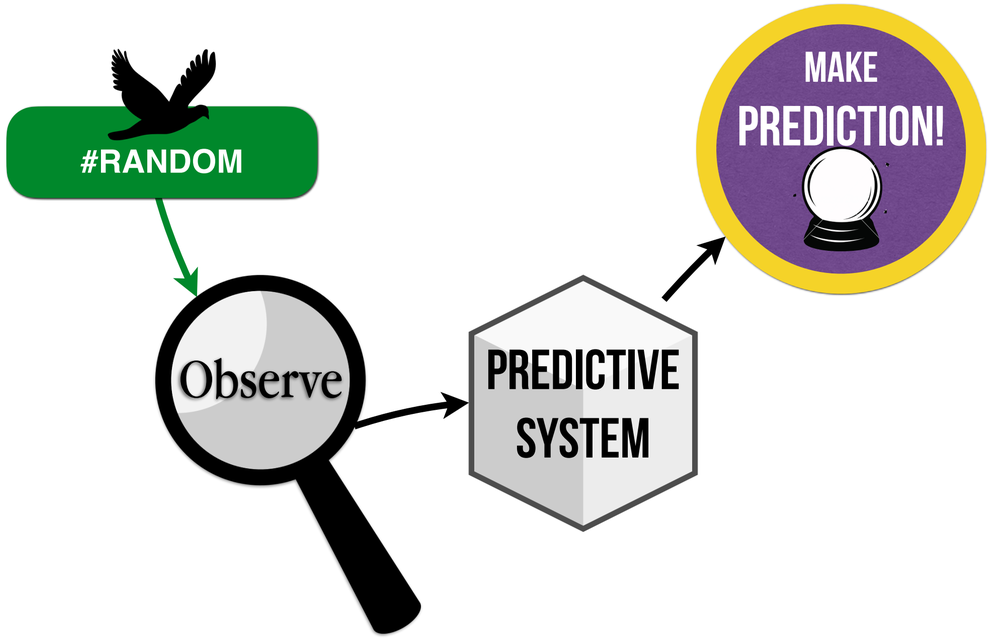
ORACLE BONES
ORACLE OF DELPHI
ROMAN AUGURY
TAROT
TASSEOGRAPHY

(see "Roman Bird Augury" video on edX)



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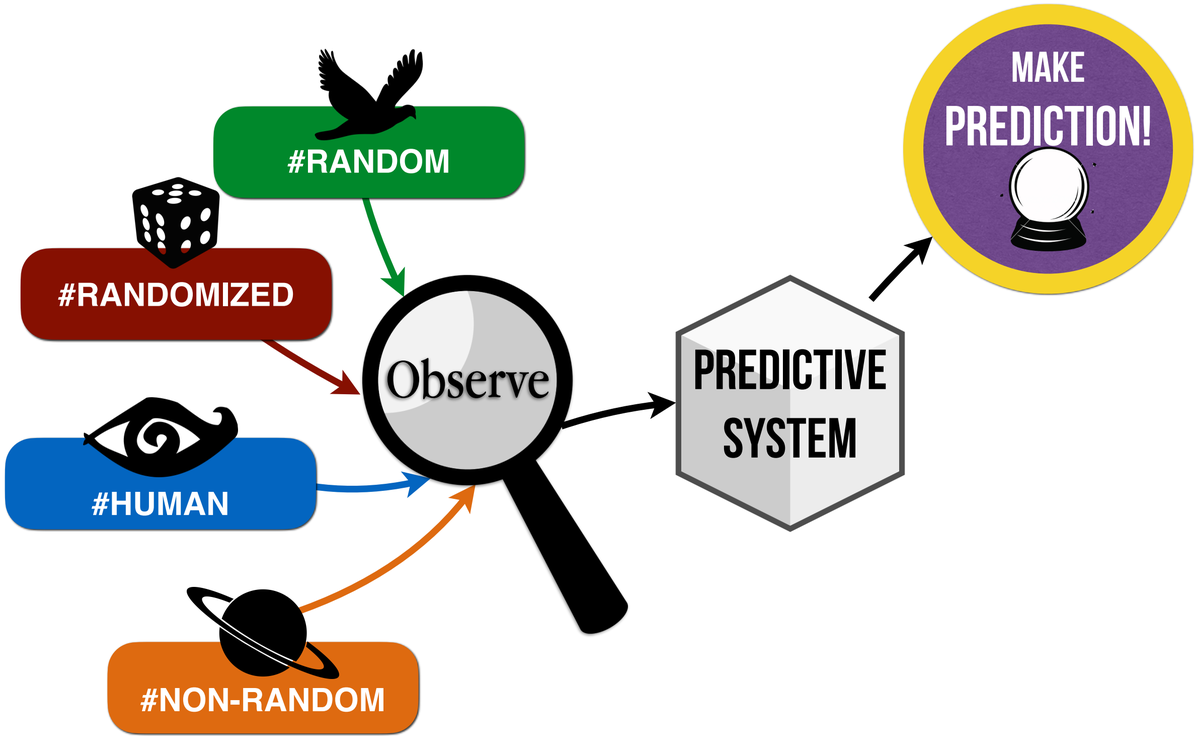

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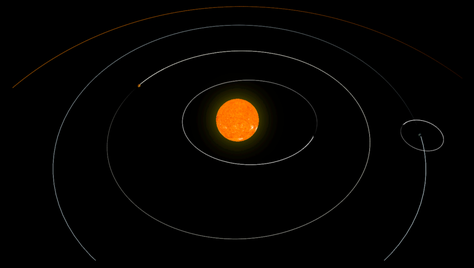
#NON-RANDOM



Celestial Motion

#RANDOMIZED

Ifa

#HUMAN

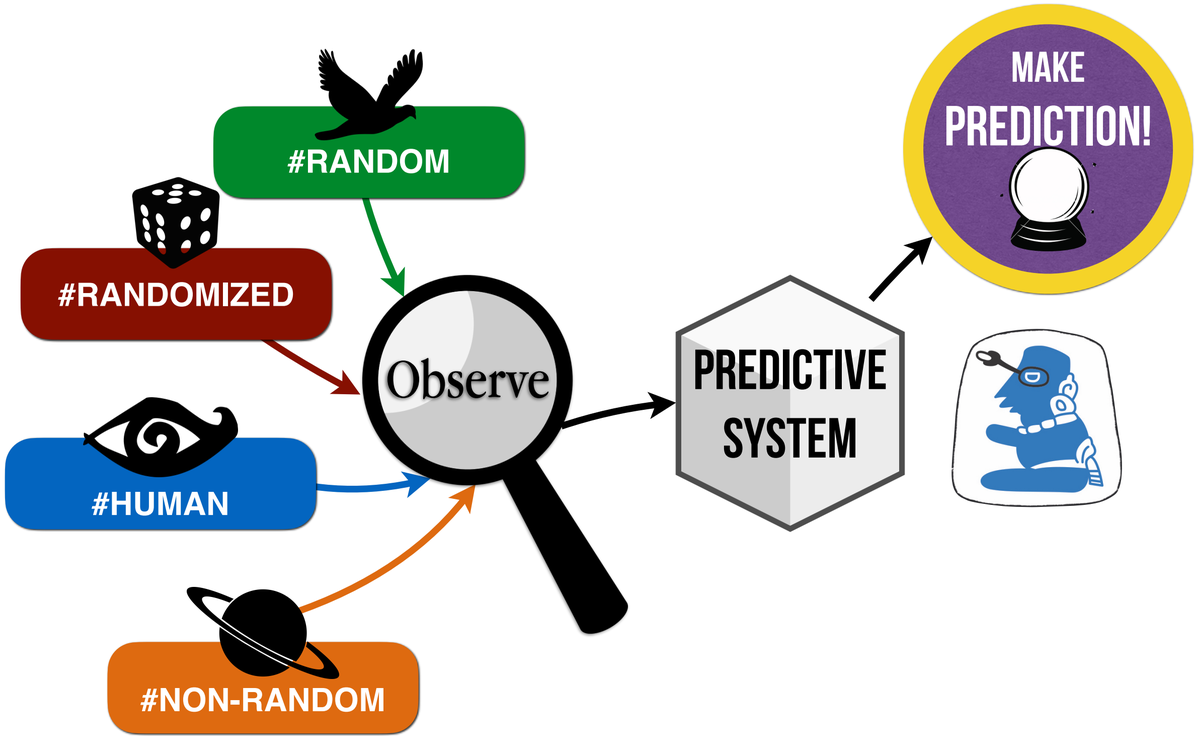
Egyptian “Bobble Head”

#RANDOM

Comets of Doom

#HUMAN

Ancient Egyptian Divination, featuring Prof. Peter der Manuelian (Harvard Semitic Museum)



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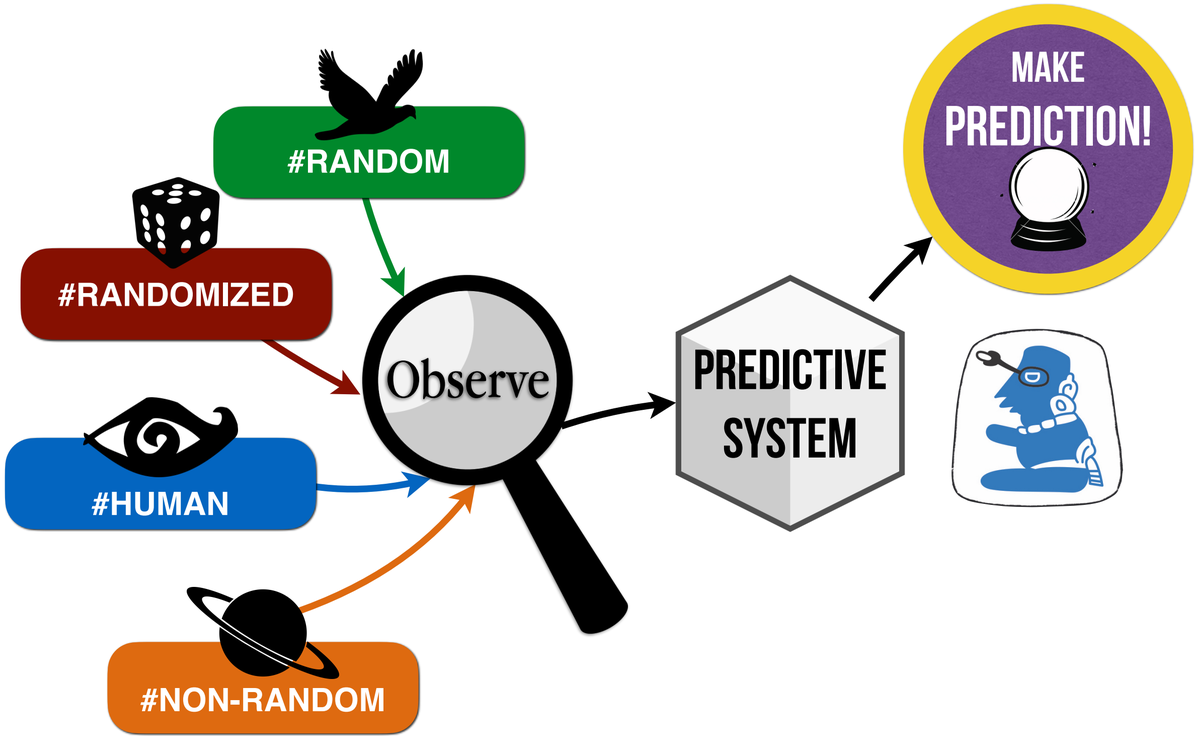

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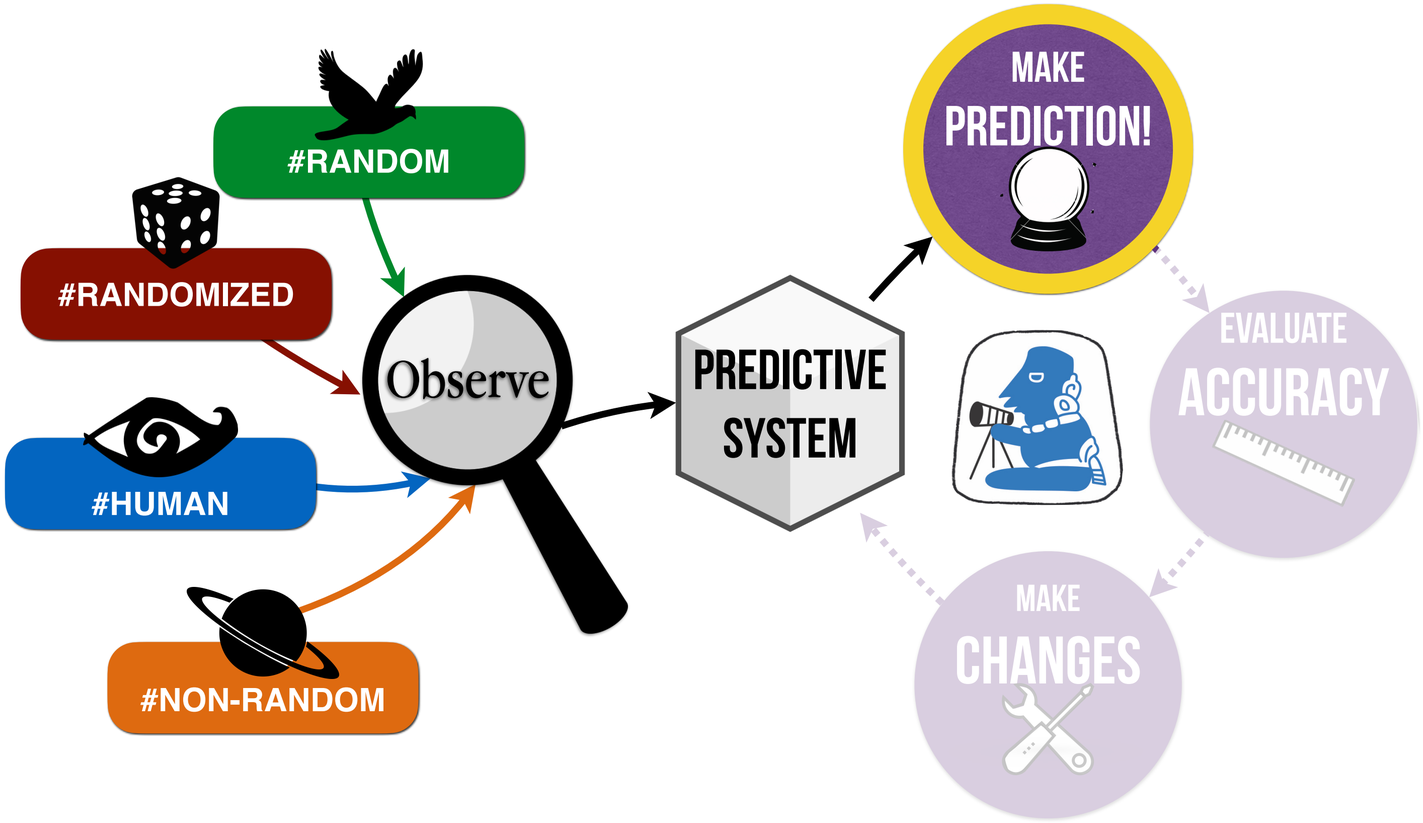

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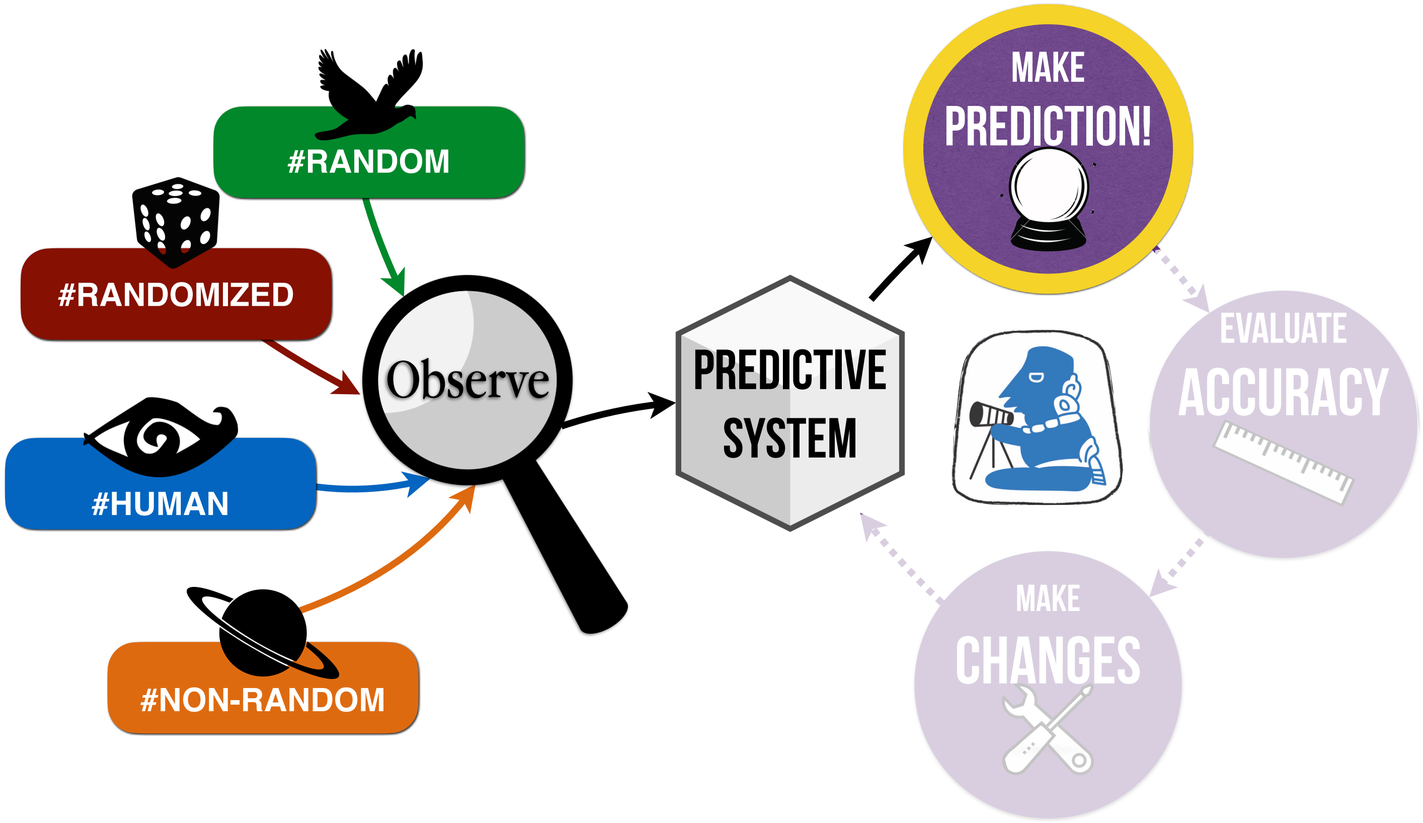

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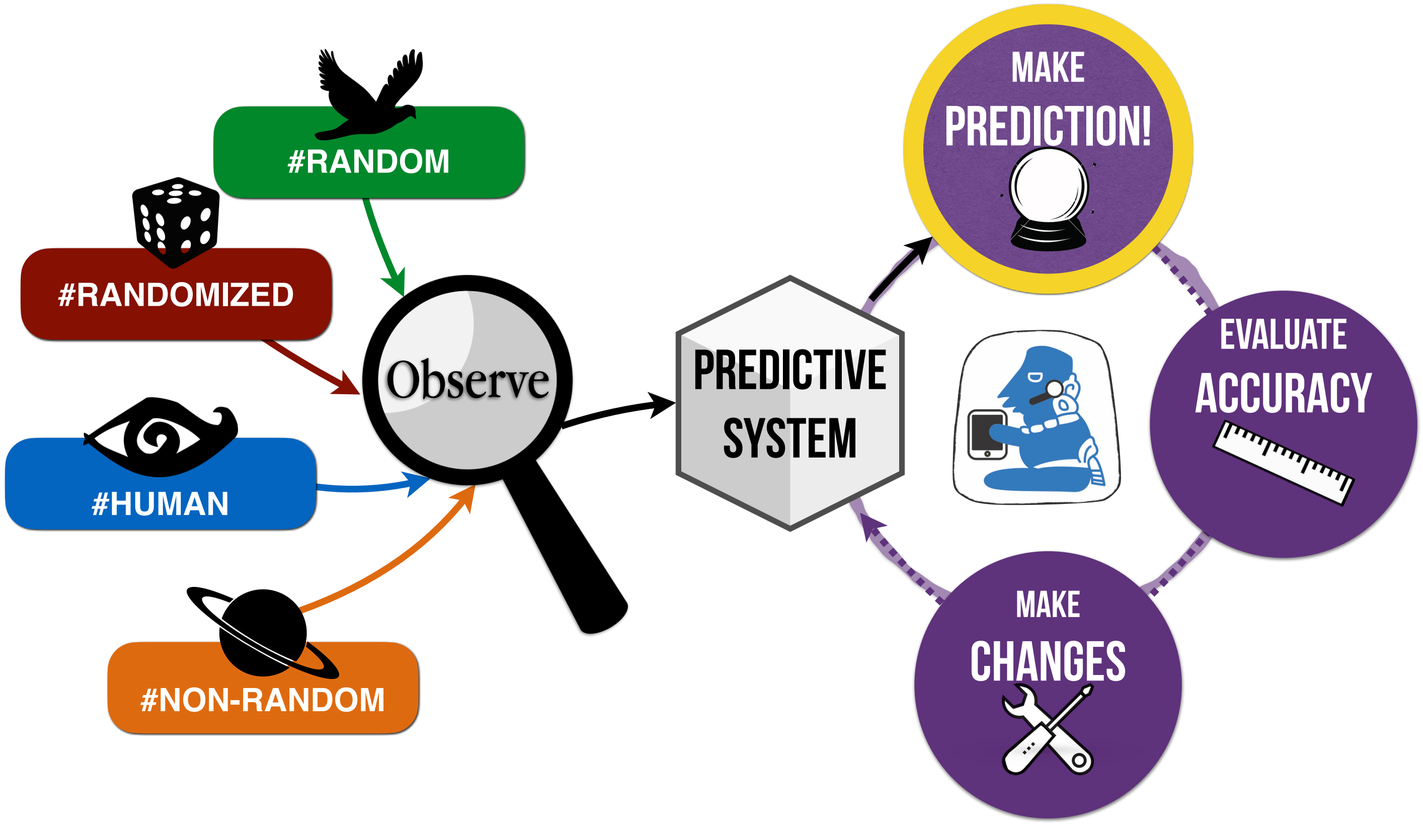

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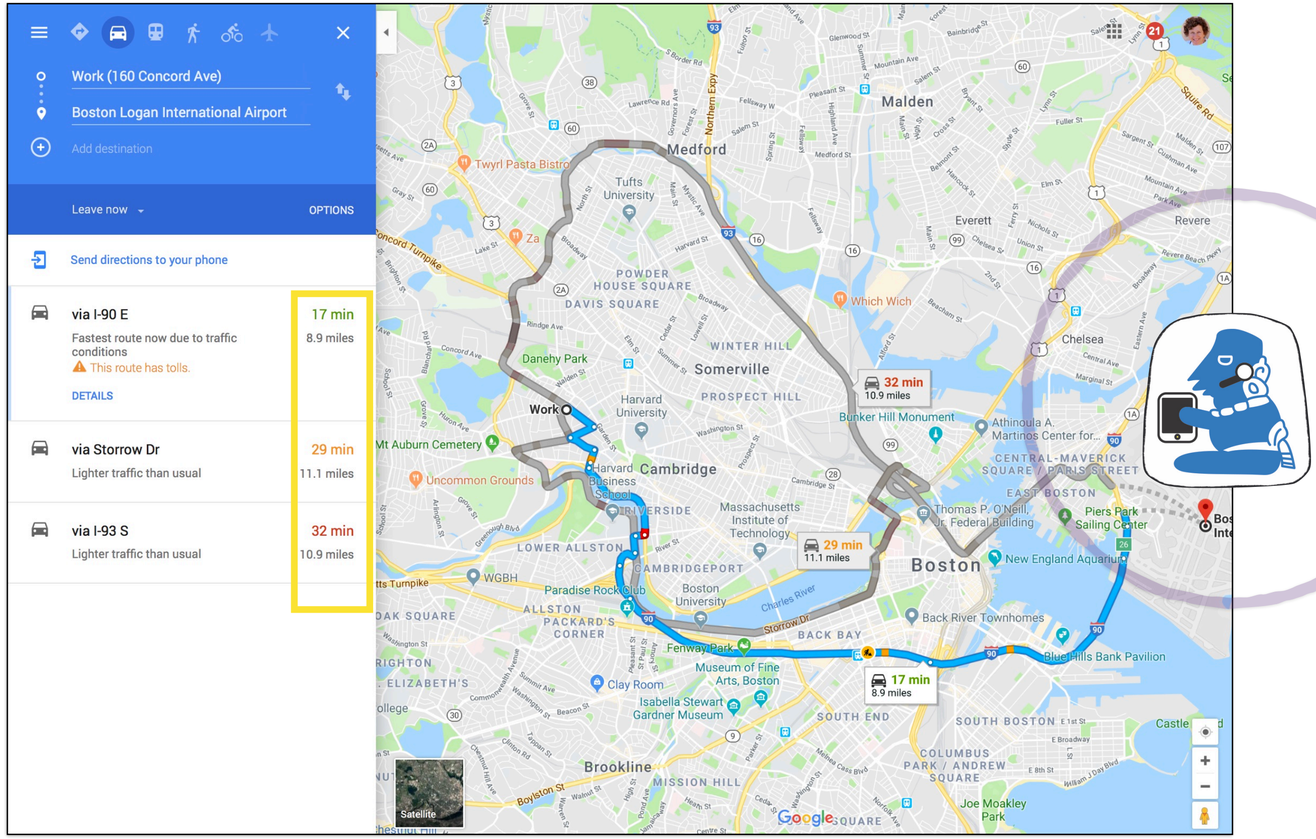
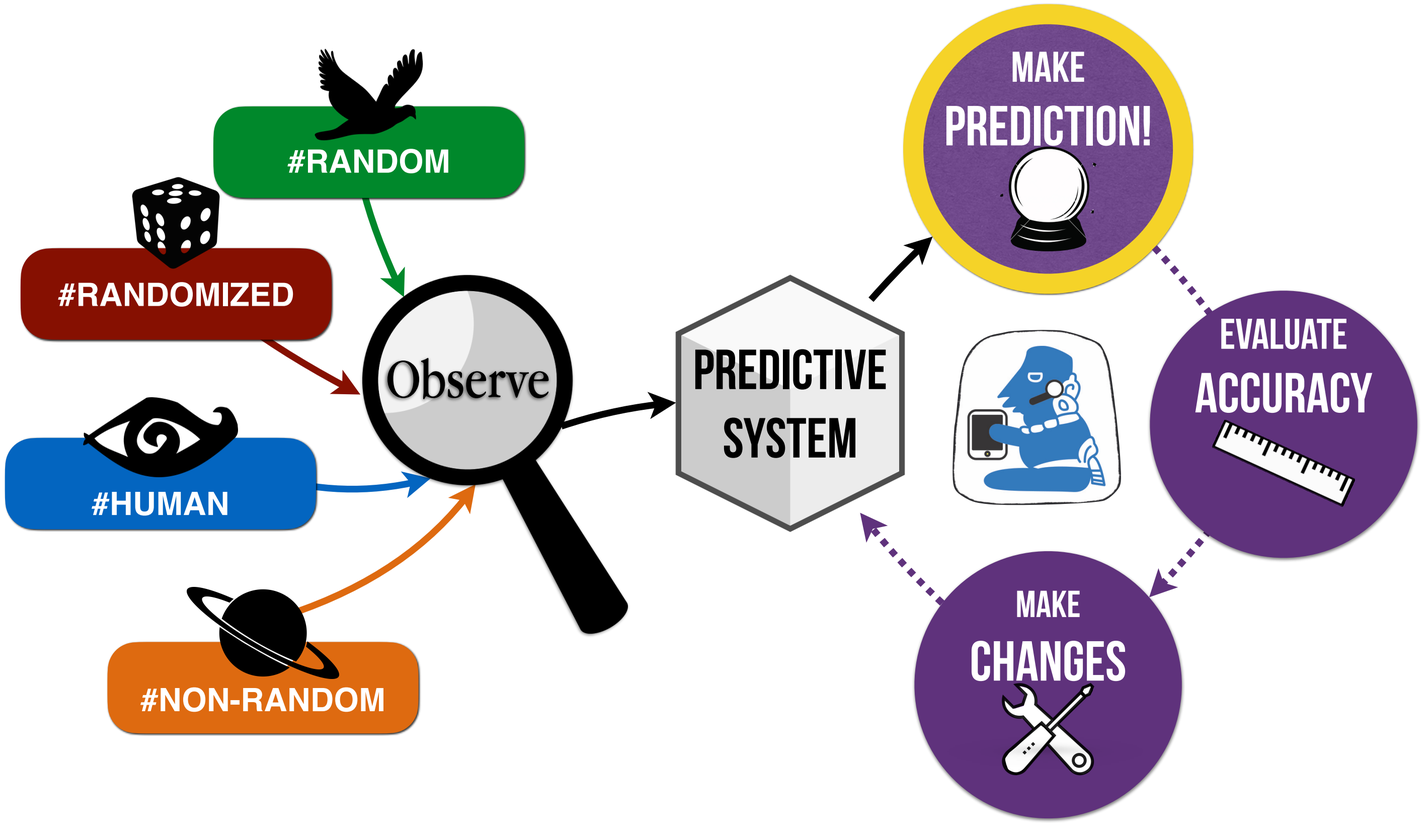


"Most companies who do live traffic **compare** their predictions against actual time in traffic to tune their algorithms and data sources.
The likely result of this is that the companies who have access to the best usage data … are likely to end up with the best predictions in the medium to long term."

Forbes Tech, July 2013

Framework for Predictive Systems



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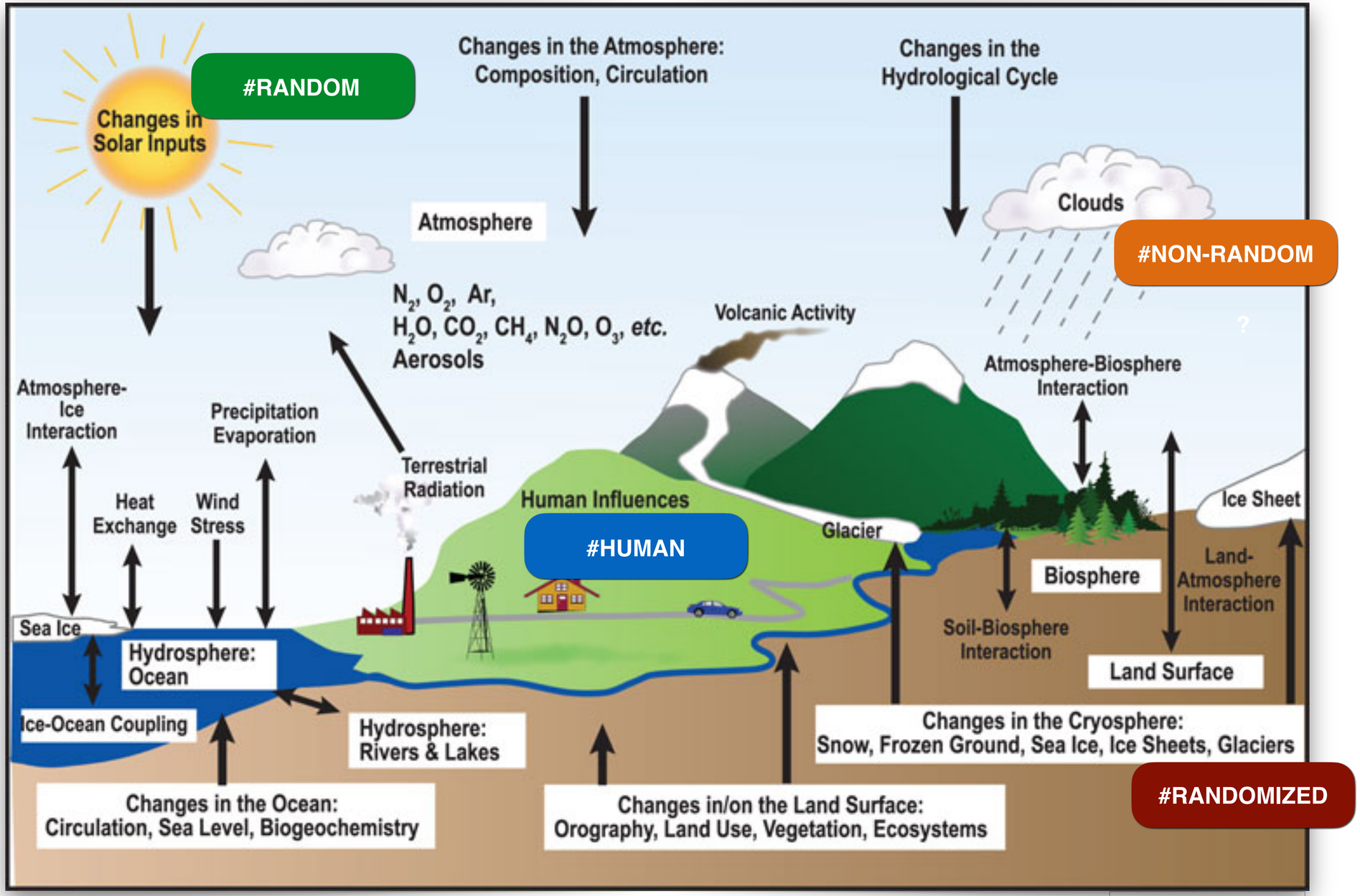
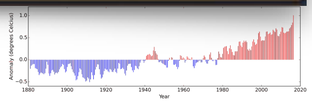
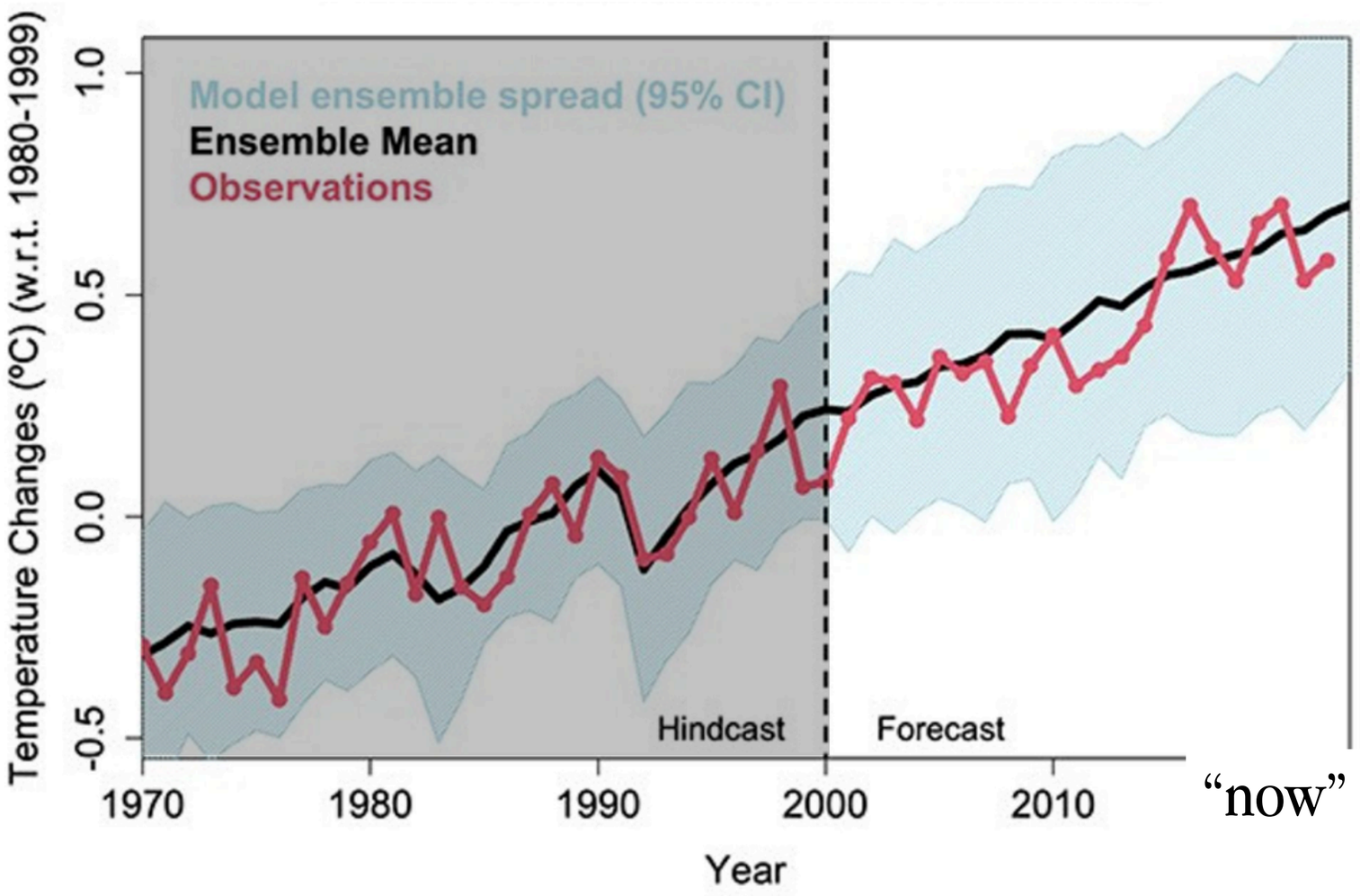
EVALUATE
ACCURACY

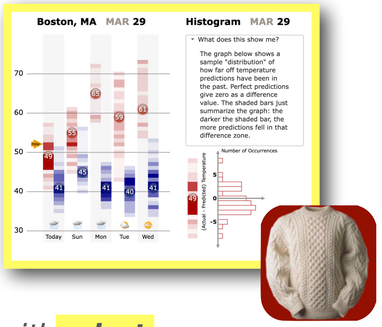


blogs.scientificamerican.com/the-curious-wavefunction/are-more-accurate-climate-change-models-worse



Uncertainty is a measure of certainty

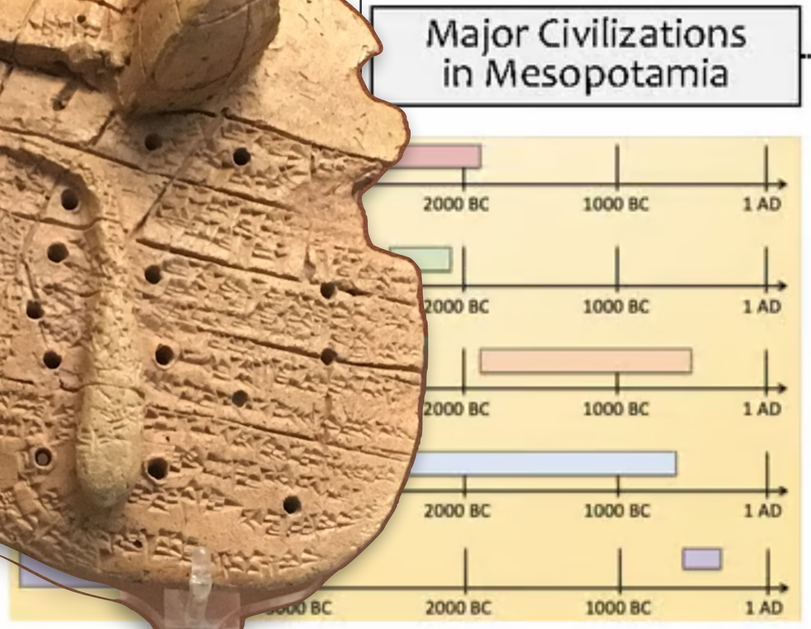




*Models that were used in the IPCC 4th Assessment Report can be evaluated by **comparing** their approximately 20-year **predictions** with **what actually happened**. In this figure, the multi-model ensemble and the average of all the models are plotted alongside the NASA Goddard Institute for Space Studies (GISS) Surface Temperature Index (GISTEMP). Climate drivers were known for the ‘hindcast’ period (before 2000) and forecast for the period beyond. The temperatures (in degrees Celsius) are plotted with respect to a 1980-1999 baseline.*
Gavin Schmidt

science.nasa.gov/earth/climate-change/study-confirms-climate-models-are-getting-future-warming-projections-right/

5000 years ago…



Timeline of Major Mesopotamian Civilizations:

1. **Sumer** ~ 3500 – 1900 BC
2. **Akkadia** ~ 2334 – 2155 BC
3. **Babylonia** ~ 1900 – 539 BC
4. **Assyria** ~ 2500 – 605 BC
5. **Persia** ~ 550 – 334 BC

#RANDOM

#HUMAN

Ancient Mesopotamian Extispicy

#RANDOMIZED

#NON-RANDOM

EVALUATE
ACCURACY

Is the future determined, or negotiable?

Understanding the will of the gods was the central pillar of Mesopotamian scholarship. Ashurbanipal would have checked the omens before taking any important decision. The most common technique was to sacrifice a sheep and examine its internal organs. This lung-shaped tablet (2) was an ancient teaching tool. Other techniques sought meaning from dreams (2), rain (3), and sex (4).

The omens were not always positive. Special magic and rituals were used to avert negative predictions. Scribes drew up lists of spells to counter all sorts of misfortunes (5). The Assyrians practiced a remarkable ritual. If a king's life was thought to be at risk, a substitute would replace him on the throne for up to 100 days (6). When the danger had passed, the king could take back the throne and the substitute would then be executed and given a royal burial.
860-830 BC
British Museum

"I am Ashurbanipal, King of the World, King of Assyria"

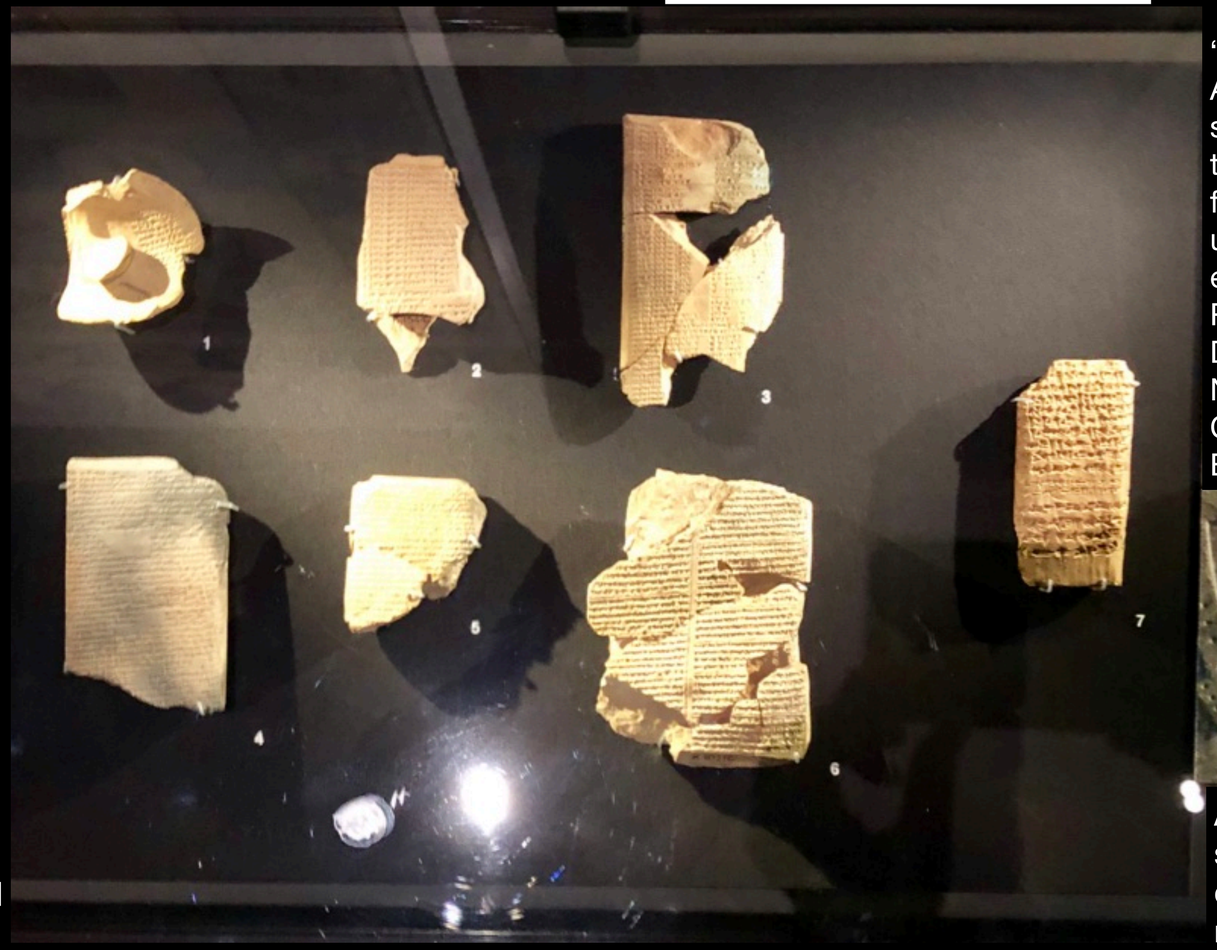


image taken by Alyssa Goodman at the British Museum galleries, 2018

Will my unfaithful brother escape? Learned textbooks explained how the divination system worked in general. Reports detail the specific questions asked, features observed in sacrificial animals and answers reported by diviners (7):

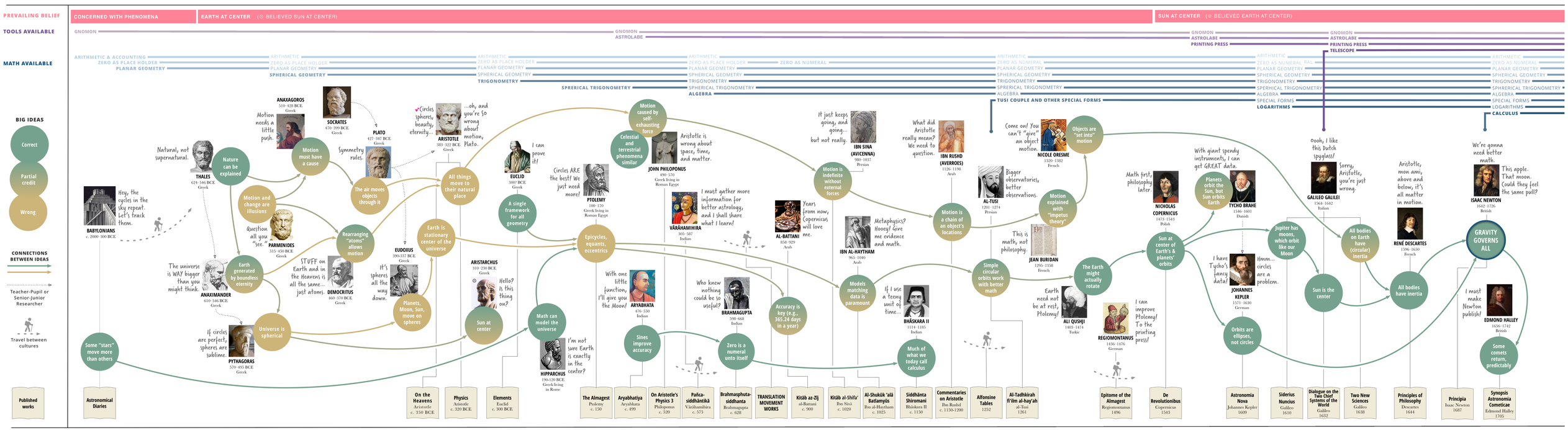
"Now Ashurbanipal, King of Assyria… has heard: "Shamash-shumu-ukin is fleeing to Elam." Is the rumor true? Five unfavorable features in the divination: it is unfavorable. Month Tishri, 15th day, eponym year of Sagab.
Reported by Dari-shamu and Dannaya."
Nineveh, 651 BC
Clay
British Museum

Assyrian experts examine a sacrificed sheep to find the divine answer to an important royal question.

The Path to Newton

PREDICTIONX
predictionx.org

The Path to Newton



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demo: path-to.org or LabXchange™ Science and learning–connected.

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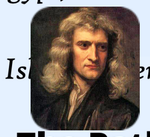

The Path to Newton

- *Indian Mathematics*
- *European Renaissance*

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“When Knowledge Conquered Fear”

"When Knowledge Conquered Fear" is the third episode of the American documentary television series Cosmos: A Spacetime Odyssey. It premiered on March 23, 2014 on Fox, and premiered on March 24, 2014 on National Geographic Channel. [Wikipedia]. IMDB link Reproduced without permission—please do not distribute.

The Path to Newton

PREVAILING BELIEF | CONCERNED WITH PHENOMENA | EARTH AT CENTER (☉ BELIEVED SUN AT CENTER)

TOOLS AVAILABLE

GNOMON

GNOMON
ASTROLABE

MATH AVAILABLE

ARITHMETIC & ACCOUNTING
ZERO AS PLACE HOLDER
PLANAR GEOMETRY
SPHERICAL GEOMETRY

ARITHMETIC
ZERO AS PLACE HOLDER
PLANAR GEOMETRY
SPHERICAL GEOMETRY
TRIGONOMETRY
SPRERICAL TRIGONOMETRY

ARITHMETIC
ZERO AS PLACE HOLDER
PLANAR GEOMETRY
SPHERICAL GEOMETRY
TRIGONOMETRY
SPHERICAL TRIGONOMETRY
ALGEBRA

ARITHMETIC
ZERO AS PLACE HOLDER
ZERO AS NUMERAL
PLANAR GEOMETRY
SPHERICAL GEOMETRY
TRIGONOMETRY
SPHERICAL TRIGONOMETRY
ALGEBRA

BIG IDEAS

Correct

Partial credit

Wrong

CONNECTIONS BETWEEN IDEAS

Teacher-Pupil or Senior-Junior Researcher

Travel between cultures

Published works

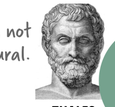
Hey, the cycles in the sky repeat. Let's track them.

BABYLONIANS
c. 2000–300 BCE

Some "stars" move more than others

Astronomical Diaries

Natural, not supernatural.



THALES
624–546 BCE
Greek

Nature can be explained

Earth generated by boundless eternity

The universe is WAY bigger than you might think.

ANAXIMANDER
610–546 BCE
Greek

If circles are perfect, spheres are sublime.

PYTHAGORAS
570–495 BCE
Greek

Universe is spherical

Motion and change are illusions

Question all you "see."

PARMENIDES
515–450 BCE
Greek

Motion needs a little push.

ANAXAGOROS
510–428 BCE
Greek

Motion must have a cause

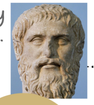
Rearranging "atoms" allows motion

STUFF on Earth and in the Heavens is all the same... just atoms.

DEMOCRITUS
460–370 BCE
Greek

SOCRATES
470–399 BCE
Greek

Symmetry rules.



PLATO
427–347 BCE
Greek

The air moves objects through it

Planets, Moon, Sun, move on spheres

It's spheres all the way down.

EUDOXUS
390–337 BCE
Greek

Earth is stationary center of the universe

Circles spheres, beauty, eternity...

ARISTOTLE
383–322 BCE
Greek

...oh, and you're so wrong about motion, Plato.

All things move to their natural place

Sun at center

ARISTARCHUS
310–230 BCE
Greek

Hello? Is this thing on?

Math can model the universe

HIPPARCHUS
190-120 BCE
Greek living in Rome

I'm not sure Earth is exactly in the center?

EUCLID
300? BCE
Greek

I can prove it!

A single framework for all geometry

Motion caused by self-exhausting force

Celestial and terrestrial phenomena similar

JOHN PHILOPONUS
490–570
Greek living in Roman Egypt

Aristotle is wrong about space, time, and matter.

Circles ARE the best! We just need more!

PTOLEMY
100–170
Greek living in Roman Egypt

Epicycles, equants, eccentrics

VĀRĀHAMIHIRA
505–587
Indian

I must gather more information for better astrology, and I shall share what I learn!

AL-BATTANI
858–929
Arab

Years from now, Copernicus will love me.

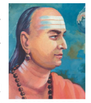
It just kee going, ar going

but not reall

Motion is indefinite without external forces

Accuracy is key (e.g., 365.24 days in a year)

With one little function, I'll give you the Moon!



ARYABHATA
476–550
Indian

Sines improve accuracy

Who knew nothing could be so useful?

BRAHMAGUPTA
598–668
Indian

Zero is a numeral unto itself

On the Heavens
Aristotle
c. 350 BCE

Physics
Aristotle
c. 320 BCE

Elements
Euclid
c. 300 BCE

The Almagest
Ptolemy
c. 150

Aryabhatiya
Aryabhata
c. 499

On Aristotle's Physics 3
Philoponus
c. 520

Pañca-siddhāntikā
Vārāhamihira
c. 575

Brahmasphuta-siddhanta
Brahmagupta
c. 628

TRANSLATION MOVEMENT WORKS

Kitāb az-Zīj
al-Battani
c. 900

Kitāb
Ibn

SUN AT CENTER (⊕ BELIEVED EARTH AT CENTER)

GNOMON
ASTROLABE
PRINTING PRESS

ARITHMETIC
ZERO AS PLACE HOLDER
ZERO AS NUMERAL
PLANAR GEOMETRY
SPHERICAL GEOMETRY
TRIGONOMETRY
SPRERICAL TRIGONOMETRY
ALGEBRA
TUSI COUPLE AND OTHER SPECIAL FORMS
LOGARITHMS

...oh, and you're so wrong about motion, Plato.

RISTOTLE
3–322 BCE
Greek

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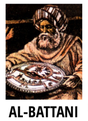
Greek living in Roman Egypt

I must gather more information for better astrology, and I shall share what I learn!

VĀRĀHAMIHIRA
505–587
Indian

Epicycles, equants, eccentrics



Years from now, Copernicus will love me.

AL-BATTANI
858–929
Arab

Metaphysics? Hooey! Give me evidence and math.

IBN AL-HAYTHAM
965–1040
Arab

Accuracy is key (e.g., 365.24 days in a year)

With one little function, I'll give you the Moon!

ARYABHATA
476–550
Indian

Who knew nothing could be so useful?

BRAHMAGUPTA
598–668
Indian

Zero is a numeral unto itself

If I use a teeny unit of time...

BHĀSKARA II
1114–1185
Indian

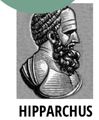
Much of what we today call calculus

Hello? Is this thing on?

ARISTARCHUS
310–230 BCE
Greek

Sun at center

Math can model the universe



I'm not sure Earth is exactly in the center?

HIPPARCHUS
190-120 BCE
Greek living in Rome

Sines improve accuracy

It just keeps going, and going... but not really.

IBN SINA (AVICENNA)
980–1037
Persian

Motion is indefinite without external forces

What did Aristotle really mean? We need to question.

IBN RUSHD (AVERROES)
1126–1198
Arab

Motion is a chain of an object's locations

Bigger observatories, better observations.

AL-TUSI
1201–1274
Persian

Simple circular orbits work with better math

This is math, not philosophy.

JEAN BURIDAN
1295–1358
French

Motion explained with "impetus theory"

Come on! You can't "give" an object motion.

NICOLE ORESME
1320–1382
French

Objects are "set into" motion

Earth need not be at rest, Ptolemy!

ALI QUSHJI
1403–1474
Turkic

The Earth might actually rotate

I can improve Ptolemy! To the printing press!

REGIOMONTANUS
1436–1476
German

Sun at center of Earth's & planets' orbits

Math first, philosophy later.

NICHOLAS COPERNICUS
1473–1543
Polish

With giant spendy instruments, I can get GREAT data.

Planets orbit the Sun, but Sun orbits Earth

TYCHO BRAHE
1546–1601
Danish

I have Tycho's fancy data!

Hmm... circles are a problem.

JOHANNES KEPLER
1571–1630
German

Orbits are ellipses, not circles

Jupiter has moons, which orbit like our Moon

Physics
Aristotle
c. 320 BCE

Elements
Euclid
c. 300 BCE

The Almagest
Ptolemy
c. 150

Aryabhatiya
Aryabhata
c. 499

On Aristotle's Physics 3
Philoponus
c. 520

Pañca-siddhāntikā
Vārāhamihira
c. 575

Brahmasphuta-siddhanta
Brahmagupta
c. 628

TRANSLATION MOVEMENT WORKS

Kitāb az-Zīj
al-Battani
c. 900

Kitāb al-Shifa'
Ibn Sīnā
c. 1020

Al-Shukūk 'alā Batlamyūs
Ibn al-Haytham
c. 1025

Siddhānta Shiromani
Bhāskara II
c. 1150

Commentaries on Aristotle
Ibn Rushd
c. 1150-1200

Alfonsine Tables
1252

Al-Tadhkirah fi'ilm al-hay'ah
al-Tusi
1261

Epitome of the Almagest
Regiomontanus
1496

De Revolutionibus
Copernicus
1543

Astronomia Nova
Johannes Kepler
1609

Siderius Nuncius
Galileo
1610

© Harvard University

PREDICTIONX

SUN AT CENTER (⊕ BELIEVED EARTH AT CENTER)

GNOMON
ASTROLABE
PRINTING PRESS
TELESCOPE
ARITHMETIC
ZERO AS NUMERAL
PLANAR GEOMETRY
SPHERICAL GEOMETRY
TRIGONOMETRY
SPHERICAL TRIGONOMETRY
ALGEBRA
SPECIAL FORMS
LOGARITHMS
CALCULUS
TUSI COUPLE AND OTHER SPECIAL FORMS

Zero is a numeral unto itself

Accuracy is key (e.g., 365.24 days in a year)

Models matching data is paramount

Much of what we today call calculus

Motion is indefinite without external forces

Motion is a chain of an object's locations

Simple circular orbits work with better math

Motion explained with "impetus theory"

Objects are "set into" motion

The Earth might actually rotate

Sun at center of Earth's & planets' orbits

Orbits are ellipses, not circles

Sun is the center

Jupiter has moons, which orbit like our Moon

All bodies on Earth have (circular) inertia

All bodies have inertia

GRAVITY GOVERNS ALL

Some comets return, predictably

BRAHMAGUPTA
598–668
Indian

IBN SINA (AVICENNA)
980–1037
Persian

AL-BATTANI
858–929
Arab

IBN AL-HAYTHAM
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Turkic

REGIOMONTANUS
1436–1476
German

NICHOLAS COPERNICUS
1473–1543
Polish

TYCHO BRAHE
1546–1601
Danish

JOHANNES KEPLER
1571–1630
German

GALILEO GALILEI
1564–1642
Italian

RENÉ DESCARTES
1596–1650
French

ISAAC NEWTON
1642–1726
British

EDMOND HALLEY
1656–1742
British

Zero as a numeral unto itself
Brahmagupta
c. 628

TRANSLATION MOVEMENT WORKS

Kitāb az-Zīj
al-Battani
c. 900

Kitāb al-Shifa'
Ibn Sīnā
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Copernicus
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Astronomia Nova
Johannes Kepler
1609

Siderius Nuncius
Galileo
1610

Dialogue on the Two Chief Systems of the World
Galileo
1632

Two New Sciences
Galileo
1638

Principles of Philosophy
Descartes
1644

Principia
Isaac Newton
1687

Synopsis Astronomia Cometicae
Edmond Halley
1705

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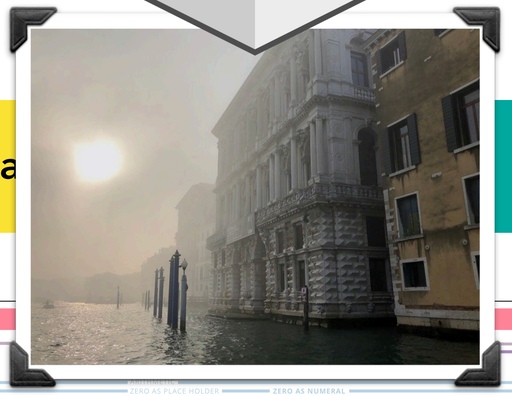
The “Padua Rainbow” & The Path to Newton

The “Padua Rainbow” & The Path to Newton

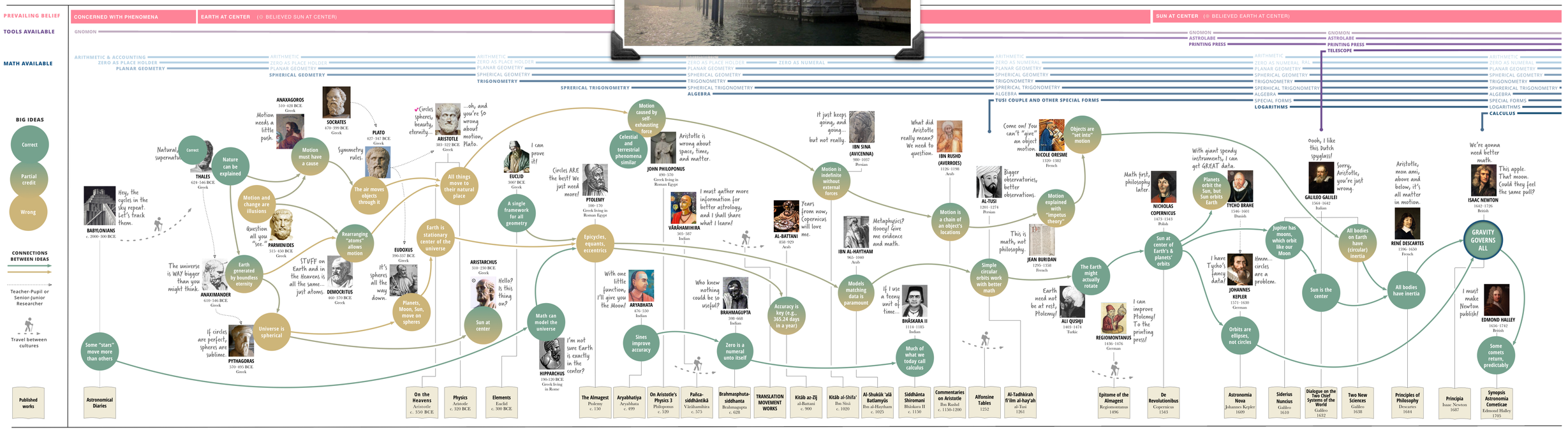
PREDICTIVE SYSTEMS



Phenomenon | Observation* | Data | Theory | Explanation | Prediction

The Path to Newton

PREDICTIONX



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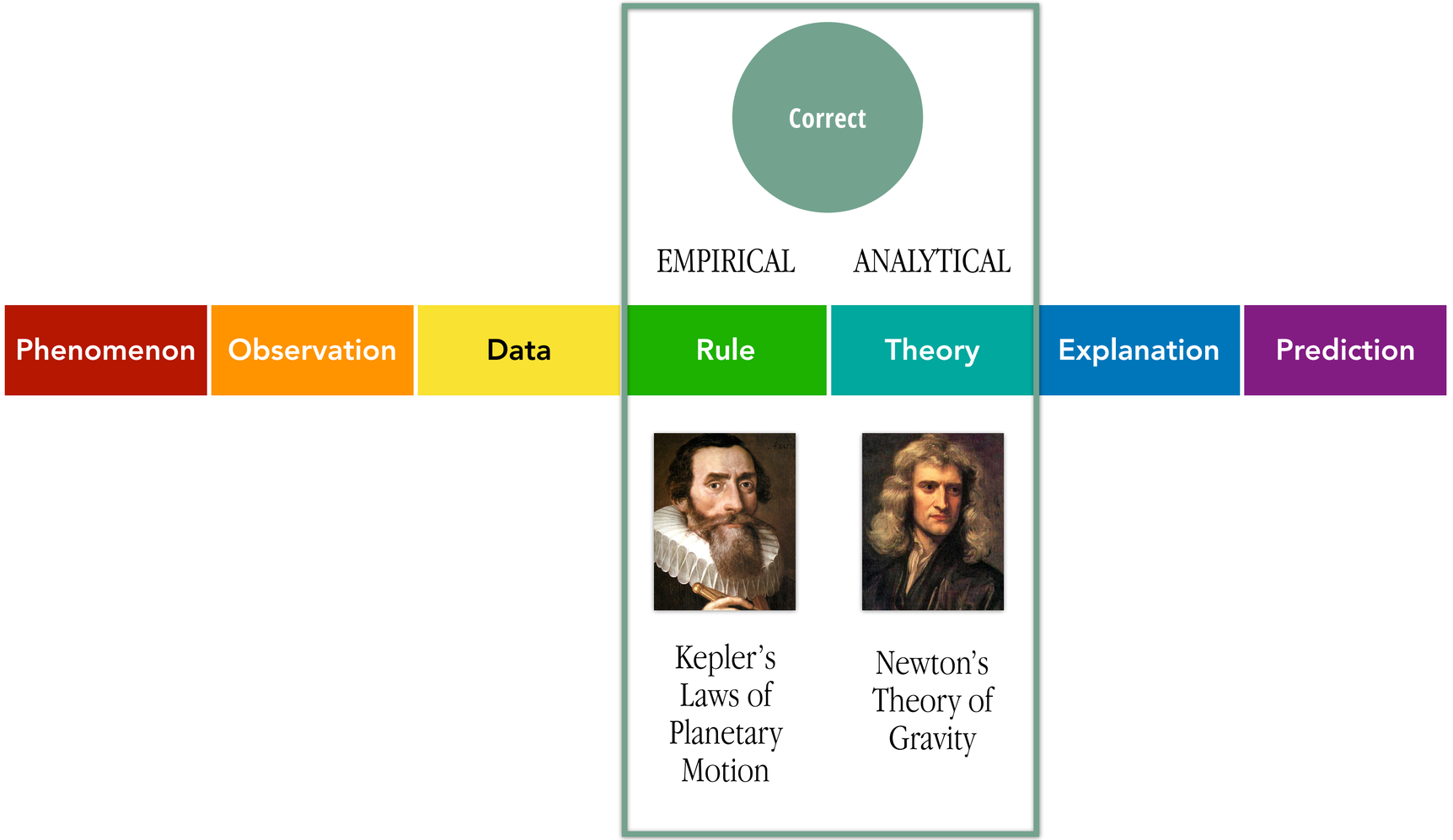
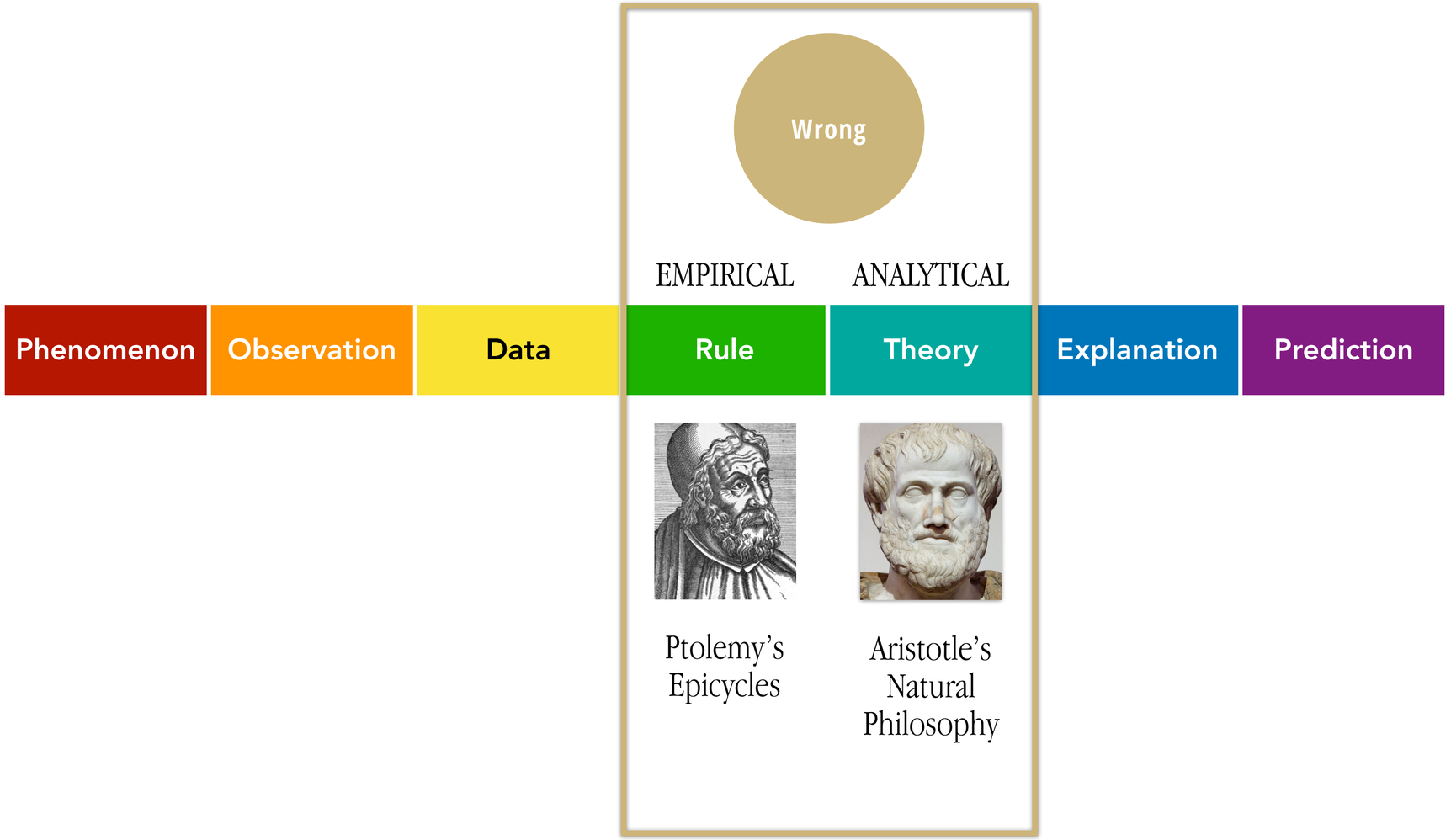
or, Experiment

The “Padua Rainbow” & The Path to Newton



The “Padua Rainbow” & The Path to Newton



Ancient Mesopotamia & The Path to Newton

The Barutu
(Ancient Mesopotamia)

Bārûtu

From Wikipedia, the free encyclopedia

The **Bārûtu**, the "art of the diviner," is a monumental ancient Mesopotamian compendium of the science of extispicy or sacrificial omens stretching over around a hundred cuneiform tablets which was assembled in the Neo-Assyrian/Babylonian period based upon earlier recensions.[1]:46 At the Assyrian court, the term extended to encompass sacrificial prayers and rituals, commentaries and organ models.[2]:619–620 The *ikribu* was the name of collections of incantations to accompany the extispicy. The *bārûtu's* extant predecessors date back to Old Babylonian times with the liver models from Mari (pictured right) and where the order of the exta were largely fixed.

The task of the *bārû*, or diviner, was summarized as *lipit qāti hiniq immeri naqē niqē nēpešti bārûti*, "the 'touch of hand', the restriction[?] of the sheep, the offering of the sacrifice, the performance of extispicy."[3]:23 This required elaborate ritual purity, achieved through washing hands and mouth, donning fresh clothing, placing tamarisk and cedar into the diviner's ears, anointing and fumigation with sulfur[3]:29 – all measures to avoid the outcome of the apodosis *lā ellu niqâ ilput*, "an unclean person has touched the sacrifice." The autopsy then proceeded in a counter-clockwise direction, beginning with the liver, the lungs, then the breastbone, vertebrae, ribs, colon and finally the heart.

Contents [hide]

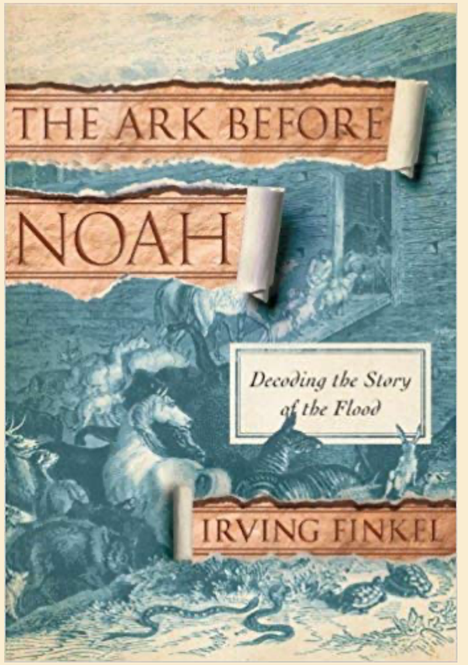
1 The text
  1.1 The parts of the *bārûtu*
  1.2 The copyists
2 References

The text [edit]

The work is particularly difficult to interpret due to the extensive use of graphemes, but included an estimated 8,000 omens.[2]:620 These were the accumulation of a millennium and a half of observations of political, social and private events and the divinatory signs that accompanied them but bereft of their chronological context or other identifying marker and stylistically posed in the form of a prediction. Occasionally, an attribution is made to a king, but it is generally archaic:

Newton's *Principia*
(the real one from 1687)

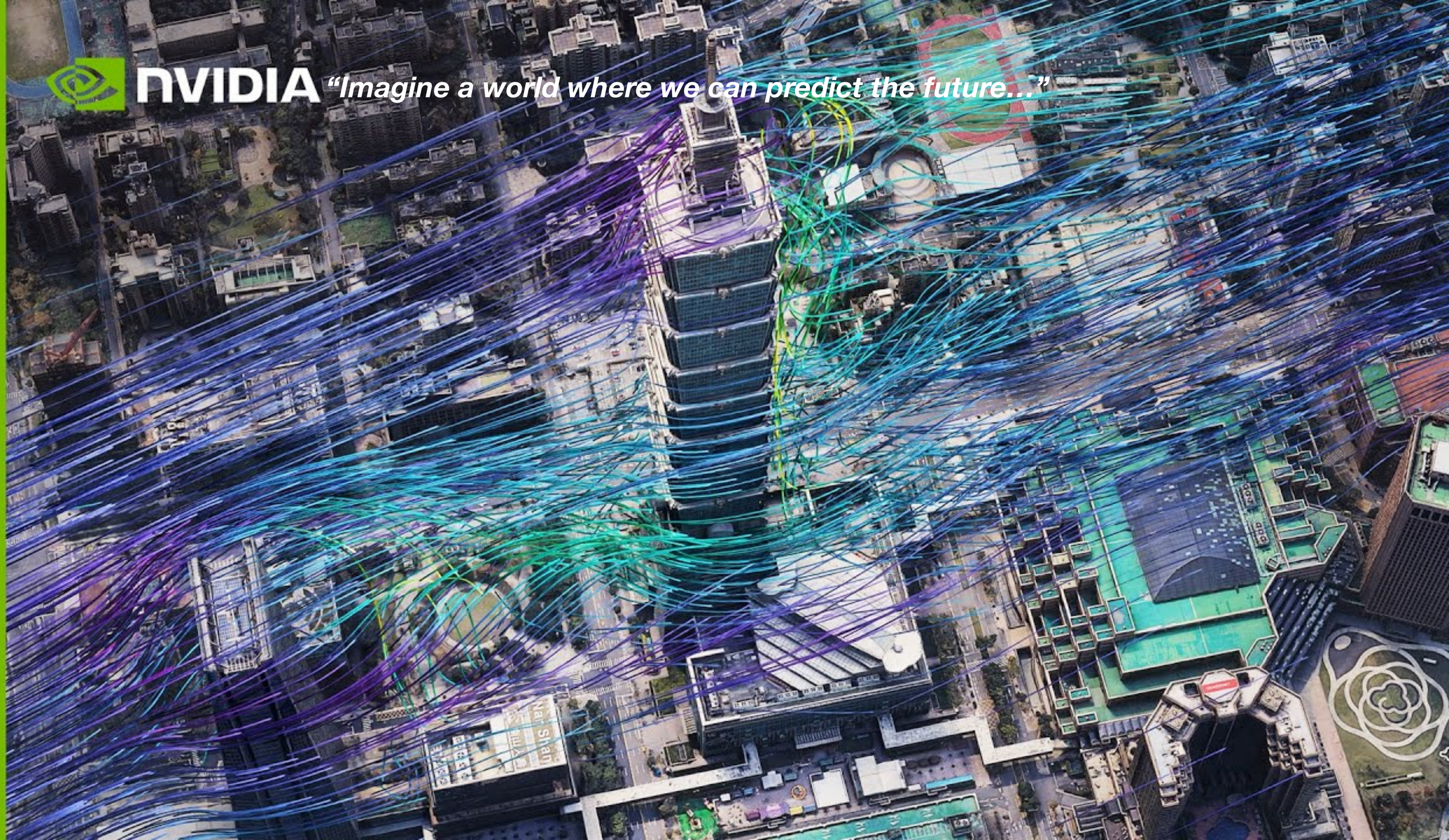
Finkel's *Ark Before Noah*
(I ♥ Cuneiform)



Phenomenon | Observation | Data | Rule | Theory | Explanation | Prediction

The FUTURE of the Future

20th century


NVIDIA
“Imagine a world where we can predict the future…”

The Prediction Project

PredictionX: The Past & Present of the Future

Essentials

Predictive Systems Framework

The "Padua Rainbow"

Understanding Uncertainty

Study Design

Timelines

Why predict?

Omens, Oracles & Prophecies

Mesopotamian Haruspicy
Egyptian Priests
Yoruba Ifa
Tarot
Roman Augury
Casting Lots
The Diviner's Guide
Chinese Oracle Bones
Greek Astronomy
Oracle of Delphi
Turkish Tasseography
Astrology
Aztec Rituals
Maya Spacetime
Comets of Doom

cross-cultural conversations

The Rise of Theory

Ancient Mesopotamia, Egypt, Greece & Rome

Islamic Science

The Path to Newton

- *Indian Mathematics*

European Renaissance

The Royal Society

Lost without Longitude (Navigation)

Help, I'm Lost!

Tools of the Navigator

John Snow & Cholera

Cholera Map

Modern Prediction

Health

- *Epidemiology*
- *Personal Genomics*
- *Population Genetics*

Wealth

- *Climate & Wealth*
- *Behavioral Economics*

The Future of the Future

- *AI, Derek's Day*
- *Philosophy*
- *Uncertainty*

Earth

- *Climate & Energy*
- *Climate Policy*
- *Tent Tarot*
- *Earthquakes*

Space

- *Futures of our Universe*
- *SETI*

Interactive Resource ▶ video(s) Coming Soon visit predictionx.org for more information on the Prediction Project

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Explore. Expand. Engage.

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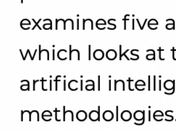
edX HarvardX LabXchange

Modern Prediction

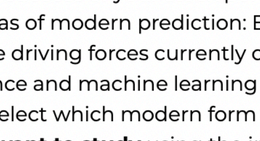
Prediction is everywhere in the modern world, making up essential aspects of almost every part of our lives. From checking the weather on your phone, knowing when you will arrive to work, to longer term predictions of the success of your stock portfolio and your personal health goals. This section of the course examines five areas of modern prediction: Earth, Health, Wealth, Space, and the Future of the Future -- which looks at the driving forces currently changing our own conceptions of prediction, including artificial intelligence and machine learning -- to give learners a picture of the state of modern predictive methodologies. Select which modern form of prediction you want to study first by **clicking on an image of the topic you want to study** using the interactive menu below.

This site contains our prediction videos uploaded on YouTube; to enjoy them in their full format with video annotations and useful links, check out our **Modern Prediction cluster on LabXchange**.



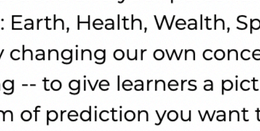
EARTH

Study the complex modeling that has defined humanity's comprehension of climate change and the future of our planet in Earth.



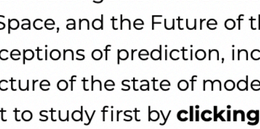
HEALTH

Discover the incredible modern advancements in global health prediction -- using technology to make humanity healthier from mobile health to genomics, and possibly altering what it means to be human.



SPACE

Learn about modern astronomical prediction, with cutting edge simulations now defining the field of astronomy and contributing to a monumental change in our understanding of the universe.



WEALTH

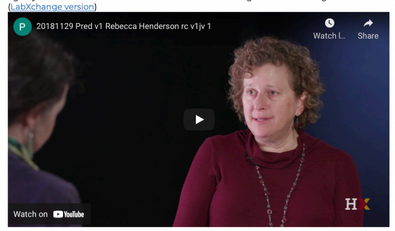
Understand the rapidly changing modern state of wealth prediction, pulling on innovative fields such as behavioral economics to comprehend the inherent difficulty of predicting markets.

FUTURE OF THE FUTURE

How will prediction change as technology further develops? How will artificial intelligence influence our ability to understand uncertainty? These questions and others are touched on by philosophers and scientists in the Future of the Future.

Corporations and Climate with Rebecca Henderson:

Alyssa speaks with Harvard University Professor Rebecca Henderson about organizational rigidity as an essential barrier to overcome in order to mitigate climate change. (LabXchange version)

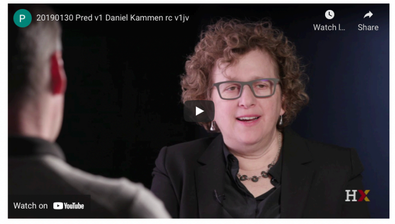


Climate Policy with Gina McCarthy:

Alyssa speaks with former head of the EPA Gina McCarthy about the future of climate and the role of prediction in policymaking. (LabXchange Version)

The Future of Energy with Dan Kammen:

Alyssa speaks with UC Berkeley's Professor of Energy Dan Kammen about climate change and the future of energy on Earth. (LabXchange Version)



Predicting Health, and Earthquakes with Susan Murphy and Brendan Meade:

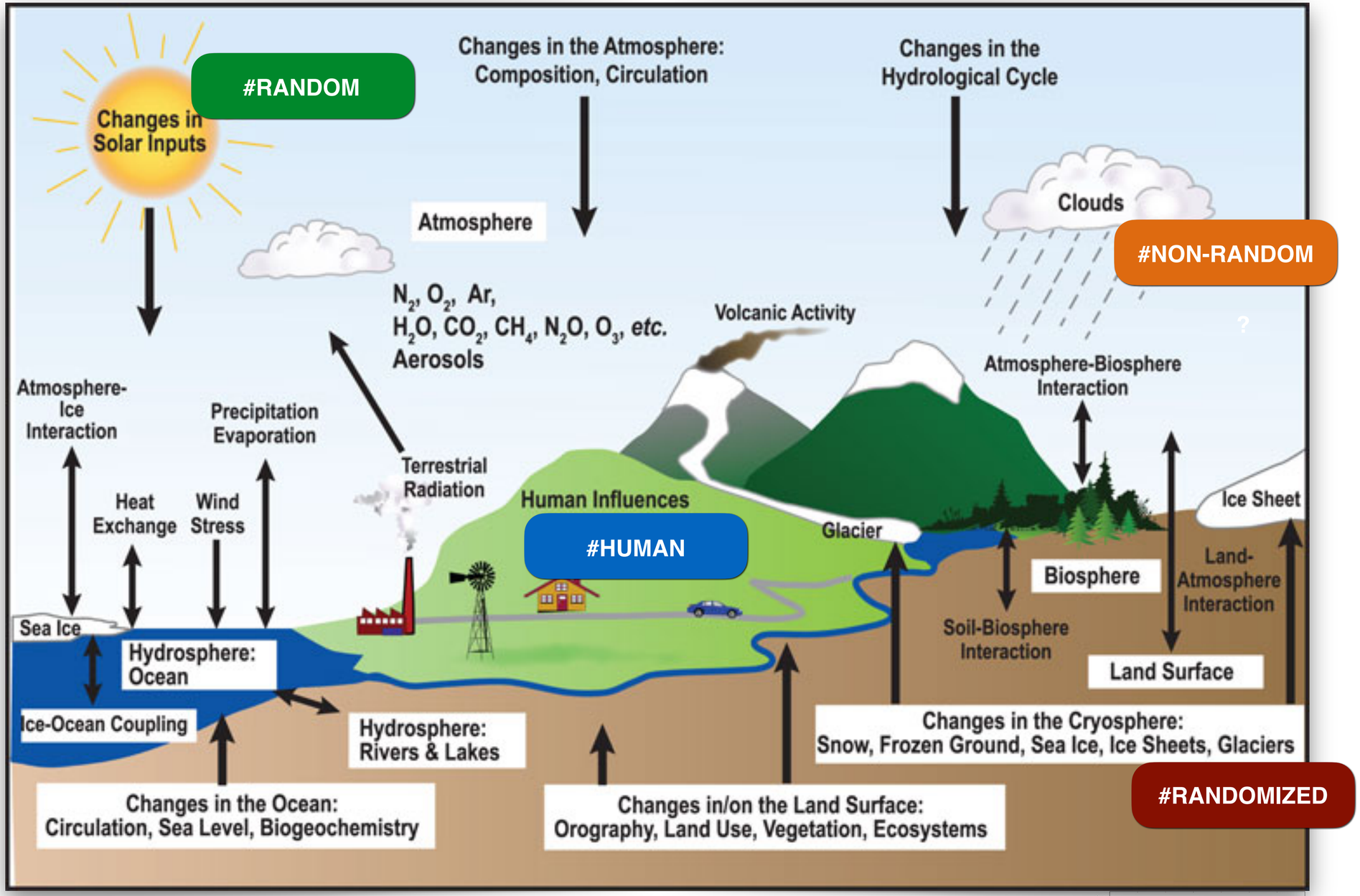
Alyssa speaks with earthquake predictions expert Prof. Brendan Meade and mobile health researcher and statistician Prof. Susan Murphy. This interview looks at the power of technology in guiding humanity's future health outcomes in a variety of ways. (LabXchange Version)

The Future of Climate Prediction by Michael Foley:

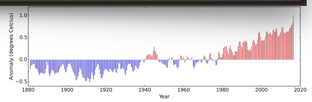
Read this essay by Alyssa's teaching fellow Michael Foley on the use of models in climate science to predict the future of Earth's climate and the outcomes of human-caused climate change:

Climate change predictions have taken on an increasingly important role in national and international decision making given that the current economic and social course would lead to catastrophic warming. Given that many sectors of society contribute to climate change and the whole world will experience its impacts, such predictions must consider the domains of both physical laws and human interactions. Addressing #health, #wealth, and #earth in the shadow of climate change is a daunting task, and responses to climate change effects and predictions have ranged from aggressive mitigation to proactive or reactive adaptation.

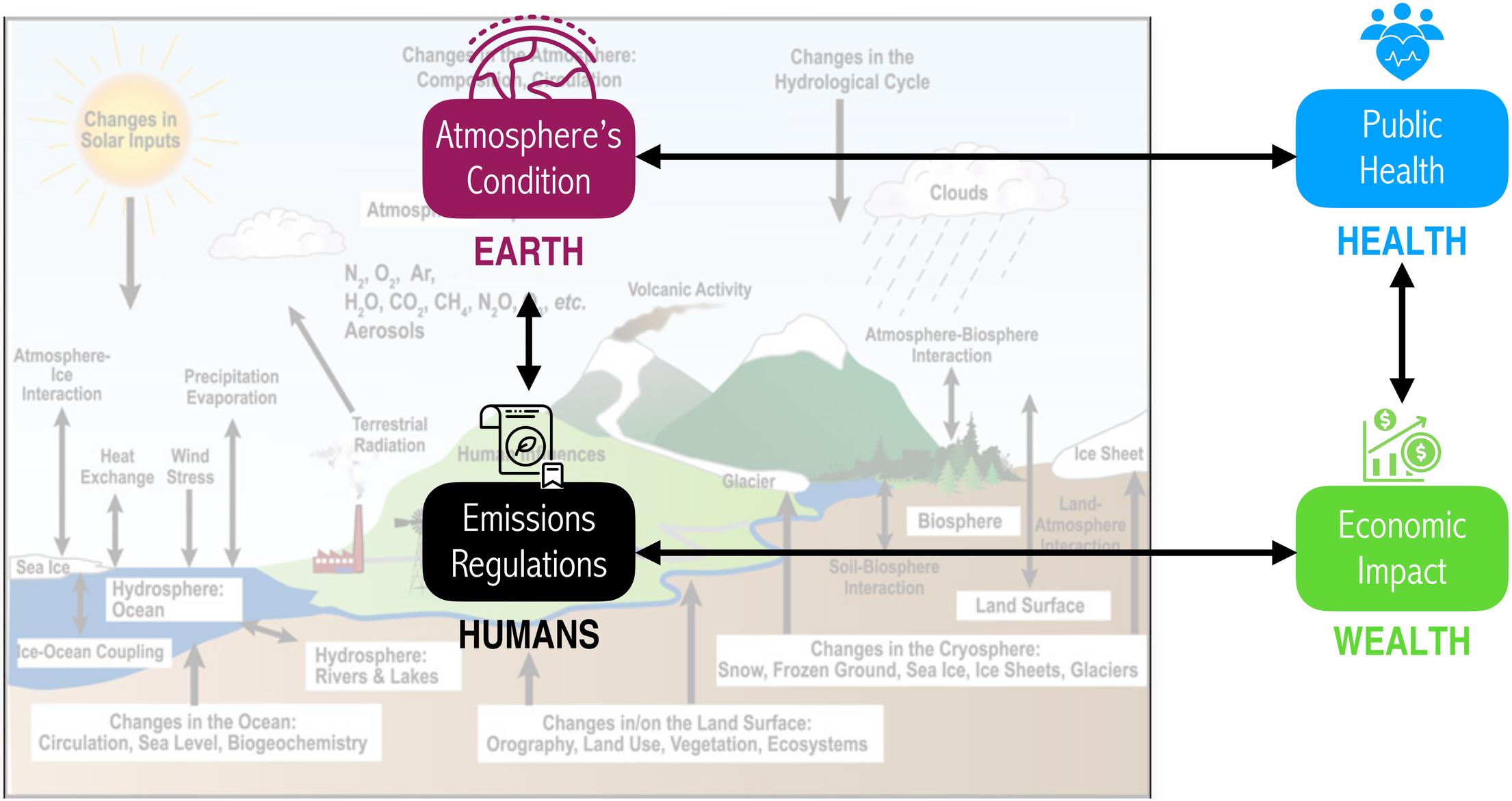
EVALUATE
ACCURACY



blogs.scientificamerican.com/the-curious-wavefunction/are-more-accurate-climate-change-models-worse



Is the future determined, or negotiable?



blogs.scientificamerican.com/the-curious-wavefunction/are-more-accurate-climate-change-models-worse

Thursday
February 12, 2026

The Guardian US

Trump administration

Trump's EPA repeals landmark climate finding in gift to 'billionaire polluters'

Rollback of government's ability to limit climate-heating pollution will make families 'sicker and less safe', environmental advocate says

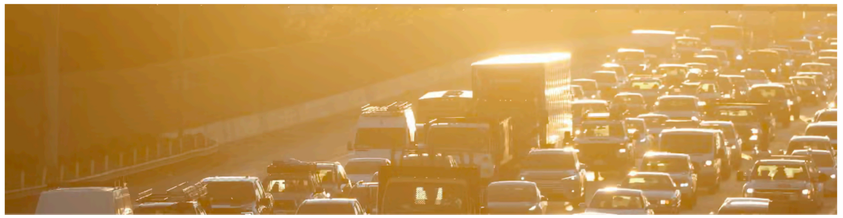
US politics live – latest updates

Dharna Noor

Thu 12 Feb 2026 15.53 EST

Share

Prefer the Guardian



Trump Administration Erases the Government's Power to Fight Climate Change

The Environmental Protection Agency repealed the bedrock scientific finding that greenhouse gases threaten human life and well being. It means the agency can no longer regulate them.

Listen to this article · 12:59 min Learn more | Share full article | 749

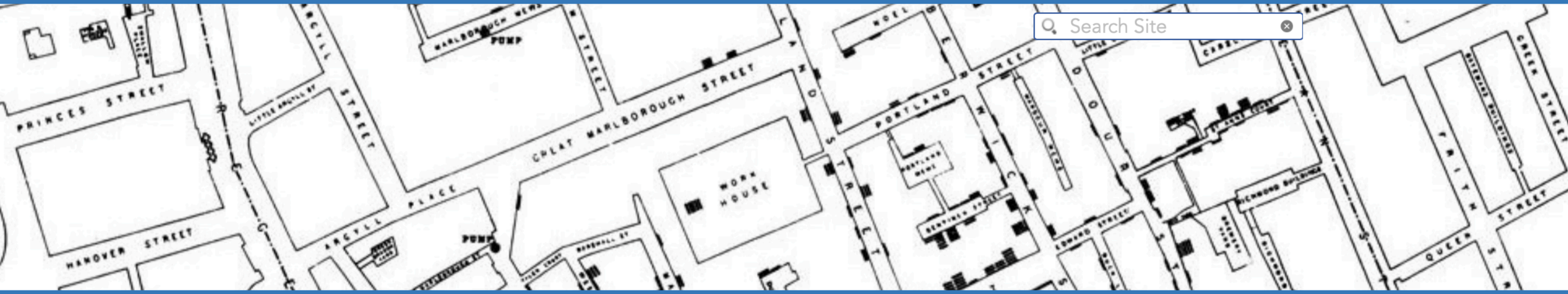
Rigorous scientific findings since 2009 have showed that greenhouse gases and global warming are harming public health. Jeff Swensen/Getty Images

By Lisa Friedman
Reporting from Washington

Feb. 12, 2026 Updated 4:29 p.m. ET

The Prediction Project

The Past and Present of the Future



Prediction Essentials

Take a look at the essential elements of the course, including the framework for predictive systems.

→

Omens & Oracles

Gain insight into prediction as a human venture by studying the most ancient forms of prediction in Omens and Oracles.

→

Rise of Theory

Learn how humanity moved from mystical divination practices to genuine, scientific theories to explain natural phenomena.

→

Modern Prediction

Discover the cutting edge predictive methods and modeling from preeminent experts across many fields.

→

The Paths to Science

Path-to-Foundation

path-to-foundation.org

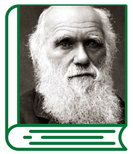
Science is so much more than equations and lab coats. It requires human creativity, ingenuity, argument, and persistence.

The goal of the Paths to Science is to deepen students,' scientists,' and the broader public's appreciation of science by telling stories of its history.

5 small books published by MIT Press, each including a narrative linked to a poster

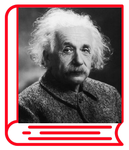
The MIT Press

The Path to Newton



The Path to Darwin

The Path to AI



The Path to Einstein

The Path to Modern Genetics

A growing consortium. . .

The Path-to Science Consortium

Università degli Studi di Padova

HARVARD UNIVERSITY

UNIVERSITY OF OXFORD

PREDICTIONX

predictionx.org

extra slides

Mendel

Phenomenon | Observation | Data | Rule | Prediction

Darwin

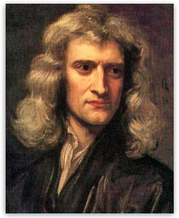
Phenomenon | Observation | Data | Theory | Explanation | Prediction

BIOLOGY

PHYSICS

Kepler

Phenomenon | Observation | Data | Rule | Prediction



Newton

Phenomenon | Observation | Data | Rule | Theory | Explanation | Prediction

Mendel *1865*

Phenomenon | Observation | Data | Rule | Prediction

Darwin *1859*

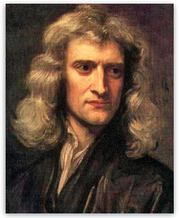
Phenomenon | Observation | Data | Theory | Explanation | Prediction

NO FULLY PREDICTIVE GENERAL THEORY

FULLY PREDICTIVE GENERAL THOERY

Kepler *1609*

Phenomenon | Observation | Data | Rule | Prediction



Newton *1687*

Phenomenon | Observation | Data | Rule | Theory | Explanation | Prediction

Ancient Mesopotamian Extispicy: ALTERING the FUTURE

Substitute King Ritual

The man who was given as the king's substitute shall die, and the bad omens will not affect that king.

Ritual for the substitute king
ME K.2600

… treated with wine, washed with water and anointed with oil…

Letter about the substitute king and queen
ME K.112

Ashurbanipal's Autobiography (668 BC)

You shall rule over the kings of the lands; you shall show them their frontiers and set the courses they take!

Oracle, 674–672 BC
ME K.883

I learnt… the hidden secret of all the scribal art. I can recognise celestial and terrestrial omens and discuss them in the assembly of scholars.

Autobiography of Ashurbanipal, 668 BC
ME K.2694

images taken by Alyssa Goodman at the British Museum galleries, 2017

PREDICTIONX
WGBH
2008
2011
edX
2014
HarvardX
HARVARD COLLEGE
Freshman Seminar Program
2015
2016
2017
predictionx.org
The TIMELINE CONSORTIUM
SPIN-OFF
(TSF METADATA STANDARD, TOOL)
LabXchange™
Science and learning-connected.
2020
Harvard College
Program in General Education
Explore. Expand. Engage.
2019
PATH TO
A project to track the evolution of science
2018
2019
2020
SPIN-OFF (PATH-TO FOUNDATION)
Path-to-Foundation
2021
2022
2026