

ASTR 350 | Under the Greek Sky: A Journey Through Space, Time and Imagination Fall 2026

Course Instructor: Dr Aimilia Smyrli
CYA Email: smyrli.aimilia@cyathens.org Class Times

Course Description

For millennia, humanity has gazed at the stars in wonder, weaving myths, making discoveries, and daring to explore the unknown. This course invites students on an exhilarating journey through space and time—one that connects the cosmic ambitions of ancient civilizations with today's groundbreaking space missions. Like Odysseus navigating uncharted waters, we will embark on a quest to uncover the mysteries of the universe through the lens of mythology, science, philosophy, and imagination.

Students will explore the celestial connections between Greek myths and modern space exploration, tracing how the stories of gods and heroes mirror our quest to understand the cosmos. From the Antikythera Mechanism to exoplanet discoveries, from ancient temples aligned with the stars to the latest space missions, this course unravels how Greece's rich heritage intertwines with our exploration of the universe.

The course offers an accessible, engaging, and thought-provoking approach to space science. Through interactive discussions, hands-on activities, virtual reality experiences, and storytelling, students will develop critical thinking and science communication skills. Topics include the search for extraterrestrial life, the ethics of space colonization, and astronomy in popular culture. The course also provides opportunities to visit observatories, participate in stargazing sessions, and engage with experts from leading research institutions, such as the European Space Agency (ESA) and the National Centre for Scientific Research "Demokritos".

By the end of the semester, students will have embarked on their own intellectual odyssey, gaining not only knowledge of the cosmos but also the ability to communicate its wonders, connecting past and present, myth and reality, Earth and the stars.

Course Approach

This course takes an interactive and interdisciplinary approach, making space exploration and its cultural impact accessible to all students. Each session combines storytelling, scientific discovery, and hands-on activities to create an engaging learning experience.

Through lively discussions and debates, students will examine space colonization, celestial myths, and the role of astronomy in philosophy. Visits to key locations—including the National Observatory of Athens and the planetarium—will bring theoretical concepts to life, while multimedia resources such as space mission data, and science fiction films will enrich the course content.

A strong emphasis is placed on creative and project-based learning. Students will develop their own science communication projects, whether through storytelling, visual media, or interactive presentations, helping them translate complex ideas into engaging narratives for diverse audiences.

Guest lectures from ESA and leading research institutions will provide insight into real-world space exploration, ensuring that students leave the course with both knowledge and inspiration.

Learning Objectives

This course is designed to equip students with an interdisciplinary understanding of astrophysics and its relevance to society. The learning objectives reflect a balance between scientific literacy, critical analysis, and effective science communication. By the end of this course, students will be able to:

1. **Explain key astronomical concepts** in a clear and accessible way, using real-world examples and non-technical language to communicate astrophysics to diverse audiences.
2. **Analyze the cultural and historical impact of astrophysics**, recognizing how different civilizations have interpreted the cosmos and how these interpretations have shaped their societies.
3. **Explore the intersection of astronomy, mythology, and philosophy**, evaluating how ancient myths, religious beliefs, and philosophical questions have been influenced by celestial phenomena.
4. **Critically assess science fiction's role in shaping public perception of astrophysics**, differentiating between scientific accuracy and creative storytelling in books, films, and other media.
5. **Evaluate the societal importance of space exploration and technological advancements**, considering the ethical, economic, and political dimensions of the space industry.
6. **Apply science communication techniques** to create engaging content, such as educational presentations, infographics, or short films, making astrophysical concepts accessible to non-expert audiences.
7. **Demonstrate collaborative research skills**, working in teams to investigate key questions in astrophysics and

presenting findings in a compelling format.

8. **Develop a critical understanding of scientific literacy**, recognizing the role of astrophysics in combating misinformation and fostering an informed public.

Course Requirements

This course is designed to be engaging and interactive, requiring students to actively participate in various activities and complete different types of assignments. Below are the key expectations and requirements:

Reading Requirements:

- Readings (either slides or bibliography) will be assigned to provide historical, cultural, and scientific context for each week's discussions and activities.
- Supplemental readings will be recommended for students interested in delving deeper into specific topics.

Assignments:

Students will complete a variety of assignments designed to enhance their critical thinking, understanding and ability to communicate astrophysical concepts. These assignments include creative writing, a podcast, keeping a notebook of the key points mentioned every week, a poster presentation, and a group presentation.

Class Field Work and CYA Field Study

Field work is an essential part of this course, designed to provide hands-on experiences that reinforce theoretical knowledge. Students will participate in various activities, including site visits, stargazing sessions, and discussions with experts in the field.

Class Field Work

The following activities will take place throughout the semester:

1. **Visit to the National Observatory of Athens:** Students will have the opportunity to use telescopes and learn about observational techniques used in modern astronomy.
2. **Planetarium Visit:** A cinematic journey through space, followed by a discussion on planetary exploration.
3. **Visit to the Kotsanas Museum of Ancient Greek Technology:** Students will explore original reconstructions of ancient Greek inventions and learn how technological innovation shaped scientific thought, engineering, and everyday life in antiquity.
4. **Visit to the Greek Meteorite Museum:** Students will explore authentic meteorite specimens from around the world and learn how these extraterrestrial rocks provide valuable insights into the formation of the Solar System, planetary evolution, and the origins of life on Earth.

Evaluation and Grading

Your grading for this course will be based on the following distribution:

- **Creative Writing Assignment (20%)**
 - Students will write a short science fiction story that incorporates real astrophysical principles. This could be in the form of a cartoon, a short essay, a short video. The goal is to bridge scientific accuracy with imaginative storytelling. Brainstorming sessions will happen inside the classroom.
 - **AI Use:** Students may use AI tools for early-stage brainstorming or to generate a limited number of visual elements (e.g. illustrations or backgrounds). AI may **not** be used to generate written content, narrative text, or scientific explanations. All AI use must be disclosed.
- **The Connections Notebook (15%)**
 - At the end of class once a week students will reflect on what they have learned during the week and how it connects to previous week material, their everyday lives and the world around them.
 - **AI Use:** AI tools are **not permitted** for this assignment. All reflections must be based on the student's own understanding, in-class discussions, and personal engagement with the material.
- **Group Podcasts on Space Exploration & Society (20%)**
 - Students will work in pairs in order to create a 10 minute podcast presenting how space missions impact technology, medicine, and society.
 - **AI Use:** AI may be used only for outlining episode structure or brainstorming discussion questions. AI may **not** be used to generate scripts, spoken content, research summaries, or citations. Any permitted AI use must be disclosed.
- **Group Presentation (15%)**
 - Each group will either present the solar activity and its relations to Space Weather or the basic methods through which

exoplanets can be detected

AI Use: AI tools may be used for organizing presentation structure or generating visual design ideas. AI may **not** be used for content creation, analysis, or research. All sources must be independently located, read, and cited by students.

- **Group Poster Presentation (20%)**

- Each group will select a famous astronomy-related sci-fi book or movie and analyze its scientific elements.

AI Use: AI-generated images may be used selectively for illustrative purposes, provided they do not replace scientific content or analysis. AI may **not** be used to generate text, explanations, or data interpretation. All AI use must be disclosed.

- **Class Engagement (10%)**

- Classroom attendance and active engagement are essential components of this course are reflected in the Class Engagement component of the final grade. In accordance with CYA policy, three (3) unexcused absences automatically lower the final course grade. More than three (3) unexcused absences may result in academic probation or failure of the course.

Evaluation Criteria - Course Assignments

1. **Creative Writing Assignment**

- Criteria 1: creativity, imagination, scientific accuracy
- Criteria 2: clear structure

2. **The Connections Notebook**

- Criteria 1: critical thinking, reflection depth
- Criteria 2: consistency

3. **Group Podcasts on Space Exploration and Society**

- Criteria 1: Communication skills, articulation, audience engagement
- Criteria 2: Originality, depth of analysis, relevance
- Criteria 3: technical quality, clarity

4. **Group Presentation**

- Criteria 1: depth and accuracy of information
- Criteria 2: critical analysis
- Criteria 3: presentation skills
- Criteria 4: teamwork
- Criteria 5: ability to respond to questions

5. **Group Poster Presentation**

- Criteria 1: scientific accuracy
- Criteria 2: clarity and visual design
- Criteria 3: engagement
- Criteria 4: teamwork

CYA Regulations and Accommodations

Attendance Policy

Coursework at CYA involves a great deal of experiential learning: classroom discussion, site visits, and the like, which cannot be replicated if the student is absent. Grades reflect a student's performance on assessments but also acknowledge the degree to which a student has mastered the material through such active learning activities. As a result, attendance and punctuality are essential to learning in CYA courses, which rely on in-class and on-site interaction. Faculty is required to record absences and either the Academic Advisor (on academic issues) or Student Affairs (on wellness issues) will check-in with students who have repeated absences.

This policy applies to all scheduled class meetings and off-site activities (Athens sessions and school-wide Field Studies).

Course Specific Attendance and Grade Impact

This course is highly interactive and experiential, involving discussions, in-class activities and site visits that **cannot be replicated outside the classroom**. Attendance and active participation are therefore essential to student learning, in accordance with CYA's Attendance and Absences Policy.

Attendance Expectations

- Attendance is required at all scheduled class sessions and on-site activities.
- Students are expected to arrive on time and remain for the full duration of the session.

Excused Absences

Excused absences are granted only through the appropriate CYA administrative channels (Student Affairs in cases of illness, and the Academic Director for exceptional circumstances), not by the course instructor.

Students should, however, notify the course instructor that a request for an excused absence has been submitted. All requests must follow the official procedures and timelines established by CYA.

Because participation is integral to this course, a high number of excused absences may still negatively affect the participation component of the final grade.

Unexcused Absences and Grade Impact

- Three (3) unexcused absences will automatically lower the final course grade.
- More than three (3) unexcused absences may result in academic probation or failure of the course, depending on circumstances.

Make-Up Work

- All missed work must be completed for both excused and unexcused absences.
- Failure to complete required make-up work will result in a minimum **one letter-grade reduction** for the affected assignment.
- In-class assessments missed due to unexcused absences may receive a zero (0).

ePolicy on Original Work

Unless otherwise specified, all submitted work must be your own original work. Any ideas taken from the work of others must be clearly identified as quotations, paraphrases, summaries, figures etc., and accurate internal citations and/or captions (for visuals) as well as an accompanying bibliography must be.

AI Policy

In line with CYA's Generative AI Policy, this course permits **limited and transparent use of AI tools** as a *supportive aid* to learning, **not as a substitute for critical thinking, research, or original work.**

Permitted Uses of AI

Students may use AI tools **only** in the following ways:

- To **brainstorm or outline** ideas at an early stage of an assignment
- To assist with **structuring** an argument (e.g. organizing sections or flow)
- To generate **a limited number of visual elements** (e.g. illustrative images or backgrounds) **only where explicitly appropriate** to the assignment

All AI use **must be disclosed** following CYA's AI disclosure guidelines.

Prohibited Uses of AI

The following uses of AI are **not permitted** in this course:

- Generating written content (paragraphs, scripts, essays, podcast text, reflections, or analyses)
- Conducting or simulating **research**, including literature searches or source summaries
- Generating or fabricating **bibliography or citations**
 - Editing or rewriting text in a way that replaces the student's own voice or ideas AI tools are **not sources** and must not be cited as such.

AI Disclosure Requirement

Any assignment that involves AI use must include a short disclosure statement describing:

- the AI tool used,
- how it was used,
- and how the student reviewed and edited the output.

Failure to disclose AI use, or use beyond what is explicitly permitted, constitutes a violation of academic integrity.

Impact on Grading

- Assignments that rely on AI beyond the permitted scope will receive a **grade penalty**, up to and including a zero (0), depending on severity.
- Students may be asked to **discuss their work orally** to demonstrate understanding.
- Repeated or serious violations may be referred under CYA's academic integrity procedures.

The responsibility for accuracy, originality, and critical evaluation of all submitted work always rests with the student.

Use of Laptops

In-class or onsite use of laptops and other devices is permitted if this facilitates course-related activities such as note-taking, looking up references, etc. Laptop or other device privileges will be suspended if devices are not used for class-related work.

1	Week Ia	<p>Introduction to Space and Society</p> <p><i>Description</i> How has the Cosmos shaped human civilization? This session sets the foundation for the course, exploring how astronomy has influenced mythology, philosophy and scientific thought across cultures.</p> <p><i>Required Reading</i> Chapters 1 & 2 from <i>Cosmos</i> by Carl Sagan</p> <p><i>Optional Reading</i> Astrophysics for People in a Hurry by Neil deGrasse Tyson</p>
2	Week Ib	<p>The evolution of Celestial Observation: From Shadows to Telescopes</p> <p><i>Description</i> Ancient civilizations and their methods of astronomical tracking. The transition from mythology to scientific explanations.</p> <p><i>Required Reading</i> Chapters 3 & 4 from "The History and Practice of Ancient Astronomy" by James Evan</p>
3	Week IIa	<p>The Antikythera Mechanism: Greece's Ancient Computer</p> <p><i>Description</i> Learn about the Antikythera Mechanism- the world's first known analog computer and explore its role in astronomical predictions through the guidance of a professor who has dedicated his career studying the mechanism.</p> <p><i>Required Reading</i> "Decoding the Ancient Greek Astronomical Calculator known as the Antikythera Mechanism", Freeth, T.</p>
4	Week IIb	<p>The Connection Between Stars and Mythology</p> <p><i>Description</i> From Orion to the Pleiades, mythology and astronomy have always been intertwined. Learn how different cultures have interpreted celestial events and dive into mythological stories and their astronomical foundations.</p> <p><i>Optional Reading</i> Star Myths of the World, David Warner</p>
5	Week IIIa	<p>Philosophy and Astronomy: The Search for Meaning in the Universe</p> <p><i>Description</i> How have great thinkers—from Aristotle to Hawking—shaped our cosmic worldview? This session explores the philosophical questions raised by astronomy.</p> <p><i>Required Reading</i> Chapters 1 & 2 from "A Brief History of Time", Stephen Hawking</p>

6	Week IIIb	<p>The Astronomical Orientation of Ancient Greek Temples</p> <p>Ancient architects used celestial alignments to design sacred spaces. How did astronomy influence the construction of Greek temples, and what can this tell us about their society?</p> <p><i>Optional Reading</i></p> <p>Michael Hoskin, "Tombs, Temples, and Their Orientations"</p>
7	Week IVa	<p>Modern Space Exploration and Technological Breakthroughs</p> <p><i>Description</i></p> <p>From the Hubble Space Telescope to Mars rovers, what are the greatest technological leaps that have expanded our understanding of the universe?</p> <p><i>Required Reading</i></p> <p>The International Space Exploration Coordination Group, "Benefits Stemming from Space Exploration"</p>
8	Week IVb	<p>Science Fiction and Space Exploration: Reality vs Imagination</p> <p><i>Description</i></p> <p>Analysis of the evolution and intersection between fiction and scientific reality. How accurately does science fiction predict the future?</p> <p><i>Required Reading</i></p> <p>Chapters 2 and 3 from "Outer Space and Popular Culture", Annette Froehlich</p> <p><i>Optional Reading</i></p> <p>"His Dark Materials", Pullman Philip</p> <p>"Do Androids Dream of Electric Sheep", Philip K. Dick</p> <p>"Foundation", Isaac Asimov</p>
9	Week Va	<p>Astronomy in Popular Culture and Media</p> <p><i>Description</i></p> <p>From Carl Sagan to modern documentaries, how has space been communicated to the public?</p> <p><i>Required Reading</i></p> <p>Chapters 2 and 3 from "Outer Space and Popular Culture", Annette Froehlich</p> <p><i>Optional Reading</i></p> <p>The Pale Blue Dot, Carl Sagan</p>
10	Week Vb	<p>Visit to the Planetarium</p> <p><i>Description</i></p> <p>Watch a space film at Athen's planetarium. How does it affect our thinking, our view of life? How important is Science Communication in inspiring future generations?</p>
11	Week VIa	<p>The Sun – Observation of our star with our own Sun Projector</p> <p><i>Description</i></p> <p>Learn about the most fascinating star, our Sun! We will create our own sun projectors and make a real time observation.</p> <p><i>Required Reading</i></p> <p>Chapter 1 from the "The Sun, A Very Short Introduction", Philip Judge</p>
12	Week VIb	<p>Sun, Earth and Geospace: Solar Storms & Space Weather</p> <p><i>Description</i></p> <p>Learn about aurora and how they are connected to our sun. Can a solar storm destroy Earth? Download solar data and create solar videos that show eruptions of solar mass.</p> <p><i>Required Reading</i></p> <p>Space Weather: The Solar Perspective, Manuella Temer</p> <p><i>Optional Reading</i></p> <p>Death from the Skies, Chapter 2, Philip Plait</p>
13	Week VIIa	<p>Travelling to the planets of our solar system – Reality or Fantasy?</p> <p><i>Description</i></p> <p>Learning more about our planets. Will humans be ever able to travel to other planets or this is something that will keep on inspiring great films.</p> <p><i>Optional Reading</i></p> <p>"The Planets", Dava Sobel</p>
14	Week VIIb	<p>Travelling to the planets of our solar system – The Ethics of Space Colonization</p> <p><i>Description</i></p> <p>Ethical considerations of colonizing other planets. International policies and space governance.</p> <p><i>Optional Reading</i></p>

"The Ethics of Space Exploration", Milligan, T., & Schwartz, J. S. J.

15	Week VIIa	<p>Visit to the National Observatory of Athens</p> <p><i>Description</i> Students will have the opportunity to see through the National Observatory's telescope and learn about observational techniques used in ancient Greek astronomy.</p>
16	Week VIIb	<p>Exoplanets</p> <p><i>Description</i> Methods of detecting exoplanets and habitable zones. What does it mean for humanity to find extraterrestrial life.</p> <p><i>Required Reading</i> Impact of Exoplanet Science on Society: Professional Contributions, Citizen Science Engagement and Public Perception, Hans-Jörg Dee</p> <p><i>Optional Reading</i> "The Contact", film</p>
17	Week IXa	<p>Are we Alone? The Fermi Paradox and the Search for Extraterrestrial life</p> <p><i>Description</i> We explore the scientific and philosophical implications of the search for alien civilizations, discussing theories behind the Fermi Paradox and recent exoplanet discoveries.</p> <p><i>Optional Reading</i> "If The Universe Is Teeming With Aliens... Where Is Everybody?: Fifty Solutions to the Fermi Paradox and the Problem of Extraterrestrial Life", Stephen Webb</p>
18	Week IXb	<p>Visit to the Museum of Ancient Greek Technology Kostas Kotsanas</p> <p><i>Description</i> We will visit the museum of ancient Greek technology Kostas Kostanas, explore original reconstructions of ancient Greek inventions and learn how technological innovation shaped scientific thought, engineering, and everyday life in antiquity.</p>
19	Week Xa	<p>Have we landed on the Moon – Fighting pseudoscience</p> <p><i>Description</i> Studying the facts behind Moon Landing</p> <p><i>Required Reading</i> NASA Faked the Moon Landing -Therefore, (Climate) Science Is a Hoax: An Anatomy of the Motivated Rejection of Science, Lewandowsky Stephan et al.</p>
20	Week Xb	<p>Diversity Shapes Innovation in Space Exploration: Artemis II mission</p> <p><i>Description</i> Learn about Artemis in Greek Mythology and the Artemis II mission that will lead the first woman and the first African American to go a lunar mission!</p> <p><i>Required Reading</i> Towards equality in the cosmos and diversity & inclusion in the space sector - Copernicus Observer</p>
21	Week XIa	<p>Effective Science Communication</p> <p><i>Description</i> Why Space is the ideal space to inspire young people to love STEM related subjects and at least develop problem solving skills and critical thinking. The key elements of Effective Science Communication</p> <p><i>Required Reading</i> Effective Science Communication (A practical guide to surviving as a scientist), Sam Illingworth and Grant Allen</p>
22	Week XIb	<p>Visit to the Greek Meteorite Museum</p> <p><i>Description</i> Students will explore authentic meteorite specimens from around the world and learn how these extraterrestrial rocks provide valuable insights into the formation of the Solar System, planetary evolution, and the origins of life on Earth.</p>
23	Week XIIa	<p>Astronomy and Art</p> <p><i>Description</i> Investigate the intersection of astronomy and art. Examine how artists have been inspired by the cosmos throughout history and how modern artists use astronomical themes in their work.</p>

Required Reading

Chapters 2 and 8 from "The Beauty of Space Art", J.Ramer & R.Miller

24 Week XIIIb

Studying the Stars: A Path to Solutions or an Utopian Dream?

Description

In this final week, we will explore the relevance of studying the stars in the context of today's global challenges. We will discuss whether astronomy and space exploration offer practical solutions to pressing issues or if they represent an idealistic pursuit disconnected from reality.

N.B.: The course schedule, in terms of subjects and readings, may be subject to change to benefit student learning and to keep up to date with current research.

COURSE BIBLIOGRAPHY

Required Bibliography

Notes will be provided to the students

- Carl Sagan, *Cosmos*, Chapters 1 & 2, 1980.
- The History and Practice of Ancient Astronomy, Chapters 3 & 4.
- Tony Freeth, "Decoding the Ancient Greek Astronomical Calculator Known as the Antikythera Mechanism," *Nature* (2006).
- Stephen Hawking, *A Brief History of Time* (1988).
- "Benefits Stemming from Space Exploration", The International Space Exploration Coordination Group, 2024 .
- Annette Froehlich, "Outer Space and Popular Culture", Chapters 2 &3, 2020.
- Philip Judge, "The Sun, A Very Short Introduction", Chapter 1, 2020.
- Manuella Temmer, "Space Weather: The Solar Perspective", 2021, Living Reviews in Solar Physics.
- Hans-Jörg Dee , "Impact of Exoplanet Science on Society: Professional Contributions, Citizen Science Engagement and Public Perception", 2024.
- Towards equality in the cosmos and diversity & inclusion in the space sector - Copernicus Observer, 2023.
- Sam Illingworth and Grant Allen, *Effective Science Communication (A practical guide to surviving as a scientist)*, 2020.
- Lewandowsky Stephan et al., "NASA Faked the Moon Landing -Therefore, (Climate) Science Is a Hoax: An Anatomy of the Motivated Rejection of Science", 2013.
- Jon Ramer and Ron Miller, *The Beauty of Space Art*, Chapters 2 & 8, 2020.

Optional Bibliography

- Neil deGrasse Tyson, *Astrophysics for People in a Hurry* (2017).
- Kip Thorne, *The Science of Interstellar* (2014).
- Robert Zubrin, *The Case for Mars* (1996).
- Paul Davies, *The Eerie Silence* (2010).
- Philip Pullman, *His Dark Materials* (1995).
- Philip K. Dick, *Do Androids Dream of Electric Sheep* (1968).
- Isaac Asimov, *Foundation* (1951).
- Carl Sagan, *Pale Blue Dot* (1994).
- Phil Plait, *Death from the Skies!* (2008).
- Dava Sobel, *The Planets* (2005).
- Milligan, Tony, & Schwartz, James S. J., "The Ethics of Space Exploration", 2016.
- Stephen Webb, *If The Universe Is Teeming With Aliens... Where Is Everybody?: Fifty Solutions to the Fermi Paradox and the Problem of Extraterrestrial Life* (2002).