



COMMUNICATION: CONFERENCE REPORT

Cosmic Harmonies: A Symposium Celebrating the Life, Science, Music, and Legacy of William Herschel (1738–1822)

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The year 2022 saw the two hundredth anniversary of the death of William Herschel, a profoundly significant figure in the field of astronomy, but one who made his early living as a musician – as an oboist, violinist, harpsichordist, organist, composer and impresario. After leaving a military band in his native Hanover for an unsuccessful two-year stint in London (1757–1759), Herschel moved to the north of England (1760), where he composed his symphonies and many other works as an itinerant musician in and around Richmond, Newcastle, Sunderland, Durham, Pontefract, Doncaster, Leeds and Halifax. In 1766 he accepted an invitation to take up the post of organist at the new Octagon Chapel in Bath, where from the following year he became a mainstay of the musical scene until 1782. In Bath William was joined by other musical family members including his sister Caroline, who assisted him first in musical and then in astronomical duties, ultimately becoming a distinguished astronomer in her own right.

Herschel's astronomical interests and construction of very high-quality telescopes, beginning in 1773, brought him international and lasting fame when in 1781 he discovered the planet now called Uranus. He came to the attention of George III, who summoned him to Windsor and effectively ended the musical portion of his career, at the age of forty-three. For the rest of his life Herschel made numerous ground-breaking contributions: designing large telescopes; mapping the Milky Way system of stars and the Sun's motion in it; cataloguing and classifying thousands of star clusters, nebulae, variable stars and double stars; proving the effectiveness of gravity outside the solar system; discovering several moons around Saturn and Uranus; discovering infrared radiation (from the Sun); postulating an evolving universe with stars and nebulae that are born, age and die; estimating the age of the universe; and arguing that all stars and planets are populated with intelligent beings.

For Herschel and other eighteenth-century thinkers, contemporary academia's separation of music and astronomy across the divide of the arts and the sciences would have been hard to understand, given that both endeavours proceeded for them on mathematical principles. In this spirit, 'Cosmic Harmonies: A Symposium Celebrating the Life, Science, Music, and Legacy of William Herschel (1738–1822)' at the University of York – organized by musicologists Rachel Cowgill (University of York) and Sarah Waltz (University of the Pacific) and astronomer Woodruff T. Sullivan III (University of Washington) – brought together an interdisciplinary confluence of musicology, performance, composition, astronomy, data science and philosophy. The aim was to explore new aspects of Herschel's work as composer, instrumentalist and astronomer in the intellectual, creative and cultural contexts of his time, including the Herschels' legacy in connections between science and art today.

Three sessions of papers, two panel discussions, a keynote lecture, a film and a two-hour concert were packed into a single day. Sullivan began by detailing the outsized place of Herschel in

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eighteenth-century science and his construction of telescopes. Sullivan then focused on the Yorkshire portion of his in-progress biography of Herschel, on which Waltz is collaborating with regard to the musical aspects of Herschel's career. Within this biographical frame, two short highlight papers provided further illumination: Cowgill on 'Herschel in Concert: Networks of Professional German Musicians in Eighteenth-Century England' and Roz Southey (University of Newcastle) on 'William Herschel in the North East'.

The second session was entirely musical in focus. Waltz gave a paper contextualizing Herschel's music theory, focusing on his unpublished music treatise, which includes a 'gravitational theory' of modulation; Matthew Spring (Bath Spa University) considered the music of Herschel's Bath years (1767–1782), sharing the beginnings of a sorely needed catalogue; and Meredith Michael (Indiana University Bloomington), with her paper 'The Inhabited Moon: Imagination, Female Astronomers, and 18th-Century Opera', discussed Herschel's belief in an inhabited moon alongside the use of lunar societies as imaginary spaces in opera. In the afternoon, the sole virtual paper – by historian Gregory Good (West Virginia University) – explored the scientific education of William Herschel's son John. (The genealogical discussion was particularly interesting, given that Herschel's great-great-great-great-grandson Will Herschel-Shorland was in attendance.) Next was a paper by John Mulligan (Rice Center for Research Computing, Rice University), 'As Numerous as the Stars that Shine on the Milky Way: Big Data and Slow Time in the Herschel Observatory'. In this he demonstrated how Caroline's immaculate archive of observational data can be translated into slow visual simulations, giving the audience a view of the sky as the Herschels saw it on particular nights, and insights into their manner of observing. Reconstructing Caroline's atlas, Mulligan suggests, enables us to talk about the communal nature of discovery, and 'by engaging with the Herschel archives aesthetically', he argues, 'we can bring out more of the experiential quality of their work-lives, and learn more from them about the life of the mind in our own era of big data'.

The panel 'Contemporary Perspectives on Music and Science', chaired by University of York Professor of Composition Martin Suckling, provided a forum for York graduate-student composers whose music is inspired by astronomical or scientific thinking to discuss their projects and the inspiration they drew from interdisciplinary work of this nature. Naomi Perera (flute) spoke about her collaboration with Phil Harrison (live computer graphics) based on a musical scale derived from the hydrogen atom, and Mark Hanslip explained his approaches to working with deep-learning audio tools in his practice as an improvising saxophonist.

The late afternoon and evening were co-hosted by the York Festival of Ideas, beginning with a showing (by kind permission) of George Sibley's hour-long film *William Herschel and the Universe*. Sibley, an American documentary filmmaker whose career spans over fifty years, regards this as his most ambitious film to date, inspired by his love of amateur astronomy. Particularly poignant were the explanations to camera by the late Michael Hoskin, historian and author of *Discoverers of the Universe: William and Caroline Herschel* (Princeton: Princeton University Press, 2011), who had died on 5 December 2021.

The keynote address was then delivered by Tom McLeish (Fellow of the Royal Society; Professor of Natural Philosophy in the Department of Physics at the University of York), who virtuosically linked the astronomical, musical and philosophical (perhaps even theological) thinking of the Herschels in 'The Herschels: Composing the Cosmos in Music and Astrophysics'. This was immediately followed by a panel of respondents – 'On Herschel's Legacies' – which included a saxophone improvisation with sympathetic vibrations from piano by Jesse Bannister, who then joined Martin Suckling, Mark Hanslip and Naomi Perera in a conversation chaired by Rachel Cowgill. Charles Draper, Chair of the Herschel Society, also gave a brief update on forthcoming events to celebrate William Herschel, which included a weekend conference/concert in Bath on 30 October–1 November 2022.

Perhaps the most electrifying element of the day was the free evening concert, 'Herschel and His Musical Worlds', supported by internal interdisciplinary research funds, in which a group of leading

period performers was directed by violinist Claire Holden. Sarah Waltz provided narration that placed a selection of works in Herschel's time and milieu, drawing on archival documents from the Herschel family in which William frequently discusses the pieces under consideration. The performance of (mainly) Herschel's music – new to many – was refreshing on all counts, whether heard as if for the first time or literally so. Special thanks were due to performers who stepped in at the last minute – harpsichordist Masumi Yamamoto was particularly brilliant in Charles Avison's Trio Sonata Op. 8 No. 4. The first half of the concert concluded with Herschel's very first composition, an Oboe Concerto in E flat major from 1759, superbly interpreted by Rachel Chaplin, whose thoughtful phrasing transformed the work. Three complete symphonies were performed – one by Herschel's brother Jacob, in C major, as well as the Symphony No. 8 in C minor (1761) and Symphony No. 14 in D major (1762) by William. Though the latter two have been recorded previously, the commitment of the performers did much to illuminate the scores in new ways, drawing on editions by Alex Voice and Robert Percival. The second movement (Andante) of Herschel's Symphony No. 9, written 261 years ago on the very date of this symposium, was given what is probably its first modern hearing.

Herschel's vocal music was also represented: two catches (including one of his only published works, the 'Echo Catch'), a duet and a glee were performed by York students and recent graduates Clara Phelps, Tania Murphy, Oliver Fulwell and David Valsamidis. The concert was bookended by contemporary works, both of which had visual components responding to data produced by and derived from the music – Mark Hanslip's *Gandering #1*, with AI-generated audio and images combined into a film (commissioned by Manchester Jazz Festival Originals), and Naomi Perera's *Hydrogen* for solo flute and drone, performed by her and accompanied by live projections. The latter piece was generated on the spot by a computer program written by Phil Harrison and employing a scale Perera developed to represent the various electron shell levels of an excited hydrogen atom, as she had explained at the earlier panel session. The piece was performed on instruments she developed herself for her Atomic Flute project.

Celebration of Herschel in his bicentenary year has also included musical and astronomical events associated with the Herschel Society (<http://herschelsociety.org.uk>), the Royal Astronomical Society and the British Institute for Organ Studies, as well as with the American Astronomical Society, the Herschel Society of Japan and the Royal Observatory of Madrid. The work presented at the Cosmic Harmonies symposium, alongside these other events, strongly suggests that this efflorescence will continue beyond the bicentenary, and demonstrates how taking an interdisciplinary, holistic approach to the work of the Herschel family – one that rejoices in the links between music and observational science – can shed new light on the eighteenth-century life of the mind.

Rachel Cowgill is Professor of Music and University Research Theme Champion for Creativity at the University of York. She has published on a wide range of topics, and is co-editor of *The Arts of the Prima Donna in the Long Nineteenth Century* (New York: Oxford University Press, 2012), *Art and Ideology in European Opera: Essays in Honour of Julian Rushton* (Woodbridge: Boydell, 2010) and *Music in the British Provinces, 1690–1914* (Aldershot: Ashgate, 2007), among other collections. She is a former editor of the *Journal of the Royal Musical Association* and a founding co-editor of the book series 'Music in Britain, 1600–2000' for Boydell. She is currently working on an article-length study of the second Pantheon opera house as a microcosm of Regency politics in early nineteenth-century London. She is also principal investigator on the AHRC-funded project 'InterMusE, or The Internet of Musical Events: Digital Scholarship, Community, and the Archiving of Performance'.

Sarah Waltz is Associate Professor of Music History at the University of the Pacific Conservatory of Music in Stockton, California. She has degrees from Oberlin College and Conservatory of Music and Yale University, with a doctoral dissertation on German musical interests in Scotland. She has published the edition *German Settings of Ossianic Texts 1770–1815* with A-R Editions (2016), articles in *Beethoven Forum* and *Beethoven Journal* and a chapter in the recent volume *Rethinking Mendelssohn* (New York: Oxford University Press, 2020), among other works. She also studies eighteenth- and nineteenth-century musical nationalism and topical analysis. Current projects include a biography of the musician and astronomer William Herschel (1738–1822) and research into networks of English musicians and touring virtuosos in London, including women virtuosos and the English career of the Black virtuoso violinist George Bridgetower.