# Welcome (back) to the future.



Time & Space

**Roman Augury** 

**Breath on a Mirror** 

What's is time?

**Breakout room discussions** 

Use "Collaborations" Google Doc

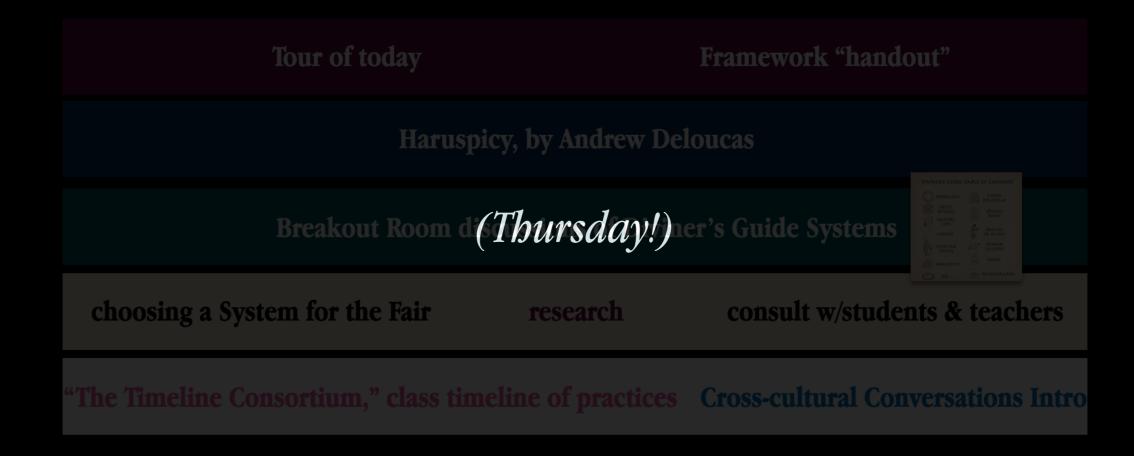
**Diviner's Guide Excerpts** 

[Celestial Mechanics Review?]

**Diviner's Guide Systems** 

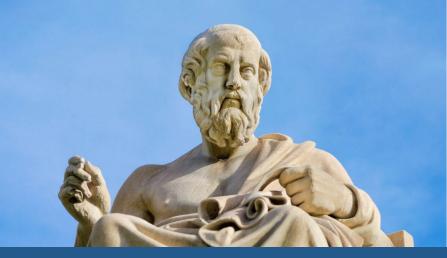
[expertise, Framework, era]

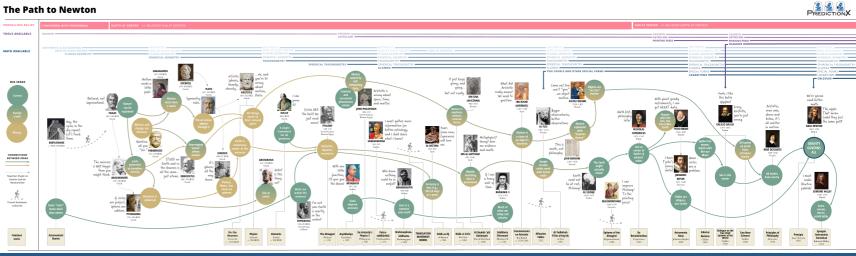
**Breakout room discussions** 



# What is time?

(to be discussed, soon, via "Collaborations" tab on Canvas, in breakout rooms)





Path To Newton

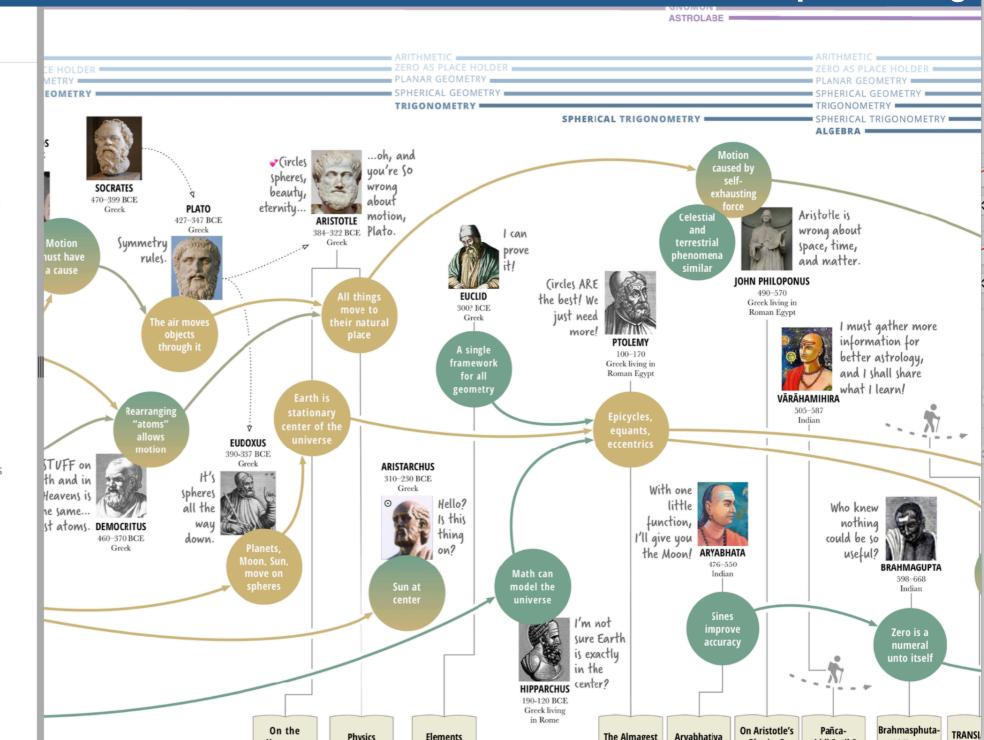
Full Document Both Full Map

path-to.org

# Plato (~427 - ~347 BCE) - Symmetry rules.

According to Plato, an object is moved through a medium (for example, air or water) by the medium itself. In his *Timaeus*, Plato claimed that an object is passive, and that the medium surrounding an object is the active agent responsible for movement. Plato's greatest student, Aristotle, strongly disagreed. (Worry not, though, Plato and Aristotle, and so many who came after, agreed completely that symmetry and beauty are essential parts of the Universe, and of understanding it.)

Consider the example of an arrow shot from a bow, which is often used to demonstrate ideas about theories of motion. In Plato's view, as the arrow and bowstring move through the air, they set the air in motion so that as soon as the arrow leaves the hand of the archer, the air (medium) continues to *move* the arrow (object). Plato argued that the air created a circular thrust, or mutual replacement, in which the air at the tip of the arrowhead moved to the back of the fletching and took the space that would otherwise be left empty by the arrow's passing. The air from the front that replaced the air in back thus propelled the arrow forward. Though Plato did not explain why the arrow would cause a circular motion of the air (as opposed to, say, pushing the air forward in front of it), such a movement of the medium prevented a(n abhorred) void or vacuum from forming behind the object. Since vacuums were considered, at least by Plato





### PLATO, ON TIME

When the father and creator saw the creature which he had made moving and living, the created image of the eternal gods, he rejoiced, and in his joy determined to make the copy still more like the original, and as this was an eternal living being, he sought to make the universe eternal, so far as might be. Now the nature of the ideal being was everlasting, but to bestow this attribute in its fullness upon a creature was impossible. Wherefore he resolved to have a moving image of eternity, and when he set in order the heaven, he made this image eternal but moving according to number, while eternity itself rests in unity, and this image we call time. For there were no days and nights and months and years before the heaven was created, but when he constructed the heaven he created them also. They are all parts of time, and the past and future are created species of time, which we unconsciously but wrongly transfer to eternal being, for we say that it 'was,' or 'is,' or 'will be,' but the truth is that 'is' alone is properly attributed to it, and that 'was' and 'will be' are only to be spoken of becoming in time, for they are motions, but that which is immovably the same forever cannot become older or younger by time, nor can it be said that it came into being in the past, or has come into being now, or will come into being in the future, nor is it subject at all to any of those states which affect moving and sensible things and of which generation is the cause. These are the forms of time, which imitates eternity and revolves according to a law of number. Moreover, when we say that what has become is become and what becomes is becoming, and that what will become is about to become and that the nonexistent is nonexistent — all these are inaccurate modes of expression.

But perhaps this whole subject will be more suitably discussed on some other occasion (Timaeus 37c-38b).

# What is time?

(to be discussed via "Collaborations" tab on Canvas, in breakout rooms)

### What is time?

### **INITIAL DISCUSSION WILL END AT 2:07**

### **Breakout room 1:**

- Thinking about time/space
  - a) Time is a means of movement, similar to space
- Platonic ideals: somewhere outside time and space where there is a perfect form of everything; all replicas are based off of this original
  - a) Allegory of Cave
- 3) What is the present?
  - a) Dependent on perspectives? Theory of relativity?
- 4) Does some objective Time exist?

### Breakout room #7:

- Time can be divided in a qualitative and quantitative sense
- When do people value time more?
  - What does time mean to a 3 year old versus 73 year old?
- How do people of different ages treat time differently?
- Time is not universal due to loss of simultaneity
- How has our interpretation of time changed because of COVID-19?

### **Breakout Room #3:**

- Time is a human created organizational tool
- Memory? A dog can't plan
- Time is heat (objective vs subjective experiences of time)

# The Prediction Project, 2021

### PREDICTIONX: THE PAST & PRESENT OF THE FUTURE



**ESSENTIALS** 

**Predictive Systems Framework** 

The "Padua Rainbow"

**Understanding Uncertainty** 

**Study Design** 

**Timelines** 



Omens, Oracles & Prophecies

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





### THE RISE OF THEORY

Ancient Mesopotamia, Egypt, Greece & Rome Islamic Science

The Path to Newton

Indian Mathematics European Renaissance

The Royal Society



**John Snow** & Cholera Cholera Map

### Lost without Longitude (Navigation)

Help, I'm Lost! Tools of the Navigator



### MODERN PREDICTION

### Health

▶ Epidemiology

▶ Personal Genomics

▶ Population Genetics

# Wealth

ightharpoonup 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

predict?

▶ video(s)

Coming Soon

visit predictionx.org for more information on the Prediction Project











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ASTROLOGY



AZTEC RITUALS



CASTING LOTS



COMETS



EGYPTIAN STATUE



HARUSPICY



IFA



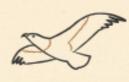
MAYA SPACETIME



ORACLE



ORACLE OF DELPHI



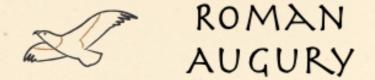
ROMAN AUGURY



TAROT



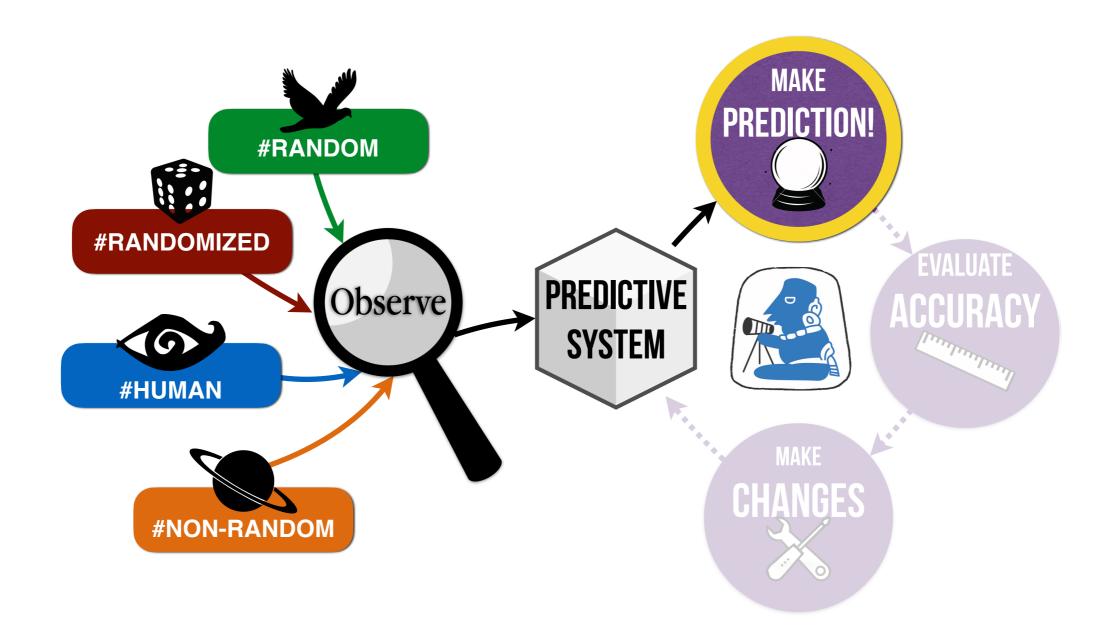
TASSEOGRAPHY



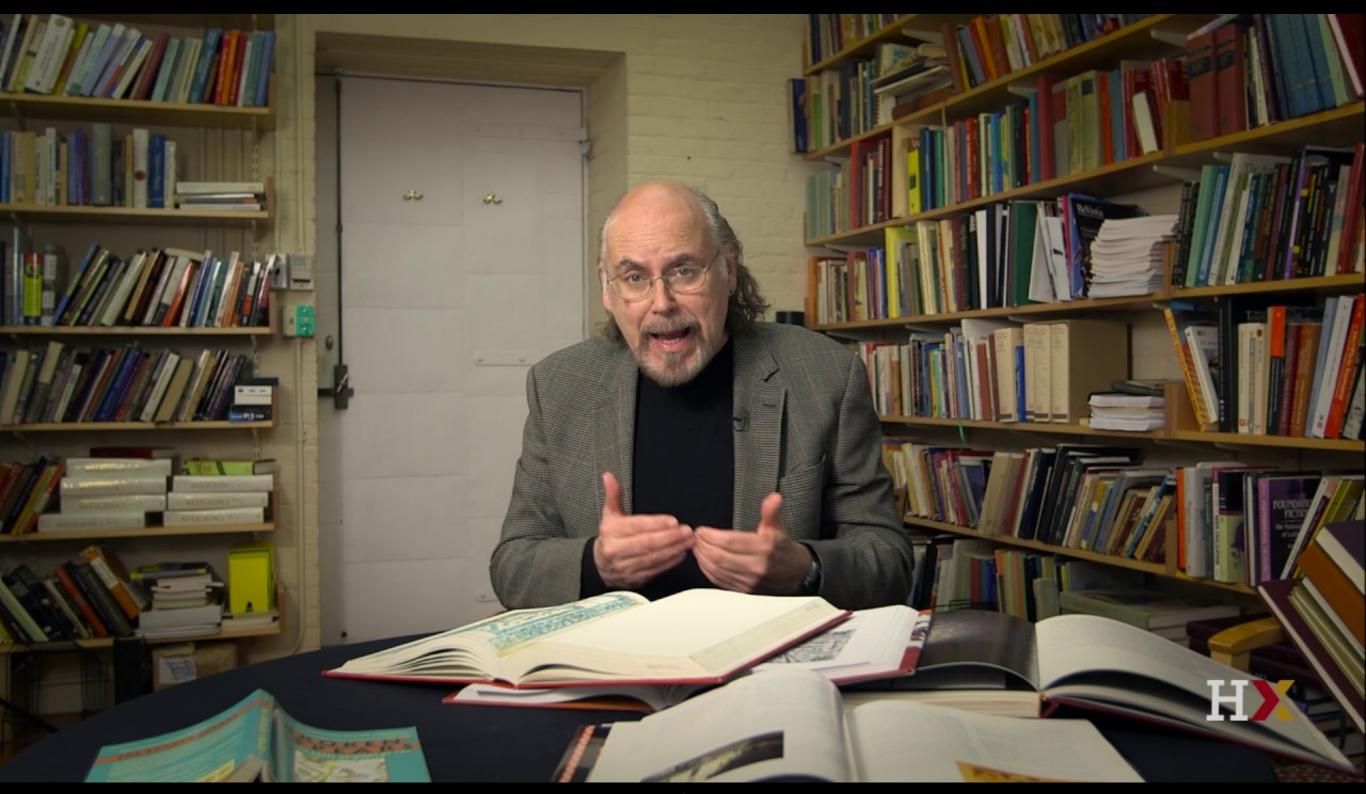
"Senior political officials of the Roman state had to take auspices before any major political event like elections." —Emma Dench



(see "Roman Bird Augury" video on edX)



# We too could once see the future...?

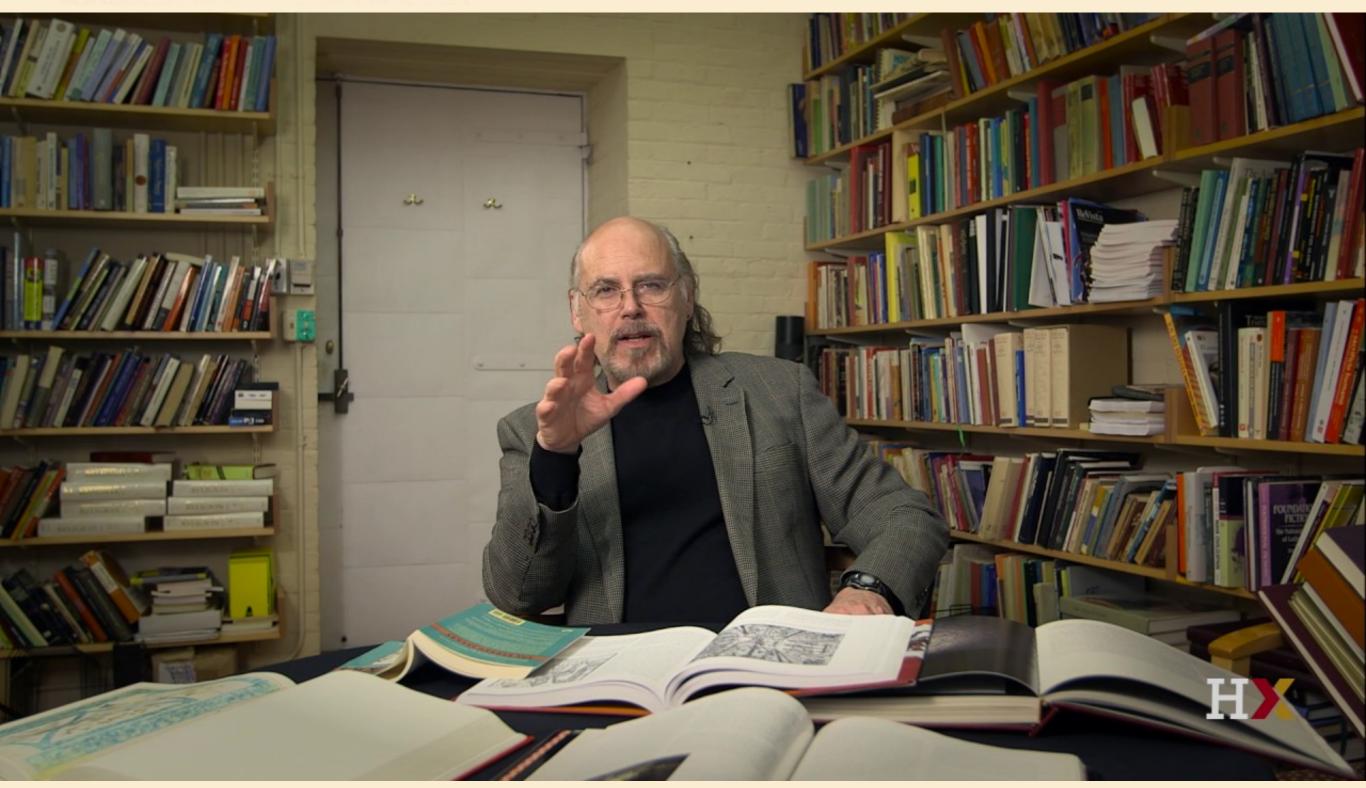


...now we need bints from Nature





### "As though a breath on a mirror" — David Carrasco



(see "Aztec Mirrors" video on edX)



Course Discussion Progress HarvardX on YouTube PredictionX Map Acknowledgements Instructor

### **Contributing Content Experts**

(Please "Meet the Expert" on each page of the Diviner's Guide for bios)

- Astrology: Kathleen Medina, practitioner
- Aztec Rituals: David Carrasco, Professor, Harvard Divinity School
- Casting Lots: Laura Nasrallah, Professor, Harvard Divinity School
- Comets: John Overholt, Curator, Houghton Library, Harvard University; Owen Gingerich, Professor, Harvard Faculty of Arts and Sciences; and & Sara Schechner, Curator of the Collection of Historical Science Instruments at Harvard University
- Egyptian Statue: Peter Der Manuelian, Professor, Harvard Faculty of Arts and Sciences
- Haruspicy: Piotr Steinkeller, Harvard Faculty of Arts and Science
- Ifa: Jacob Olupona, Professor, Harvard Divinity School
- Maya Spacetime: Dylan Clark, University of North Carolina (Asheville)
- Oracle Bones: Rowan Flad, Professor, Harvard Faculty of Arts and Sciences
- Oracle of Delphi & Roman Augury: Emma Dench, Professor, Harvard Faculty of Arts and Sciences
- Tarot: Colin Fredericks, practitioner; James Leonard, independent performance artist
- Tasseography: Cengiz Cemaloglu, practitioner



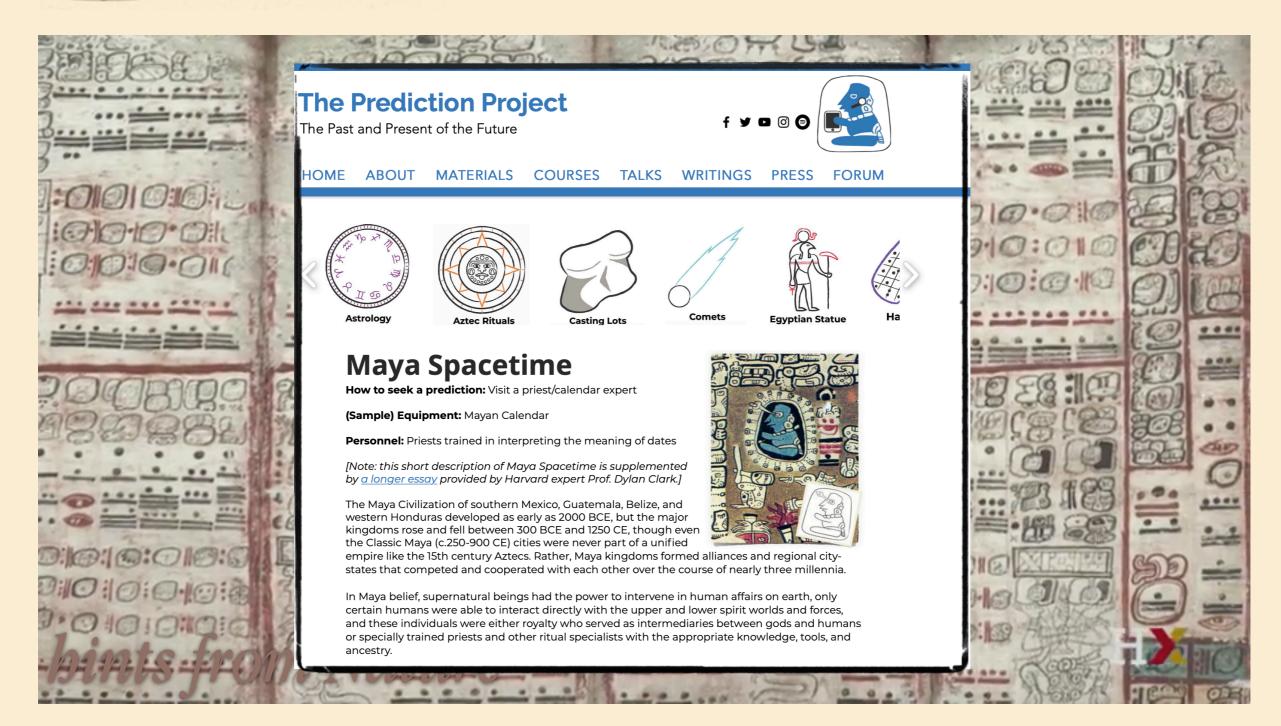
# Quick intro to Celestial Motions & WorldWide Telescope



visit worldwidetelescope.org to follow along



# "Astronomical events were the physical manifestations of gods."—Dylan Clark



Note: All Omens & Oracles Materials are on edX, and also at PredictionX.org.



### 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." 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. In 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 copyists2 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:

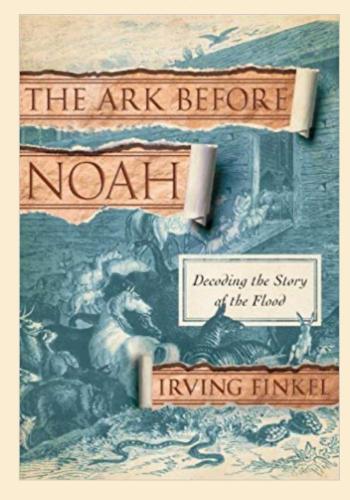
# Newton's Principia

(the real one from 1687)



# Finkel's Ark Before Noah

(I **C**uneiform)



Phenomenon Observation Data Rule Theory Explanation Prediction



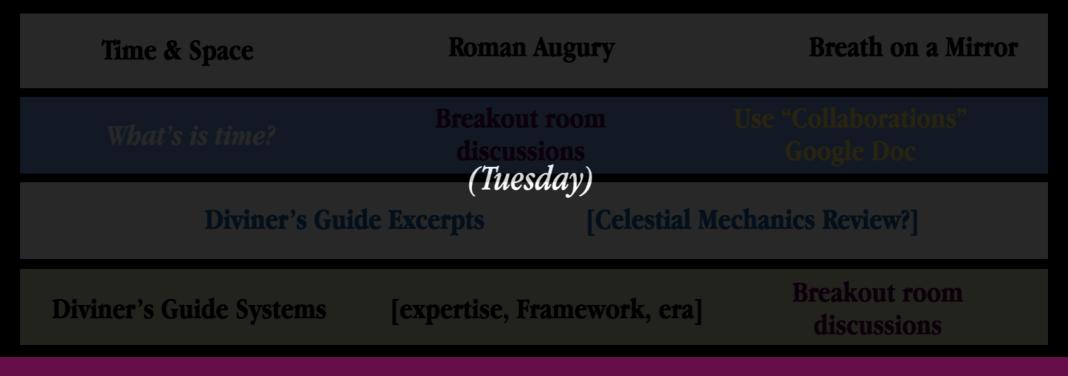
# "Seeing" what we already know, with artist James Leonard.

### The Tent of Casually Observed Phenologies



see video clip from 6:16 - 11:30





Tour of today

Framework "handout"

Haruspicy, by Andrew Deloucas

Breakout Room discussions of Diviner's Guide Systems

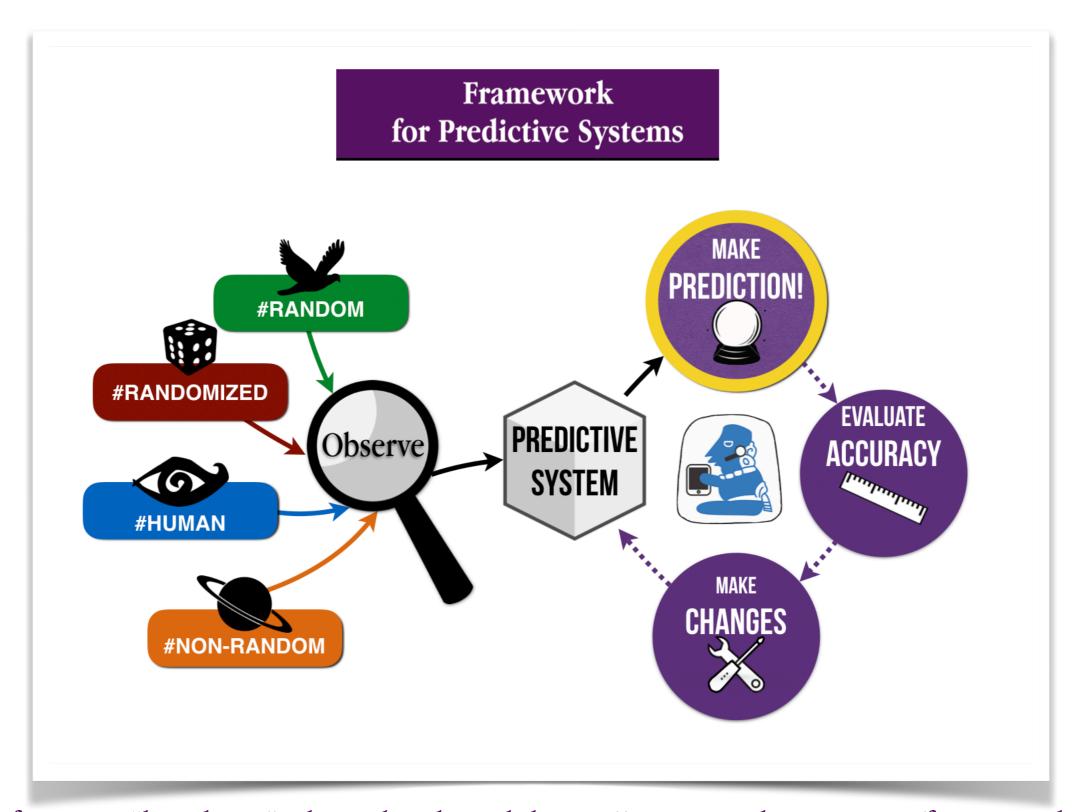


choosing a System for the Fair

research

consult w/students & teachers

"The Timeline Consortium," class timeline of practices Cross-cultural Conversations Intro



for your "handout," please bookmark https://www.predictionx.org/framework



Time & Space Roman Augury Breath on a Mirror

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# **Diviner's Guide**

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SPACETIME



AZTEC RITUALS



BONES



LOTS



ORACLE OF DELPHI



COMETS



ROMAN



EGYPTIAN STATUE



TAROT



HARUSPICY



TASSEOGRAPHY



# Reminder: What's a "prediction"?

(motivational discussion questions from the GenEd 1112 syllabus)

"Prediction" is a very common word in English, but what does it mean?

How far is this "future"?

Is testability required? How about past data?

Is a prediction always part of a decision?

How is a decision different from a prediction?

Who really knows and doesn't know the future?

Why do we want to know? How can we know?

How does prediction manifest in your everyday life? In society?

Today? In the past? In the future?

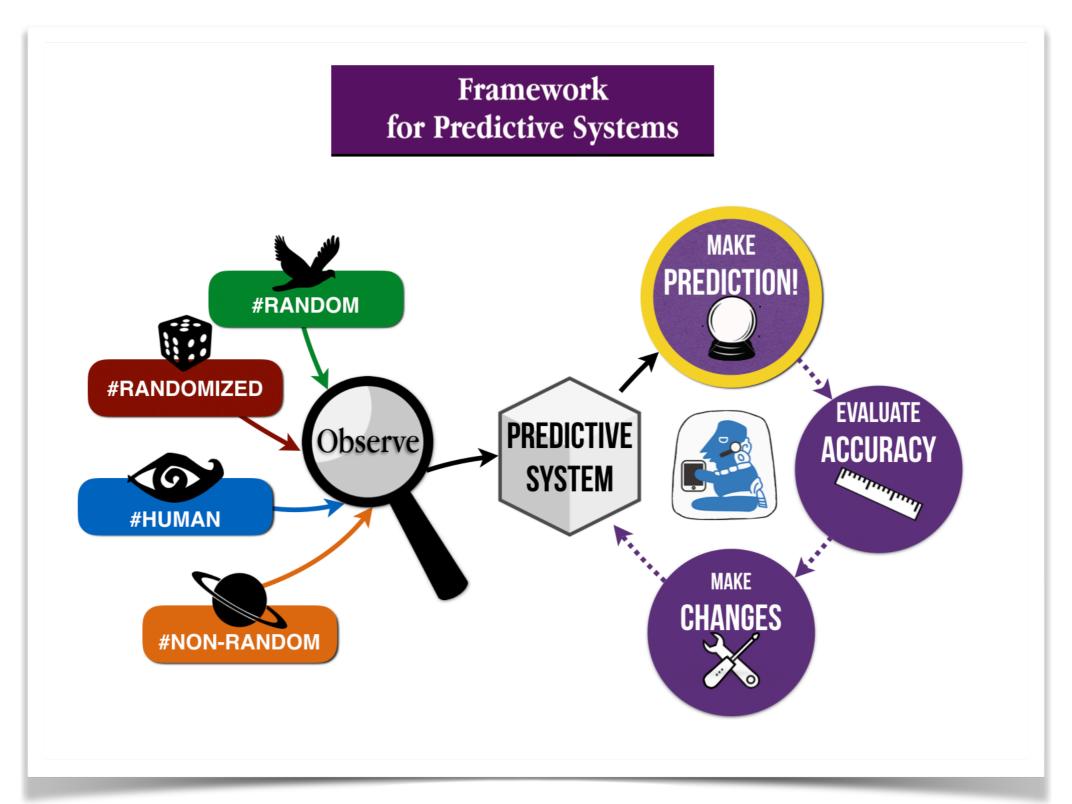
# Reminder: What's a "prediction"? (v2 of Week 1 poll)

### what-s-a-prediction-v2-results Response attempting the impossible, often falsely Predictions are a projection of our subconscious humanity An educated guess about the future Using a pool of gathered information to give a potential outcome or reality using past events to make more informed choices about the future A guess about the future a claim about the future that is grounded in evidence from the present/past and can be tested in the future Suggestion about the future based on an observation from the present/past something that either alters a person's behavior or their perception of it a statement about the future, potentially testable data-driven distribution of potential events refining systems designed to reveal future events Not a definition: we talked about predictions affecting outcomes Informed and reasonable idea (guess?) about what will come to pass predictions are like poetry Using present information to foretell the future

events forecasting

An evidence-based forecast of something in the future

# Reminder: Framework Handout





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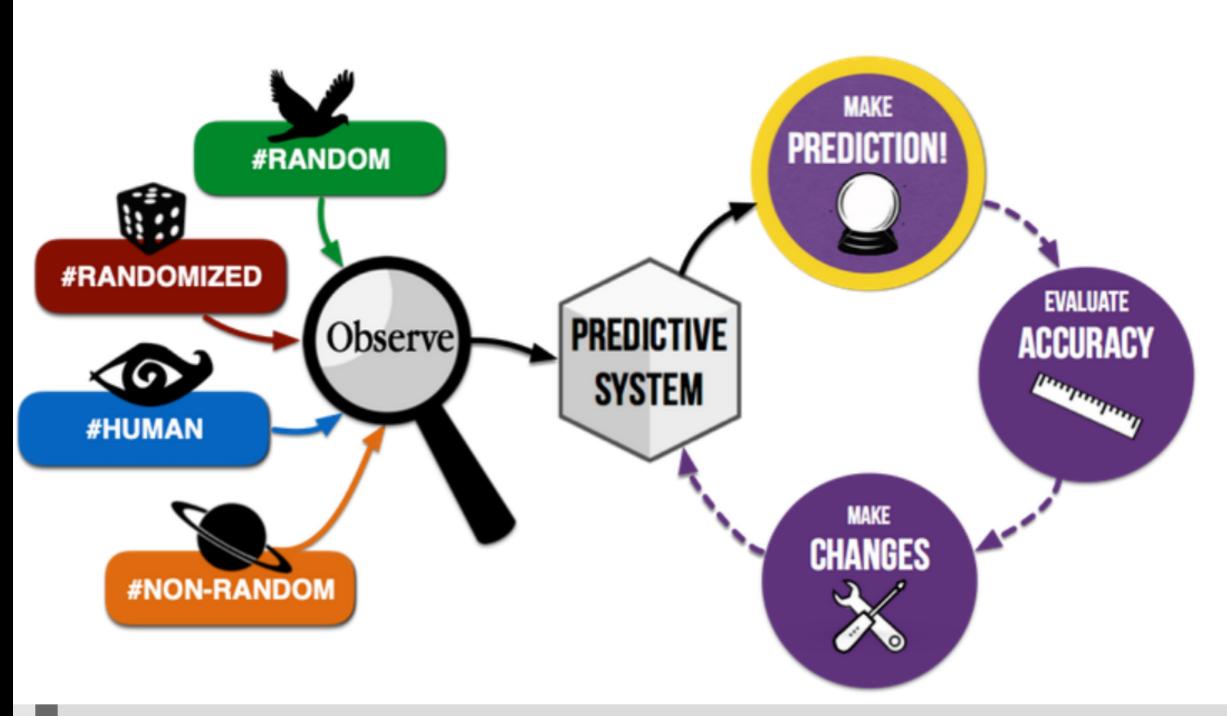
IFA



TASSEOGRAPHY

# **Framework Distribution**

# A Framework for Predictive Systems



# Type a few words describing the most surprising aspect of the system you discussed

Time & Space Roman Augury Breath on a Mirror

What's is time?

Breakout room discussions Google Doc (Tuesday)

Diviner's Guide Excerpts [Celestial Mechanics Review?]

Diviner's Guide Systems [expertise, Framework, era]

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consult w/students & teachers

# Please open this Canvas "Assignment" now...

### Presenting a Divinatory System

Submit Assignment

**Due** Feb 11 by 1pm **Points** 140 **Submitting** a website url

As we discussed in class, you should choose a divinatory system *outside* of the realm of (what today we would call) "science" to present to your classmates at our Divination Systems Fair on 2/11, during class time. The Wikipedia page on "Methods of Divination" & offers a good list of options, but you can go beyond that with any system *not* of your own invention (that comes later in the course!). You need to choose a system for which you will be able to cite reputable sources in your description of it. We'll use this "Divination Fair 2021" Google Doc & (also accessible from "Collaborations" on Canvas) for signups, during Week 2. Try not to choose exactly the same system as anyone else. And, yes, it's alright to expand upon one of the systems in the edX Diviner's Guide if that's of particular interest.

#### More specifically--here's what you need to do:

- 1. Choose your system, and enter it in the list on the "Divination Fair 2021" Google Doc. 

  ☑
- 2. If it turns out the system you chose in class isn't a good option given the other numbered items below, you can change your mind by editing your entry on the "Divination Fair 2021" Google Doc &.
- 3. **Research your system** using any resources you can find, including books, websites, videos, etc. Be sure to keep track of your sources, as we will ask you to cite them (see below).
- 4. Create an **online description** (e.g. using a Google Doc you create ) that resembles a page from the edX Diviner's guide. We have created this <u>template</u> of for your convenience, showing exactly what we'd like you to do. Make sure to include #hashtags referring back to the <u>Framework for Predictive Systems</u>, or as in the template. Add the link to your online description to the same <u>"Divination Fair 2021" Google Doc</u> you used to choose your system--other students may want to refer to it there during the Fair.
- 5. Assemble any materials you need to **demonstrate** your system. If you need to make facsimile materials, that's fine. If you can only show a video of what would be needed, that is also fine. You do NOT need to actually make predictions during the Fair: you need only show the tools and explain how the system works. We do not expect you to be an expert in using the system--instead you should learn and be prepared to **explain how, when, where, and why it was and/or is used.**
- 6. For the fair, make sure you have the materials you need for your demonstration. You might also want to create a zoom background appropriate to your system (e.g. if you're doing something from a particular region, how about an image suggesting you're "in" that region?) Costumes are optional. We will provide more detailed zoom instructions prior to the Fair. (We may run a tech "practice" session on Tuesday, 2/9, but the actual Fair will take place on Thursday, 2/11.)
- 7. About ten or so students, in small groups, will experience your system over the course of the fair, so be prepared to explain it more than once!

This assignment will be reviewed via anonymous peer review by your classmates, and those reviews will inform the grade given by your TF. The total number of units (points) available is 140. The "submission" here should be the URL for the (Google Doc) description of your Divinatory System.



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Photograph your local culture, help Wikipedia and win!

Q

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### Methods of divination

From Wikipedia, the free encyclopedia

This article is about the numerous varieties of divination. For divination as a whole, see Divination.



This article has an unclear citation style. The references used may be made clearer with a different or consistent style of citation and footnoting. (December 2013) (Learn how and when to remove this template message)

Methods of divination can be found around the world, and many cultures practice the same methods under different names. During the Middle Ages, scholars coined terms for many of these methods—some of which had hitherto been unnamed—in Medieval Latin, very often utilizing the suffix -mantia when the art seemed more mystical (ultimately from Ancient Greek μαντεία, manteía, 'prophecy' or 'the power to prophesy') and the suffix -scopia when the art seemed more scientific (ultimately from Greek σκοπεῖν, skopeîn, 'to observe'). Names like drimimantia, nigromantia, and horoscopia arose, along with other pseudosciences such as phrenology and physiognomy.[1]

Some forms of divination are much older than the Middle Ages, like haruspication, while others (such as megapolisomancy or coffee-based tasseomancy) originated in the 20th and 21st centuries.

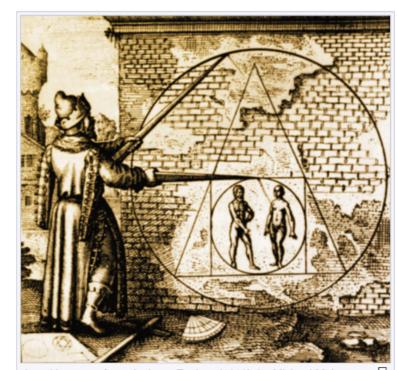
The chapter "How Panurge consulteth with Herr Trippa" of Gargantua and Pantagruel, a parody on occult treatises of Heinrich Cornelius Agrippa, contains a list of over two dozen "mancies", described as "common knowledge". [2]

### Part of a series on the Paranormal Main articles [show] Skepticism [show] Related [show] **Parapsychology** [show]

# en.wikipedia.org/wiki/Methods\_of\_divination

#### A [edit]

- abacomancy / æbekoumænsi/ (also amathomancy): by dust (Hebrew 'ābāq, dust + Greek manteia, prophecy)
- acultomancy /əˈkʌltoʊmænsi/ (also acutomancy): by needles (from acutomancy below, influenced by Latin acus, needle, or acūleus, prickle or thorn)
- acutomancy /əˈkjuːtoʊmænsi/ → see acuttomancy (Latin acus [acut-], needle + Greek manteía, prophecy)
- adromancy / ædrowmænsi/ → see ALOMANCY (from idromancy below, influenced by alomancy)
- adryomancy → see HYDROMANCY (metathesis of hydromancy)
- aeromancy / seroumænsi/: by atmospheric conditions (Greek āēr, air + manteia, prophecy)
- agalmatomancy /əˈgɔːlmətoʊmænsi/:[citation needed] by statues (Greek ágalma [agálmatos], statue + manteía, prophecy)
- aichmomancy / ɛkmoʊmænsi/: by sharp objects (Greek aikhmē, spearhead + manteia, prophecy)
- ailuromancy/aeluromancy → see THERIOMANCY
- alectormancy/alectromancy /əˈlɛktroʊmænsi/: by rooster sacrifice (Greek alektor, rooster + manteía, prophecy)
- alectryomancy/alectoromancy: by rooster divination → see THERIOMANCY
- aleuromancy¹ /əˈljʊəroʊmænsi/: by flour; see also chartomancy (Greek áleuron, meal + manteía, prophecy)
- alomancy/Halomancy / œloumænsi/ (also adromancy): by salt (Greek háls, salt + manteía, prophecy)
- alphitomancy/ælfxtoumænsi/: by barley (Greek alphis [alphit-], barley + manteía, prophecy)
- alveromancy /æl'vɪəroʊmænsi/:[citation needed] by sounds
- amathomancy /æmeθουmænsi/ → see ABACOMANCY by sand (Greek amathos, sandy soil + manteía, prophecy)





Time & Space Roman Augury Breath on a Mirror

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# The TIMELINE CONSORTIUM

About

Members

The Standard ▼

Prototype Tool ▼

Test Data ▼

**News & Events** 

Links

We envision a best-case scenario for the use of timelines where researchers and learners can re-configure, compare, cannibalize, and share timelines to suit specific topics or questions. The standard and prototype we create will demonstrate the utility of this vision.

The problem: A widely-agreed-upon standard for tagging rich but relatively unstructured online information (e.g. Wikipedia, articles, manuscripts, media archives, online course content) for use in rich timeline displays does not yet exist. Related "calendar" standards (e.g. hCalendar, h-event) and language-specific standards (e.g. for Python, d3, Wikidata) do exist. Many of these standards are richly descriptive and flexible, but they are largely not interoperable—and they are not being used in mainstream education-oriented or research- oriented timeline software today. The lack of community-driven agreement on a common standard for describing and tagging the kinds of information that timeline tools need to import and then display is presently inhibiting researchers' and learners' abilities to understand and compare temporal sequences in pursuits ranging from Big History to Epidemiology to Criminology to Cell Biology. Arguably, the lack of agreement upon, or use of, interoperable standards goes a long way toward explaining why no excellent, customizable, tool for displaying online timelines exists.

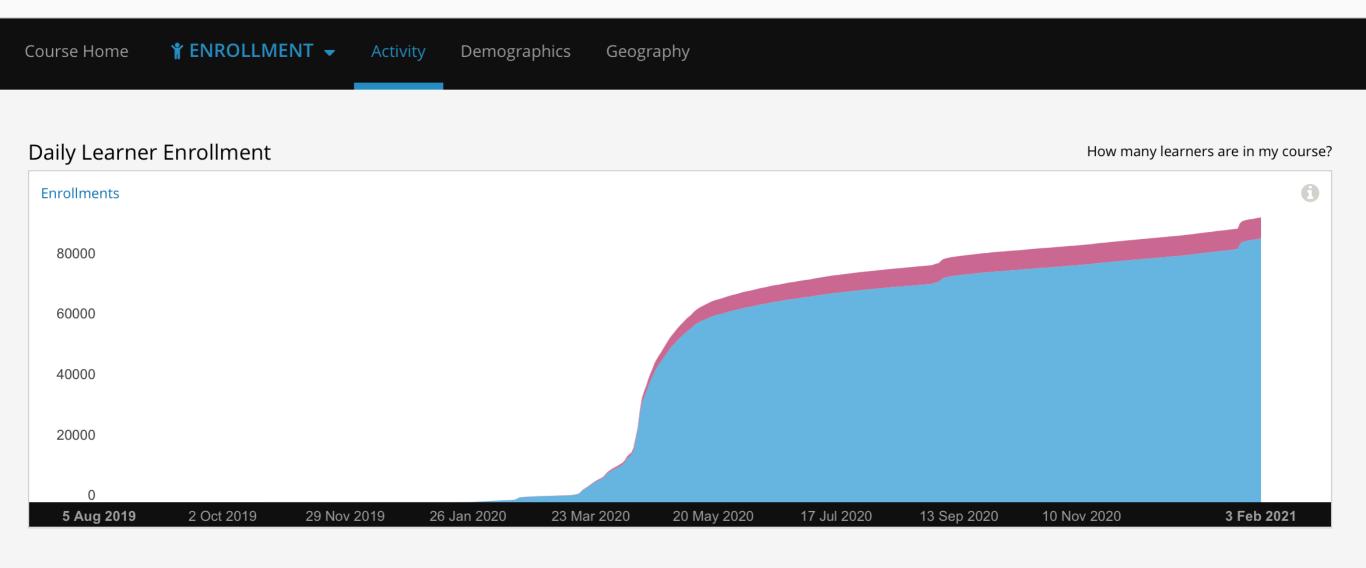
To solve this problem, we have created a standard for timeline-related information. Our process included researching existing standards and conversion options between them, deciding which pieces of existing standards to adopt, and then defining the minimum useful standard set as a list of semantic tags and formats for basic concepts such as "start time."

# "Omens, Oracles & Prophecies"



PredictionX: Omens, Oracles & Prophecies

Help ≈ AlyssaGoodman •



### **Enrollment Metrics**

97,097 Total Enrollment

0

94,194
Current Enrollment

0

865 Change in Last Week

0

6,964
Verified Enrollment

0

# (Section Preview)

### **INSTRUCTIONS to STUDENTS**

- Enter examples from your *Prediction Journals* here, under the categories provided--or make a new category if you must, and add it to the Table of Contents.
- If your prediction falls in more than one category, you may enter it more than once.
- Try to summarize each entry to three lines or less
- DO not use your real name (although you may use a pseudonym to identify your entries)

# tinyurl.com/gened1112predictions

**Sports** 

Health

**Weather** 

**Politics** 

**Family** 

Food

Life Plan

Harvard-specific

Course-choice specific

Additional Category 1 copy/paste this heading as neede Screenshot esh" the Table of Contents