



BRENT: We would like to share with you a pilot project for a University Library utilizing special collections to make OERs. At the end we will appreciate your guidance and suggestions, as we are very much at the beginning of this effort.



I'm Brent Purkapple, a graduate student in HSCI Department, AND a GA in the Library for the History of Science Collections. I found the program via online course...



Libraries as makers of OER: A Pilot Project

History of Science Collections
University of Oklahoma Libraries

Brent Purkale, OU Lynx outreach director

Kerry Magruder, Curator

KERRY: I'm Kerry Magruder, Curator of the History of Science Collections in the Library. As a faculty member in the History of Science Department, I have frequently taught the online course Brent mentioned, often lamenting the dearth of quality OERs for the history of science.



Libraries as makers of OER: A Pilot Project

History of Science Collections
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Brent Purkale, OU Lynx outreach director

Kerry Magruder, Curator

Stacy Zemke, OER Librarian (until last month)

BRENT: We should also mention Stacy Zemke, a past participant at this conference who could not make it this year. We thank her for encouraging us to come and share our story, although if she were here, you would hear a better talk.

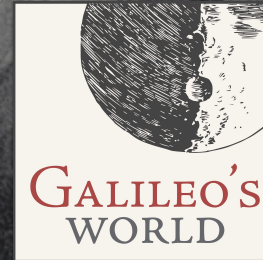
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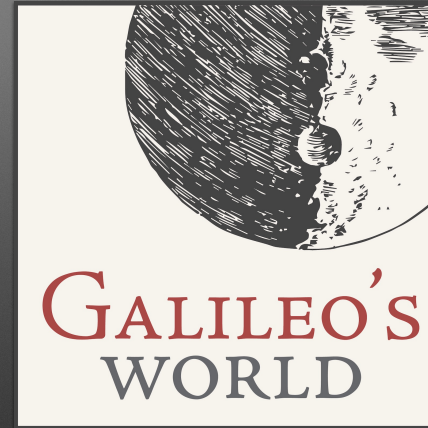
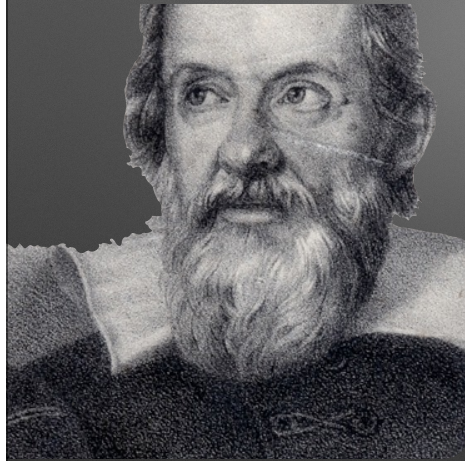
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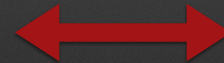


BRENT: Let's look at some of the open educational resources being developed alongside OU's Galileo's World exhibition.

Bringing Worlds Together



World of Galileo



World of OU

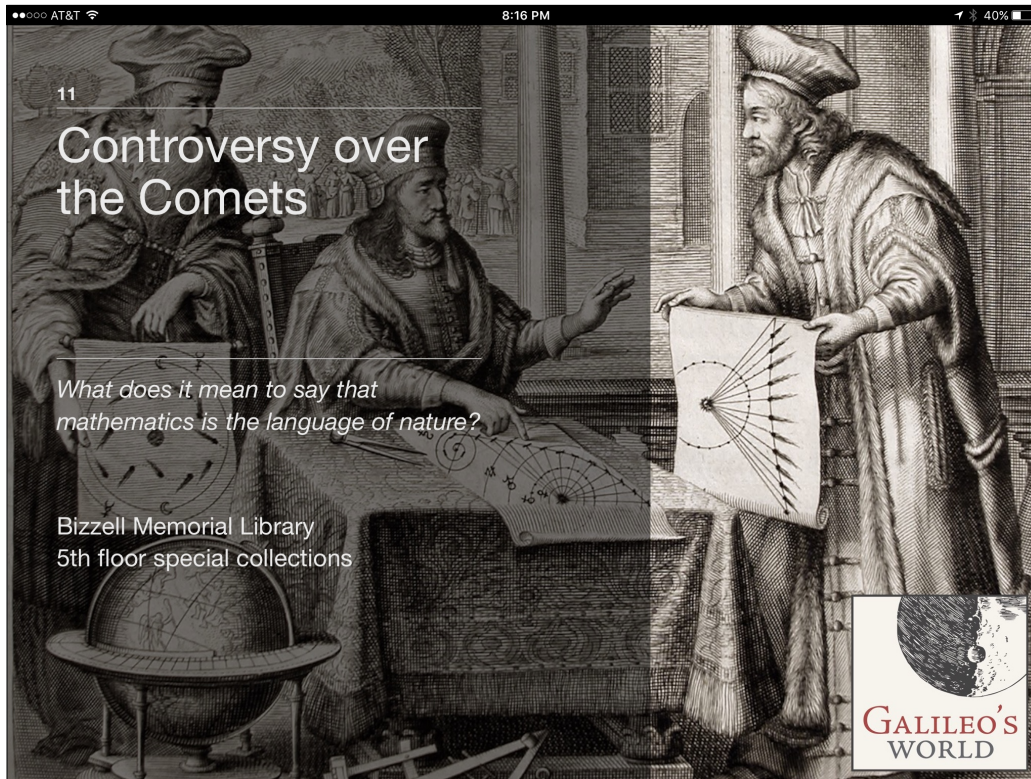
KERRY: The theme of Galileo's world is • "bringing worlds together. We are connecting the • World of OU with • the World of Galileo.

EXHIBITION WITHOUT WALLS

4 CAMPUSES • 8 LOCATIONS • 21 GALLERIES

- OU NORMAN
 - FRED JONES JR. MUSEUM OF ART
 - SAM NOBLE MUSEUM OF NATURAL HISTORY
 - NATIONAL WEATHER CENTER
 - ATHLETICS DEPARTMENT
 - OU LIBRARIES
 - HISTORY OF SCIENCE COLLECTIONS
- HEALTH SCIENCES CAMPUS, OKLAHOMA CITY
 - BIRD LIBRARY
- OU TULSA
 - SCHUSTERMAN LIBRARY
- OU AREZZO, ITALY – AREZZO PUBLIC LIBRARY

Galileo's World is an exhibition without walls. It is appearing over the course of the academic year in 21 galleries in 8 locations across the OU campuses of Norman, Oklahoma City, Tulsa and even Arezzo.



We can't take time to introduce all the different galleries, but here are some Exhibit Guide screenshots for a few. (Read titles)



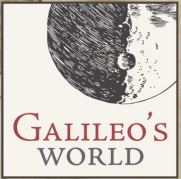
12

The New Physics

How did Galileo create a mathematical physics?

Bizzell Memorial Library
5th floor special collections

*...animadvertisset Geometrica schemata descripta, exclamavisse ad
comites ita dicitur, Bene speremus, Hominum enim vestigia video.
Vitruv. Architect lib. 5. Prof.*



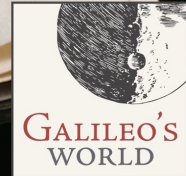


15

The Sky at Night

What is the artistic and scientific heritage of the sky at night?

Fred Jones Jr. Museum of Art:
An Artful Observation of the Cosmos
(Spring 2016)





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Chapter 20

Galileo and Kepler

Overview

20.1 Kepler



Galileo and Kepler

Why were Galileo and Kepler such a controversial scientific duo?

Historical Research Center 865

Gallery Introduction

The history of astronomy is full of dramatic events. In 1609, the telescope was invented, and the sky was opened up to a new level of detail. Galileo Galilei was the first to use the telescope to observe the sky, and his discoveries revolutionized our understanding of the universe. In 1609, Galileo Galilei was the first to use the telescope to observe the sky, and his discoveries revolutionized our understanding of the universe. 866

Gallery highlights

Galileo Galilei and Johannes Kepler

867

Reading Groups

868

Reading Groups Primary sources

The Six Corners of SNOW FLOKE

869

Exhibit videos

870

Navigation dots



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Chapter 22

Space Science after Galileo

- Overview
- 22.1 Sun
- 22.2 Planets
- 22.3 Space
- 22.4 Stars

Space Science after Galileo

Gallery Introduction

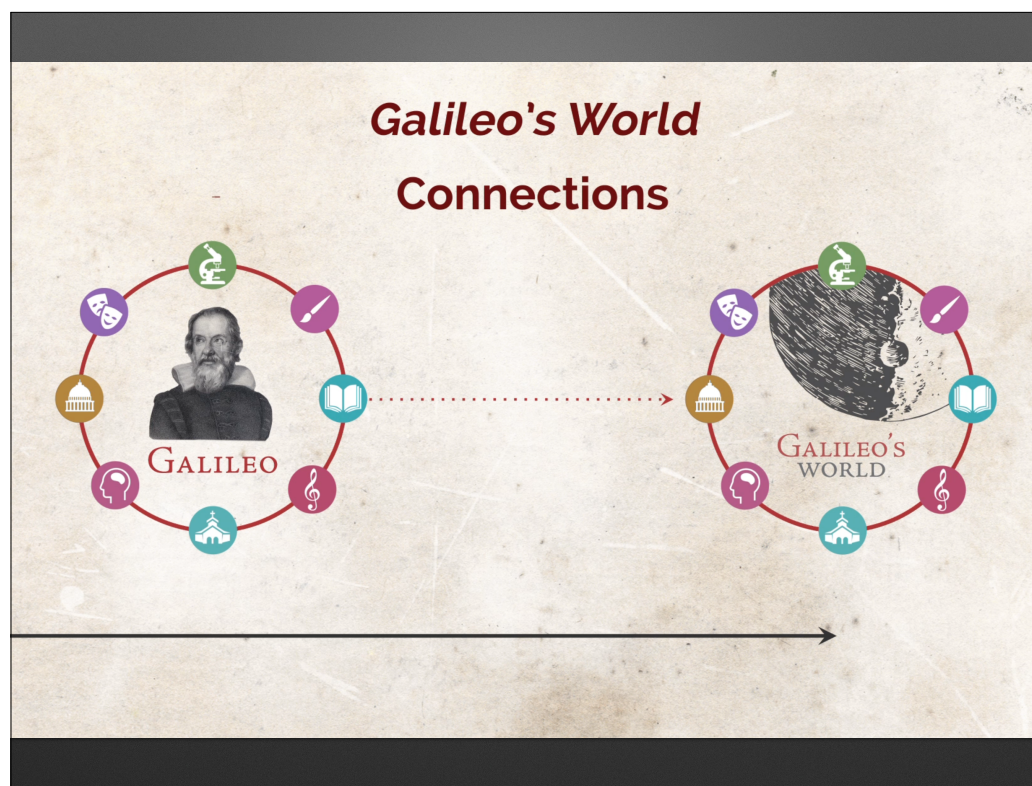
Gallery highlights

Reading Groups

Reading Groups Primary sources

Exhibit videos

919 920 921 922 923 924



So the overall purpose of the Galileo's World exhibition is to explore Connections – between the world of Galileo and our world today, and across the natural sciences and humanities.

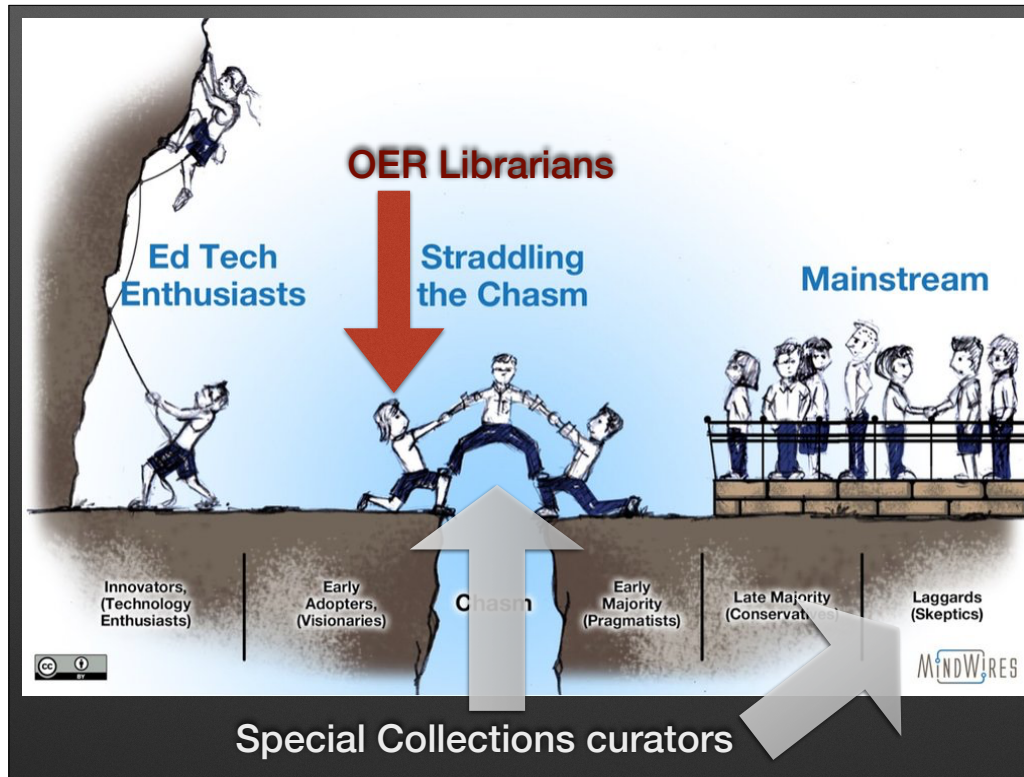
Goals

OER role for special collections

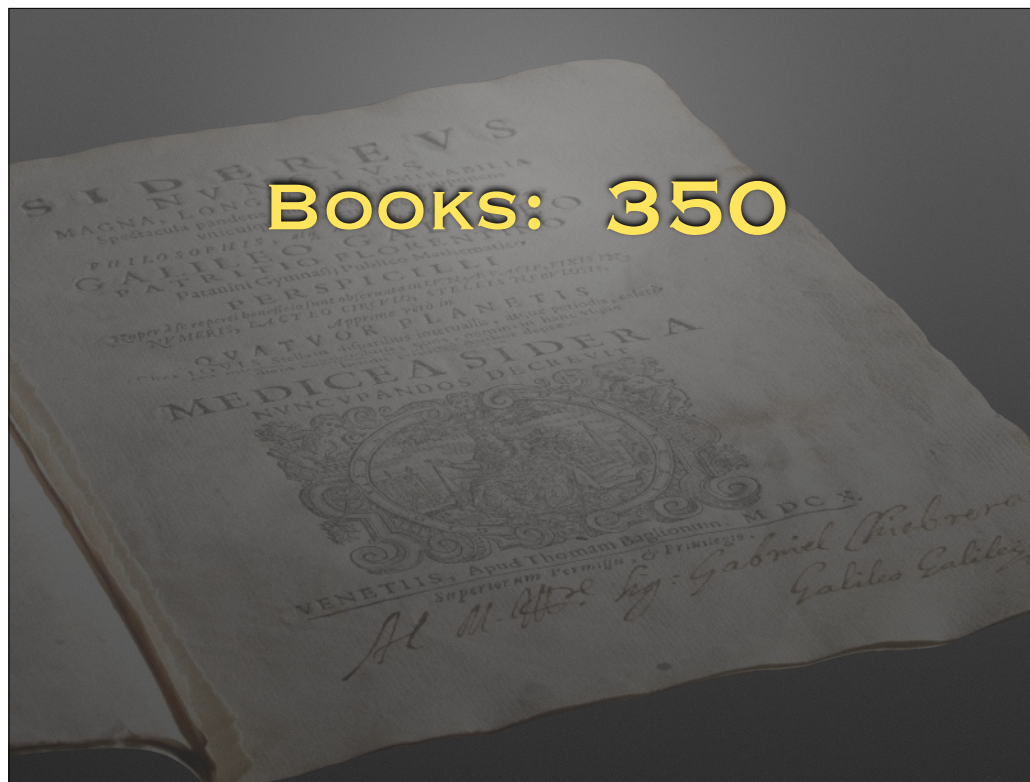
History of Science provides multidisciplinary,
cross-cutting resources

Visual impact of OERs

BRENT: What are our goals for making OER's? • First, we want to model an OER role for special collections.



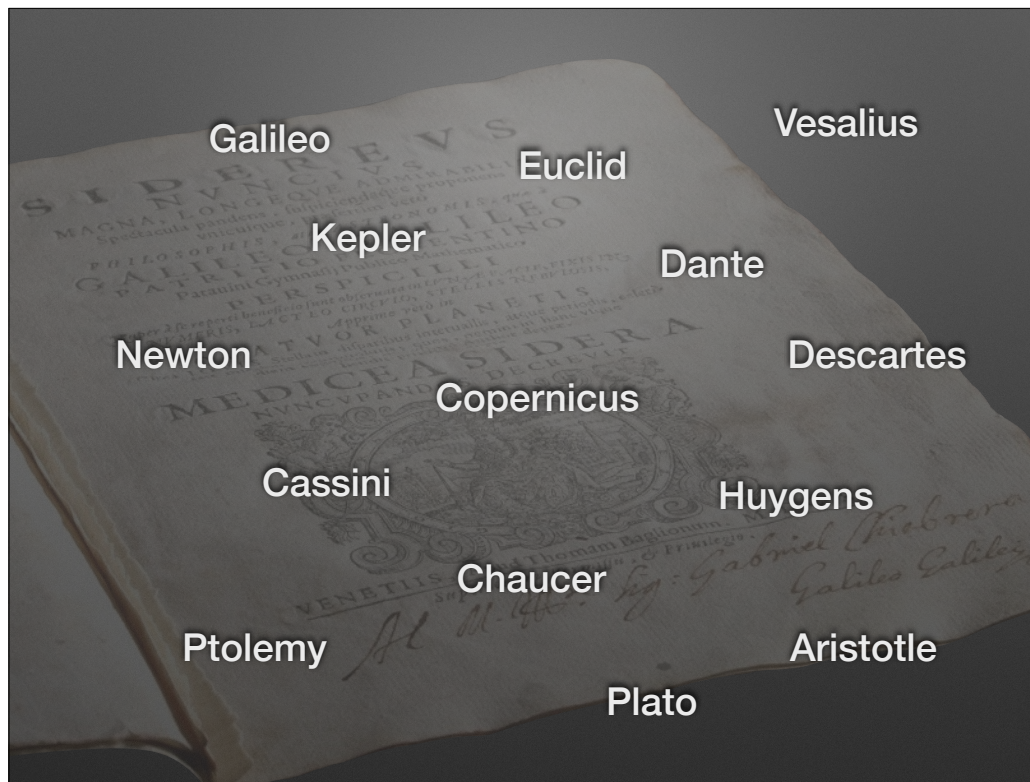
OER Librarians are among the innovators and early adopters, recruiting special collections curators who are straddling the chasm or wondering if physical items still matter. Yet special collections offer distinctive resources, opportunities for undergraduate research, and immense potential for library-based creation of oers.



KERRY: The Galileo's World exhibition features 350 rare books on display, selected from nearly 100,000 volumes in the History of Science Collections.



These are amazing books — here is Galileo's *Starry Messenger*, the first report of observations made with a telescope. The OU copy is the only extant copy with Galileo's handwriting. OU has all 12 Galileo first editions, 4 of which contain his own handwriting.



The exhibit includes dozens of first editions...



But the 350 books are not dusty tomes sealed up in cases to be admired as treasures. • They are displayed because they tell stories in the thousands!



Let's look at three quick stories. First, consider this book, bound and cased in a typical Asian style.

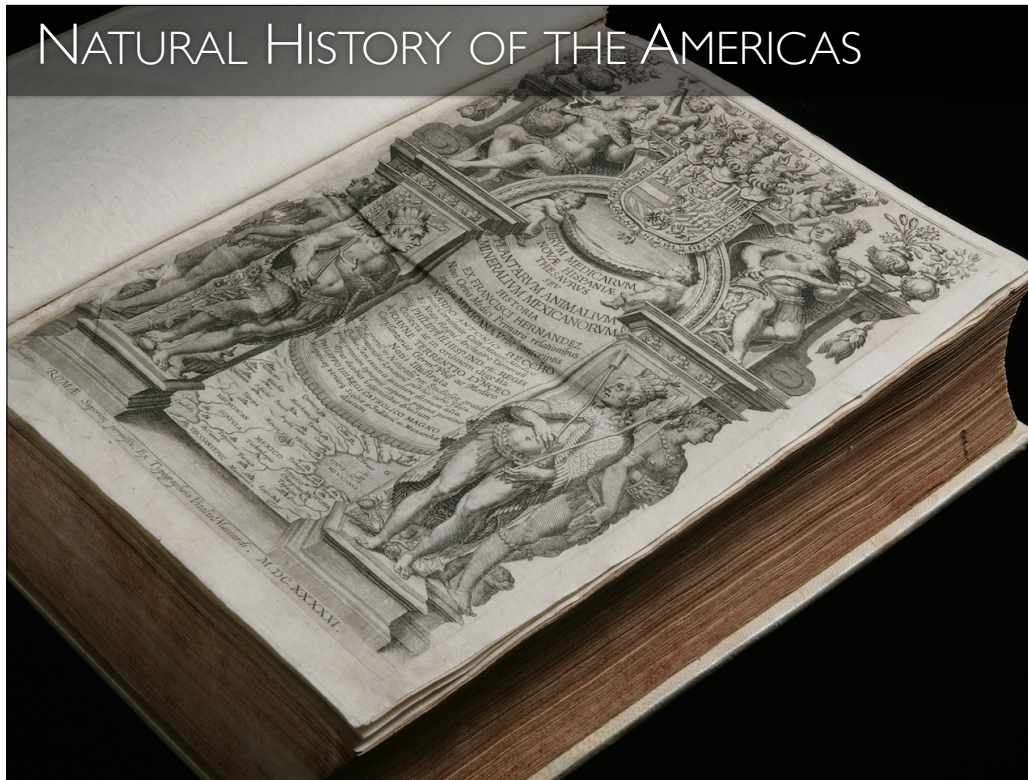
GALILEO AND CHINA

JOHANN SCHRECK, 1830

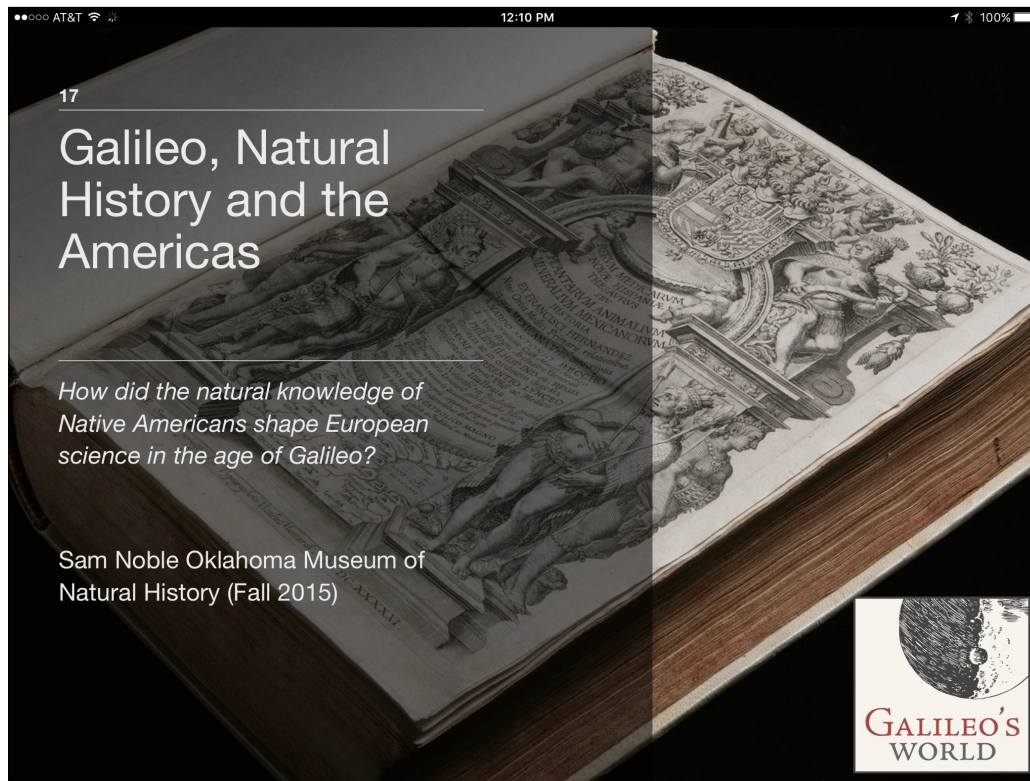


Johann Schreck was a friend of Galileo's who assisted him during his telescopic discoveries. A few years later, Schreck went to China, where he wrote this work on engineering in Chinese.

NATURAL HISTORY OF THE AMERICAS



Here's a second story. This book, by Francisco Hernandez, is the most important early natural history of the Americas. Hernandez spent a decade with the Aztecs in central Mexico. Galileo and his colleagues in the Academy of the Lynx published it in 1651.



Native American biology and medicine shaped European science in the age of Galileo. We tell this story with an exhibit at the OU Natural History Museum.




Consider a third story: Johann Hevelius was the leading European telescopic observer in the mid-17th century. This massive book was the first comprehensive lunar atlas. It accurately mapped the Moon less than 40 years after Galileo's telescopic discoveries.



On the frontispiece, Hevelius portrays Ibn al-Haytham, a leading medieval Islamic astronomer and optical theorist.

“TOP 10” TOURS

- ART
 - ASTRONOMY
 - BIOLOGY
 - ENGINEERING
 - INSTRUMENTS
 - MATHEMATICS
 - MUSIC
 - SCIENCE EDUCATION
- 

Here are some top 10 books for particular cross-cutting themes. • Here are a few more... The top 10 tours go across all the galleries. • For example, every gallery has something to say about women and science.

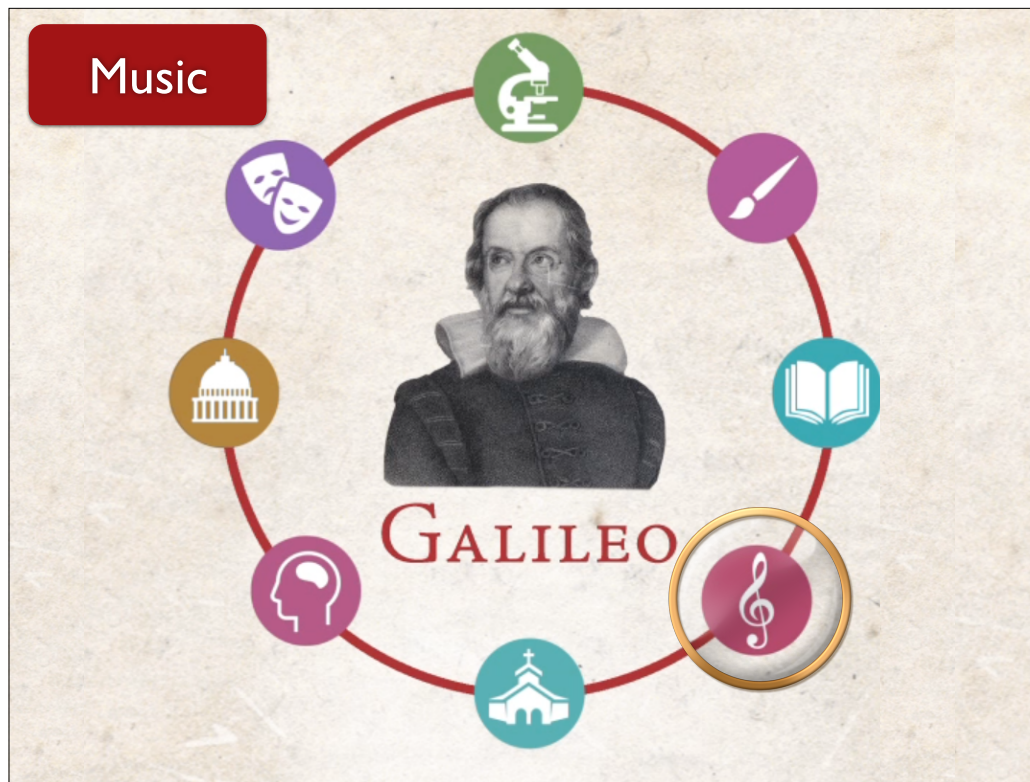
Goals

OER role for special collections

History of Science provides multidisciplinary,
cross-cutting resources

Visual impact of OERs

BRENT: This leads us to our second goal, which is to increase awareness of how the history of science provides multi-disciplinary impact, making connections with cross-cutting resources. No matter what the subject area, OERs in the history of science have the potential to enhance learning across the curriculum.



KERRY: The history of science helps us envision a circle of subject areas and recover connections that may have been lost in our overspecialized training. • For an example, let's look in particular at the worlds of astronomy and music.



In the Music of the Spheres gallery, visitors see that Kepler's third law, presented in every astronomy textbook today, was originally expressed in musical notation!



Kepler achieved a synthesis of his new astronomy with recent polyphonic musical theory.



Jonathan Annis, an OU graduate student in music composition, has composed a suite for harp, flute and oboe entirely based upon musical themes from Kepler's book. Jonathan arranged the themes, but they're all from Kepler's musical description of the universe as a cosmic dance. • [listen to a sample]



We will perform the entire suite sometime this year, and make a recording widely available as an OER.



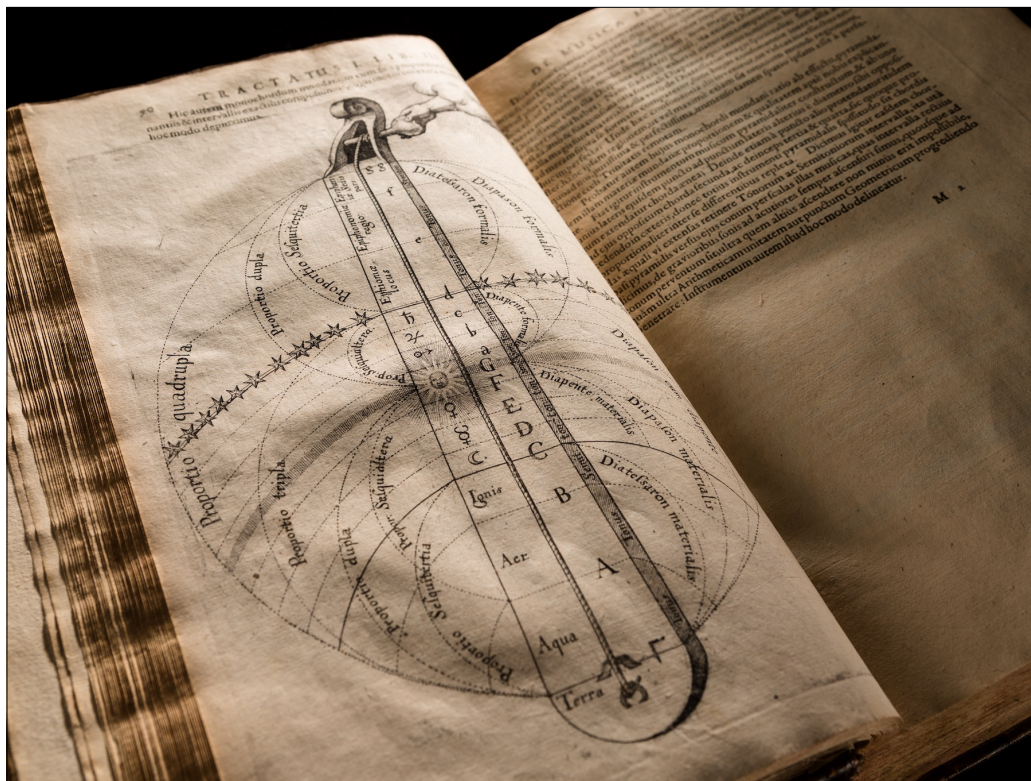
Galileo's father, Vincenzo Galilei, published a Dialog on music theory in 1581.



When Galileo conducted his inclined plane experiments, he measured the times of the balls to “within a 10th of a pulsebeat.” Friends who were not musicians, were not able to successfully replicate the experiment. It’s still difficult to replicate today! Galileo’s science was made possible because of his skill in music.



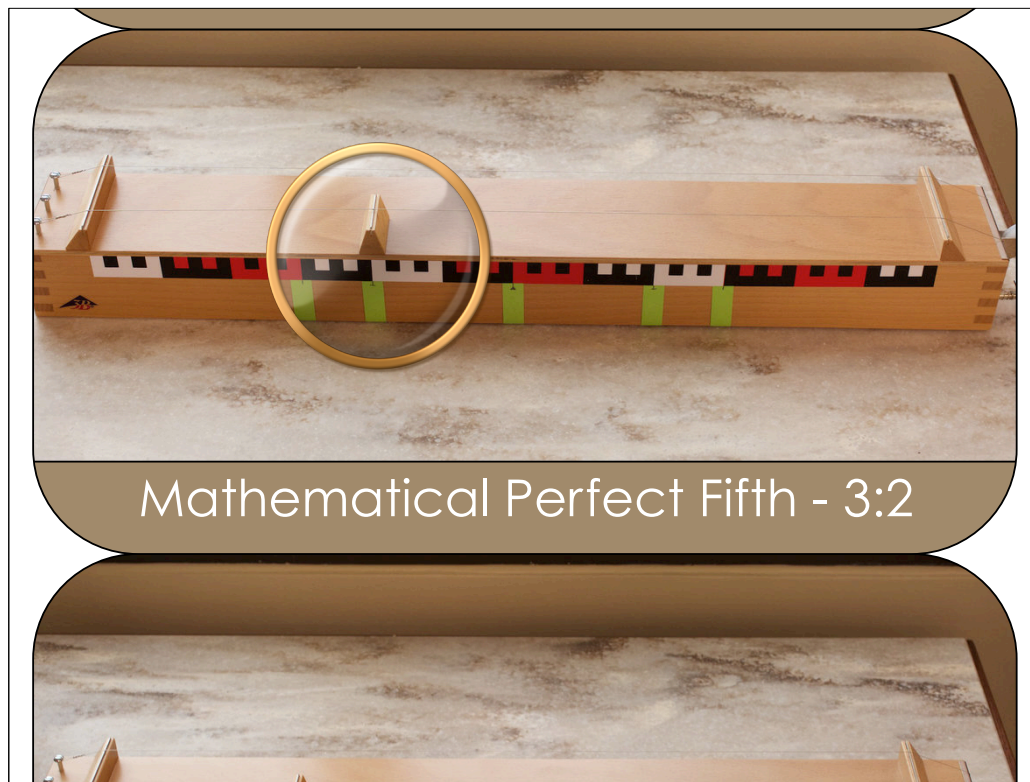
Two weeks ago, the School of Music presented an opera by Monteverdi that reflects Vincenzo's influence. OERs include more than just information in text form. This artistic performance will soon be posted online. The history of science is not just for scientists, but embraces both music and astronomy together.



BRENT: According to Robert Fludd, a London physician contemporary with Galileo, the universe itself is a monochord, a musical instrument.



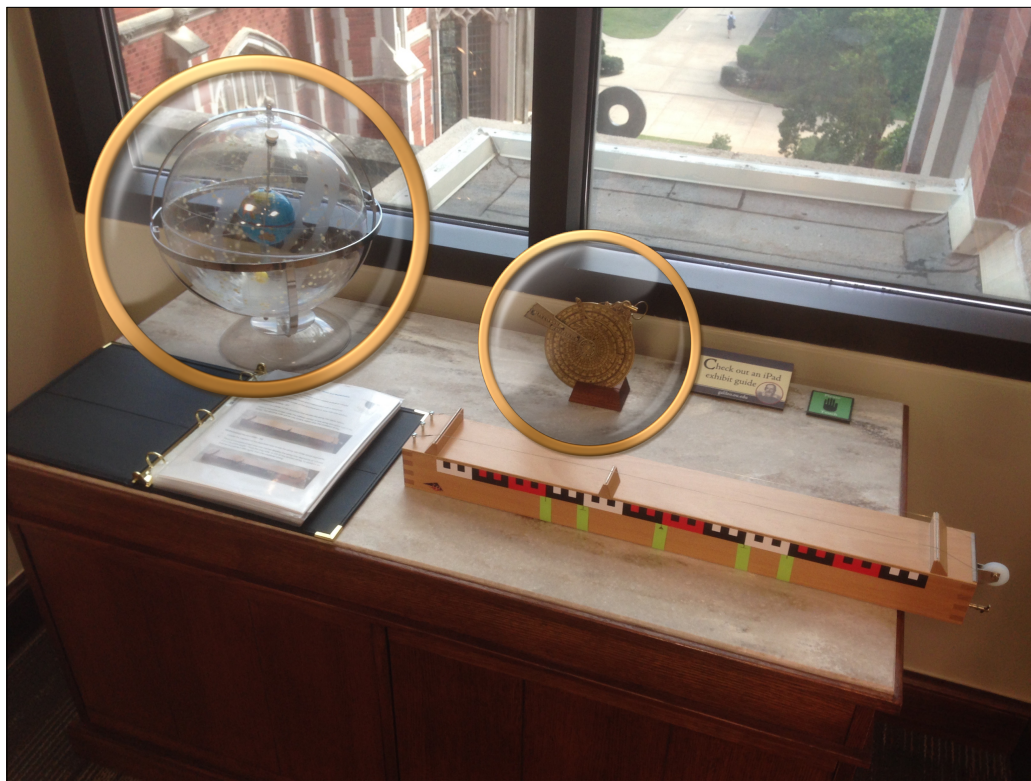
In the Music of the Spheres gallery, visitors explore the connections between mathematics and music with a duochord. Here a bridge divides a string into two equal halves. The long string and the half string are an octave apart.



Divide the string into three equal segments, and the 2/3rds string and the original string produce the harmony called a perfect fifth.



Divide the string into four equal segments, and the $\frac{3}{4}$ ths string and the original string produce the harmony called a perfect fourth.



In addition to the duochord, the Music of the Spheres activity station offers stand-up activities for the celestial sphere, and • an introduction to telling time by the stars with the nocturnal dial. There are two dozen such stand-up activities in the 5th floor exhibit hall, each of which we are preparing as an OER.

Goals

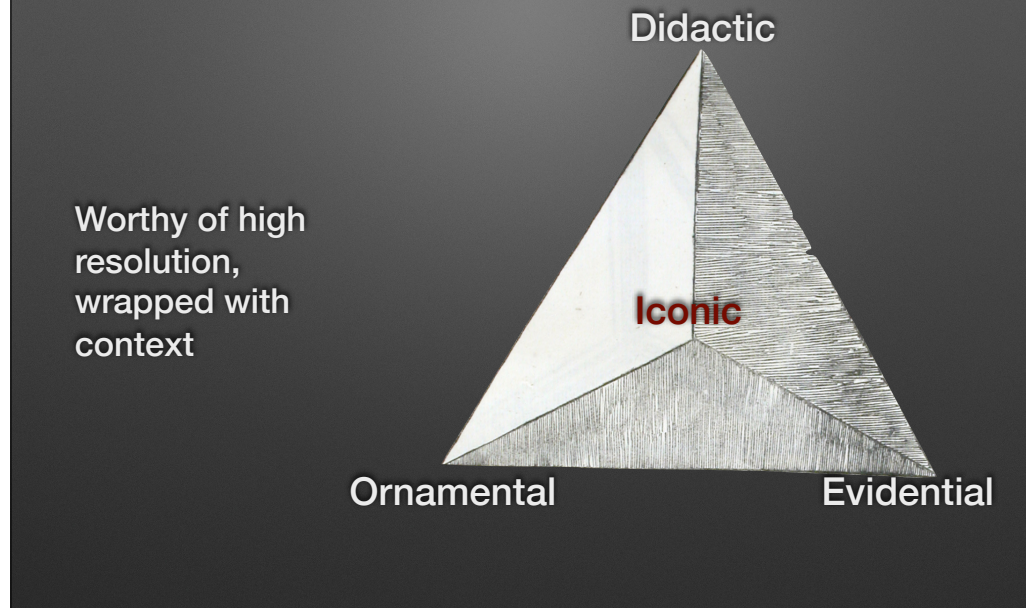
OER role for special collections

History of Science provides multidisciplinary,
cross-cutting resources

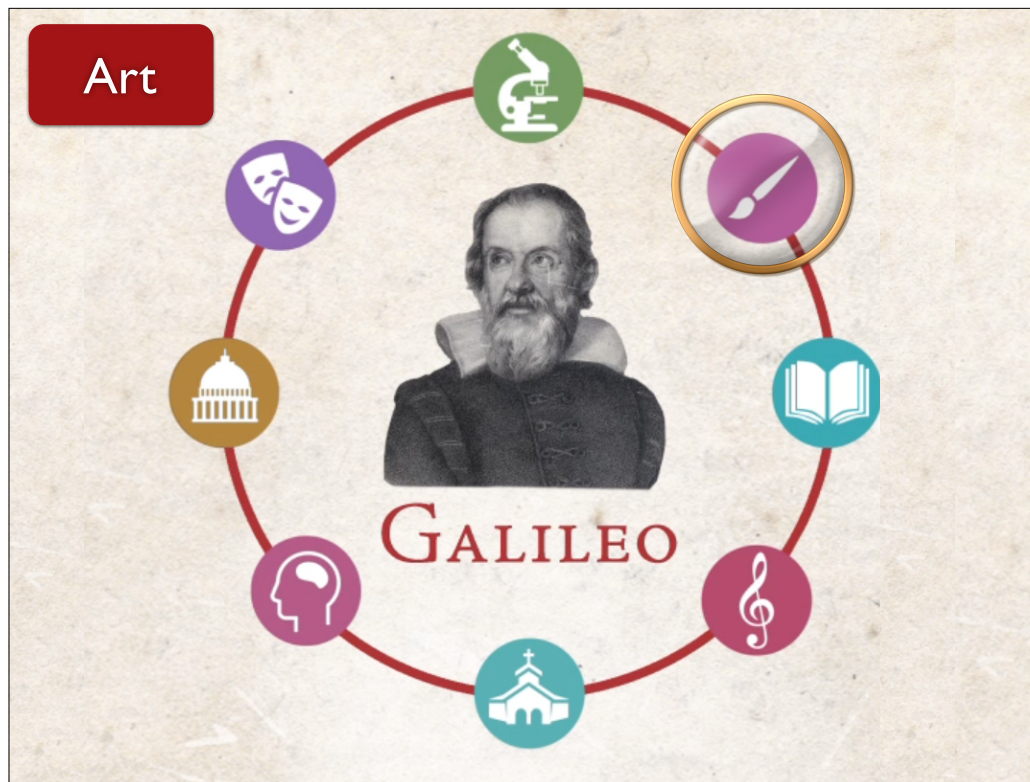
Visual impact of OERs

BRENT: Our third goal is to increase the visual impact of oers. Are open textbooks beautiful and compelling, with a high visual impact?

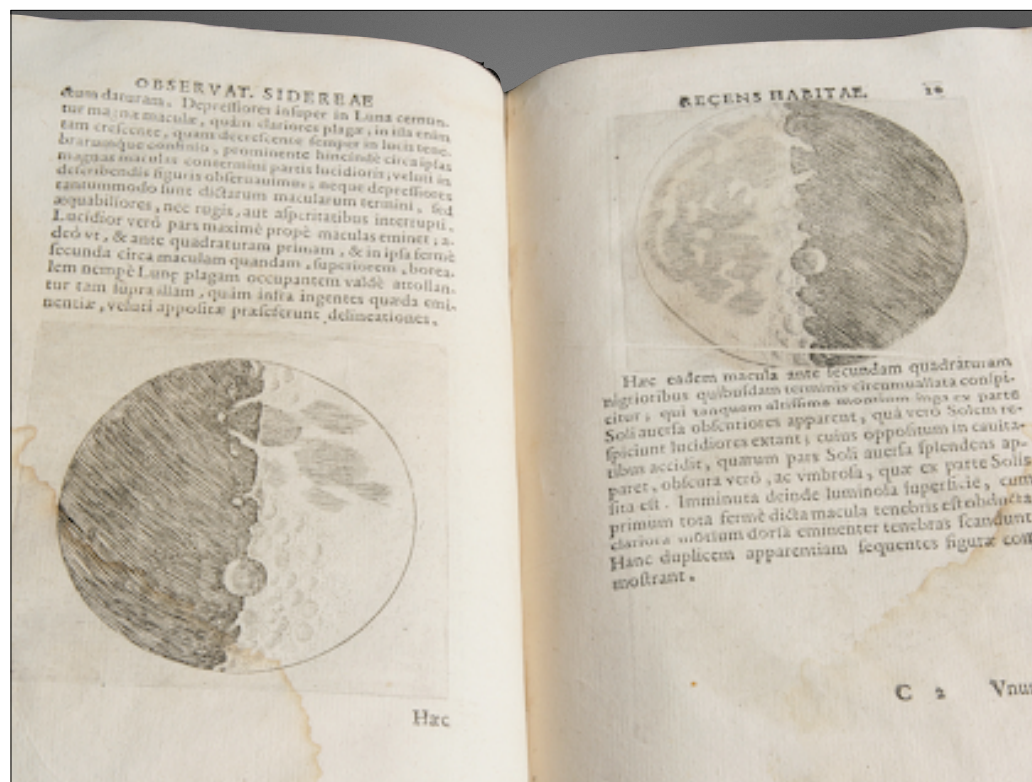
Images



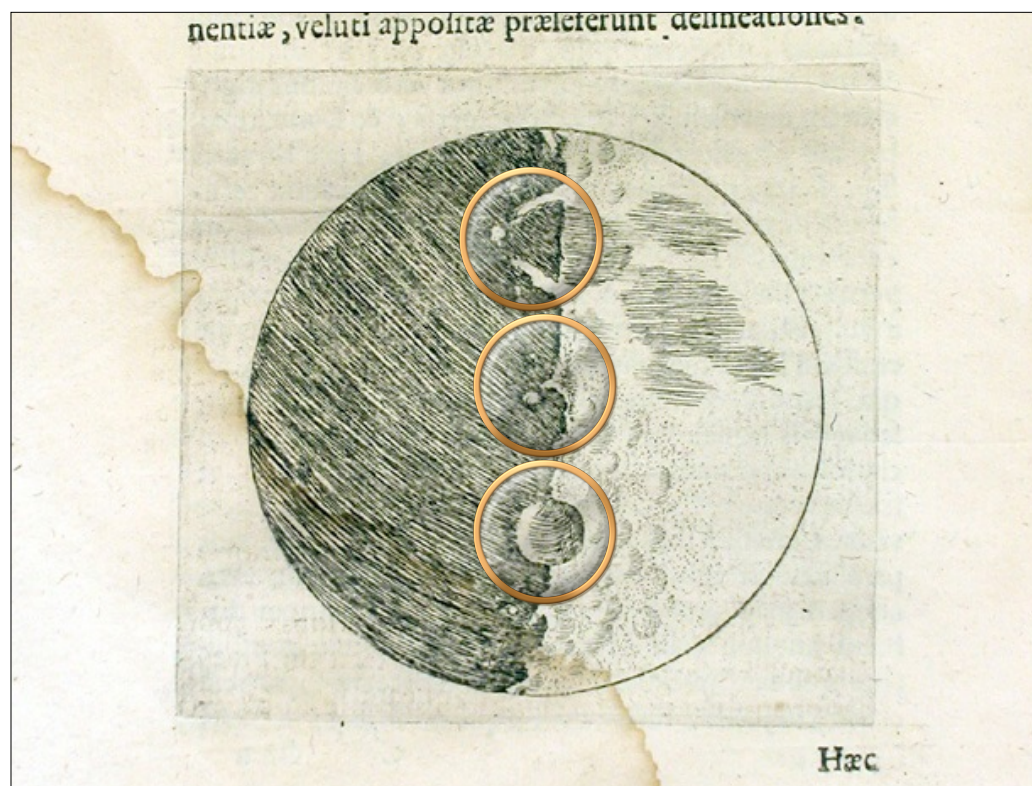
Images are not just *ornamental*. • Often they summarize EVIDENCE presented in visual form. • **Didactic** images help clarify thinking. • And they serve as **icons** of larger meanings. We are not just serving up web-quality images, • but providing high resolution images, wrapped with authorized context.



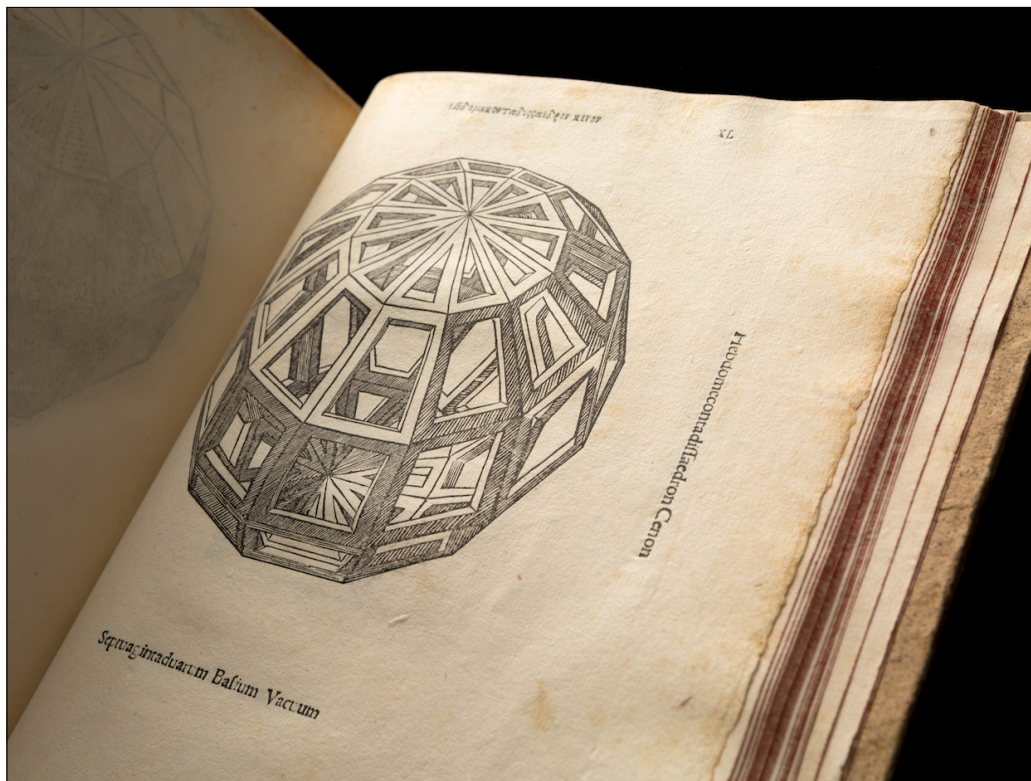
KERRY: For some examples of images worthy of high resolution, and being wrapped in context, let's look at some connections between astronomy and art.



Galileo's discoveries were made not by optics but by the artistic training of his eyes. Galileo's sensational telescopic discoveries would have been impossible were it not for Galileo's training and experience in Renaissance art.



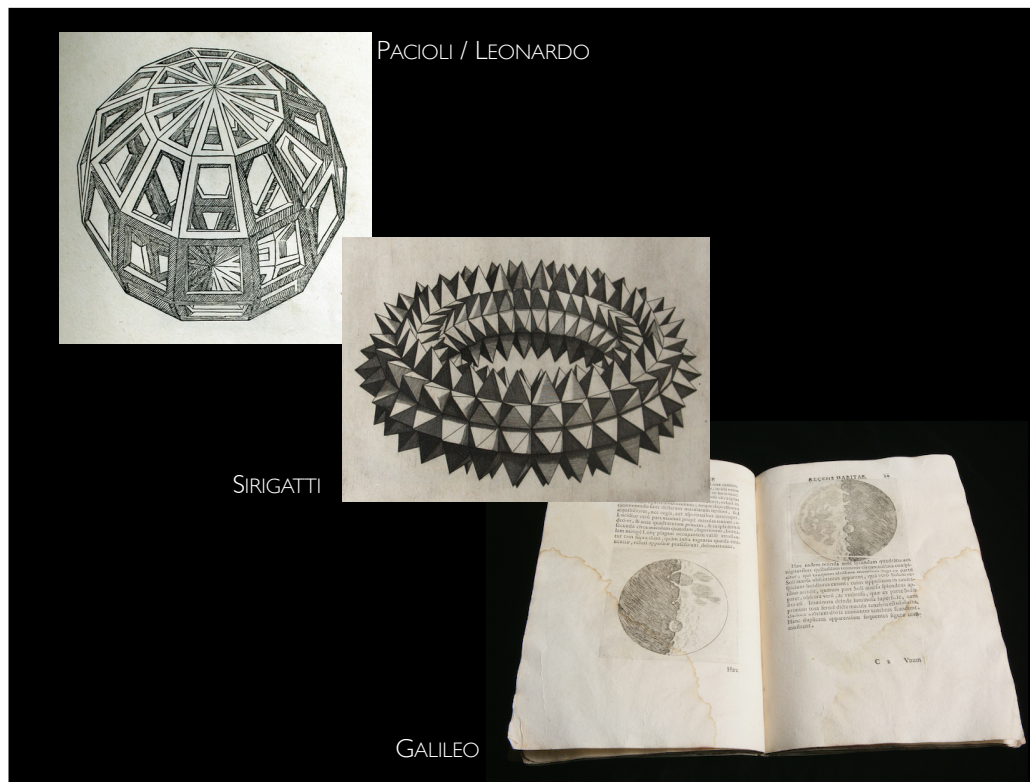
What appears as an isolated peak one night, □ may become a chain of mountains the next night, □ or converge in a circular structure after that. He was not mapping the moon, or implying that a crater of that size is present in that location, but showing how to detect real lunar topography.



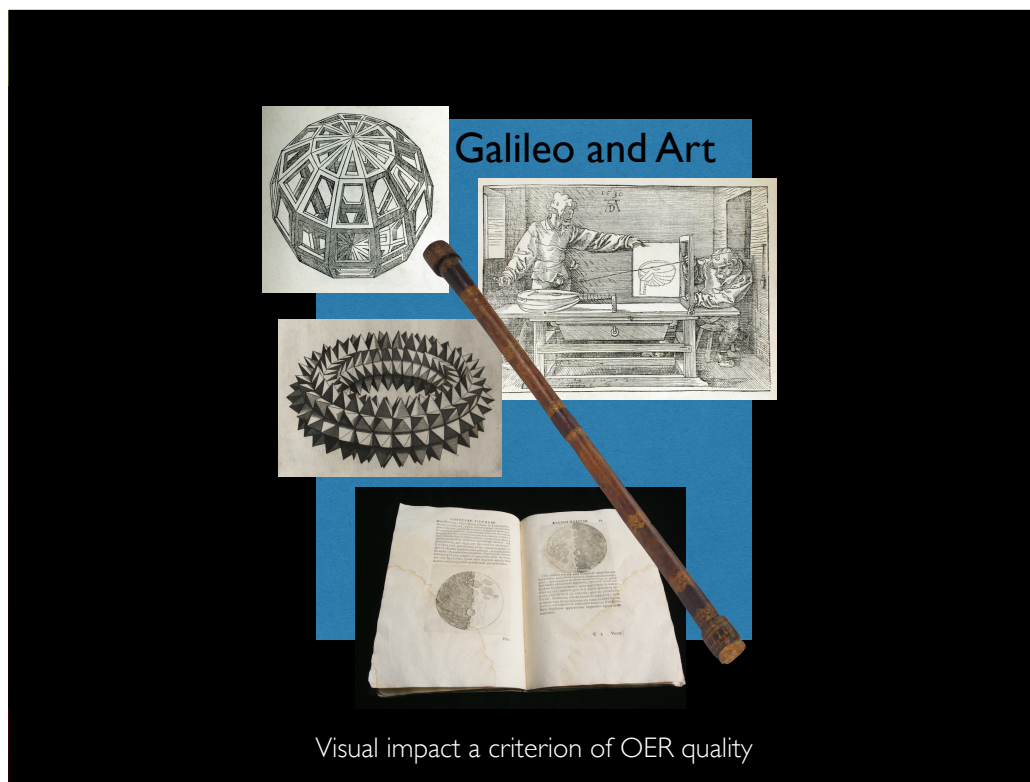
This image demonstrates true perspective and a mastery of light and shadow. This and other similar diagrams were drawn by Leonardo da Vinci. They were the only materials ever published in print by Leonardo during his lifetime. Geometrical figures like these were used to train artists over the following century.



This work on perspective drawing is in the same tradition, published in Venice almost a century later, when Galileo was a young man. Consider the spiked donut at the bottom of the page. Careful study of the spikes on this ring and the shadows they cast prepared Galileo's eyes to interpret what others regarded merely as the "strange spottedness of the Moon" as in fact shadows cast by real mountains.

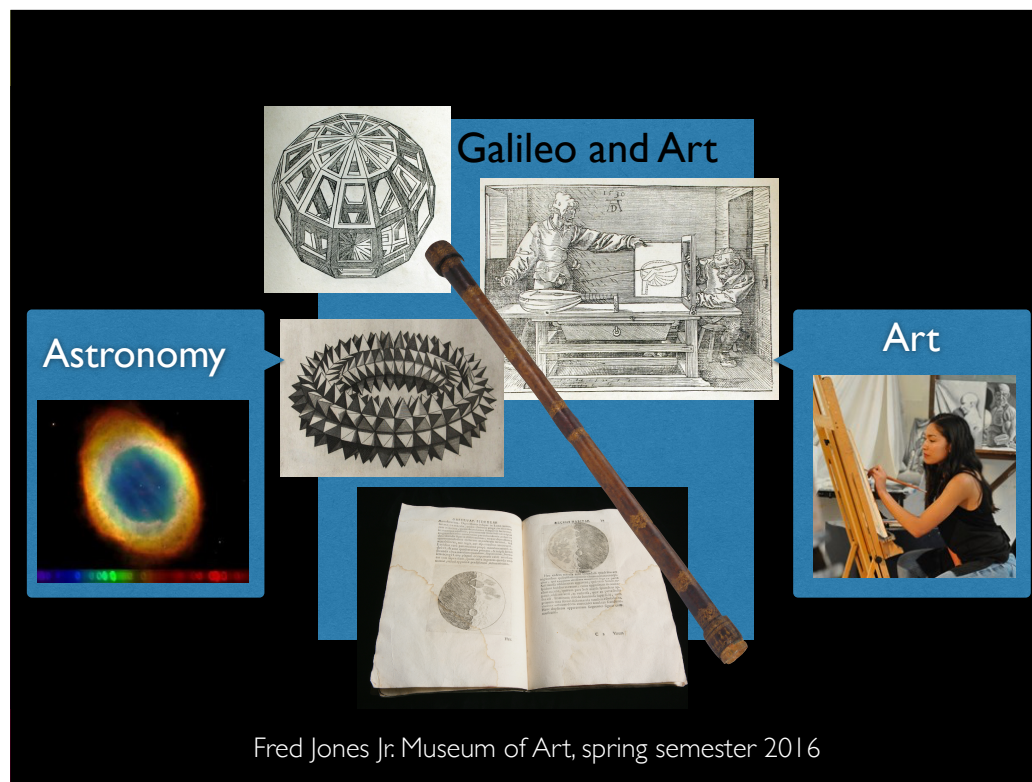


When Galileo peered through his telescope and discovered the shadows of mountains on the Moon, he did so only because he was seeing with the eyes of an artist. He made his telescopic discoveries as much through art as through optics.



Visual impact a criterion of OER quality

These are some of the images we will provide with stories that put them in context. Images like these were not merely ornamental, but didactic in the way they helped to clarify thought. Scientists often think visually, beyond the reach of text alone. The close relationship of science and art makes it crucial to consider visual impact as one criterion in any study of OER quality, particularly in the sciences where spatial reasoning is prominent and 3-D instruments and operations are frequent.



This story also illustrates our 2d goal, the multidisciplinary character of history of science. Students in astronomy and art have much to talk about.

Goals

OER role for special collections

History of Science provides multidisciplinary,
cross-cutting resources

Visual impact of OERs:
High resolution images with context

BRENT: So our three goals are to model an OER role for special collections, to increase awareness of the multidisciplinary potential of OERs in the history of science, and to increase the visual impact of OERs. These are specific and distinctive goals in which we think a local effort may have wide-ranging impact.

Strategies



Library as
intellectual commons



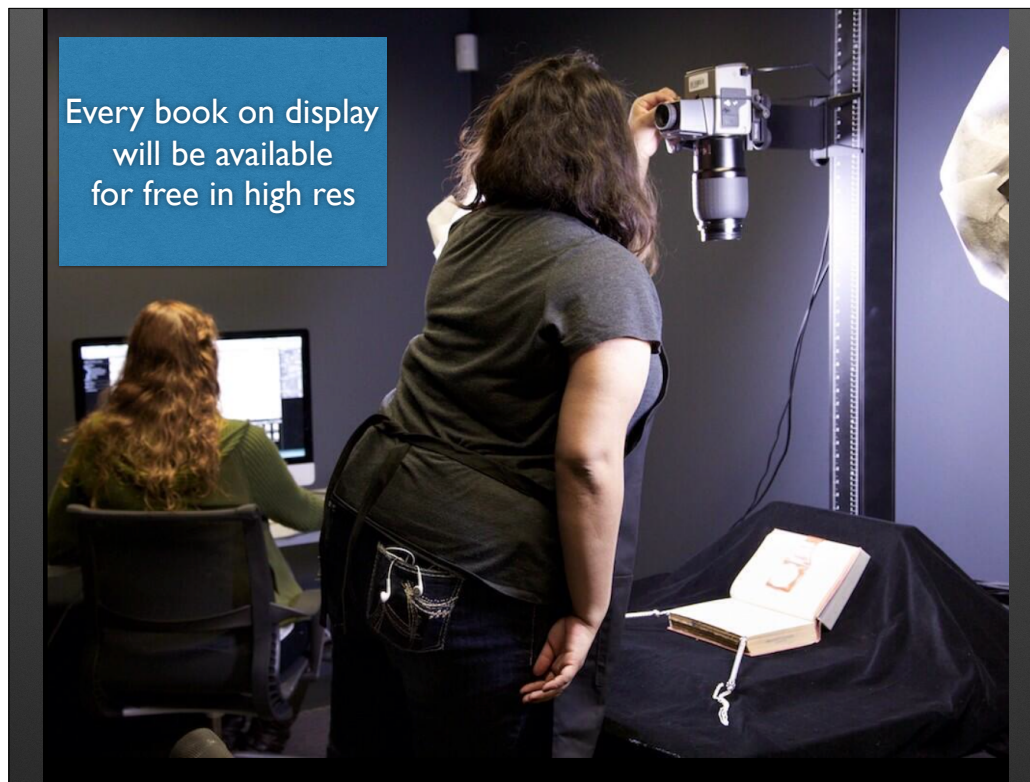
Small pieces
loosely joined

Our first strategy depends on the library as an intellectual commons for the University.

University Collaborators

- Academic programs: History of Science Department, Education, Engineering, Sciences, Humanities...
- Center for Teaching Excellence – Adam Croom
- K20 Center
- Athletics, Natural History Museum, Art Museum
- OU Libraries
 - History of Science Collections
 - DigiLab

Special collections are at the crossroads of academic departments. We are collaborating with partners across the university. Within the University Libraries, the GW exhibit has served as a focus for the entire library organization to retool itself toward the end of making Open Access resources.



Every book will be available in its entirety online, each page in high resolution files for free download.

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 - History of Science Collections
 - DigiLab
 - Repository - Islandora, analytics, version control (spring 2016)
 - Edition Open Sources

The Repository is being built on the Islandora platform and will support analytics, version control, and a • new peer-reviewed academic publishing effort called Edition Open Sources. The Digital library will launch this spring.

Strategies



Library as
intellectual commons

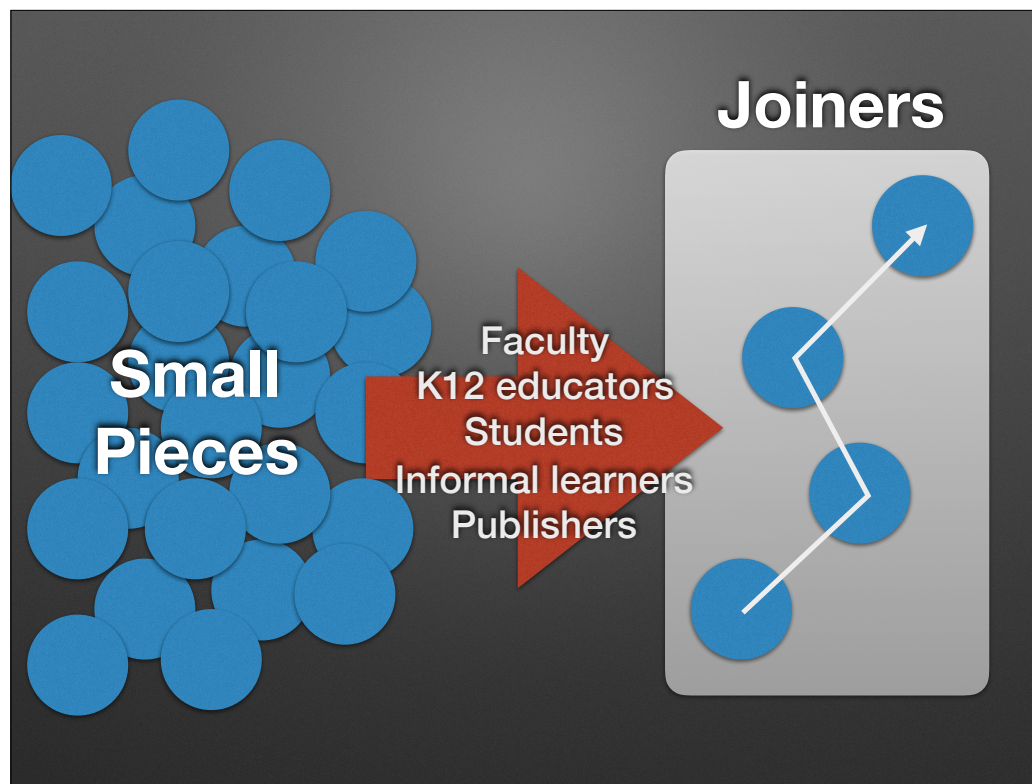


Small pieces
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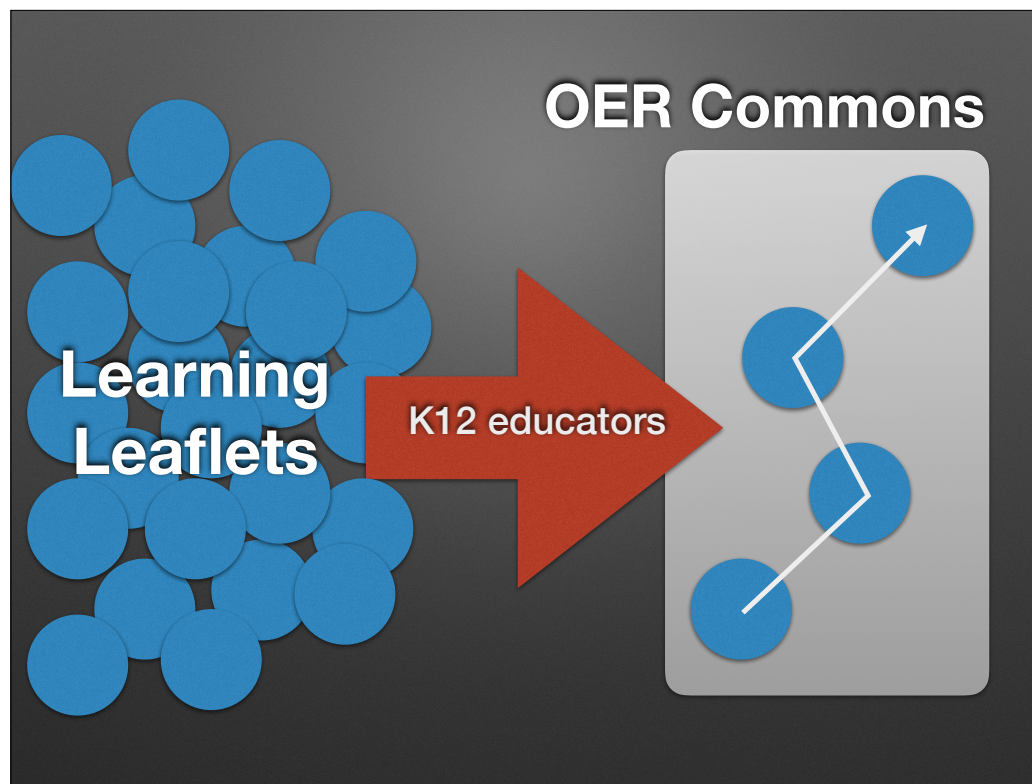
The second aspect of our strategy is inspired by the theory of the web as “Small pieces loosely joined.”



Back in 2002, David Weinberger famously defined the essential character of the web as small pieces loosely joined. This characterization aptly describes learning objects, both physical and virtual. We are not aiming to create full textbooks, not even in the history of science! Rather, we are focusing on smaller chunks which may be used in wide-ranging and unexpected ways.



In special collections, we, our faculty, and our students, create Small Pieces. • Then, Joiners will construct meaning by connecting the dots according to their own context and interests. • The joiners may be Faculty, K12 teachers, students in classes, informal adult learners, or even publishers.




Our small pieces are learning leaflets. We'll collaborate with K12 educators to join them together at OER Commons.

Learning Leaflets

Elisabeth Hevelius
Observational Astronomer

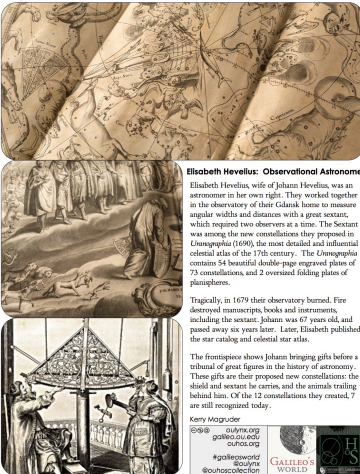
Learning Leaflet: Women in Science
OU Academy of the Lynx
History of Science Collections
University of Oklahoma Libraries



Johann and Elisabeth Hevelius, *Firmamentum Sobiescianum sive Uranographia*
("The Firmament of King Sobieski, or Map of the Heavens"; Gdansk, 1690)

Exhibit: Galileo's World | Gallery: The Sky at Night | No. 11
Download learning leaflets at oulynx.org/visit/cbr-commons; read more in the Exhibit Guide (Bookstore).

Can you find the sextants?




Elisabeth Hevelius: Observational Astronomer
Elisabeth Hevelius, wife of Johann Hevelius, was an astronomer in her own right. They worked together in the observatory of their Gdansk home to measure angular widths and distances with a great sextant, which required two observers at a time. The Sextant was among the new constellations they proposed in *Uranographia* (1690), the most detailed and influential celestial atlas of the 17th century. The *Uranographia* contains 54 beautiful double-page engraved plates of 73 constellations, and 2 oversized folding plates of Planisphere.

Tragically, in 1679 their observatory burned. Fire destroyed manuscripts, books and instruments, including the sextant. Johann was 67 years old, and passed away six years later. Later, Elisabeth published the star catalog and celestial star atlas.

The frontispiece shows Johann bringing gifts before a tribunal of great figures in the history of astronomy. These gifts are their proposed new constellations: the shield and sextant he carries, and the animals trailing behind him. Of the 12 constellations they created, 7 are still recognized today.

Kerry Magruder
@kerry_magruder
@galileoworld
@southeastcollection



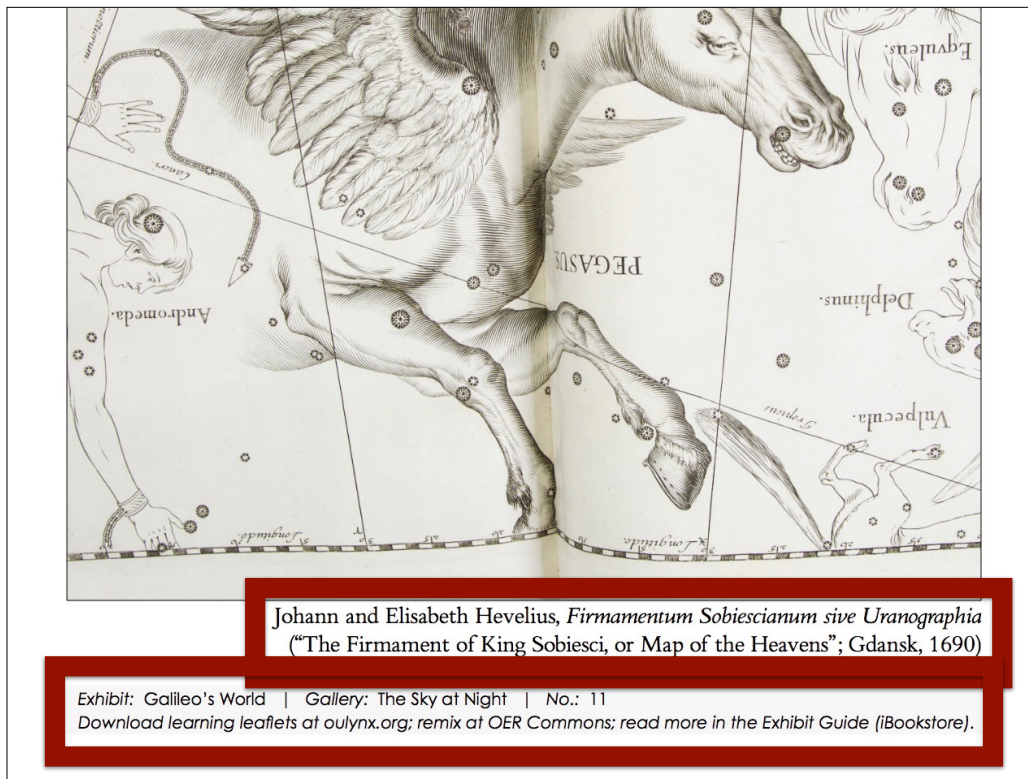
Learning Leaflets are brief learning activities, designed to be useful in a variety of teaching situations. They are “Small Pieces,” adaptable to support lessons in multiple subject areas and age levels.

Elisabeth Hevelius Observational Astronomer

Learning Leaflet: Women in Science
OU Academy of the Lynx
History of Science Collections
University of Oklahoma Libraries



This learning leaflet is from a series called Women in Science. • Every learning leaflet features a main image to prompt reflection and discussion.



Johann and Elisabeth Hevelius, *Firmamentum Sobiescianum sive Uranographia*
("The Firmament of King Sobiesci, or Map of the Heavens"; Gdansk, 1690)

Exhibit: Galileo's World | Gallery: The Sky at Night | No.: 11
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Beneath the main image is a caption • and an indication of one or more exhibit objects in the exhibit related to the leaflet.

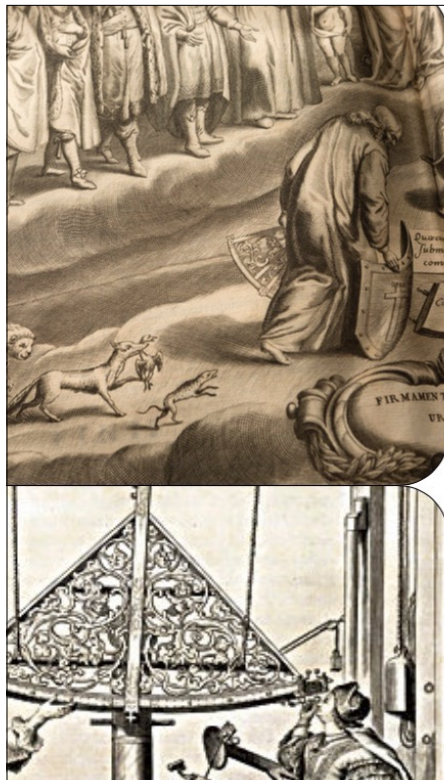
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The back side usually has a question for discussion: (read)



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The frontispiece shows Johann bringing gifts before a tribunal of great figures in the history of astronomy. These gifts are their proposed new constellations: the shield and sextant he carries, and the animals trailing behind him. Of the 12 constellations they created, 7 are still recognized today.

The text tells an interesting story related to the images. In the case of the most influential star atlas of the 17th century, the person responsible for *much* of the content, and *solely* for its publication, was a woman, Elisabeth Hevelius.



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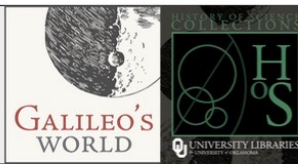
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Kerry Magruder

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ouhos.org

#galileosworld
@oulynx
@ouhoscollection




At the bottom, we have the CC license indicating permission to share it. As a result of conversations here at OpenEd, we are now thinking we'll drop the non-commercial restriction and just go with either cc-by or cc-share alike. The same content will be posted to the blog, the repository and OER Commons, both text and the image files.

Series

- Iconic Images

Blueprints of the Universe
Johann Kepler

Learning Leaflet: Iconic Images
OU Academy of the Lynx
History of Science Collections
University of Oklahoma Libraries



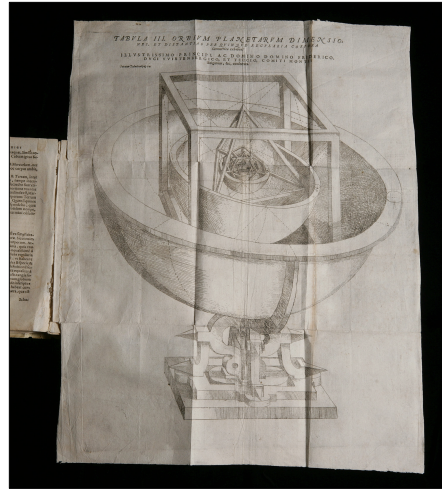
Johann Kepler, *Mysterium cosmographicum* (Tübingen, 1596), "Mystery of the Cosmos"

Exhibit: Galileo's World | Gallery: Music of the Spheres, no. 18
Download learning leaflets at oulynx.org/remix at OER Commons; read more in the Exhibit Guide (Bookstore).

Other series we're working on right now are "Iconic images"

Blueprints of the Universe Johann Kepler

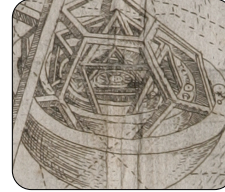
Learning Leaflet: Iconic images
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Johann Kepler, *Mysterium cosmographicum* (Tübingen, 1596), "Mystery of the Cosmos"

Exhibit: Galileo's World | Gallery: Music of the Spheres, no. 18
Download learning leaflets at oulynx.org; remix at OER Commons; read more in the Exhibit Guide (Bookstore).

Is there a mathematical basis of the universe?



Johann Kepler: Blueprints of the Universe

Kepler's blueprint of the universe is rightly considered one of the brilliant illustrations in the history of astronomy. In it, Kepler used the five regular Pythagorean solids to refute the major objections to Copernicanism.

By far the best known 16th-century defender of Copernicus was Johann Kepler. In this work he demonstrated that vast empty regions lying between the planetary spheres, which were required by Copernicus, were not wasted space. Rather, these gaps perfectly matched, within the limits of observational error, the geometry of the 5 regular Pythagorean solids.

In the *Mysterium*, Kepler addressed two major differences between the systems of Ptolemy and Copernicus and turned them both to Copernicus' advantage.

First, the number of the planetary spheres: in the Earth-centered Ptolemaic system there are 7 planets, including the Sun and the Moon, not counting the outermost sphere of fixed stars. In the Copernican system, there are only 6 planets, not counting the outermost sphere of fixed stars: The Sun and the Earth switch places. The number of planets decreases by one, because the Moon is demoted; it becomes a satellite of the Earth, within the Earth's sphere, rather than a planet. So Kepler asked, why should there be only 6 planets instead of 7?

Second, and more critically, the distances of the planets: In the Ptolemaic system all the planetary spheres nest together with no intervening spaces. By contrast, in the Copernican system, the spheres of the planets become thin, separated by large distances. Skeptics asked, why would the Divine Architect have wasted so much empty space? Indeed, Kepler calculated that the gaps are quite large, so that most of the universe is empty space.

Kepler's blueprints of the universe used the 5 regular Pythagorean solids to address both the number of the planets and the amazing proportions of the planetary spheres.

For Kepler, the mystery of the universe was now revealed, because the Divine Architect knew Pythagorean geometry and used it to construct a Copernican universe! Instead of nesting one planetary sphere immediately after another, in the ideal blueprints of the cosmos, the Creator alternated planetary spheres with regular solids. The vast empty regions lying between the planetary spheres, as required by Copernicus, were not wasted space. Rather, these gaps perfectly matched the geometry of the solids within the limits of observational error.

Kerry Magruder

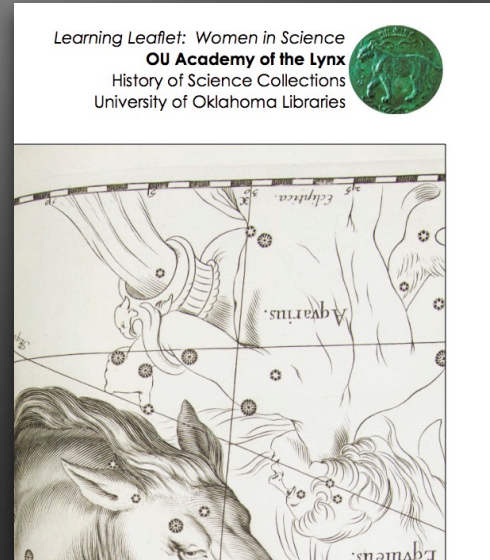
*"And how intense was my pleasure from this discovery can never be expressed in words... Day and night I was consumed by computing, so as whether this idea would agree with the Copernican orb, or if my joy would be carried away by the wind. Within a few days everything worked, and I touched in one body regular solid after another fit precisely into its place among the planets" (Kepler, *Mysterium cosmographicum*).*



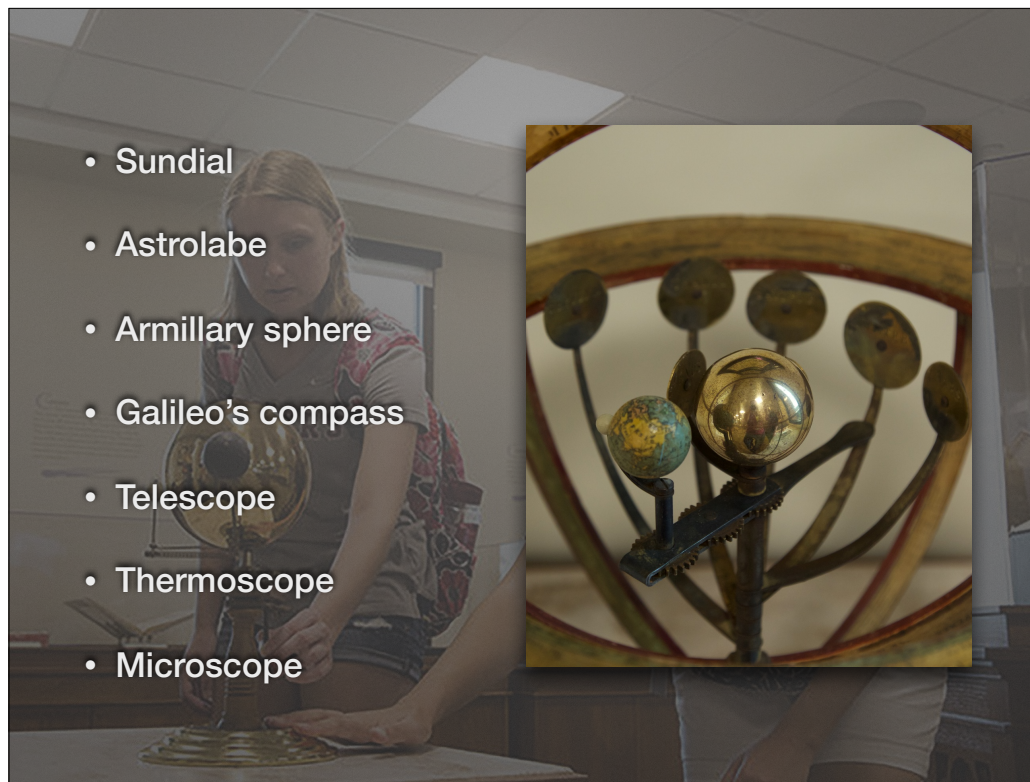
This one describes how Kepler used the Platonic solids to prove Copernicus, constructing the blueprints of the universe, in his first book published in 1596.

Series

- Iconic Images
- Instruments and Experiments



Another series is on classic instruments and experiments.



Leaflets for these instruments are in preparation. Images can help us move beyond the printed page, into the student's physical world, with replicas and even 3D models.

Inclined Plane Law of Falling Bodies

Learning Leaflet: Instruments & Experiments
OU Academy of the Lynx
History of Science Collections
University of Oklahoma Libraries

Galileo, *Discorsi e Dimostrazioni Matematiche* ("Discourse on Two New Sciences"; Leiden, 1638)
John Philoponos (1504) and Galileo, *Two New Sciences* (1730)

Exhibit: Galileo's World | Galleries Galileo, Natural History and the Americas, no. 20
Galileo & Microscopy, no. 6
The New Physics, nos. 9, 13, 14, & 15
Download learning leaflets at oulynx.org; remix at OER Commons; read more in the Exhibit Guide (Bookstore).

Why was variable tilt so important?

Inclined Plane

Galileo's Law of Free Fall

Aristotle supposed that the more an object weighs, the faster it will fall. In Athens in the 6th century CE, John Philoponos tested this hypothesis by dropping balls of different weights from a tall height. Philoponos reported that although heavier objects do reach the ground a little faster, they do not increase in speed according to their weight.

Philoponos initiated a research tradition into what later became known as *impetus* and eventually *inertia*. It was in light of this experimental tradition that Galileo's world began their investigations in mechanics. The falling bodies experiment of Philoponos is often misattributed to Galileo at the Leaning Tower of Pisa. Rather, Galileo refined the *impetus* experimental tradition by using an inclined plane to slow down the motion of free fall to speeds which might accurately be measured. The result was an experimental demonstration of Galileo's law of free fall, which remains fundamental to the physics of motion.

The OU Inclined Plane

Galileo described his experiment with an inclined plane in *Two New Sciences*. Unfortunately, he omitted many details about the plane itself. We asked master craftsman Ron Mitchell to design an inclined plane that would have delighted Galileo. The greatest design challenge was to make the tilt of the beam adjustable. Ron's solution was to employ one of Galileo's favorite simple machines, the balance. In Ron's elegant design, one may slide the massive beam to a desired height with a single hand. The director of OU Libraries' Conservation and Book Arts Lab, Sean Richards, lined the ball channel with vellum.

As an experienced musician, Galileo timed the ball's descent to a 10th of a pulse beat.

Kerry Magruder
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Here's a leaflet about Galileo's law of free fall and his inclined plane experiment, which also describes the design of our reconstruction of Galileo's inclined plane.

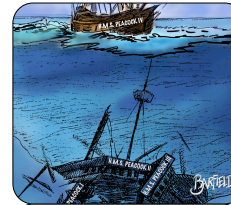
Relativity of Motion
The Moving Ship Thought Experiment:
Why were there no eye-witness reports?

Learning Leaflet: Starting Points
OU Academy of the Lynx
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Michael Barfield, "The Answer" (thepaintedsoul.com; cc-by-nc-sa)

Exhibit: Galileo's World | Gallery: The New Physics
Download learning leaflets at oulynx.org; remix at OER Commons; read more in the Exhibit Guide ([Bookstore](#)).



The Relativity of Motion: Galileo's Version of the Moving Ship Thought Experiment

The 2015-2016 year is the centenary of Einstein's General Theory of Relativity. Einstein attributed the formulation of the principle of the relativity of motion to Galileo.

This excerpt from Galileo's *Dialogue on the Two Chief Systems of the World* (1632) illustrates the principle of the relativity of motion:

"Salviati: [You say...] Drop a lead ball from the top of the mast of a boat at rest, noting the place where it hits, which is close to the mast; but if the same ball is dropped from the same place when the boat is moving, it will strike at that distance from the foot of the mast which the boat will have run during the time of fall...." [BUT] anyone who... [actually performs that experiment] will find that the experiment shows exactly the opposite of what is written: ... the stone always falls in the same place on the ship, whether the ship is standing still or moving."

If sailors actually had performed the experiment, believing with Aristotle that a cannonball dropped from the mast would fall harmlessly into the wake of the ship, why were no reports made to the contrary? This cartoon has the answer.

17th-century investigations of inertia by Galileo, Descartes and Newton represent the culmination of a long line of investigations reaching back from Nicole Oresme and Jean Buridan in the 14th century, through medieval Islamic and European civilizations, to Basil of Caesarea and John Philoponos in late antiquity. Undoubtedly, like Basil, Philoponos, and Oresme, sailors throughout history knew good and well that Aristotle's account of falling bodies was wrong. This explains why the Captain depicted in the first panel of the cartoon has gone mad.

Cartoon: Michael Barfield, thepaintedsoul.com, cc-by-nc-sa.

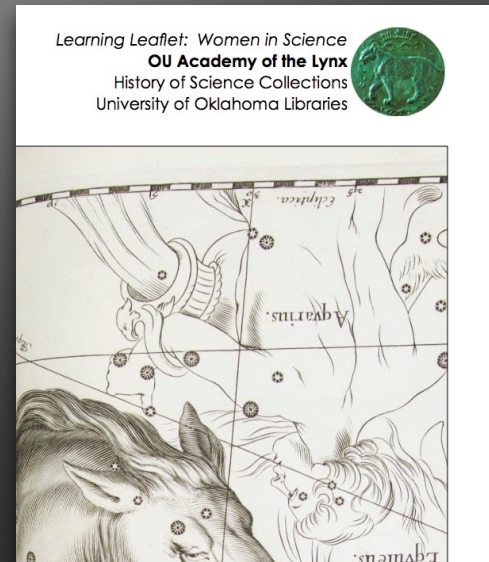
Kerry Magruder



Not all of our images are from rare books; this one features a cartoon for physics classes we are making available cc-by. The cartoon explains a thought experiment in which a cannon ball is dropped from the mast of a moving ship. According to Aristotle, the cannonball would land safely in the wake behind the ship. The cartoon explains why there were no reports that Aristotle's theory was wrong — if Galileo was right, the cannonball would sink the ship.

Series

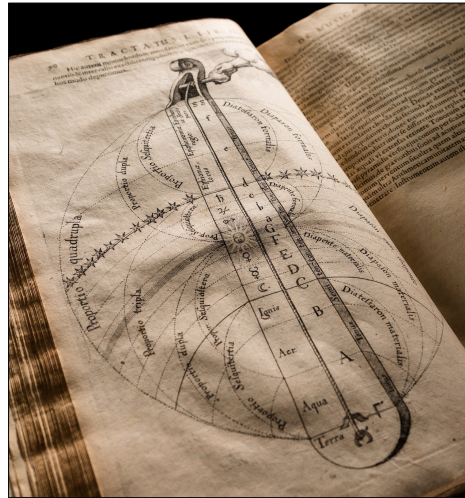
- Iconic Images
- Instruments and Experiments
- Starting Points for discussion
- Primary Source excerpts
- 2-minute stories
- Stand-up activities
- Constellations
- Women in Science



The cartoon is in the Starting Points series; there are also primary source excerpts and 2-minute stories, among others. Anyone may print these leaflets off for classes, remix and revise the content, include them in course packets, and use them in making their own OERs.

Astronomy & Music
Introduction to the Duochord

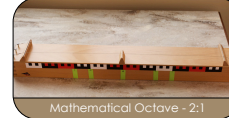
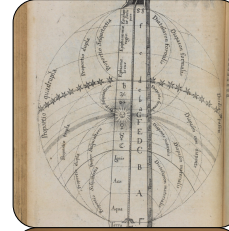
Learning Leaflet: Stand-up Activities
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Robert Fludd, *Utriusque cosmi maioris scilicet et minoris* (Oppenheim, 1617-21)
"On the Two Worlds, namely, the Macrocosm and the Microcosm"

Exhibit: Galileo's World | Gallery: Music of the Spheres, no. 4
Download learning leaflets at oulynx.org; remix at CC-BY Commons; read more in the Exhibit Guide (@bookstore).

Can you identify any intervals below?



Mathematical Octave - 2:1



Mathematical Perfect Fifth - 3:2



Mathematical Perfect Fourth - 4:3

Astronomy & Music:
Introduction to the Duochord

The ancient Pythagoreans envisioned the heavens as celestial spheres rotating according to harmonious music. For Robert Fludd, the universe was a monochord, its physical structure unintelligible without an understanding of music. Galileo's father, Vincenzo Galilei, experimented with pitch and tuning.

Explore the relations between music and mathematics with a duochord. Make sure that the strings of the duochord are in tune with one another.

Mathematical Octave - 2:1

1. Locate the marker on the duochord that divides the string into *two equal halves*.
2. Place a moveable bridge under the halfway marker of one string and pluck half of the string. The resulting note will be one octave higher than the unaltered string.

Mathematical Perfect Fifth - 3:2

1. Locate the markers on the duochord that divide the string into *three equal segments*.
2. Place a moveable bridge over one marker dividing the string into segments of 1/3 and 2/3 of its entire length. Pluck the long side, or 2/3 of the divided string, to produce an interval of a perfect fifth higher than the unaltered string.

Mathematical Perfect Fourth - 4:3

1. Locate the markers on the duochord that divide the string into *four equal segments*.
2. Place a moveable bridge over one marker dividing the string into segments of 1/4 and 3/4 of its entire length. Pluck the long side, or 3/4 of the divided string, to produce an interval of a perfect fourth higher than the unaltered string.

Jonathan Annis

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This leaflet shows Fludd's depiction of the universe as a monochord on the front, and leads you through the activity with the monochord on the back.

Pythagorean Solids Five Regular Solids

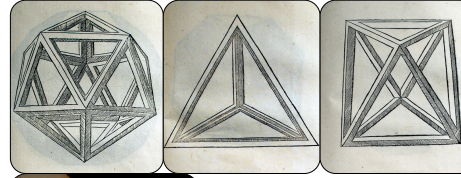
Learning Leaflet: Starting Points
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Euclid, *Elements of Geometry* (London, 1570), trans. Henry Billingsley.

Exhibit: Galileo's World | Gallery: The New Physics, no. 2
Download learning leaflets at oulynx.org; remix at [CC BY](https://creativecommons.org/licenses/by/4.0/); read more in the Exhibit Guide ([Bookstore](#)).

Can you identify the five regular solids?

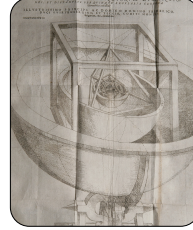


Pythagorean Solids: 5 Regular Solids

We can define a solid as regular when every face, edge and corner angle is identical, whether a square on every side of a **cube**, or a triangle on every side of a **tetrahedron**. The Pythagoreans proved that there are only five regular solids: The **octahedron**; the **dodecahedron**; and the **icosahedron**. There are no others.

Name	Face	#sides
Cube	Square	6
Tetrahedron	Equilateral triangle	4
Octahedron	Equilateral triangle	8
Dodecahedron	Pentagon	12
Icosahedron	Equilateral triangle	20

In the images on this page, which is which? And which solid shown is *not* a regular solid?



Because Plato used the 5 regular solids to explain the structure of the Universe in his dialogue, *Timaeus*, they are also called the Platonic Solids. After Plato, astronomers supposed that the geometry of these five solids would hold an essential clue to the true structure of the universe. Euclid analyzed the properties of the regular solids in Book 13 of his *Elements of Geometry*. Kepler used the regular solids to prove Copernicanism. The works of Leonardo da Vinci, Luca Pacioli, Albrecht Dürer, and Lorenzo Sgarbi show that artists, in addition to astronomers, mathematicians and philosophers, were also deeply familiar with the properties of regular solids.

Kerry Magruder

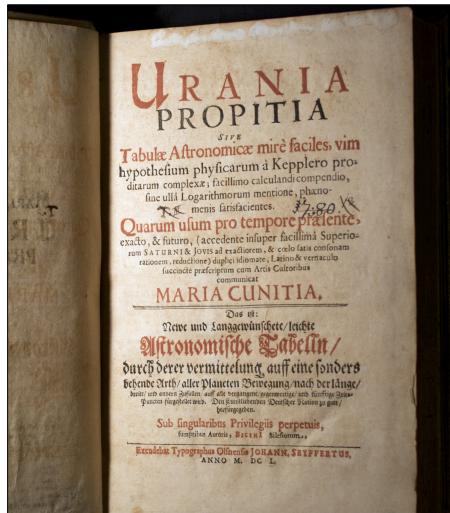
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This leaflet introduces the properties of the 5 regular Pythagorean solids.

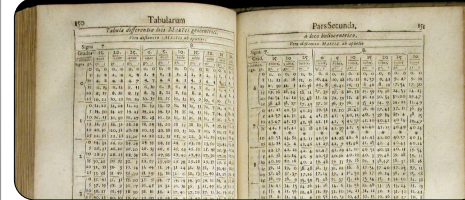
Maria Cunitz
Kepler's Defender

Learning Leaflet: Women in Science
OU Academy of the Arts
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Maria Cunitz, *Urania propitia* ("Beneficent Urania, Generous Muse of the Heavens"; Oels, 1650)
Exhibit: Galileo's World Gallery: Galileo and Kepler No.: 9
Download learning leaflets at ouhns.org/remix of OER Commons; read more in the Exhibit Guide (Bookstore).

Why is it important in science to make data easily usable and accessible?



Maria Cunitz: Kepler's Defender

Prior to Newton, perhaps half a dozen astronomers accepted Kepler's three laws. Galileo was typical in ignoring Kepler's accomplishments. Yet this beautiful book is an exception: it clearly demonstrated that Kepler's laws were more accurate than anything that had come before. It was written by Maria Cunitz, one of the first astronomers to adopt Kepler's astronomy. Cunitz recast Kepler's planetary predictions into a form equally accurate but much more convenient and easy to use. Kepler's tables may have been cumbersome to use, but these were not. Cunitz made Kepler's achievement easy to grasp.

In an age when women were not admitted to European universities, Cunitz became one of the most accomplished mathematical astronomers of her generation.

Cunitz published this work in Latin, for the sake of European astronomers, but also in German, for the sake of others, outside university circles, who might wish to learn astronomy even without knowing Latin.

Kerry Magruder



This is the book which made clear to many, including Newton, that Kepler's laws are correct. It was written by a woman, Maria Cunitz.

Madame du Châtelet Newtonian Physicist

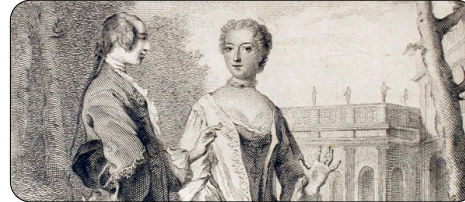
Learning Leaflet: Women in Science
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Francesco Algarotti, *Il Newtonianismo per le dame* ("Newtonianism for Women", Naples, 1737)

Exhibit: Galileo's World Gallery: New Physics No.: 34
Download learning leaflets at oulynx.org; remix at OER Commons; read more in the Exhibit Guide (Bookstore).

Are they talking about physics as they stroll through the garden?



PRINCIPES MATHÉMATIQUES

DE LA
PHILOSOPHIE NATURELLE,
Par feu Madame la Marquise DU CHÂTELET.

TOME PREMIER.



DISSERTATION SUR LA NATURE ET LA PROPAGATION DU FEU.

Epica covered v.0. & fine pander call
Emeric, fandumque locum libi logi in arce.
Quid.

Madame du Châtelet: Newtonian Physicist

Madame du Châtelet (or Gabrielle-Emilie le Tonnelier de Brevill, Marquise du Châtelet) translated Newton's masterwork of physics, the *Mathematical Principles of Natural Philosophy*, into French. She also defended Newton in the Newton-Leibniz controversy. She submitted a work on the nature of fire to a contest sponsored by the *Académie des Sciences*. Voltaire, her lover, also prepared an entry. Although neither won the prize, both of their contributions were published with those of the winners in 1739.

Madame du Châtelet is shown on a frontispiece in Algarotti's popular introduction to Newtonian science. Algarotti went through many editions and aided in the dissemination of Newtonian ideas on the European continent. Like Fontenelle's *Platinity of Worlds*, which popularized the earlier science of Descartes, this was written as an entertaining dialogue.

How did women at this time learn Newtonian science?

Kerry Magruder

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Madame du Chatelet translated Newton's Principia into French, and popularized the idea that women should be taught science in order to discuss Newtonian physics while strolling in the garden.

Urania's Mirror Constellation Cards

Learning Leaflet: Women in Science
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Urania's Mirror (London 1825), a boxed set of 32 cards

Exhibit: Galileo's World - Gallery: The Sky at Night No.: 20
Download learning leaflets at oulynx.org; remix at [CCER Commons](https://creativecommons.org/licenses/by/4.0/); read more in the Exhibit Guide ([Bookstore](#)).

What are your favorite constellations?



Urania's Mirror: Constellation Cards

Constellation figures, as sketched on these constellation cards, make learning the constellations easy. This set includes 32 cards, each focused upon one or a few constellations. Holes punched in the positions of bright stars allow one to hold any card up to a light and compare the star pattern with the constellation figure.

The 80 cards include several constellations no longer recognized today, such as the Glory of Frederick, the Telescope of Herschel and the Harp of King George III.

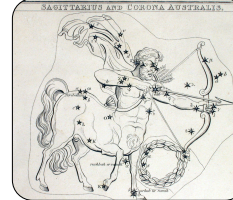
Urania, the Muse of Astronomy, appears on the cover of the box.

This is the first edition; subsequent editions included stars outside the boundaries of the featured constellations.

The creator of the cards remains a mystery. In a companion book providing a simple introduction to the night sky, Jehoshaphat Aspin explains only that the constellation cards "were designed by a lady."

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This one introduces the constellation cards in a boxed set from 1825

Catherine Whitwell
Astronomy & Creative Writing


Learning Leaflet: Women in Science
OU Academy of the Lynx
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Catherine Whitwell, *An Astronomical Catéchisme* (London, 1818)

Exhibit: Galileo's World Gallery: The Sky at Night No.: 19
Download learning leaflets at oulynx.org; remix at [CER Commons](https://commons.wikimedia.org/); read more in the Exhibit Guide (Bookstore).

Why write science in a creative format?



**Catherine Whitwell:
Astronomy & Creative Writing**

This dialogue between a mother and her daughter offers a delightful and engaging introduction to the night sky.

It contains 23 engraved plates drawn by Whitwell herself, including four hand-colored folding plates. One of the plates depicts the constellations of Corvus the Crow, Crater the Cup and Hydra the Water Snake.


Another plate conveys a dramatic impression of the Full Moon at night, shown against a striking black background.

Whitwell, who also wrote on economics and education, taught at Robert Owen's school at New Lanark, Scotland, in the 1820's. Owen later came to America and founded a utopian socialist colony in Indiana called New Harmony.

How would you go about teaching astronomy?

Kerry Magruder

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Catherine Whitwell combined astronomy and creative writing, using an innovative pedagogy, for a Scottish school in the early 19th century

Boldly Explore
Camille Flammarion (1888)

Learning Leaflet: Iconic Images
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Camille Flammarion, *L'Atmosphère* (Paris, 1888)

Exhibit: Galileo's World | Gallery: Copernicus and Meteorology, no. 1
Download learning leaflets at oulynx.org; remix at OER Commons; read more in the Exhibit Guide (Bookstore).

Where will the quest of discovery lead you?



Boldly Explore: Camille Flammarion (1888)

Science is a quest of discovery, the challenge of boldly exploring where no one has gone before. That is the appeal and rhetorically durable theme which has made this woodcut so appealing.

Many have reprinted this illustration through the years, sometimes without recognizing that it first appeared in a popular work on meteorology. Occasionally misattributed to the Middle Ages or Renaissance, this book is its original source. Flammarion was an astronomer and popular science writer who worked at the Juvvisy Observatory in Paris.

This iconic image bookends the *Galileo's World* exhibition at the National Weather Center: it opens with Flammarion's *L'Atmosphère* and ends with two cases of current meteorological instruments beneath a modern colorized version. The juxtaposition connects the historical books on display and the work of modern scientists exploring space, Earth and sky today. Susanna J. Magruder has provided the colorized version CC-by, so create your own wall graphic or put it on a t-shirt or coffee mug!

Kerry Magruder



And this one in the iconic images series describes the source of a famous image that conveys the excitement of science as a quest to boldly explore where no one has gone before.

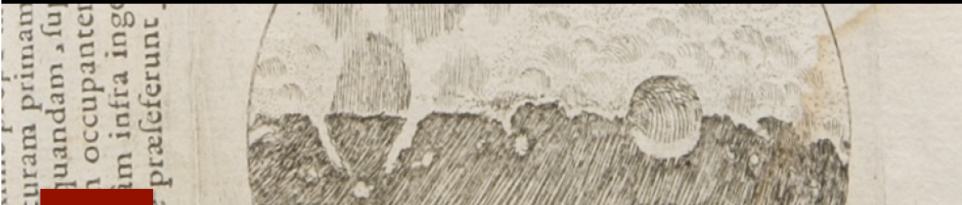
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COLLABORATING IN EXHIBIT-BASED LEARNING



The OU Academy of the Lynx is our new umbrella organization for collaborating in exhibit-based learning.

OU Lynx Collaborating in exhibit-based learning





Home **OERs** About the OU Lynx About the Authors Galileo's World Get Involved University of Oklahoma Libraries

OERs

[OER Formats](#) | [Learning Leaflets by Series](#) | [Learning Leaflets by Gallery](#)

OER Formats

Have you noticed the Open Educational Resources (OER's) that are being produced in conjunction with the *Galileo's World* exhibition? OER's are free learning resources that may be shared, customized and reused. Here are a few you will not want to miss!



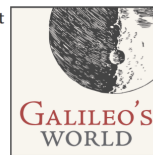
Educational Resources
• [OER Commons](#)

Until the Digital library launches, find learning leaflets on the oulynx blog. • Click on the OER link at the top. At present, they exist as pdfs, to print front and back. Once the repository launches in the spring semester, the pdfs will be hosted there, organized and tagged.

OER's by series:

[Explanation of OER formats](#). For additional text, images and context beyond these, see the [Exhibit Guide](#) (free download from the iBookstore; items listed below without links are already present in the Exhibit Guide).

- **Starting Points** for discussion
 - Pythagorean Solids: Five Regular Solids ([Learning Leaflet](#))
 - Kepler's Harmony of the Universe: Modern Realizations ([Learning Leaflet](#))
 - Relativity of Motion: The Moving Ship Thought Experiment ([Learning Leaflet](#))
 - The Bible and Science: Augustine
 - The Bible and Science: Calvin and other writers
 - The Printing Revolution: Geneva Bible
 - Banned Books of the Scientific Revolution ([Learning Leaflet](#); [OER Commons](#)).
 - The Bible and Science: Galileo
 - The Trial of Galileo
- **Primary Source excerpts** for analysis and comparison
 - Euclid's Geometrical Method
- **Iconic Images**
 - Boldly Explore: Camille Flammarion (1888) ([Learning Leaflet](#))
 - Johann Kepler: Blueprints of the Universe ([Learning Leaflet](#))
- **2-minute stories**
 - Johann Schreck: Galileo's Friend in China ([Learning Leaflet](#))
- **Women in Science**
 - Hildegard of Bingen: An Abbess for Health Care ([Learning Leaflet](#))
 - Maria Cunitz: Kepler's Defender ([Learning Leaflet](#))
 - Elizabeth Hevelius: Observational Astronomer ([Learning Leaflet](#))



Educational Resources

- OER Commons
- Galileo's World website
- Galileo's World Exhibit iBook
- Galileo's World iTunes U Course
- Galileo's World Discussion Guide

Schedule a Tour

- [Tour Request Form](#)

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[Galileo's World](#) [History of](#)

For now, on the lynx blog, they are listed by series...

- Catherine Whitwell: Astronomy and Creative Writing ([Learning Leaflet](#))
- *Urania's Mirror*: Constellation Cards ([Learning Leaflet](#))
- Ada Lovelace: First Computer Programmer ([Learning Leaflet](#))
- Florence Nightingale: Professionalized Health Care ([Learning Leaflet](#))

Instruments and Experiments

- Introduction to the Duochord: Music and Mathematics ([Learning Leaflet](#); [OER Commons](#)).
- Introduction to Sundials ([Learning Leaflet](#); [OER Commons](#)).
- Introduction to the Planisphere: ([Learning Leaflet](#); [OER Commons](#)).
- Introduction to the Celestial Globe ([Learning Leaflet](#); [OER Commons](#)).
 1. Horizon ([Learning Leaflet](#); [OER Commons](#)).
 - Introduction to a Protractor Sextant/Quadrant
 - Find your latitude by measuring the altitude of Polaris
 2. Celestial Equator ([Learning Leaflet](#); [OER Commons](#)).
 - Diurnal Motion ([Learning Leaflet](#); [OER Commons](#)).
 - Introduction to the Nocturnal Dial: Tell time by the stars
 3. Ecliptic
 - The Zodiac
 - Zodiacal Motion of Planets
- Armillary Sphere
- Astrolabe
- Orrery (Planetarium)
- Tellurian
- Sextant
 - Introduction to a Protractor Sextant/Quadrant
 - Stellar Parallax
- Celestial Coordinates: Flamsteed
- Abacus: Simple Addition
- Napier's Bones
- Slide Rule: Simple Multiplication
- Galileo's Engineering Compass
- Galileo's Telescope ([Learning Leaflet](#); [OER Commons](#)).

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Recent Comments

If there are no links, then they're already in an iPad Exhibit Guide and will soon appear in the leaflet format.

Galileo's Telescope ([Learning Leaflet](#), [OER Commons](#)).

- The Galileoscope
- Inclined Plane
 - Inclined Plane ([Learning Leaflet](#))
 - Galileo's Inclined Plane (excerpt from *Two New Sciences*)
- The Foucault Pendulum

• **Stand-up activities**

1. Introduction to the 5 Pythagorean Regular Solids ([Learning Leaflet](#); [OER Commons](#)).
2. Renaissance Engineering: Exploring Ramelli's Machines
3. Cosmological Systems: Phases of Venus
4. Cosmological Systems: Beati's cosmic section
5. Cosmological Systems: Theory Choice and Underdetermination
6. Retrograde Motion
7. Anatomy of the Book


• **Constellations**

1. Introduction to the Constellations ([Learning Leaflet](#); [OER Commons](#)).
2. The Big Dipper
3. Finding Constellations with the Big Dipper
4. Ophiuchus and the Question of Constellation Boundaries

- Orion the Hunter ([Learning Leaflet](#); [OER Commons](#))

OER's by exhibit gallery:

[Explanation of OER formats](#). For additional text, images and context beyond these, see the [Exhibit Guide](#) (free download from the iBookstore; items listed below without links are already present in the Exhibit Guide).




Kathleen Crowther on Galileo's World writing...

OU Athletics Departm... on A Guide to the Galeries:...

John Stewart on Galileo's World Exhibit...

After the name of an OER, you'll see links for the formats in which it is available. This one is for Orion the Hunter. The first link takes you to the Learning Leaflet

Orion the Hunter

Orion the Hunter

Learning Leaflet: Constellations
OU Academy of the Lyra
History of Science Collections
University of Oklahoma Libraries

Size: 24 of 88. Region: Equatorial. Season: Winter.
Origin: Eudoxus of Knidos, Aratos of Soli, and Ptolemy



Johann Bode, *Uranographia* (Berlin, 1801)

Exhibit: Galileo's World | Galleries: Music of the Spheres: The Sky at Night, no. 17: Space Science after Galileo (ony-constellations)
Download learning leaflets at oulyra.org; remix at OER Commons; read more in the Exhibit Guide (@bookstore).

Is the star pattern the same? the constellation figure?



Orion the Hunter

Three stars in a row make up Orion's belt, within a rectangle of four bright stars representing his shoulders and feet. Since Orion's belt of three bright stars lies nearly upon the celestial equator, Orion is visible from every inhabited part of the globe.

In Greek mythology, Orion the Hunter boasted that he would slay all animals on earth. To prevent this, Gaia sent Scorpion to kill him first. Now they move eternally on opposite sides of the starry sky.

Bayer (first published 1603) showed the star patterns as they appear from the Earth (rather than from the outside, as on a celestial globe). However, he sometimes reversed the constellation figures, drawing them as seen from the back, which created potential confusion. For example, the star Rigel, described by Ptolemy as the left foot of Orion, became Orion's right foot in Bayer's figure, even though the star pattern remained the same as seen from Earth.

When Galileo observed the belt and sword of Orion the Hunter, and the Pleiades star cluster on the back of Taurus the Bull, the background of night gave way before his eyes: his telescope resolved an astonishing number of unexpected stars never seen before, including 80 new stars near the belt and sword of Orion.

A sword hanging from Orion's belt at first sight looks like three stars, but the middle one is ill-defined.

With binoculars one may discern that it is not a star, but a cloudy region, called the Great Orion Nebula (M42, mag. 4.0). A powerful telescope reveals the nebula to be a giant cloud of luminous gas, a cosmic nursery where stars are now being born. Through the Hubble Space Telescope the Great Orion Nebula becomes a colorful and awesome spectacle, over 20000 times larger than our solar system. (Credit: NASA)

Kerry Magruder
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galileo.ou.edu
ouhis.org
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Which looks like this.

- Galileo's Telescope ([Learning Leaflet](#), [OER Commons](#)).
- The Galileoscope
- Inclined Plane
 - Inclined Plane ([Learning Leaflet](#))
 - Galileo's Inclined Plane (excerpt from *Two New Sciences*)
- The Foucault Pendulum



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OU Athletics Departm... on A Guide to the Galeries:...

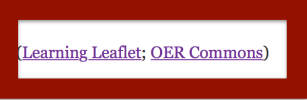
John Stewart on Galileo's World Exhibit...

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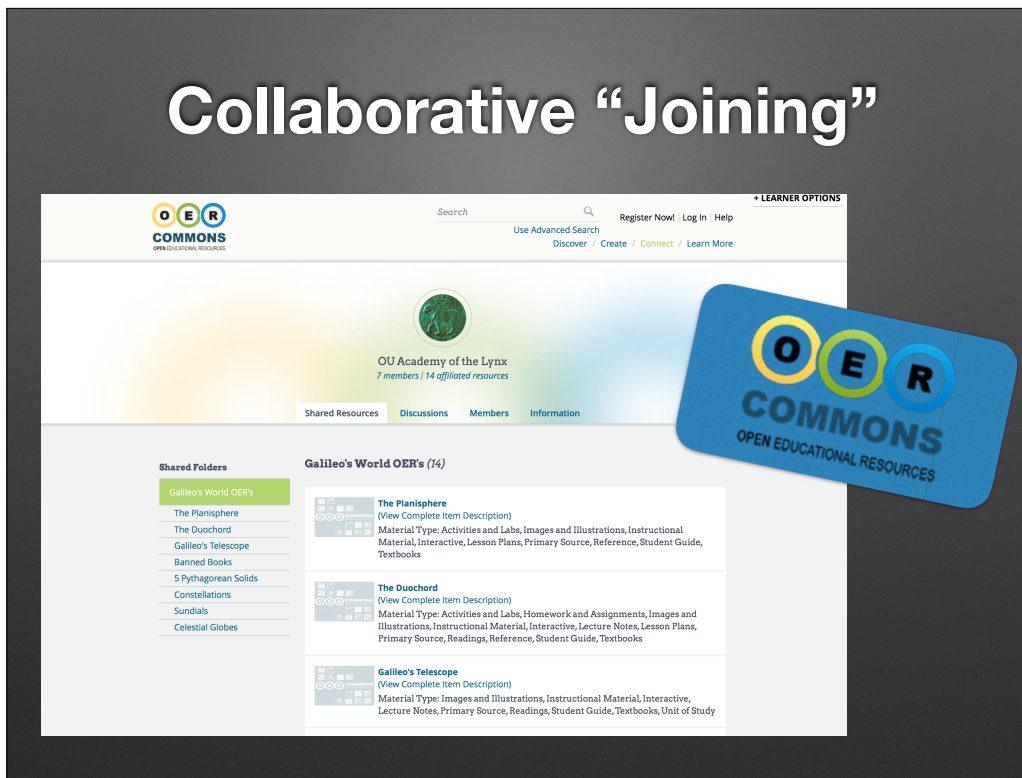
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The second link takes you to OER Commons.

Collaborative “Joining”



which looks like this. OER Commons is a repository for educators to share activities and learning resources. Learning resources may be tagged according to specific educational standards in multiple subject areas and age levels for each state. Educators may customize existing activities to fit their own needs. Here is where we move from our “small pieces” into the “joining” effort, by collaborating with educators to serve multiple contexts.

OER COMMONS
OPEN EDUCATIONAL RESOURCES

Search [Use Advanced Search](#) [Discover](#) / [Create](#)

[export to Google Docs](#) [download \(teaching bundle\)](#) [download \(PDF\)](#)

SUMMARY | [TABLE OF CONTENTS](#)

This OER explores the constellations Orion the Hunter. It contains both an activity as well as resources for further exploration. It is a product of the OU Academy of the Lynx, developed in conjunction with the Galileo's World Exhibition at the University of Oklahoma.

LEARNING GOALS

- Provide a basic 5 minute activity about Orion the Hunter, as well as digital resources for further exploration.

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[Version History](#)

[Cite this work](#)

Orion the Hunter

Created **Oct 27, 2015** by [Brent Purkapple](#)

This OER was designed by the OU Academy of the Lynx ([oulynx.org](#)) in conjunction with the "Galileo's World" ([galileo.ou.edu](#)) exhibition at the University of Oklahoma.

This activity is designed to be completed in 5 minutes by a typical visitor to the exhibition. For adaptations to other age levels and pedagogical settings, visit the "Orion the Hunter Educational Cluster" below.

[Download: Activity Handout](#)

Introductory Orion the Hunter Activity

Three stars in a row make up Orion's belt, within a rectangle of four bright stars representing his shoulders and feet.

Find Orion on a celestial globe and/or a planisphere.

- Is it easy to see the figure of a man in the star pattern of Orion?

On a celestial globe and/or a planisphere, and on the historical star maps shown in the figure (right), identify the following:

- Orion's belt.** Do the three stars of Orion's belt lie near the celestial equator?
- Rigel,** the star to the lower right of his belt. Is Rigel depicted as Orion's left foot?
- Betelgeuse,** the star to the upper left of his belt. Is Betelgeuse shown as Orion's right shoulder?
- Orion's sword.** Is there any indication of Orion's nebula?

Location

Orion the hunter appropriately faces the red eye of Taurus the Bull. His two hunting dogs follow behind: The Big Dog or Canis Major, with the bright star Sirius. And the Little Dog, or Canis Minor, with the bright star Procyon.

A sword hanging from Orion's belt at first sight looks like three stars, but the middle one is ill-defined. With **binoculars**

Visit the OU Lynx pages at OER Commons to download related materials, along with the original images, in order to remix them for your own use.

Robert Graves writes of Orion in winter (from <http://www.poemhunter.com/poem/star-talk/>)

What do you hunt, Orion,
This starry night?
The Ram, the Bull, and the Lion,
And the Great Bear, says Orion,
With my starry quiver and beautiful belt
I am trying to find a good thick pelt
To warm my shoulders tonight,
To warm my shoulders tonight.

Further OER's on Orion the Hunter

Use the following OER's to further explore the *Galileo's World* exhibition.

- *Galileo's World* iPad Exhibit Guide, itunes.apple.com/us/book/galileos-world-exhibit-guide/id1032005948?mt=1.
- *Galileo's World* iTunes U Course, itunesu.itunes.apple.com/enroll/FDS-EYK-MRL.
- Galileo's World website, galileo.ou.edu.

Orion the Hunter Educational Cluster

We want to create variations on this activity that connect Orion the Hunter to a variety of ages. Use the following chart and hyperlinks to find the one to best fit your group.

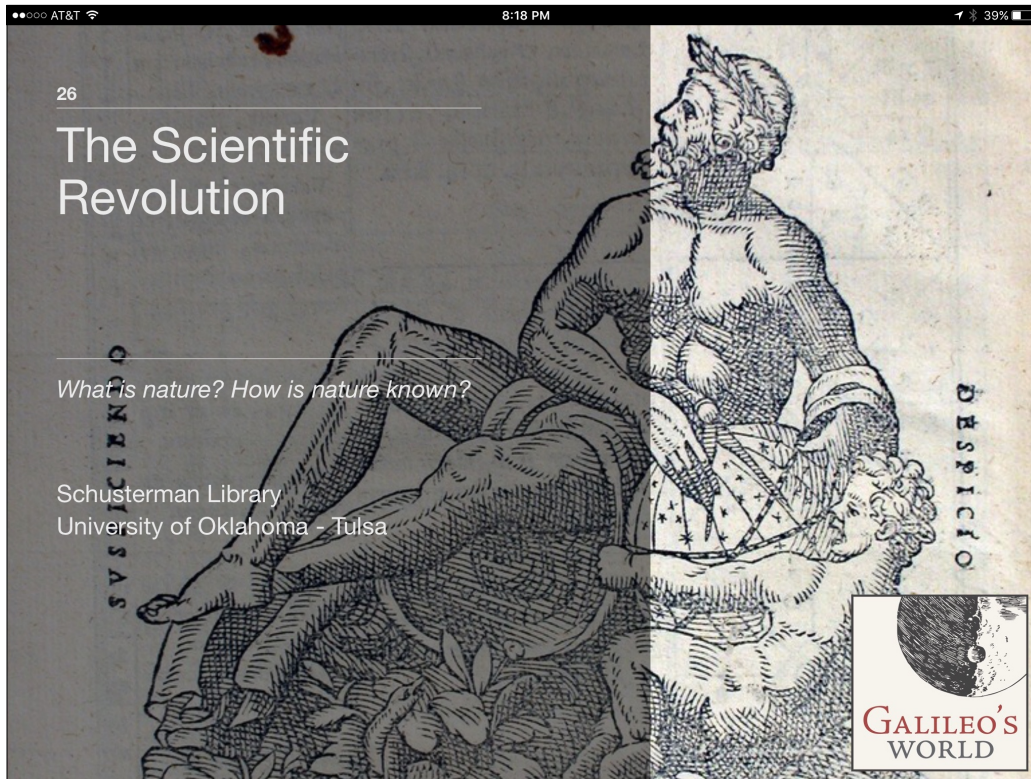
	<u>Elementary School</u>	<u>Middle School</u>	<u>High School</u>	<u>Undergraduate</u>
Introductory Activity				
30 Minute Activity				
One Hour Activity				

At OER Commons we can offer slightly longer versions of the leaflet text, and links to OER's from other sources.

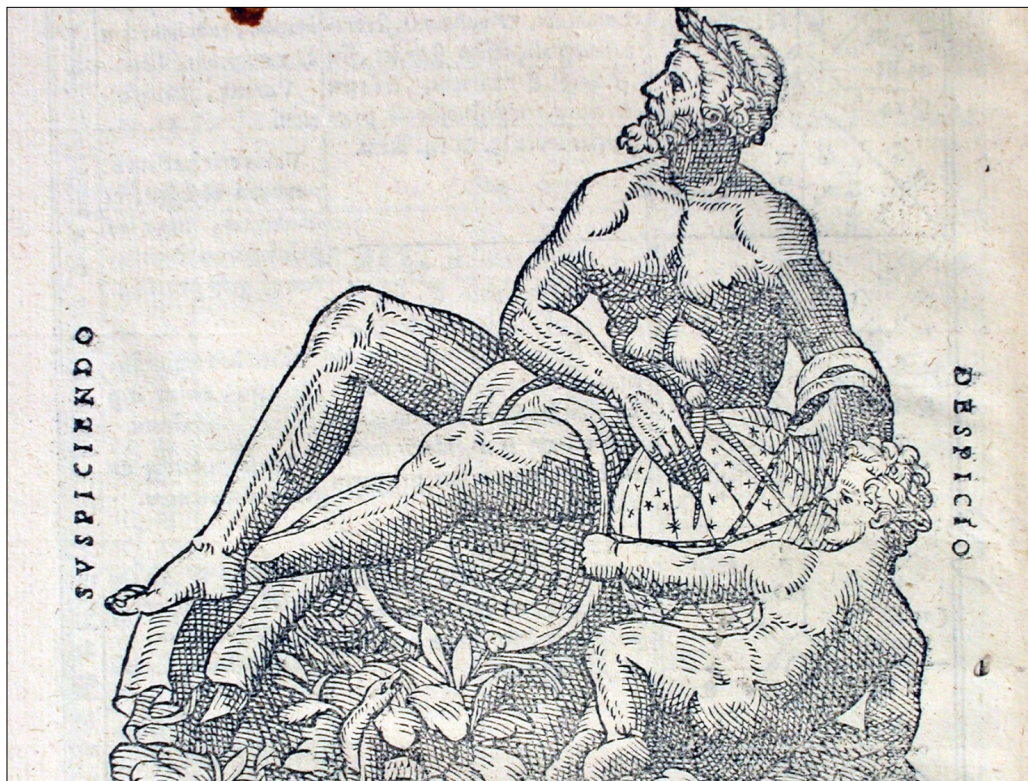
We are recruiting educators who will work with us to develop longer versions of these activities and resources, and as we do so we will add links to the matrix at the bottom of each OER page.

The screenshot shows a Commons profile page for Brent Purkape. At the top left is the Commons logo with the text 'COMMONS OPEN EDUCATIONAL RESOURCES'. To the right is a search bar and navigation links: 'Register Now!', 'Log In', 'Help', 'Use Advanced Search', 'Discover / Create / Connect / Learn More'. The profile header features a red box with the name 'Brent Purkape' and email 'oulynx@ou.edu', a globe icon, and the affiliation 'OU Academy of the Lynx' with '7 members | 14 affiliated resources'. Below the header are tabs for 'Shared Resources', 'Discussions', 'Members', and 'Information'. The main content area is divided into 'Shared Folders' on the left and 'Galileo's World OER's (14)' on the right. The 'Shared Folders' list includes 'Galileo's World OER's' (highlighted), 'The Planisphere', 'The Duochord', 'Galileo's Telescope', 'Banned Books', '5 Pythagorean Solids', 'Constellations', 'Sundials', and 'Celestial Globes'. The 'Galileo's World OER's' section lists three items: 'The Planisphere' (Material Type: Activities and Labs, Images and Illustrations, Instructional Material, Interactive, Lesson Plans, Primary Source, Reference, Student Guide, Textbooks), 'The Duochord' (Material Type: Activities and Labs, Homework and Assignments, Images and Illustrations, Instructional Material, Interactive, Lecture Notes, Lesson Plans, Primary Source, Readings, Reference, Student Guide, Textbooks), and 'Galileo's Telescope' (Material Type: Images and Illustrations, Instructional Material, Interactive, Lecture Notes, Primary Source, Readings, Student Guide, Textbooks, Unit of Study).

We've only just started, beginning this semester. Many more OERs will be added over the course of the year. • Subscribe to the oulynx blog for updates, or contact me by email.



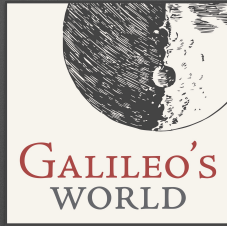
KERRY: To conclude, I'd like to mention the exhibit in Tulsa on the Scientific Revolution.



Its emblem comes from the motto of Tycho Brahe, “looking up, I look down.” Tycho coordinated the study of astronomy (looking up) with the study of medicine, chemistry and geology (looking down). This emphasis on connections between different disciplines encourages us all today to consider the lessons we might learn from the history of science.



BRENT: Many of you have piloted a project like ours. Please tell us what we will wish we had known! We welcome your suggestions and advice. In particular, we would like to know if any of you have had experience with OER Commons.



Q & A



oulynx.org

Kerry Magruder
Brent Purkale
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