



Astronomy Section
of La Société Guernesiaise

Educational Outreach Prospectus 2022/2023

David Le Conte Astronomical Observatory



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Front page image shows the Veil Complex 2,400 light years distance in the constellation of Cygnus. It is a supernova remnant of a star 20 times more massive than our Sun, which exploded between 10,000 and 20,000 years ago. Many elements within our bodies are created in such supernovae. The image was taken in Guernsey and represents a total integrated imaging time of 6 hours. Image credit: J.M. Dean

1. Introduction

This document provides information for those wishing to visit the David le Conte Astronomical Observatory with a group of children.

We welcome visits from island schools and youth organisations. Typically, they take place in the evenings during the hours of darkness, in the late autumn, winter and early spring months. A visit might consist of a lecture followed by observing through our research-grade telescopes. If it should be cloudy on the night we will extend the lecture, or offer an additional short presentation to replace the viewing.

Below you will find all the relevant information for planning your visit. In addition, you will find details of the lectures we can offer for different age groups. Generally, we do not provide bespoke lectures, but if you have a specific need then please contact us further to discuss how we might accommodate you.

Our educational outreach is offered free. However, we rely on donations to run and maintain the observatory site, so contributions are gratefully received.

2. The Astronomy Section

The Astronomy Section of La Société Guernesiaise was formed in 1972. The current observatory site was opened in April 1991 by Nigel Henbest and the late Heather Couper and the original roll-off roof telescope building was added in 1993 and opened by the late Sir Patrick Moore. In 2022 we replaced the telescope building with a new, larger structure specifically designed to be dual use – observing and as an extra classroom with presenting facilities.

We have a current membership of about 80, who have a broad spectrum of interests including: the solar system, galaxies, nebulae, stellar evolution, cosmology, black holes, the history of astronomy and astrophotography. Members hold a mixture of BSc and MSc degrees, and PhD doctorates in science and astronomy subjects, and three members who lecture in our educational outreach programme are Fellows of the Royal Astronomical Society.

Some of our past junior members have attended university, studying subjects such as physics, astronomy and astrophysics, and have subsequently gone on to work as astronomers and astrophysicists.

The Astronomy Section is a member of the British Astronomical Association and the Federation of Astronomical Societies.

We are manned entirely by volunteers, most of whom work full time. We do not ask for payment for educational visits. However, the cost of running and maintaining the site and equipment is very expensive and therefore donations are always welcome and assist us in continuing to provide a public astronomical observatory.

3. Where we are

We are situated in one of the darkest parts of the island, ideally suited to observational astronomy, at:

Rue du Lorier, St Peter's, Guernsey, GY7 9JU

To find us, we are about 100m further up the hill from La Houquette Primary School , just behind the bunker on the left, coming from the coast. Turn into Rue du Lorier, and then immediately right, into our car park adjacent to the bunker. Proceed around the back of the bunker where you will find our main building with double doors and the wooden roll-off roof telescope building. Usually, our car park provides sufficient capacity for educational visits, however, on the rare occasion it might not you may use the car park at La Houquette School. If you use the school car park, be aware that there is no street lighting, so we recommend high visibility clothing and a torch. For further details please see map in Appendix C.

4. Contact details

To make a provisional booking please use our online booking form:

<http://astronomy.org.gg/events/outreach>

For general enquiries please contact:

astronomy@societe.org.gg

You may find general information on our website:

<http://www.astronomy.org.gg>.

5. Facilities

On site we have a meeting room and a modern roll-off roof telescope building; both are equipped with projector/OLED flat screen facilities and may be used for lectures, but they have different seating capacities.

Seated capacity in our meeting room is 18 visitors (children and adults combined) and in the telescope building it is 12 children plus up to 3 accompanying adults. However, the total visiting group size should not exceed 30 (children and adults combined).

Our telescope building is equipped with two research grade telescopes: a 16" diameter Schmidt Cassegrain reflector and a 5" refractor. They sit on a computer controlled mount that tracks the night sky. We also have additional telescopes that we may occasionally use; these include a 12" Dobsonian reflector and 8" Schmidt-Cassegrain which are computer controlled and sit outside on concrete pads.

There is a single unisex outhouse-type toilet with hand washing facilities.

6. What we can offer

We can offer visits to children from 4 years to 18 years of age. Please see Appendix A for details of talks and recommended ages groups. Visits are typically accommodated on Thursday and Friday evenings, ideally starting at 7 to 7.30 pm. However, for the youngest age group we can usually start earlier if required. If these nights do not suit a visit, then we will make every effort to offer an alternative evening but cannot promise it. Visits can last between 1 and 1 ½ hours. We like to add a little extra time at the beginning for the occasional late arrival.

Ideally, we aim to offer a lecture and viewing through the telescopes. However, we cannot guarantee clear skies, so if it is cloudy, we will extend the chosen lecture, provide an additional short lecture or simulated presentation of the night sky, whichever we deem most suitable for the visiting group.

Viewing will include identification of the main constellations and asterisms, how to find north, and objects currently in the night sky. Attention is given to the planets, Mars, Jupiter and Saturn if they are visible.

If you wish a daytime visit to view the Sun, please contact the La Société Guernesiaise Educational Officer by email: ecl@societe.org.gg or Astronomy@societe.org.gg. We will be offering solar outreach visits to schools in the coming year, visiting the school with portable solar telescopes. Alternatively, you may choose to visit the observatory to view the Sun.

Please note our presenters are there to offer instruction, and we expect the adults accompanying children to provide behavioural supervision, and ensure that children are attentive at all times. Their behaviour should respect sensitive and expensive equipment, some of which is heavy and could potentially cause injury.

7. Safeguarding

We have a Safeguarding Children and Vulnerable Adults Policy. A copy can be provided upon request. Many of our members who engage with visiting groups have attended and passed the Islands Safeguarding Children Partnership Level 1 and Level 2 courses. In addition, some hold a current Advanced Disclosure and Barring Service check.

8. Public Liability Insurance

We carry a £5 million Public Liability Insurance; a copy of confirmation can be provided upon request.

9. Other policies

We have Data Protection and Data Security Policies. We also have an Equality and Diversity Policy. Copies can be provided upon request.

10. Covid Policy

Our main building and telescope building are quite small. Therefore, we ask that before attending an event please take a Lateral Flow Test and do not attend if positive. Do not attend if you are feeling unwell and have Covid symptoms.

Hand sanitiser and anti-bacterial handwash is available on the premises and should be used. If a visitor develops Covid in the few days following a visit please inform the Astronomy Section Secretary by email: secretary.astronomy@societe.org.gg

11. Feedback

Following your visit we welcome feedback, positive or negative. If there are any topics that you might like us to cover on a future visit, please let us know and we will try to add them to our inventory of talks. You can find a feedback form at the end of the prospectus.

Appendix A

Talk Details

Note: The age ranges are a guide. There is some flexibility depending on the individual group's abilities which should be determined by the school staff.

1. Journey into Space

Age range: Reception and Year 1 (4 to 6 year olds)

Time: 45 minutes

Prior knowledge required: none

Description:

Take a ride in a spacecraft and travel to the Moon, Sun and eight planets in the Solar System, finishing on Neptune's moon Triton, then return in your spacecraft to Earth.

This talk gives an introduction to the Sun, Earth, Moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune and Triton. It introduces the idea of orbits and the basic structure of our Solar System.

2. The Solar System Introduction

Age range: Years 2 and 3 (6 to 8 year olds)

Time: 45 minutes

Prior knowledge required: none

Description:

A description of the structure of the Solar System, including the Sun, planets, dwarf planets, asteroid and Kuiper belts. Using actual video footage, it looks at the space mission OSIRIS-Rex, which retrieved a sample from the surface of asteroid Bennu.

3. The Solar System and Introduction to Exoplanets

Age range: Years 4 to 6 (9 to 11 year olds)

Time: 45 to 60 minutes

Prior knowledge required: an elementary understanding of the structure of the Solar System, although this is briefly reviewed with a question and answer session.

Description:

The talk starts with a recap on the Solar System's basic structure and extends it to the Oort Cloud and comets. The talk then looks at the OSIRIS-REx mission to asteroid Bennu, and discusses the importance of such missions in understanding how life might have evolved on Earth. The talk goes on to consider the formation of the Solar System and introduces the topic of exoplanets and other solar systems.

4. Cosmology

Age range: Year 7+ (11 year olds+)

Time: 45 minutes

Prior knowledge required: none

Description:

The Universe began 13.8 billion years ago with the Big Bang and has been expanding ever since. We explore how light from distant galaxies reaches us, the difference between dark matter and dark energy and ask how the universe might end.

5. From Pythagoras to Einstein

Age range: Year 7+ (11 year olds+)

Time: 45 to 60 minutes

Prior knowledge required: none

Description:

It starts with a review of some historical astronomers, physicists and mathematicians starting with the ancient Greeks. There is an examination of what the ancients knew about the Earth and how it fitted in to the rest of the solar system. It looks at how the early scientific method developed and overturned the dogma of earlier centuries. We look at the way in which objective fact was derived from observation and experiment; then see how mathematics helped to build modern theories of how the Universe works.

6. Cosmological Distance Scale

Age range: Year 7+ (11 year olds+)

Time: 45 to 60 minutes

Prior knowledge required: none

Description:

This talk examines how we try to turn what looks like a 2-dimensional image of the sky into a 3-dimensional model. To do this we need to calculate the distance to astronomical objects - from the relatively close to the extremely distant. We look at a number of techniques that are used for objects of various distances. An attempt is made to explain how the various techniques are used to calibrate each other and what this ultimately means for our understanding of the size of the Universe.

7. Stellar Evolution

Age range: Year 9+ (13 year olds+)

Time: 45 to 60 minutes

Prior knowledge required: none

Description:

We explain how we obtain an understanding of how stars are born, mature and eventually die by piecing together evidence from stars at various stages of their lives. This involves an examination of nuclear processes that take place within stars and how we try to organise data from the stars that we can observe. We explain how the Hertzsprung-Russell diagram is formed and what it can tell us about how stars age. There is an analysis of the various fates that lie in store for stars of different initial masses.

8. Light – A User’s Manual

Age range: Year 9+ (13 year olds+)

Time: 45 to 60 minutes

Prior knowledge required: none

Description:

In this talk we explain how we came to understand the nature of light. It starts by looking at what the ancients thought about light and how we came to realise that light has a finite speed. It looks at Newton's work in his book "Opticks" and the wave theory of light. Then we explain how various sorts of "invisible" light came to be discovered and then extend this idea to the whole of the electromagnetic spectrum. We look briefly at the particle theory of light, wave-particle duality and the photoelectric effect. Then we examine how the James Webb Space Telescope is going to revolutionise astronomy in the years to come.

9. An Introduction to Astrophotography with a DSLR

Age range: Year 9+ (13 year olds+)

Time: 60 minutes

Prior knowledge required: none, but a basic understanding of cameras and optics might benefit.

Description:

Astrophotography requires the photographer to capture photons from targets that are tens to thousands of light years away. This talk gives an introduction to the equipment required, how to capture the images and calibrate them for noise removal. *Please note:* there is no telescope viewing, this is a lecture only.

10. Artemis – to the Moon and beyond

Age range: Year 9+

Time: 60 minutes

Prior knowledge required: none.

Description: The Artemis space program is an international effort to place humans onto the lunar surface and establish a long term presence for detailed exploration. This will involve building *Gateway* which is an orbiting space station around the Moon and construction of the *Artemis Base Camp* for extended stays on the lunar surface. Further on from this, the aim is to use these facilities as a staging post for manned missions to the planet Mars.

Appendix B

Risk Assessment for Educational Visits

During your visit Astronomy Section members are there to provide instruction, and we expect the adults accompanying children to provide adequate behavioural supervision and ensure that children are attentive at all times. Their behaviour should respect sensitive and expensive equipment, some of which is heavy and could potentially cause injury. There should be no running around the site or within the buildings. We ask that you be attentive please to all instructions given by members.

Car Parking

Car parking is available on entry to the Observatory. The surface is gravelled and therefore slightly uneven, but there are no exceptional surface hazards. Care should be taken when entering/leaving as there is a small dip (about 50 cm) on the left hand side as you enter the car park. There are two motion-sensor lights that illuminate the car parking area. They may occasionally be switched off, so it is advisable to bring a small torch.

Rear Grassed Area

As you walk round to the rear, the outside area is grass. It is fairly even, but not entirely flat and it may be damp from rain or dew, wearing suitable footwear is recommended. There are two red lights outside that illuminate some areas of the site, typically these will be on, but they give limited illumination so take care when moving around all external areas in the dark. It takes approximately 20 minutes for your eyes to fully adapt to the dark, after which you will be able to see more, so avoid using a white light torch and be extra careful until your eyes fully adapt to the darkness. The edging to the grassed area has been left to grow to provide habitat to wildlife and contains brambles and nettles.

There are four outdoor concrete pads to provide a flat surface for additional telescopes. On the large concrete pad in front of the main building there is a raised double power socket (about 10 cm height). When small telescopes are in use outside, this socket will typically be covered by the telescope. Otherwise, it will have a white plastic chair over it, in which case please do not remove the chair. The three smaller concrete pads might have telescopes on them, if they do there may be trailing power leads from the timber telescope building. If there are, they will have white plastic chairs over them. Do not move the chairs. When moving around any of the telescopes outside please be careful of any associated cables/leads and follow the instructions of the person operating the telescope. Telescopes are motor driven and slew at speed to observing targets, the operator will advise when this is about to happen and make sure everyone is standing at a safe distance. For younger children we have steps that can be used to allow them to reach the eyepiece, the person operating the telescope will provide instruction and may steady the child with a supporting hand.

Main Building

The main building is used for lectures and there is a single door entry from the outside concrete pad with a very slight sill of about 1 cm height. Typically, there will be either white or red light illumination inside. There are no known hazards. Children should not touch the displays on the walls or items around the room on the horizontal surfaces. Members of the public are not generally permitted in the kitchen area to the rear. If dark outside then take care

in exiting the main building, allowing for your eyes to adjust to the darkness. On the right hand side immediately inside the door is a water and CO2 fire extinguisher.

Timber Telescope Building

To enter the telescope building there are two steps up to a single door, which have non-slip safety treads. There is a single white-painted handrail and on the opposite side is the opened door. There is a non-slip mat at the entrance and non-slip flooring throughout. Typically, there will be a red light on in the telescope building when observing, this is over the doorway and helps to illuminate the entrance/exit, care must be taken on and around the steps.

The telescope is motor driven and will slew at speed to observing targets, the operator will advise when this is about to happen and make sure everyone is standing at a safe distance. Do not stand between the telescope and two long walls of the telescope building as the gap can be limited when the telescope moves. The telescopes are situated at height to look over the walls and it may be necessary for children to use steps. The person operating the will provide instruction and may steady the child with a supporting hand.

There is a 40 watt heater attached to the telescope column at floor level, it can get warm, but it is typically out of reach for visitors.

The telescope building may serve as an additional classroom, in which case there might be white or red lighting.

Observing Protocols

It is helpful if those waiting their turn to look through a telescope can queue, and then, once they have had a look, move away from the telescope so that the next person can observe. However, we are happy for people to take their time to ensure that they get a good telescope view. There are no eye hazards from observing objects visible in the night sky. We generally guide viewers to the eyepiece of the telescope. Be careful you do not hit your head on the telescopes when moving forward to view and when moving away afterwards. A small stepladder is available for use when the telescope eyepiece is in a high position, especially for children who may not be tall enough. The ladder should not be too close or too far, the child should be able to stand upright, without unduly leaning forward or backward, and should not mount higher than the second step, holding onto the rail provided on the ladder. The telescope operator may use a steadying hand to support the child.

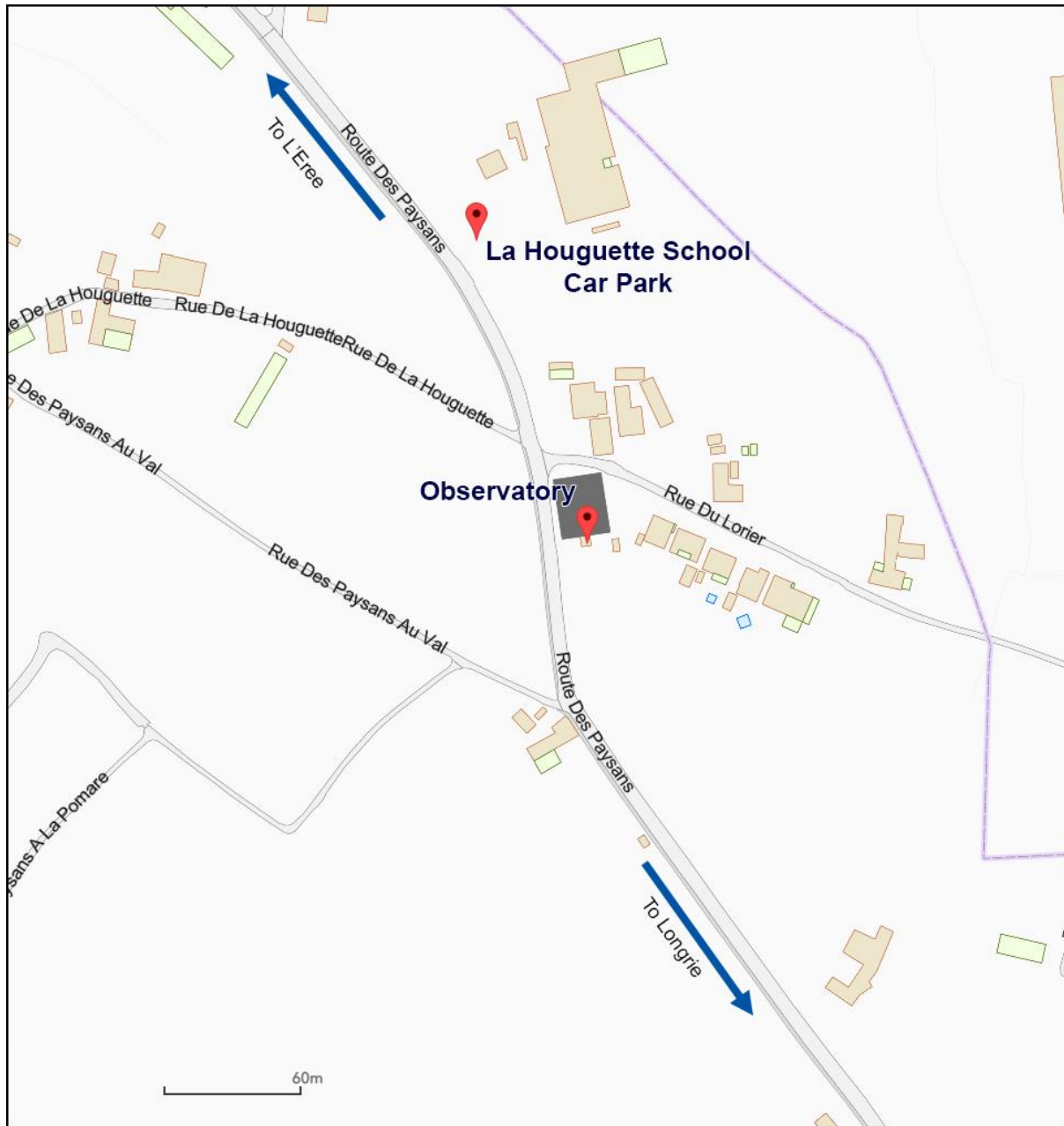
Please do not touch the telescopes, as this can cause them to go out of alignment, which takes time to re-establish. Please be attentive to guidance from Astronomy Section members at all times.


Solar Observing

Generally, the same rules above will apply. All our telescopes are fitted with appropriate filters to allow safe solar observation. These filters must not be removed or tampered with, and all instructions given by Astronomy Section members must be followed. Children should be advised of the dangers of looking at the sun directly or through optical instruments without the correct glasses or filters. An additional solar observing risk assessment will be provided prior to a solar observing visit and can be found [here](#).

Appendix C

Location Map for the David Le Conte Astronomical Observatory.



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Booking Form

This can be submitted online by clicking [here](#).

School:

Name of Contact:

Email:

Telephone/Mobile:

Group Details

Age Range:

Number of Children:

Number of Supervisors:

Date(s) Requested:*

* If possible, please give alternative dates.

Presentation Requested:

Feedback Form

This can be submitted online by clicking [here](#).

School:

Date of Visit:

Name of Contact:

Email:

Title of talk:

Feedback about your visit and/or suggestions:



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Revision 0 : 12/06/22