



# Secondary Programme Guide 2021/22

## About the Royal Observatory Greenwich

The Royal Observatory at Greenwich was founded by Charles II in 1675 and is one of the most important historic scientific sites in the world. Today the Observatory is a museum and science centre which provides access to information about space to schools and the wider public. A visit to the Observatory offers inspiring, curriculum-linked experiences delivered by REAL astronomers based around REAL cutting-edge science.

### What we offer

Whether you are looking for something to ignite the imagination and enthusiasm of your group, develop and stretch their knowledge or give them an insight into the working world of space science there will be something to suit.

Our content relates to space science and its associated branches of the STEM (Science, Technology, Engineering and Mathematics) subjects. It is not often that students get access to state of the art equipment, real scientific data and to chat to real scientists; at the Royal Observatory they do, and it is what makes our education programme truly unique. As a result of our programme being so different, we naturally get asked a lot of questions about it. Here we have answered some of the most frequently asked questions, if you have any others please do get in touch.

### What does the Secondary Programme consist of?

For KS3, KS4 and Post-16 we offer a **Discovery Day**, a **Space Spectacular Day**, or a **Study Day**. Depending on which you choose your visit can be made of: a planetarium show, an interactive workshop, a self-facilitated visit to the historic north site and a timeslot in the lunchroom.

### How much does a visit cost?

**Study Days** run on Thursdays and are by far the most popular choice for our secondary school visitors. The cost of a **Study Day** is £144 (for 30 students) and includes a: planetarium show, workshop, a self-facilitated visit to the historic north site and a timeslot in the lunchroom. Whether it's a **Discovery Day**, a **Space Spectacular Day**, or a **Study Day**, if you wish to book only one of these elements, you can do so at a charge of £90 for a planetarium show (for 30 students) and £90 for a workshop or science theatre show (for 30 students).

### How much does a digital session cost?

Secondary sessions of a virtual planetarium show or an online workshop, each carry a charge of £60 for a group of up to 30 students.

### Is the schools offer the same every day, all year round?

No, we understand that there are certain times of the year when it is easier and more appropriate to bring groups out on trips, so we have designed our programme to fit in with our school visitors. Therefore, we have key stage specific **Discovery Days** and **Space Spectacular Days** on certain days throughout the year and vary the amount of **Study Days** on offer to meet the demand of our audiences. For information on what is on and when, please check with our bookings team or online on the website.

## Our Secondary Programme Explained



Below you will find answers to some of the most frequently asked questions about the schools programme. If you have any more questions, please contact the bookings team as they will be more than happy to help. **Please note, whether you're joining us for a facilitated school session, or your school is visiting the historic ROG North site as a self-guided visit, you must book your visit by contacting our bookings team.**

### ONSITE SCHOOL PROGRAMME

#### **What is a *Discovery Day*?**

***Discovery Days*** are designed to be very flexible visit days. It is up to you what sessions you select for your ***Discovery Day***. Depending on the day you can choose from: a planetarium show, workshop, gallery visit, use of the lunchroom or all of these. The bookings team will be able to timetable your day so you can include all the components you want to.

#### **What is *Space Spectacular week*?**

***Space Spectacular Days*** are very special as they only run during 3 weeks across the year so you will need to book fast. Visits on ***Space Spectacular Days*** are made of: a planetarium show (*Final Frontier*), the hands-on *Exploring Ocean Worlds* workshop, a visit to the ROG's historic north site and a lunchroom slot.

#### **What is a *Study Day*?**

The ***Study Day*** offer is exclusively for secondary groups with specific sessions for KS3, KS4 and Post-16. The structure is the same as a ***Discovery Day*** but there is a greater variety of secondary workshop on offer. These sessions aim to teach curriculum science with the context of astronomy, highlighting the relevance of science learning in the real world. Delivered by our expert astronomers, it provides an opportunity for students to enquire about STEM careers from those who are in them!

#### **What is a planetarium show?**

Think of our planetarium as a tour bus of the Universe taking you on amazing journeys to explore and experience the wonders of the night sky. Combining real images from spacecraft and telescopes with advanced CGI, all projected onto a fully immersive dome, the planetarium can fly you over the Earth, transport you to distant galaxies, show you the birth of a star or even land you on Mars.

### What is a workshop?

The astronomer-led workshops are very interactive and have plenty of opportunities to ask questions and discover new things. The workshops use a combination of sound, film, demonstrations, and team activities to explain different amazing scientific concepts with tools from physics and mathematics.



### What else can I do on a visit day?

If a *Discovery* or *Space Spectacular Day* or *Study Day* still doesn't satisfy your scientific appetite you can also visit our temporary exhibition gallery and we also have visit guides and trails for those doing self-facilitated sessions which are available for free on the website.

<https://www.rmg.co.uk/content/visit-guides-activities>

### DIGITAL SCHOOL PROGRAMME

#### What is a digital session?

We run *digitals session* so that schools who might not be able to visit us can still bring astronomy with the Royal Observatory to their students in school. *Our digital sessions* are run on Zoom or Teams and you can book either an online workshop, a virtual planetarium show or both!

#### What is an online workshop?

Delivered via Zoom or Teams, our online workshops are led by ROG astronomers and are very interactive. Each session ends with a segment for Q&A so there are plenty of opportunities to ask questions and discover new things. The workshops use a combination of sound, film, and activities to explain different scientific concepts.

### What is a virtual planetarium show?

Our astronomers will take your students on a tour of the Universe from the comfort of your classroom. You'll experience the wonders of the night sky through the combination of real images from spacecraft and telescopes. You'll be transported around space with animated sequences that could fly you over the Earth, transport you to distant galaxies, show you the birth of a star or even land you on Mars.

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### Who develops and runs the sessions?

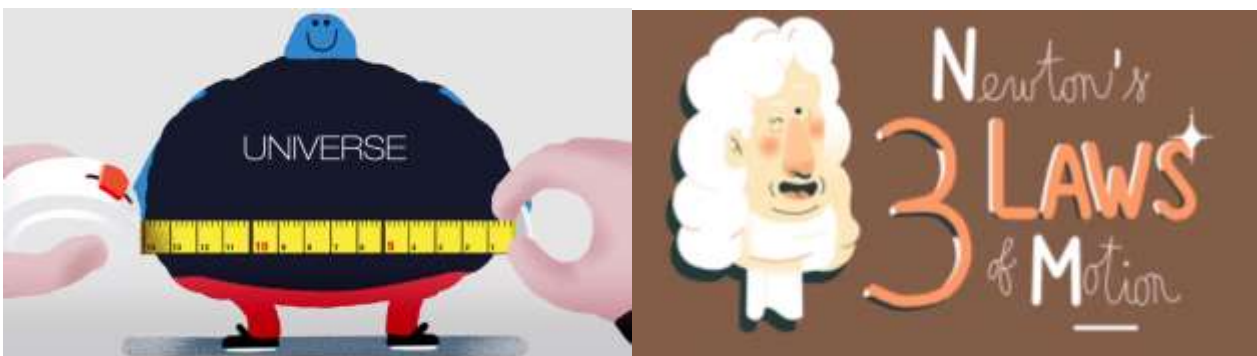
All of our content is developed by the astronomy education team in collaboration with the teacher's forum. All sessions are tested and evaluated with the teacher's forum and also with school groups to ensure that the content developed is exactly what teachers are looking for and what students will thoroughly enjoy! The sessions are then run by real astronomers so there is always an expert available to ask any questions.

### Are there activities that can follow on from my visit?

Yes, lots. We have a large selection of classroom resources available on the website that have been developed with our teacher's forum. They can be used after your session as a follow-up or before to introduce new topics. We also have brand new videos that can be used as part of a science lesson.

<https://www.rmg.co.uk/schools-communities/all-astronomy-science-resources>

On our website you will also find information about: our teacher forum, free teacher training sessions, podcasts, *Think Space* lectures, our Young Advisors Group and even blogs.



## Workshops – onsite session

Our interactive workshops take place in one of three purpose-built learning spaces and are designed to encourage active learning and hands-on scientific enquiry.



Each session is led by a Royal Observatory astronomer and lasts 45 minutes. Sessions offered at more than one key stage will be tailored to link to the curriculum of your group and can be further customised through the inclusion or exclusion of more challenging mathematics and physics content. Please speak to our bookings team about any special learning needs or objectives when you book.

### Supporting resources for teachers

Pre- and post-visit resources linked to our workshops which include background reading for teachers, discussion questions, classroom activities and extension work for advanced students are available online on the website.

<https://www.rmg.co.uk/schools-communities/all-astronomy-science-resources>

You can find FREE trails for KS3, KS4 and Post-16 on our website:

<https://www.rmg.co.uk/schools-communities/visit-guides-activities>

All you need to do is download, print, and bring along on the day! These trails are great if you are looking for help structuring your group's time during the self-directed parts of your visit.

**Title: Exploring Ocean Worlds - NEW**

*This workshop runs during Space Spectacular Weeks only.*

**Session level: KS3**

**Session length: 45 minutes**

**Key points covered** - Evolution, exploring ocean life, gravity – force acting at a distance (tidal heating – friction and heat), pressure in fluids, states of matter

**Workshop summary** – our understanding of the conditions required for life to exist is based on our studies of life found in different regions on the Earth. The surprising discovery of life at the depths of the oceans has changed the targets for our search for life elsewhere in the Solar System. In this workshop, students will explore the oceans of the Earth before heading out into our Solar System, using images taken by satellites and spacecraft to search for other ocean worlds. Through the use of demonstrations and activities, students will learn about the physics of pressure, the extreme conditions of the ocean depths, and how life might be able flourish in similar conditions on distant ocean worlds.

**Title: Time and Seasons - NEW**

**Session level: KS3**

**Session length: 45 minutes**

**Key points covered** - Earth's rotation, day and night, solar/sidereal day, orbits and gravity, calendar vs. astronomical year, Earth's axial tilt, seasons, solstices and equinoxes.

**Workshop summary** – the length of a day, duration of a year and the changing seasons are unique to the Earth. Students will explore the motion and mechanics of the Earth relative to the Sun to understand how our days, years and the seasons are all determined by Earth's alignment and movement. They'll also investigate how these characteristics differ on the other planets.

**The Solar System and Beyond**

**Session level: KS3 and KS4**

**Session length: 45 minutes**

**Key points covered** – Kepler's laws of planetary motion, orbits, Newton's laws of gravity, mathematical calculations and graph work.

**Workshop summary** – students learn about the different ways that planets in our solar system were discovered. They then use real astronomical data in this session to travel through the solar system investigating the orbits of the planets. They will also explore how the mathematics used to describe planetary orbits has been used to discover a supermassive black hole at the centre of the Milky Way Galaxy.

**Maths in the Milky Way**

**Session level: KS3 and KS4**

**Session length: 45 minutes**

**Key points covered** – mathematical techniques including calculations, unit conversions, drawing and interpreting graphs / charts, the relationship between speed, distance, and time.

**Workshop summary** – in this session students see how maths can be used to find out more about the world around us and beyond. They learn about calculating travel times to other planets along with how to draw and interpret graphs. They will also then look at how the knowledge they build up in the workshop can even be used to help them find the travel time from extrasolar planets to our planet so they see how long alien life forms might have to travel if they were headed our way.

### Exploring Exoplanets

Session level: KS3, KS4, Post-16

Session length: 45 minutes

**Key points covered** – the electromagnetic spectrum (infrared), Kepler's laws of planetary motion, orbits, mathematical calculations and interpreting graphs.

**Workshop summary** – in this hands-on session students are introduced to the challenges of detecting small, faint extrasolar planets around bright stars and an infrared camera is used to demonstrate one solution to finding them. They learn how astronomers discover planets orbiting distant stars using another detection method by making and discussing measurements of their own exoplanet system and applying their knowledge of light and gravity. They will then go on to analyse real data from the NASA space telescope Kepler and think about whether their exoplanets would be habitable.

### Studying Starlight

Session level: KS4 and Post-16

Session length: 45 minutes

**Key points covered** – the electromagnetic spectrum, reflection, absorption and emission of light, and for Post-16, the Doppler Effect.

**Workshop summary** – in this hands-on workshop, students learn how astronomers determine the properties of distant stars by examining spectra and applying their knowledge of the electromagnetic spectrum, the reflection, absorption and emission of light, and at Post-16 the Doppler Effect. They also look through spectroscopes to identify gases and see the spectrum of the Sun.

### The Expanding Universe

Session level: KS4 and Post-16

Session length: 45 minutes

**Key points covered** – Velocity, calculating distances and team working, Hubble's law, rearranging equations, unit conversions, graph work and interpretation.

**Workshop summary** – in this session students are introduced to the Citizen Science online project Galaxy Zoo, whereby members of the public can classify galaxies and contribute to scientific research. Students are given real data on galaxies from the Sloan Digital Sky Survey and plot a graph of velocity vs. distance. They use basic equations to determine large-scale properties of the Universe and are encouraged to think about the statistical significance of their result.



## Planetarium Shows – onsite session

Planetarium shows take place in the Peter Harrison Planetarium and are delivered live by Royal Observatory astronomers. Our state-of-the-art digital planetarium provides an inspiring, immersive and interactive learning experience, allowing students to examine the day and night-time sky, fly through our solar system or enjoy visually stunning pre-recorded shows about the latest discoveries in astronomy.



### Universe On Your Doorstep

**Session level:** KS3

**Session length:** 45 minutes

**Key points covered** – main bodies in our solar system including the Sun, Earth, and Moon, why we see different phases of the Moon

**Show summary** – this amazing, interactive show takes students on a journey around the Solar System and beyond. Starting from our own Peter Harrison Planetarium, they'll be transported to a special view of the Earth from space to see how it moves, before traveling a bit further away, to explore the Moon and its lunar phases. They'll become astro-navigators, viewing the constellations, and using Polaris to find the direction of North. Next, they'll fly out to view the Solar System, visiting a rocky planet, the asteroid belt, an outer planet, and dwarf planets in the Kuiper Belt. Venturing even further out, they'll be introduced to extrasolar planets, before being wowed by our stunning Milky Way Galaxy and its place in the local Universe.

### Solar System Galaxy Universe

**Session level:** KS3, KS4 and Post-16

**Session length:** 45 minutes

**Key points covered** – contents and structure of the Solar System, our Milky Way Galaxy, and the larger Universe. KS4/Post-16 – also includes the electromagnetic spectrum and spectroscopy.

**Show summary** – in this inspiring interactive show, a Royal Observatory astronomer will take your students on a bespoke tour of the cosmos, exploring our place in space and the contents of our solar system, our Milky Way galaxy and the larger Universe. The show explores the different classes of objects in the Universe, the variety found within each category and how they compare to what is most familiar to us: the Earth, the Sun, and the Milky Way. At the higher Key Stage, the show also highlights how observing at different wavelengths of light allows astronomers to unravel the mysteries of the Universe.

**Final Frontier**

*This show runs during Space Spectacular Weeks only.*

**Session level: KS3**

**Session length: 45 minutes**

**Key points covered** – aspects of our solar system, lunar phases, size and scale of different stars, forces in action

**Show summary** – Final Frontier is a show all about space exploration – amazing! This action-filled show packs a lot, so buckle up and get ready to do some serious exploring. It looks at the challenging conditions of space, the types of things we must be prepared to encounter should we travel there, and the distances and scales involved in going on such a mission. This show also highlights the people involved in space science and showcases some of the greatest contributions and ambitions of scientists and engineers. Final Frontier shows us just why using our imagination is very important when it comes to heading out on our adventure into space.

## Study Days – onsite session

The **Study Day** offer is exclusively for secondary groups with specific sessions for KS3, KS4 and Post-16. The structure is the same as a **Discovery Day**.



### Think Space Lectures

If your group wants to get more involved after their **Study Day**, you can bring them back to one of our Think Space lectures. Pitched at students at KS4 and above, the lectures are led by a guest researcher from in the field of astronomy and space science. They run on selected evenings after school from autumn through spring. Places are limited so booking is essential. Think Space Lectures may take place online, but you'll find more details on the website.

<https://www.rmg.co.uk/whats-on/online/think-space-lectures>

### Young Advisors Group

Targeted at students in full time education between the ages of 14 and 18, this group provides young people with the opportunity to participate in, and contribute to, the work that we do at the Royal Observatory. From providing feedback on our educational offer to engaging with members of the public about topics in space and astronomy, the activities will assist with the development of skills that will be useful for students considering tertiary studies in science.

<https://www.rmg.co.uk/schools-communities/young-advisors-group>

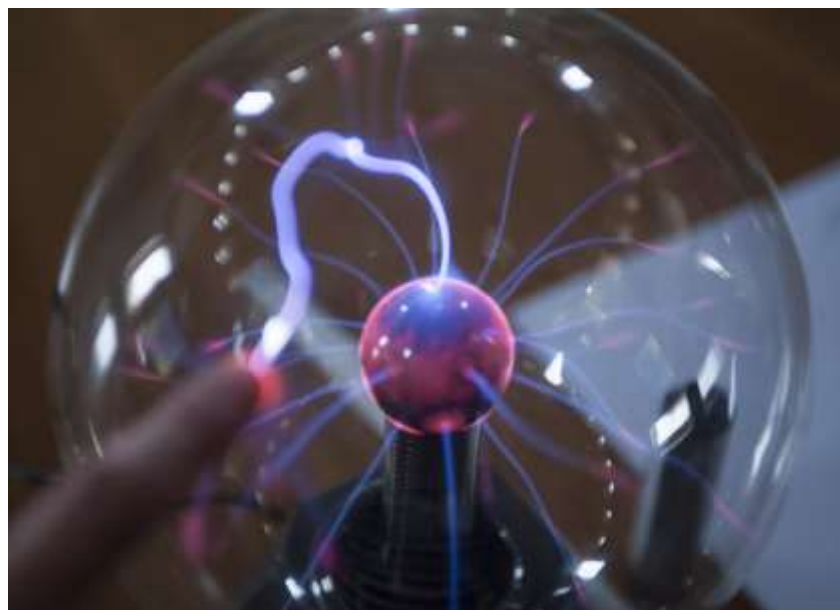
### Podcasts and Blogs

The astronomers at the Royal Observatory Greenwich regularly release new content so you and your students can stay up to date with the world of astronomy. We release monthly *Look Up!* podcasts and even podcasts of interviews when we have special guests like speakers from our *Think Space* lectures. There's also our regular *Night Sky Highlights* blog along with various other astronomy blogs. Check out the website for more information.

<https://www.rmg.co.uk/schools-communities/royal-observatory-greenwich-schools-podcasts>

## Special Educational Needs *Aurora Days*

**Aurora Days** for the 2021/22 academic year will run twice a term and include specially designed sessions for SEND groups.



While you are of course welcome to visit at any time with SEND groups **Aurora Days** are dedicated slots where we hand the Observatory over to you without any other school groups on site. This means that we are able to dedicate more time to you answering your space questions and making your visit as enjoyable and easy as possible.

We are developing our **Aurora Day** programme further throughout the 2021/22 academic year and have a SEND forum to help inform the programme. If you would like to join, please take a look at our website for more details (<https://www.rmg.co.uk/schools-communities/networks-forums>), we would love to have you with us. **Aurora Days** are made up of the following components where you can choose one workshop and one planetarium show.

### Planetarium shows

Planetarium shows take place in the Peter Harrison Planetarium and are delivered live by Royal Observatory astronomers. On **Aurora Days** we have:

**Show Name: Starry Skies**

**Session Level: there is flexibility to tailor this show to fit your needs.**

**Session length: 45 minutes**

**Show summary** – this show takes the audience on a tour of some of the most beautiful aspects of our solar system. It was developed in collaboration with our local autism spectrum disorder visitors and their families and has consistently received fantastic feedback since it launched. It is presented live by one of our astronomy team and runs at a much calmer pace than many of our other school shows. The lighting levels used are higher for this show, so the planetarium never becomes pitch black, and the music and narration is kept to a minimum. If your students have any questions about space at the end, our astronomer will be there to answer them.

If your students are working at KS2/KS3 level (or above) and are able to cope with a show that runs at a more moderate pace with more content, then speak to our astronomers who can talk to you about an alternative offer.

## Workshops

Our multi-sensory, interactive workshop takes place in one of three purpose-built learning spaces and is designed to encourage active learning and hands-on scientific enquiry.

**Workshop Name: Searching the Solar System**

**Session level: this workshop is linked to the KS3 curriculum**

**Session length: 30 minutes**

**Workshop summary** – in this workshop students will be encouraged to compare the similarities and differences between our planet Earth and other planets in our Solar System. We will explore parts of the solar system using multi-sensory demos and practical activities to help students understand more about some of their closest neighbours in space. There are a number of different activities that can be done as part of this workshop, and you are able to choose a selection which will be the most interesting and applicable to your students. Different activities are pitched at different levels, from KS1 up to KS3, so we can tailor this workshop to suit your needs. Please be sure to chat to a member of the ROG education team when you are planning your visit so they can advise.

### How much does an onsite visit cost?

Visits including a planetarium show and SEND workshop carry a charge of £48 for a group of up to 10 students (maximum capacity). If you wish to book only one of these elements, you can do so at a charge of £30 for a planetarium show (for up to 10 students) and £30 for the SEND workshop (for up to 10 students).

If you would like to chat about bringing a group to an **Aurora Day** or coming along for a pre visit, please do get in touch with the ROG education team [ROGeducation@rmg.co.uk](mailto:ROGeducation@rmg.co.uk)

## Online workshops – digital session

Our interactive online workshops are delivered via Zoom or Teams and are designed to encourage learning and scientific enquiry through participation.



Key Stage 3 / Key Stage 4 / Post-16 digital workshops are 45 minutes long and delivered by Royal Observatory astronomers. They focus on the curriculum science in an astronomical context covering forces, stellar evolution and measuring distances in space. Each online session uses interactive elements like video clips and activities to help get your students thinking and inquiring about space.

### Supporting resources for teachers

Resources linked to our workshops which include background reading for teachers, discussion questions, classroom activities and extension work for advanced students are available online on the website.

<https://www.rmg.co.uk/schools-communities/all-astronomy-science-resources>

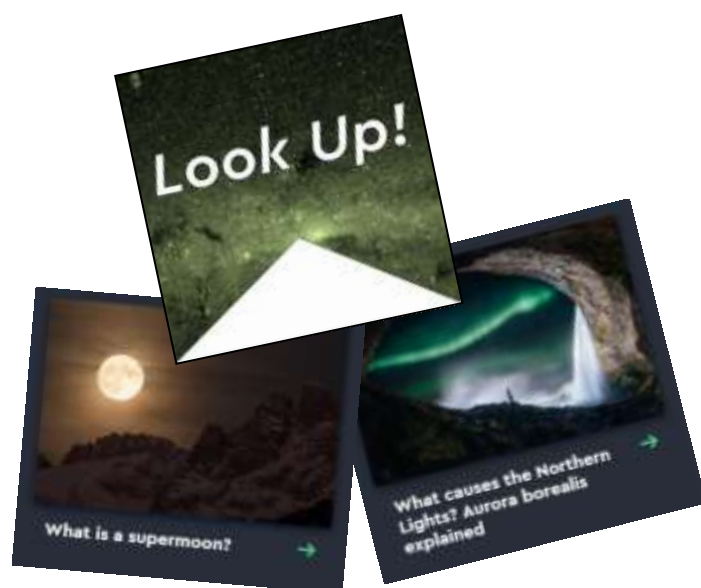
We also have a number of FREE digital blogs

<https://www.rmg.co.uk/stories/2021-guide-night-sky>

and podcasts with guest scientists and astronauts

<https://www.rmg.co.uk/schools-communities/royal-observatory-greenwich-schools-podcasts>

to keep your students excited and intrigued with all things space science and astronomy.



<b>Forces and Space Exploration</b> <b>Session level: KS3</b> <b>Session length: 45 minutes</b>
<b>Key points covered</b> – forces, gravity, mass, weight, environment, and planet surface features
<b>Workshop summary</b> – in this digital session, students will explore the difference between mass and weight and look at what determines the strength of the force of gravity. They'll apply their learning to see how gravity affects space exploration on the International Space Station, the Moon and Mars before diving into some of the Mars missions of 2020. Delivered by a Royal Observatory Greenwich astronomer, this session will include a range of interactive activities such as video clips and activities to help explain the scientific concepts in a real-world context. The session finishes up with a question-and-answer segment, so students have the opportunity to ask any questions they have. Post-session activities will also be supplied for your students to try afterwards and test what they have learned.

<b>Life Cycle of Stars</b> <b>Session level: KS4</b> <b>Session length: 45 minutes</b>
<b>Key points covered</b> – stars and galaxies, sun, star formation and evolution (nebula, main sequence, red giant/supergiant, planetary nebula, white dwarf, supernova, neutron star, black hole)
<b>Workshop summary</b> – stars are born, live out their lives and die all throughout the universe, but what determines the path they take? What makes some stars meet an explosive end, while others simply quietly fizzle out? In this interactive digital workshop, a Royal Observatory Greenwich astronomer will walk your students through the life cycle of a star the size of our Sun, as well as the life cycle of stars much larger too. In the question-and-answer session students will have the opportunity to ask questions about stars or indeed anything astronomical, as well as being provided with post-workshop exercises to ensure they understand the key stages of a star's life.

<b>Cosmic Distance Ladder</b> <b>Session level: Post-16</b> <b>Session length: 45 minutes</b>
<b>Key points covered</b> – radar, speed of light, parallax, standard candles (variable stars and Ia supernovae), redshift and Hubble's law
<b>Workshop summary</b> – how do we measure distances in space? We can't exactly pull out the tape measure to work out the distance between the Earth and the Moon, so astronomers have had to develop various methods to calculate distance on cosmic scales. In this interactive digital session, an astronomer from the Royal Observatory Greenwich will describe these methods and explain how they build on each other to create the cosmic distance ladder that allows us to measure the most distant of objects. Towards the end of the session students will have the opportunity to ask any astronomy or careers questions they may have, and we will provide follow-up activities to stretch their knowledge of space even further.

## Virtual planetarium shows – digital session

Our interactive online planetarium shows are delivered via Zoom or Teams. Delivered live by Royal Observatory Greenwich astronomers, they are designed to provide an inspiring and interactive learning experience, allowing students to examine the day and night-time sky, fly through our solar system and enjoy learning about the latest discoveries in astronomy.



### **Our Solar System**

**Session level: KS3**

**Session length: 45 minutes**

**Key points covered** – Main bodies in our solar system including the Sun, Earth, and Moon; the reason why we have seasons

**Show summary** – Let us take you and your students on an amazing journey to explore the wonders of the Solar System. Combining real images from spacecraft and telescopes our Royal Observatory Greenwich astronomers will fly you around the Solar System and beyond- wow! All sessions will finish with a question-and-answer session so students can ask their big space questions. You will also then get follow-up activities so students can give their brains a real workout and test what they have learned.

### **Discovering the Universe**

**Session level: KS3, KS4 and Post-16**

**Session length: 45 minutes**

**Key points covered** – contents and structure of our solar system, the Milky Way galaxy and larger Universe

**Show summary** – join our Royal Observatory Greenwich astronomers as we take a tour of the cosmos – wow! Combining real images from spacecraft and telescopes we will explore our place in space as well as the contents of our solar system, the Milky Way galaxy and the larger universe. All sessions will finish with a question-and-answer session so students can ask their big space questions. You will also then get follow-up activities so students can consolidate their learning and stretch their knowledge further.



## Home Educator Sessions – onsite and digital sessions

Here at the Royal Observatory Greenwich, we engage all types of learners in the formal learning programme and home education groups are welcome to take part in our school programme. Below you will find some useful guidelines to help you make the most of your visit.



### What is the home education group offer?

Home education groups can book into one of our **Discovery Day** sessions. **Discovery Days** are designed to be flexible visit days. It is up to you which sessions you select for your **Discovery Day**. You can choose from: a planetarium show, an *Ask the Astronomer* session, a visit to the historic north site, use of the lunchroom or all of these!

Alternatively, home education groups can book **digital sessions** – including a virtual planetarium show and an online *Ask the Astronomer* session which are delivered through Zoom or Teams.

### What is the *Ask the Astronomer* session?

During this session one of the Royal Observatory Greenwich astronomers will chat about their career path and any research they have done. They will then open the session up to questions from the students and parents. These questions can be based around careers, recent discoveries, something they have found out that day and want to know more about or even something they have always wanted to know about space science.

### How much does an onsite visit cost?

Visits including a planetarium show and an *Ask the Astronomer* session carry a charge of £144 for a group of up to 30 students (maximum capacity). If you wish to book only one of these elements, you can do so at a charge of £90 for a Planetarium show (for 30 students) and £90 for an *Ask the Astronomer* session (for 30 students). The minimum number of students required to book a home education visit is 10. The entire group (inclusive of all extra adults/siblings) must be at least 15. Please ask the bookings team for information on costs for groups smaller than 30 students.

**How much does a digital session cost?**

The virtual planetarium show and Ask the Astronomer session each carry a charge of £60 for a group of up to 30 students.

**Are there resources I can use before and after the visit?**

Yes - lots! We have a large selection of resources available on the website that can be used either before a visit to introduce new topics, or as a follow-up afterwards. You'll find them here on our Astronomy learning at home page: <https://www.rmg.co.uk/schools-communities/learning-home-royal-observatory>

## Temporary Exhibition gallery

On your way to the planetarium, stop off to have a look at the images in this temporary gallery – the theme of which changes every so often to tie into a seasonal astronomy focus.

### The Historic Observatory

The Royal Observatory at Greenwich, was founded by Charles II in 1675 and is one of the most important historic scientific sites in the world so don't forget to have a look around and soak up some of the history too. We have developed visit guides and trails for KS3, KS4 and Post-16 which you can find on our website to download and print before your visit if you would like extra activities to do.

<https://www.rmg.co.uk/schools-communities/visit-guides-activities>



**The Prime Meridian** - every place on Earth is measured in terms of its distance east or west from the Greenwich Meridian, which divides the eastern and western hemispheres of the Earth, just as the Equator divides the northern and southern hemispheres. Since the late 19th century, the Prime Meridian at Greenwich has served as the reference line for Greenwich Mean Time. It can now claim to be the centre of world time and was the official starting point for the new Millennium.

**Flamsteed House** – this is the original Observatory building at Greenwich, designed by Sir Christopher Wren in 1675 on the instructions of King Charles II. Take a fascinating glimpse into the apartments where the Astronomers Royal and their families lived and worked. Tour the beautiful Octagon Room, designed to observe celestial events including eclipses, comets and planetary movements then see one of the world's earliest public time signals, the bright red Time Ball, on top of Flamsteed House.

**Time Galleries** - The award-winning time galleries explore our need for accurate timekeeping and the role it plays in our everyday lives. Find out about two British solutions to the longitude problem, including Harrison's famous chronometers. Watch our horology conservators at work and learn about the provision of accurate timekeepers for the Navy. Explore the history of the development of timekeeping and find out about the role of time in our everyday lives.

**The Meridian Galleries and Great Equatorial telescope** - explore a display of historic telescopes, including the Great Equatorial Telescope, which is the largest of its kind in the UK and the seventh largest in the world. Completed in 1893, it was designed to keep the Royal Observatory at the forefront of contemporary astronomy. Visiting this section is free to schools that have booked onto one or more of our education sessions.

## Onsite visit information

### Supervision

You are legally responsible for your group at all times, whether they are visiting the shop; having lunch; in a planetarium show, workshop, or looking around the galleries. Please ensure that you have sufficient staff with your group throughout the visit:

- KS3 and KS4 - 1 adult per 10 students.
- Post-16 – 1 adult per 16 students.

### Arrival and Departure

On arrival you will be greeted by a member of our schools hosting team, who will provide you with orientation and take you to a place where you can store bags and coats. You may visit the PHP foyer to collect bags and coats at the end of your programme before you leave the Royal Observatory. Note that if you intend to visit the historic site you may leave your bags and coats and collect them later.

### Storage Facilities for Bags and Coats

Bags and coats are stored in cages in the Planetarium Foyer for groups who have booked a lunch space, with one cage used for bags (lunches) and another for coats. At lunch time you are responsible for transporting the cage in which lunches are stored to the lunchroom. These cages must be returned to the Planetarium Foyer after lunch. The space is permanently occupied, so possessions are secure. However, many students like to take small bags and valuables with them.

### Lunch Facilities

If you require a lunch space, please make sure you have one booked prior to your visit. Due to limited space, lunchrooms are only offered to schools who have booked a full science programme. Lunch facilities are provided on the first floor of the Astronomy Centre. Capacity is limited and groups must adhere strictly to the lunchtime listed on the Visit Schedule. Please ensure the lunchroom is left clean and tidy after use. In good weather, many groups choose to enjoy a picnic in Greenwich Park.

### Toilet Facilities

A disabled toilet is available next to the lunchroom for emergencies or use during lunch time. The main toilets are on the lower ground floor, next to the Temporary Exhibition gallery. An early morning toilet stop is advised before programmes commence.

### The Shop

The shop is also on the lower ground floor. If you would like to visit the shop you are advised to do so at the end of your visit. You are strongly advised not to visit the shop just prior to your planetarium show, as show start times cannot be delayed to accommodate students in the shop.

### The Café

Hot drinks and food are available for teachers in the café. However, please note that you are legally bound to ensure that the requisite number of teachers remain with your groups. Older students are welcome to make purchases from the café if they so desire.

## Digital session Information

### Supervision

You are legally responsible for your group at all times. Please ensure that you have sufficient staff on every digital session with your group. If students are joining from home, please be sure to pass all relevant information on to their parents:

Sessions to be streamed in school - At least one member of teaching staff must be in the session at all times. Pupils will not be allowed access into sessions until there is sufficient teacher or group leader supervision.

For students joining a session from home aged:

7-13 years, they must have an adult within the same social space of their home at all times.

14-18 years, they must join the session from a social space in their home.

Find more information about keeping students safe during a digital session in our [online safeguarding policy](#).

### Joining a session

Our sessions are delivered via Zoom and Teams. Once your booking is confirmed, you'll be sent the joining link along with a tech support guide. Not only will it help you setup and troubleshoot any issues you might come across, but it will also outline how you'll be able to communicate and interact with us on the day.

Be sure to join the session no less than 10 minutes in advance of your session to ensure it begins on time.

## How to Organise A Visit?

There can be a lot to think about when organising a school trip, so we have come up with a ‘to-do’ list to help you to make sure you have everything you need to make your visit to the Royal Observatory Greenwich as enjoyable as possible. If you have any questions don’t hesitate to get in touch with the bookings team or take a look at the website.

### Step one – choosing your sessions.

**Top tip – book early.** Our sessions are very popular, time slots are limited, and all sessions must be booked in advance. We recommend choosing your sessions and booking them as early as possible to avoid disappointment.

### Payment of sessions

#### Onsite school sessions

To make sure your day runs as smoothly as possible we would highly recommend paying for your session when you book. Payment in advance can be taken by credit or debit card only. If you choose to pay on the day, payment by cash, cheque, credit/debit card will be accepted. Please note that failure to pay for sessions prior to them commencing will result in your group not being allowed to take part in the session.

**Please also note that we do not invoice schools for the onsite school sessions.**

#### Digital school sessions

Payment in advance can be taken by credit or debit card only. Please note that failure to pay for sessions prior to them commencing will result in your group not being allowed to take part in the session.

**Please also note that we do not invoice schools for the digital school sessions.**

Step 1 Checklist Questions	For more information	Complete?
What date and time would you like to visit? Do you have some alternatives?		
How many students and accompanying adults will be visiting?	See the <i>Programme Guide</i>	
Would you like to book a Discovery Day or Space Spectacular Day?	See the <i>Programme Guide</i>	
What sessions would you like your visit to be made up of?	See the <i>Programme Guide</i>	
Would you like to book some time in the lunch space?		

### Step 2 – booking.

If you’d like to visit us at the observatory for your session, please complete the [onsite school sessions booking webform](#)

Alternatively, if you’re looking for an online session to join from your school, please complete the [digital school sessions webform](#)

Our bookings team will get back to you once they’ve received your completed webform.

Step 2 Checklist Questions	For more information	Complete?
Have you checked that the booking information sent by the bookings team is as it should be?	See booking webform	
Have you read the cancellation policy?	See booking webform	
If you have more than one class visiting at once, have you split them up into groups of 30 and labelled them A, B, C, D?	See booking information you have been sent.	
Have you ensured that you have enough staff to supervise each group?	See the <i>Programme Guide</i>	

### Step 3 – planning.

**Top tip** – prepare for each of your visits carefully to ensure it runs smoothly on the day.

**Your journey** - while we will do all we can to accommodate school groups who are delayed in transport, it is not always possible to reschedule learning sessions and planetarium shows for groups who arrive late for their sessions.

**Your staff** - please provide all accompanying adults with a copy of the timetable for the day and make sure you have enough supervising adults to satisfy the safety requirements.

If you have more than one class, before you arrive split your students into the relevant number of groups as indicated on your booking sheet.

**Your students** - please remind students to act responsibly while on site and ensure they know what to do if they get lost. Site staff are fully briefed on 'lost child' procedures and are always on hand to help. [Risk assessment information can be found on the website](#). You can also prepare your students for learning - full information on each of our pre- and post-visit resources and extension activities is available [on the website](#). Please check back frequently as this webpage is regularly updated.

Step 3 Checklist Questions	For more information	Complete?
Would you like to do a pre-visit?	Ask the bookings team for details.	
Have you read the health and safety requirements?	For onsite sessions: <a href="https://www.rmg.co.uk/schools-communities/booking-onsite-schools-session">https://www.rmg.co.uk/schools-communities/booking-onsite-schools-session</a> For digital sessions: <a href="https://www.rmg.co.uk/schools-communities/booking-digital-learning-session">https://www.rmg.co.uk/schools-communities/booking-digital-learning-session</a>	
Would you like your class to complete any of the challenges in the visit guides?	These are available to download free from the website. <a href="https://www.rmg.co.uk/content/visit-guides-activities">https://www.rmg.co.uk/content/visit-guides-activities</a>	
Do you have all the information you need to plan your journey?	See the website for details.	
Have all accompanying staff been briefed?		

### Step 4 – following on.

**Top tip** – tell us how we did and get more involved with our teacher forum.

Step 4 Checklist Questions	For more information	Complete?
Would you like to get more involved with the teacher forum?	Sign up to our teacher forum: <a href="http://www.rmg.co.uk/teachersforum">www.rmg.co.uk/teachersforum</a>	
Would you like to keep updated about the ROG's schools offer, resources and events?	Subscribe to our monthly e-newsletter: <a href="http://www.rmg.co.uk/schoolnews">www.rmg.co.uk/schoolnews</a>	
Have you seen the Classroom Resources?	<a href="https://www.rmg.co.uk/schools-communities/all-astronomy-science-resources">https://www.rmg.co.uk/schools-communities/all-astronomy-science-resources</a>	
Tell us what you thought, please get in touch, and tell us what you thought of your visit.	Follow the link to our online evaluation on your bookings sheet: <a href="https://www.rmg.co.uk/form/school-session-feedback">https://www.rmg.co.uk/form/school-session-feedback</a>	