



## WELCOME

This month's newsletter looks at inventors and Scientists. Check out the amazing Herschel family who changed the way we look at our universe.

Remember, we're here to support you, however we can. Contact us at (03) 9802 9913 or email us at [sales@scorpiotechnology.com.au](mailto:sales@scorpiotechnology.com.au)

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### TEACHER CONFERENCES, WORKSHOPS & EVENTS



Scorpio is attending or supports these teacher activities:

[DATTA ACT Conference](#) Daramalan College, Dickson, **Sat 09-09-2023**

[Victorian Model Solar Vehicle Challenge](#) **14-15-10-2023**

[Design and Technologies Week](#) 16-22 October 2023

[iTE Technology Education Conference 2023 TechExpo](#), Sydney **30-11-2023 – 01-12-2023**

[DATTA WA Conference Bridging the Gap](#), Perth, 30-11 to 01-12-2023

[DATTA VIC Conference Future Innovators](#), NCAT Preston **01-12-2023**

## PRIMARY STEM: INVENTORS

**The most famous inventor is probably Leonardo Da Vinci. We have introduced two new items that investigate his work.**

### Da Vinci Crossbow Wooden Miniature (Code: WM6740)

The Da Vinci Crossbow Miniature is a working re-creation of his 15th Century design. The Giant Crossbow is one of Leonardo's most epic weapons. He made drawings of many crossbow styles, and this one was designed to launch stone balls, instead of arrows, like most crossbows. We don't know if it was ever made, but it sure was big!



### Da Vinci Aerial Screw Miniature WM6745

The Da Vinci Aerial Screw Miniature is an iconic image that defines an artist and inventor well ahead of his time. This working model has a canopy that spins on the support structure, illustrating a way Leonardo thought flight might be possible!



Check our online **catalogues** for more inspirational ideas.

**LEARN TO MAKE,  
MAKE TO LEARN**

***“Seeing is in some respect an art,  
which must be learnt.”***

***William Herschel***



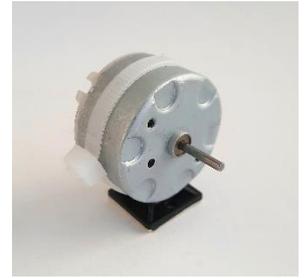


**NOW AVAILABLE:**

**Click here:** <https://www.scorpiotechnology.com.au/>

## Electric motor clip kit: (Code: EMCL-GEN)

This kit consists of a Clip with self-adhesive tape on the bottom. A wide cable tie attached to the clamp holds the Generator or other large items that are too large for the normal motor mounting clip. (Sold in packs of 5)



Remember to check out our **Snap Circuits** range which is being **drastically reduced to clear**, while stocks last.

See our website for prices. Great for small groups and also home education settings.

**Click here:** <https://www.scorpiotechnology.com.au/snap-circuits>



## SECRETS TO A SUCCESSFUL SOLAR CHALLENGE VEHICLE

**Model Solar Victoria** is encouraging teams to enter their Solar Challenge (or Challenges held in other states) and experience Solar Power racing for themselves. Lots of fun, excitement, hands on learning and problem solving.

### WHERE TO START?

When starting, there is always so much to learn. MSV is ready to help. They are offering online sessions on Facebook. This is a great chance to hear from the people who run the events on what you need to ensure you have a top performing vehicle. If you did not get to see the last online information session, then you can see a recording of it here - [https://fb.watch/I4\\_Ho0yIW2/](https://fb.watch/I4_Ho0yIW2/)

**Clint Steele**, VMSVC Chair, [csteele@modelsolar.org.au](mailto:csteele@modelsolar.org.au)

Check out Scorpio' **2023 Solar & Solar Challenge Catalogue** available on our website. A comprehensive technical guide (page 18 onwards) provides lots of information on solar boat and car making.



Einstein developed a theory about space, and it was about time too!

The density of Saturn is so low that the whole planet would float on the water in your bath. However, you wouldn't want to try this experiment at home as it would leave a massive ring around the tub.

Copernicus' parents might deserve some of the credit for his great discovery. Apparently at the age of twelve they said to him: "Copernicus, young man, when are you going to realize that the world does NOT revolve around you."



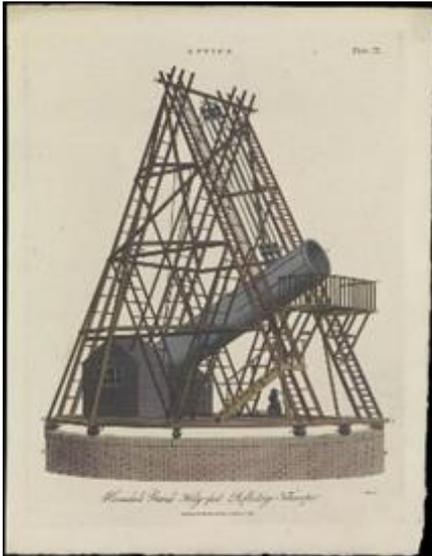
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# THE HERSCHELS – A FAMILY OF STARS

Alex Kapoyanis



William Herschel's 40ft Telescope

(Source:  
<https://www.rmg.co.uk/collections/objects/rmg-c-object-386474>)

***“Science is not just a profession, it is a way of life, and those who embrace it will find themselves enriched and ennobled by the experience.”***

*Caroline Herschel. (1750-1848)*



William Herschel Telescope with a 4.2 metre paraboloidal primary mirror on La Palma in the Canary Islands.

## MEMORABLE ACHIEVEMENTS:

**(FREDERICK) WILLIAM HERSCHEL** - FIRST MAN TO GIVE A REASONABLY CORRECT PICTURE OF THE SHAPE OF OUR STAR-SYSTEM. DISCOVERED THE PLANET URANUS (1781). HE WAS THE BEST TELESCOPE-MAKER OF HIS TIME, AND POSSIBLY THE GREATEST OBSERVER WHO EVER LIVED.

**CAROLINE HERSCHEL** –DISCOVERED 8 COMETS. FIRST WOMEN TO BECOME A PROFESSIONAL FEMALE ASTRONOMER.

**(JOHANN) ALEXANDER HERSCHEL** – CONSTRUCTED TELESCOPES AND THEIR MOUNTINGS USED BY WILLIAM AND CAROLINE.

**SIR JOHN FREDERICK WILLIAM HERSCHEL** - MATHEMATICIAN, ASTRONOMER, CHEMIST, INVENTOR, EXPERIMENTAL PHOTOGRAPHER

**SIR WILLIAM JAMES HERSCHEL** - LAID THE GROUNDWORK THAT WOULD LEAD TO USING FINGERPRINTS AS A METHOD OF CATCHING CRIMINALS.

**PROFESSOR ALEXANDER STEWARD HERSCHEL** - DEVELOPED A DIRECT-VISION SPECTROSCOPE FITTED WITH PRISMS THAT HE DESIGNED USING IT IN HIS METEOR OBSERVATIONS.

**William Herschel (1738-1822)** was a fascinating man of science, but he was not the only Herschel to contribute to the field of astronomy or science in general. Below is a glimpse of other accomplished and perhaps not so well-known members of the Herschel family.

***“I have looked further into space than ever human being did before me. I have observed stars of which the light, it can be proved, must take two million years to reach the earth.”***

*William Herschel*

William Herschel worked closely with his sister, **Caroline (Karoline) (1750-1848)** when she moved to Bath in 1772 from Hannover, Germany, at the age of 22. Although Caroline was encouraged to train in music and mathematics by her talented musician father, Isaac, her mother, Anna, did not. In Bath William gave her voice lessons, as well as training her in mathematics. William himself, was an accomplished musician and conductor, while astronomy was initially just a hobby.



She became an avid observer and comet hunter using a small telescope William had given her in 1782, discovering her first comet in 1786. She was the first woman to do so and would go

on to discover another 7 over the next 11 years. (Picture: Caroline Herschel, Source: Royal Museums Greenwich)

**Caroline** assisted her brother “noting measurements, grinding telescope mirrors, and carrying out calculations on astronomical data, on top of running the household”.

She also became the world's first professional female astronomer when she began receiving a £50 annual salary from the king for working as her brother's assistant and received several awards for her scientific contributions.

**(Johann) Alexander Herschel** (1745-1821), brother of William and Caroline, is not as well-known as his brother, yet provided invaluable assistance to his brother in the building of his telescopes. **Alexander** was, like his siblings and father, a gifted musician. Alexander also developed into quite a skillful craftsman. Over the years he was increasingly pressed by **William** and **Caroline** to construct telescopes and their mountings, amongst other items. The trio developed a great partnership in which Alexander's engineering skills proved invaluable. Much of the information about Alexander has been found in Caroline's letters and memoirs not pictures of him remain.

**Sir John Frederick William Herschel** (1792-1871), 1<sup>st</sup> Baronet, son of William, polymath - mathematician, astronomer, chemist, inventor, experimental photographer. Sir John Herschel attended Cambridge University and even began studying law but gave up in order to assist his father with his scientific research. He compiled and published several astronomical catalogues and books on science and even relocated to present day South Africa for a few years to study the skies of the Southern Hemisphere. He was a member of the esteemed Royal Society and a founding member of the Royal Astronomical Society in 1820.



*“Every student who enters upon a scientific pursuit, especially if at a somewhat advanced period of life, will find not only that he has much to learn, but much also to unlearn.”*  
John Herschel

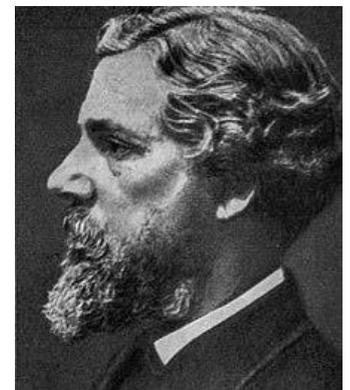
Astronomy was not his only area of interest. He contributed to the field of physics (light), mathematics and chemistry. His talents as a chemist resulted in his making huge advances in photography through the discovery in 1819 of “a fixative for use with silver-based photographs, techniques for making photographs in colour and on glass plates and was also the first person to use the terms 'positive', 'negative'” (Slough History Online). He was also the inventor of the blueprint

He was appointed master of the Mint in 1850, but as a result of bad health, resigned a few years later and eventually resumed working on his astronomical catalogues. John Herschel received a knighthood and later received a baronet. He is buried next to Sir Isaac Newton in Westminster Abbey.

Picture: Sir John Herschel (Source: Royal Museums Greenwich)

**Sir William James Herschel**, 2<sup>nd</sup> Baronet (1833-1917), son of Sir John Frederick William Herschel, grandson of William Herschel. Interestingly, his father discouraged him from pursuing astronomy as a career.

Sir William used fingerprints in place of a written signature on business contracts in his work in India and was the first European to recognize fingerprints as a unique form of identification after initially using handprints. He experimented significantly on fingerprints but would only ever use it for administrative purposes. His recommendation of using fingerprints on legal documents to avoid contract repudiation and impersonation was ignored by the governor of Bengal at the time. Nevertheless, the groundwork that he laid in this area would lead to using fingerprints as a method of catching criminals.



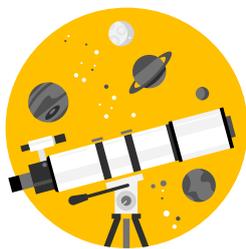
Another grandson of Sir William Herschel who pursued science as a career was South African born **Professor Alexander Steward Herschel** (1836-1907). He was raised and worked in Great Britain. Like his father, Sir John Herschel, and grandfather before him, he was an avid observer, particularly of meteors, publishing several papers relating to them. He took on several appointments as a professor including that of Mechanical & Experimental Physics. Amongst his accomplishments, Herschel developed a direct-vision spectroscope fitted with prisms that he designed using it in his meteor observations. He shared the same

interest in photography as his father and was the first person to use glass as a support for a photographic film.

## REFERENCES

- <https://www.barchetta.co/articles/harley-earl>
- P. Murdin & A. Boksenberg (1987, Jul-Sep). The William Herschel Telescope, *Astronomy Now*, pp. 17-25
- A.V. Sims (1987, Apr-Jun). The William Herschel Society and its Work, *Astronomy Now*, pp. 30-32
- Isaac Newton Group of Telescopes, <https://www.ing.iac.es/PR/archive/wht/whtdig6.jpg>
- <http://herschelsociety.org.uk/wp-content/uploads/2021/03/Johann-Alexander-Herschel-Biography-2021.pdf>
- Royal Museums Greenwich, <https://www.rmg.co.uk/stories/topics/herschel-family-royal-observatory>
- Britannica, The Editors of Encyclopaedia. "Caroline Herschel". *Encyclopedia Britannica*, 12 Mar. 2023, <https://www.britannica.com/biography/Caroline-Lucretia-Herschel>. Accessed 14 June 2023.
- Caroline Herschel, StarChild website [https://starchild.gsfc.nasa.gov/docs/StarChild/whos\\_who\\_level2/herschel.html](https://starchild.gsfc.nasa.gov/docs/StarChild/whos_who_level2/herschel.html)
- <https://www.britannica.com/biography/Caroline-Lucretia-Herschel>
- J. Hall, March 2021, The Herschel Society, <http://herschelsociety.org.uk/wp-content/uploads/2021/03/Johann-Alexander-Herschel-Biography-2021.pdf>
- Slough History Online, Famous Slough – Sir John Herschel, [http://www.sloughhistoryonline.org.uk/ixbin/hixclient.exe?a=query&p=slough&f=generic\\_theme.htm&\\_IXFIRST\\_1&\\_IXMAXHITS\\_1&%3dtheme\\_record\\_id=sl-sl-johnherschel](http://www.sloughhistoryonline.org.uk/ixbin/hixclient.exe?a=query&p=slough&f=generic_theme.htm&_IXFIRST_1&_IXMAXHITS_1&%3dtheme_record_id=sl-sl-johnherschel)
- Slough History Online, Famous Slough – William James Herschel and the discovery of fingerprinting, [http://www.sloughhistoryonline.org.uk/ixbin/hixclient.exe?a=query&p=slough&f=generic\\_theme.htm&p=slough\\_williamjamesherchel&\\_IXFIRST\\_1&\\_IXMAXHITS\\_1&a=query&f=generic\\_theme.htm&p=slough](http://www.sloughhistoryonline.org.uk/ixbin/hixclient.exe?a=query&p=slough&f=generic_theme.htm&p=slough_williamjamesherchel&_IXFIRST_1&_IXMAXHITS_1&a=query&f=generic_theme.htm&p=slough)
- Britannica, The Editors of Encyclopaedia. "Sir John Herschel, 1st Baronet". *Encyclopedia Britannica*, 7 May. 2023, <https://www.britannica.com/biography/John-Herschel>. Accessed 19 June 2023. <https://forensicfield.blog/william-james-herschel-a-fingerprint-pioneer/>
- Britannica, The Editors of Encyclopaedia. "William Herschel". *Encyclopedia Britannica*, 11 Nov. 2022, <https://www.britannica.com/biography/William-Herschel>. Accessed 19 June 2023.
- Royal Astronomical Society (1908, Feb). Obituary, 88<sup>th</sup> Annual General Meeting, *Report of the Council to the Royal Astronomical Society*, pp.231-233.
- Strathclyde University Archives, <https://www.theglasgowstory.com/image/?inum=TGSS00051>, Alexander Stewart Herschel, The Glasgow Story
- For kids: <https://www.lottie.com/blogs/strong-women/caroline-herschel>
- The Comet Hunter - Objectivity 148
- <https://www.youtube.com/watch?v=yxyWdw8lQog&t=291s>

## INVESTIGATE OPTICS



Our Physics Section has a great selection of items related to this article.

Check out **LIGHT & OPTICS** which includes items such as polaroid filters, mirrors, lenses and much more.

New to our range is the **Laser View Kit** from IEC The Laser view Kit is a useful kit of specially moulded prisms and bars that permit a Laser beam to be visible as it passes through the plastic. (Code: HL1985-001)



**CLICK HERE:**

<https://www.scorpiontechnology.com.au/light-optics-applied-light-and-colour-fundamentals>



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