

Discovering Slough and the Universe



Herschel
200

sloughmuseum

Presentation for Slough Cultural Education Partnership and Arts Lead Forum June 2022

Discovering Slough and the Universe

- To give updates about Slough Museum – where we are now (including literally)
- To share information about the Herschel 200 programme and how to get involved
- To demonstrate how the Herschel family history in Slough has national, international and intergalactic significance
- To provide ideas for Slough art teachers about resources and inspiration from Slough Museum's collection to support the art curriculum and the cross-curricular art and design opportunities
- To find out what else is needed to shape the offer for Slough schools and students

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HERSCHEL

The Early Years

When William Herschel died in 1822 he was a famous astronomer and telescope maker, known for discovering a planet and for mapping the stars. He had come a long way from his modest upbringing.

William was born in 1738 to a humble family in Hanover (modern day Germany). His father, Isaac, was bandmaster of the Hanoverian Guards, and William joined him in the band as an oboist and violinist when he was fourteen, alongside his elder brother, Jacob. When the French invaded Hanover in 1757, Isaac convinced the then eighteen-year-old William to flee and seek sanctuary in England. William arrived in London as a refugee and survived for two years copying music scores, as well as teaching and performing where he could.

William was also an aspiring composer. Realising that London was already full of musicians and composers, he took up a position in charge of a small military band in Richmond, Yorkshire. It was a part time post, and allowed William the chance to compose and work as a freelance musician across the north of England.

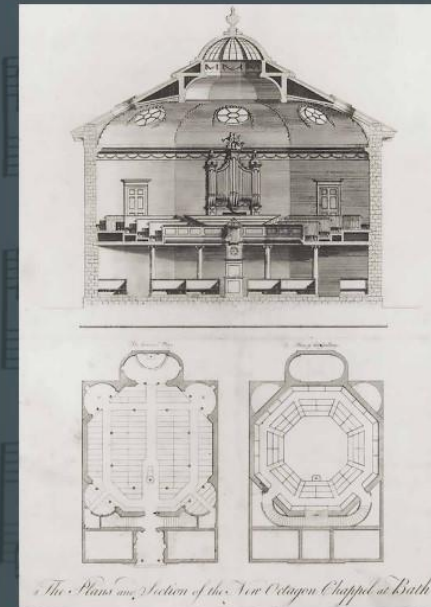
It was a lonely existence, and William suffered from homesickness. During his long night-time journeys on horseback, William took up a hobby his father had introduced him to as a child, studying the stars. He also read avidly about stellar theory, devouring books by astronomers James Ferguson, Robert Smith and Thomas Wright.

Securing a position as the organist at the Octagon Chapel in Bath in 1766 enabled William to finally make a home for himself, which allowed his astronomical curiosity to flourish.



William Herschel in around 1760.

Courtesy of the Herschel Family Archive



The Plans and Section of the New Octagon Chapel at Bath

Plans and Section of the New Octagon Chapel at Bath.

Bath & North East Somerset Council © bathneme.co.uk

Background

Sei Sonate, composed by William Herschel.

Courtesy of David Shuker

HERSCHEL

The Innovator

The focus of William Herschel's curiosity about the night sky set him apart from his fellow astronomers. While others confined themselves to the solar system, William sought to explore deep space. In order to do this, he realised he needed bigger telescopes to capture more light. When he discovered the mirrors he required did not exist, William went about learning how to make his own.

In 1774, only a year after purchasing his mirror making equipment, William successfully assembled his first home-made telescope, and was confident enough in its quality to start his first observation journal. William would go on to make bigger and bigger telescopes, his most successful was his 20-foot, and his largest, the enormous 40-foot.

William decided his first major project would be to catalogue double stars. It was during this project, on 13 March 1781, that he came across 'a curious either nebulous star or perhaps a comet'. It would take many more observations, and the review of astronomers across Europe, to finally identify this object as the planet Uranus, or 'Georgium Sidus' as William first named it, after King George III.

It was through his constant development and experimentation that William made what is considered his greatest discovery, infrared radiation. He wanted to observe sun spots, and experimented with different coloured lenses to find the best one for protecting his eyes from the sun's rays. William's detailed experiments with the temperature of different coloured light, as divided by a prism, led to this extraordinary discovery, and revolutionised astronomy in the 20th and 21st centuries.



Image of Uranus taken by Voyager 2, the first spacecraft to fly past the planet.
NASA/JPL



Diagram of William Herschel's infrared light experiments, 1800.

Courtesy of the Royal Astronomical Society, *Philosophical Transactions of the Royal Society*, vol. 90 (1800), plate XI, p. 292

Background

William Herschel's observation journal.

Courtesy of the Royal Astronomical Society, RAS MS Herschel W 2/1.2

HERSCHEL

A Family Enterprise

William Herschel was a dedicated, meticulous observer and a pioneer telescope maker, but he would not have achieved the heights of eminence he reached without his siblings, Caroline and Alexander.

Caroline originally trained as William's observing assistant and then became an equal partner. William would call out detailed descriptions of what he saw through his telescope and Caroline would meticulously note down all the data, consulting time pieces and star catalogues to make the required calculations. She would also copy out and prepare the data for publication. She was the first woman to be paid as a professional astronomer.

When William was away from home, Caroline took up the observing mantle herself, sweeping the night sky for unusual objects. She achieved great success in this, discovering eight comets and fourteen nebulae.

William's brother Alexander, also a professional musician in Bath, proved himself to be a fine mechanic and assisted William in making telescopes. Alexander remained in Bath when William and Caroline left, but he spent his summers with them in Slough, making the brass-work for William's telescope making business.

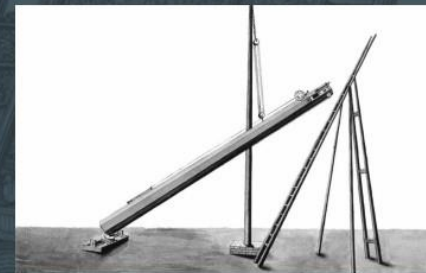
Alexander also turned his hand to other gadgetry, making an astronomical clock for Caroline to use during observing sessions, and mechanisms for William and Caroline to communicate with each other during these sessions.

William and Caroline's observing 'sweeps', supported by machinery made by Alexander, were more accurate than any stellar observation that came before them. They added 2,510 nebulae and star clusters to the approximately 100 previously catalogued by French astronomer, Charles Messier.



Copy of a portrait of Caroline Herschel, taken by Tielemen in 1829.

Courtesy of the Royal Astronomical Society.



The first version of the 20-foot telescope made by William and Alexander Herschel.

Courtesy of the Royal Astronomical Society, RAS M5 Herschel W 5/15 No.4

Background

A copperplate engraving of the large 20 foot telescope, 1794.

Courtesy of the Royal Astronomical Society, RAS M5 Herschel W 5/15 1

HERSCHEL

The Slough Story

When William Herschel took up his position as the King's Astronomer, he and Caroline left Bath to be near Windsor Castle. They eventually settled in Observatory House, Slough, on the corner of Windsor Road, now named Herschel Street. It was here that William married, raised his son John and remained for the rest of his life. He died on 25 August 1822 and is buried in St Laurence's Church.

It was in the garden of Observatory House that William built his 40-foot telescope. For fifty years it was the largest telescope in the world and was so big it even featured on ordinance survey maps. It was dismantled on New Year's Eve 1839.

Observatory House was demolished in the late 1960s. The *William Herschel Memorial* sculpture, created in 1969 by artist Franta Belsky, now marks the former site of the house.

The Herschels' legacy lives on in Slough, with a street, school, and doctor's surgery bearing the family name. The Herschel Arms pub even depicts the landlord as William on its sign. Slough's oldest green public space was renamed Herschel Park in 2001, and the design for Slough Bus Station was inspired by William's discovery of infrared. The name and design of Observatory Shopping Centre are references to the Herschel family.

Perhaps the most enduring legacy however, away from the royal court and the cosmos, is that Slough continues to be a town of pioneers and innovators, a place where people discover, invent and create. A place where people – like William and Caroline – come from all over the world, to make their home.



Photograph of Observatory House, Slough, taken in the early 20th century.

Slough Museum

Background Observatory House, Slough, 1924.

Courtesy of the Royal Astronomical Society, RASC Photo 2, BN/08



Stained glass window in St Laurence's Church depicting the solar system along with William Herschel and his telescope.

Designed and made by Andrew Taylor FMGP, andrewstaylorarts.co.uk

HERSCHEL

Timeline

William Herschel, pastel by John Russell, 1790s.
Herschel Museum of Astronomy



15 November 1738
William Herschel born

13 November 1745
Alexander Herschel born

16 March 1750
Caroline Herschel born

1753 – William joins the band of the Hanoverian Guards

1756 – William's first visit to England

1757 – William escapes to London after the French defeat the Hanoverian Guards at the Battle of Hastenbeck

1766 – William moves to Bath

1770 – Alexander moves to Bath

1772 – Caroline moves to Bath

1774 – William assembles first reflector telescope and starts his observation journal

1779 – William joins the Bath Philosophical Society

13 March 1781
William discovers Uranus

Uranus taken by the spacecraft Voyager 2.
NASA/JPL

November 1781 – William awarded the Copley Medal from the Royal Society

July 1782 – William takes up position as the King's Astronomer and he and Caroline move to Datchet

February 1783 – Caroline discovers her first nebula

1783-1802 – William and Caroline carry out systematic observations of the sky and identify 2510 nebulae

March 1786 – William and Caroline move to Observatory House, Slough

August 1786 – Caroline discovers her first comet

1787 – Caroline awarded salary as William's observation assistant by George III

8 May 1788 – William marries Mary Pitt

1789
Forty-foot telescope completed and William discovers a sixth moon of Saturn



Herschel's 40-foot telescope, 1789.
Courtesy of the Royal Astronomical Society

7 March 1792 – John Herschel born (William's son)

1800 – William discovers infrared radiation

1816 – William is made Knight of the Royal Guelphic Order

1820 – William is made President of the newly formed Royal Astronomical Society

16 March 1821 – Alexander Herschel dies

25 August 1822 – William Herschel dies

1833-1838 – John Herschel maps the southern skies from South Africa, completing his father's work

9 January 1848 – Caroline Herschel dies

11 May 1871 – John Herschel dies

HERSCHEL

The Legacy

In his later years, William Herschel turned his focus to revolutionary stellar theory. He was able to demonstrate through his numerous telescopic observations, assisted by Caroline, that stars were not 'fixed' in an ordered and mechanical universe, they were evolving. He was the first to model the shape of our Milky Way based on the distribution of stars, making space dimensional. His desire to understand the 'construction of the heavens' led to the development of modern cosmology we know today.

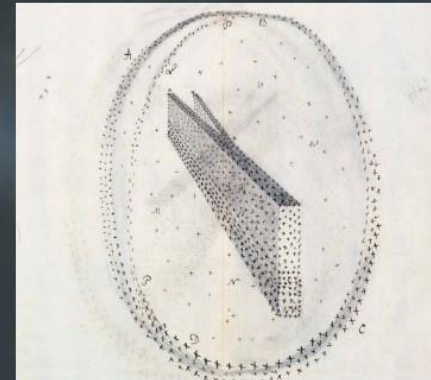
After William's death, his son, John, took on what he described as his 'sacred duty' and completed his father's work. John revised and re-ordered William's catalogues of nebulae (with assistance from his Aunt Caroline) and mapped the stars of the southern hemisphere.

In 1888 the catalogues of nebulae that William and Caroline created and John completed were consolidated and expanded by John Louis Emil Dreyer, to create *The New General Catalogue of Nebulae and Clusters of Stars* (NGC). This numbering of deep sky objects is still in widespread use today.

When William Herschel discovered infrared radiation, or 'calorific rays' as he called it, he did not realise its significance. His discovery has however, gone on to revolutionise astronomy. Telescopes launched into space to observe in the infrared include The Herschel Space Observatory, named after William, and the James Webb telescope. These infrared telescopes allow astronomers to study the birth of stars from within nebulae. It is fitting that William's discovery is now enabling astronomers to study the deep space objects that fascinated him so much.



William Herschel in old age, copy of a painting by Artaud.
Courtesy of the Royal Astronomical Society



Galactic model created by William Herschel.
Courtesy of the Royal Astronomical Society, RAS MS Herschel W 4/23

Background

Rosette nebula, taken by the Herschel Space Observatory.
ESA and the PACS, SPIRE & HSC Consortia

Discovering Slough and the Universe



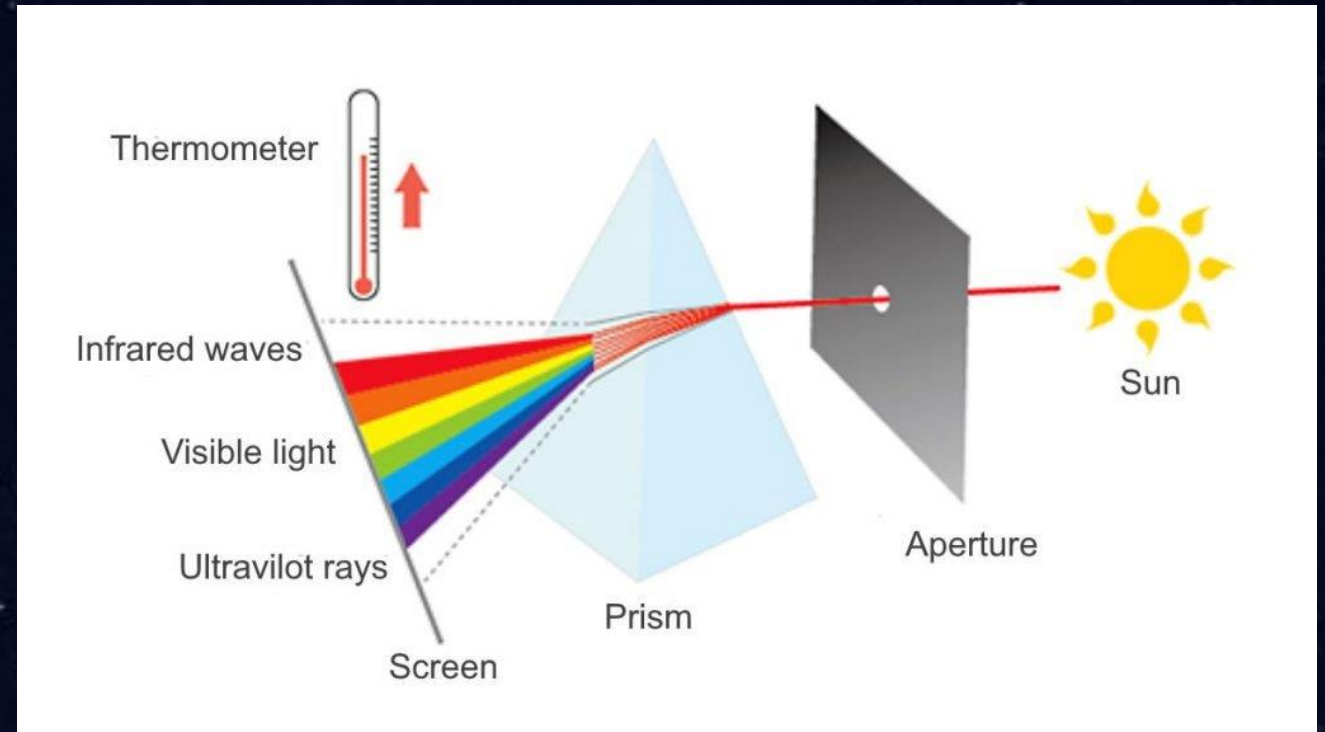
Herschel Compass – journey, maths, location tracking, moral compass, gifts, typeface

Discovering Slough and the Universe



Observatory House fireplace tile – natural history, myth, manufacture, then & now

Discovering Slough and the Universe



Infrared discovery in Slough – science, medicine, environment, portraiture, rainbows

Discovering Slough and the Universe



Cyanotype – photographic process

In 1839, William's son - Slough born John Herschel – coined the term *photography* within the European scientific community and was the first to apply the terms *negative* and *positive* to photography.

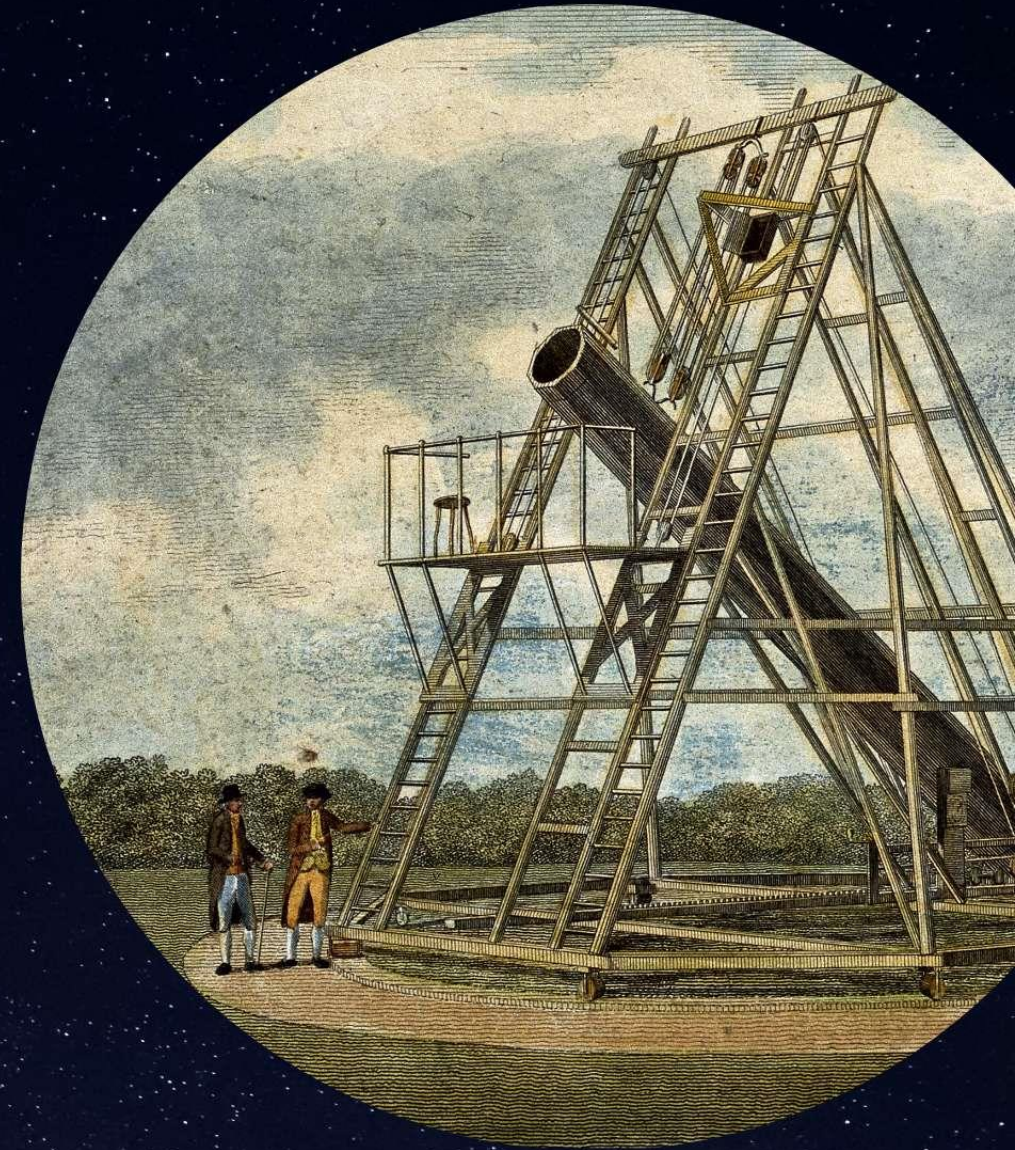
John Herschel also made numerous important contributions to photography and photographic processes, particularly in inventing the cyanotype, as a way of reproducing astronomical and mathematical notes and diagrams.

Cyanotype is a photographic printing process that produces a cyan-blue print. Engineers used the process well into the 20th century as a simple and low-cost way of producing copies of architectural plans, known as blueprints. The process uses two chemicals: ammonium iron citrate plus potassium ferricyanide that gives its deep blue quality.

Herschel 200

Discover a free programme of Slough based events, activities and exhibitions to mark the bicentenary of William Herschel's death and the astronomical heritage of our town.

For more information visit
www.sloughmuseum.co.uk
or find [@SloughMuseum](https://www.instagram.com/SloughMuseum) on social media



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Discover a free programme of Slough based events, activities and exhibitions to mark the bicentenary of William Herschel's death and the astronomical heritage of our town.



Slough Museum - in partnership with The Herschel Museum of Astronomy in Bath, The Royal Astronomical Society and artist in residence Lynda Laird, The Curve, The Herschel Arms and St Laurence's Church, Slough - are marking the 200th anniversary of the death of William Herschel - who lived, built telescopes, explored the cosmos, discovered infrared, married, raised his family and is buried in Slough.

Herschel Make with the Museum at Curve Club

The Curve

Astronomical themed family activities.

Saturdays, 11am - 12pm
28 May, 25 June, 30 July,
27 August, 24 September,
29 October, 26 November

Innovation and Discovery Pod Herschel exhibition

The Curve

Slough Museum and The Herschel Museum of Astronomy joint exhibition in one of our Pods.

From Tuesday 21 June

Summer Solstice Special

The Herschel Arms

Astronomical themed spoken word, poetry, music and quiz evening with special Stargazer Pilsner.

Tuesday 21 June, 7.30pm

Bicentenary of William Herschel's Death

St Laurence's Church

Exhibition launch, music performances and afternoon tea.

Thursday 25 August,
3pm - 5pm

An Imperfect Account of a Comet

St Laurence's Church

Light installation of 560 stars Caroline Herschel discovered, created by Lynda Laird using The Royal Astronomical Society archive.

Thursday 25 August -
Sunday 2 October

8 Comets

St Laurence's Church

Immersive sound and video performance celebrating the astronomical discoveries of Caroline Herschel to accompany An Imperfect Account of a Comet.

Friday 2 & 3 Saturday
September, 7.30pm

Create a Cyanotype

The Curve

Sun prints using a Herschel family technique.

Saturday 3 September,
12 - 2pm

Stardust Concerts

St Laurence's Church

Original composition featuring the Herschel Stars Choir and local artists.

Friday 16 & 30 September,
7.30pm

William Herschel and the Universe screening

St Laurence's Church

Friday 7 October, 7.30pm

William Herschel's birthday celebration

The Curve

Finale event with the Herschel Stars Choir and local artists to mark William's 284th birthday.

Tuesday 15 November, 7.30pm

For more information visit www.sloughmuseum.co.uk or find @SloughMuseum on social media

Make with the Museum Last Saturday of the month The Curve

Create a Cyanotype Saturday 3rd September The Curve as part of Slough

William Herschel birthday celebration Venue TBC Tuesday 15th November Choirs, singers, musicians....

Slough Museum is about more than just the universe!

The collection covers a period of around 10,000 years – from woolly mammoths to the present day and charts the development of the town of Slough, its public, social and domestic life, developments in science, technology, agriculture and industry and the impact of these on the town in the past, present and the future.

Since collecting began in 1985, Slough Museum has acquired around 3,500 objects and documents (consisting of prints, paintings, drawings; maps; numismatics; documents; decorative art; costume; geology; archaeology; occupational tools and equipment; Slough-made products & packaging; toys and other juvenilia) and 7,500 photographs.

Slough Museum has eight Pods in The Curve, the central library and cultural hub for Slough. We also run **Make with the Museum at The Curve Club** on the last Saturday of the month. These themed Pods, located over three floors, explore the heritage of the town, focusing on its nationally important industrial heritage and the history of its pioneering, vibrant community.

Also actively seeking volunteers for events, collections support, local history research and Trustees

Please lets discuss what else is needed to shape the offer for Slough schools and students

rob.harris@inbox.com