Institution: University of Sussex		
Unit of Assessment: 32 – Art and Design: History, Practice and Theory		
Title of case study: *Revelations*: changing understandings and influencing artistic and curatorial practices through the innovative display of early science photography		
Period when the underpinning research was undertaken: Oct 2011 – Feb 2015		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Ben Burbridge	Senior Lecturer in Art History	Sep 2011 – present
Period when the claimed impact occurred: Mar 2015 – Jun 2019		
Is this case study continued from a case study submitted in 2014? N		

1. Summary of the impact

Revelations: Experiments in Photography (2015-16) was co-curated by Burbridge and Greg Hobson (Curator of Photographs at the National Science and Media Museum) in 2015-16, and was staged at the Science Museum, London and the National Science and Media Museum, Bradford. By bringing little-known practitioners to light, and securing access to rare works, the exhibition explained how early scientific photography informed and inspired modern and contemporary art. In so doing it challenged traditional curatorial approaches to displaying scientific photography, both within the Science Museum Group and internationally, and raised important questions about the nature of photography. It benefitted the museums economically (through book and ticket sales) and it enhanced the understanding and awareness of different visitor groups. Additionally, it has influenced the creative practices of students and artists, and curatorial and publication practices in the UK, the Netherlands and the USA.

2. Underpinning research

Institutional histories of photography have traditionally focused on the potential of the medium as an expressive art, its relationship to drawing and painting, or to pictorial documentary practice. This is particularly true of UK exhibitions during the past twenty years. Cultural institutions have neglected photography's applications in scientific research and the significance of that imagery for artists. That neglect has important implications for what the public and arts professionals understand photography to be: privileging pictorial representations of the real over more experimental and abstract idioms. It also obscures the potential of artists' engagement with scientific imagery to illuminate wider questions about the aesthetic, social and cultural meanings of science and technology.

Research by Dr Ben Burbridge, carried out between 2011 and 2015 remedied the effects of this absence, by making the following contributions to the field:

1. Burbridge's research mapped **scientific photography's radical expansion of the visual field** during the second half of the nineteenth century, when it lent visible form to the astronomically distant and microscopically small, to unseen energy sources and to the minutiae of rapid movement. Synthesizing existing work on the social, cultural and technical histories of photography and their relationship to histories of science and technology, the research identified pivotal moments, key practitioners and important publications, and situated them in relevant socio-cultural contexts.

2. Burbridge's research identified the **importance of early scientific photography for twentieth-century photographic art**. Burbridge was the first to corral literature about individual artists into a single, focused history, requiring a far-reaching knowledge of twentieth-century art history and its wider cultural contexts.

3. Burbridge identified the **importance of earlier scientific photography for contemporary art practice**. The role of science photography had sometimes been acknowledged in literature about specific artists, but these practices had not been linked together as part of a larger

tendency. Burbridge's research was the first to identify and critically analyse what he termed a 'scientific turn' in contemporary photographic art.

4. Burbridge's research explored the **nature, the meanings and the significance of that history**, unpacking relationships between the three areas of research outlined above. Drawing on the history of science, technology and its popular reception in different social and political contexts, Burbridge's interdisciplinary analysis pointed to scientific photography both as an important formal and technical reference for artists, and as an allegory for humanity's relationship to technology.

Burbridge's research culminated in the exhibition *Revelations: Experiments in Photography* (R2) and its accompanying book (R1), which shed new light on the ways that early scientific photography informed modern and contemporary photographic art. The research identified the formal and technical insights that early science photography made available to art, and what artists' engagement with the earlier imagery indicates about changing perceptions of science and technology. Originally, Burbridge was asked only to write an accompanying book for the exhibition. His growing reputation as a curator (Brighton Photobiennial, 2012) and editor (*Photoworks* magazine) in the field, combined with his 'conceptual structure for the story of *Revelations*' (S2a) led to him being asked to co-curate the show. Burbridge's input was 'critical to shaping the exhibition narrative' (S2a): his research informed the selection of objects for display – including rare and not widely distributed works – and helped distil the show's thematic structures. His research also influenced choices about which key moments and key practitioners to foreground, and led to the inclusion of lesser-known individuals such as György Kepes. As [text removed for publication] from the Science Museum Arts Projects and MediaSpace explained:

> Ben's fundamental role…in dialogue with the Museum curators was to agree which unique resonances between contemporary and historical photographer[s] were the strongest, to work out what the dynamic relationships between the old and the new were, and which works could clearly show the key qualities we wanted to capture in the exhibition. This was all critical to shaping the exhibition narrative. Ben's input was very also important in subdividing the story and utilizing themes which I feel made the exhibition digestible and more accessible to a broader range of people. We all really benefitted from his scholarly expertise and knowledge'(S2a).

3. References to the research

R1. Ben Burbridge (ed.), *Revelations: Experiments in Photography*, MACK/Media Space, 2015. 216pp. Submitted to REF2.

R2. Ben Burbridge (co-curator), *Revelations: Experiments in Photography*, Media Space at The Science Museum, London (March-September 2015) and National Science and Media Museum, Bradford (November-January 2015/6).

4. Details of the impact

Staged at The Science Museum, London, and The National Science and Media Museum, Bradford, across 2015-16, *Revelations* was a landmark exhibition for a number of different constituencies: visitors, artists, and curators. Its influence has been substantial, international, and long-lasting; its reach has been extended by sales of the accompanying book and web content.

Economic benefits for the Science Museum Group and MACK publishers

29,377 visitors saw the exhibition in person and, since its publication, the accompanying book has sold over 1,600 copies in the UK, Europe, North America, China, Japan and Australia. (S1a & b). Blogs and online videos produced by The Science Museum Group reached a further 20,588 people (S3i-o).

Revelations benefitted both of its host museums economically by generating c.£576,740 in 2015-16, through ticket and merchandise sales (S1a & b). [text removed for publication] explained that 'The *Revelations* book is published by MACK who are recognised as one the foremost photography publishers…Michael Mack has told me that a lot of educational institutions

and universities buy the book so it clearly continues to have an important role in the ongoing research of photography and history of photography' (S2a). Ongoing global book sales continue to bring revenue to the publishers, who describe it as 'one of our cornerstone books', which 'we are constantly re-promoting… to new audiences' (S1b).

New knowledge for exhibition visitors and reviewers leading to changed understanding

The exhibition established dialogues between art and science, enabling audiences to appreciate the creative and aesthetic dimension of science photography, often for the first time (at the Science Museum, 24% were first-time visitors and 23% had no particular interest in science subjects (S2d)). *Revelations* was the subject of 37 features and reviews in the national press, (including *The Guardian*, *The Observer* and *The Telegraph*) and international press, receiving widespread critical acclaim. Reviewers celebrated the 'staggering' ambition of the works chosen and noted how the exhibition 'engages on many levels' (S3.e). *The Guardian* listed it as one of the top three photography exhibitions of 2015 (S3.c). A review in *The Telegraph* declared that the exhibition 'has unearthed some genuinely revealing images':

> Refreshingly, what emerges is far from a straight-forward story about how science has aided art and vice-versa. On the contrary, the biggest delights in the show are often by unknown names, talented individuals – scientists or artists – whose experimentation was lost to history because they became too enamoured with the wrong discipline. The curators should be commended for making this potentially overwhelming subject into a show that engages on many levels, social, scientific, historic, and visual (S3.e).

Specialist photography publications described the exhibition as being 'as rich as it is daring' (S3.b). Pairing artistic and scientific photography prompted audiences to think actively about the nature of the relationship between art and science. As Lucy Davies reported in the *British Journal of Photography*, 'The deeper you delve, the more connections appear. One senses that the new constellation it produces could expand indefinitely' (S3.b).

Visitors reported changes to their understanding of the relationship between art and science: 'I suppose to me science and art seem like completely different fields, until seeing this, I guess. It's made me think about them differently'; 'I have come away with somethings [sic] I didn't know... absolutely have come away with a different perspective on photography, art and science, and really the relationship between all three' (S2b). One commented that 'In terms of what I have learnt, it is probably that contemporary art has a lot more to it than I thought… (I) have dismissed it in the past really. To realise that the photos at the end had had such a lot of influence and historical meaning, and could be traced all the way back to those images at the beginning has really made me think about it differently…' (S2b). A BA photography student 'had read about some of the photographers before and seen some of the photos in books and online… Actually seeing them had quite an impact – they are amazing' (S2b).

Those more familiar with science were prompted to reassess their opinion of art. A retired engineer was 'made to realize there is more to art than I thought… I will definitely visit more art exhibitions in the future'; for another visitor, the exhibition 'has really made me think about it [contemporary art] differently and that I should maybe consider that it has a bit more behind it' (S2b).

Inspiring new forms of artistic expression, presentation and new ways of teaching

The pairing of art and science encouraged students and artists to appreciate how the formal, technical and conceptual qualities of scientific photography could inform and enrich their creative practices.

Artists' practices were changed as a result of visiting the exhibition: 'actually seeing them [the images] in the flesh has absolutely been an influence and I have taken things from them that I hadn't in previous research and now want to use in my work' (S2b). Artist [text removed for publication] used techniques inspired by the exhibition for his series *Exit Ghost*, explaining how that project 'would not exist without the excellent *Revelations*':

> After the show I read the *Revelations* book and I did some more research online into Marey. This led to two things – firstly I started to use flatbed scanners in my work.…I

> began to work with scanners experimentally because I wanted to use other imaging technology in different ways. I wanted to escape cameras. Exposure to Marey's work in that show definitely contributed to this change in artistic direction. It also led to me making new work using the scanner, a body of work called *Exit Ghost* (S4).

For [text removed for publication], the exhibition meaningfully demonstrated how, 'even in science, [when] an image is framed and presented to the world there is some aesthetic judgement to this process. Not many shows from my experience have succeeded in exploring this subject as successfully and as comprehensively as this exhibition did. Many friends went to see *Revelations* who wouldn't have gone to see a science exhibit show' (S4).

Burbridge's innovative approach to *Revelations* also had a curatorial impact at the Science Museum Group and beyond. For the former, it provided a much-needed 'opportunity to explore and interrogate that multiplicity of purpose within photography. And understand the interface of art and science within photography' (S5). For an institution seeking to better understand 'how to engage with photography in our collection and in our exhibitions… [and] to showcase that developing rationale through a curatorial narrative… *Revelations* was an important starting point which has allowed us to articulate and arrive at that position today and beyond' (S5). Following the model of *Revelations*, the Science Museum Group no longer shows exhibitions of single artists, instead using photography to explore questions of process and practice (S5). It also enabled them 'to target and grow an adult audience for the Science Museum' in new ways (S5).

Revelations had an impact on individual practice too. For [text removed for publication] at the time of the *Revelations* exhibition, it:

> …added new depth to my knowledge as a curator. For example, when I'm asked to talk about media art history and when I do lectures, talks or teaching about media art history I'm able to bridge new technologies with photographic histories and use that to demonstrate that artists have always been attracted to working with emerging technologies in ways which aren't necessarily 'new'. I have used *Revelations* as one of my references in teaching this and it has added a new depth to my knowledge on how technologies have interfaced throughout the nineteenth century and in subsequent centuries. It has created a new resource for me to draw upon in my work, including for lectures I've presented at Queen Mary University of London, The Royal College of Art, Sotheby's institute and various other institutions. (S2a)

The influence of *Revelations* goes well beyond the Science Museum Group and it has had an impact on curatorial practice and arts programming elsewhere. For example, Photofusion, London's largest independent photography resource centre, launched an open call for photographs 'made using experimental photographic techniques or alterative processes', explicitly 'inspired by the Science Museum's Exhibition, *Revelations*'. The images that were submitted were exhibited online (S6).

Revelations has influenced practice beyond the UK. In 2018 FOAM – the international photography organization based in Amsterdam – mounted its award-winning exhibition *Back to the Future*. This toured to Berlin and Budapest, was seen by 52,755 people, and was accompanied by a special issue of *FOAM* magazine, for which Burbridge was invited to write a contribution: 4,000 copies were sold (S7). Both the exhibition and special issue were 'directly inspired' by *Revelations*. [text removed for publication] of FOAM stated that:

> *[Revelations]* was absolutely enlightening. It was the first publication we had encountered which dealt with the matters we wanted to cover, basically how photography and science from the nineteenth century were intertwined historically, but also exploring how developments in contemporary photography are connected with topics and problematics that were apparent in the nineteenth century. So *Revelations* was absolutely fundamental and influential for us (S7).

[text removed for publication], found the exhibition similarly inspirational. 'Looking at Ben's catalogue for *Revelations* I could see that he had reached out both to scientists and science historians and looked at images in the context of the scientific culture that generated them and I hadn't seen this done before' (S8). His own work developed in response to Burbridge's ideas; for

[text removed for publication], '*Revelations* was very important to me and became an important part of the research and helped shape my *Seeing Science* project' (S8). Moreover, he notes, 'projects like *Revelations* play a major role in helping the public feel more comfortable with science' so 'that they can engage with science more and feel less estranged from it' (S8).

The exhibition was also a catalyst for A-Level and HE students to explore new techniques: photograms with polaroid; experiments with long exposures; playing with scale and illusion; remaking science photographs using household objects. Photography students reported that they would use the techniques they had seen in their future work: 'I haven't seen this (the exposure times) anywhere else and I am going to use them in my work.'; 'I really want to include some of the shutter speed and exposure time experimentation in my work before I submit' (S2b). For arts teachers, *Revelations* provided a useful bridge to the STEM subjects that dominate school curricula. A GCSE photography teacher explained 'they are all studying science, so I can use this material to engage them in my future teaching' (S2b).

Revelations was selected by the Association for Photography in Higher Education (APHE) — who work annually with an estimated 3,500 students — 'as one of three key exhibitions we wanted our members to see and engage with that year' (S9). Their Chair at the time of the exhibition found Burbridge's approach to be 'both rigorous and thorough, but it also allows photography teachers to see and engage with work in new ways'; furthermore, as he points out, 'it is immensely valuable for teachers of photography to have access to that depth and breadth in a show' (S9). The exhibition stimulated one APHE member's students' interest in analogue photographic processes and the materiality of the image to such an extent that the University of Huddersfield installed a darkroom in their new photographic facilities (S10).

5. Sources to corroborate the impact

S1. Ticket (a) and book (b) sales:
- a) Visitor figures from the National Media Museum, 23 March 2016;
- b) Testimonial from [text removed for publication] MACK publishers, 10 January 2020

S2. *Revelations* Exhibition:
- a) Testimony from [text removed for publication] Science Museum Arts Projects and Media Space, 10 February 2020.
- b) Science Museum Visitor Feedback, May 2015.
- c) Understanding Art: Science Museum Photography Study Day Evaluation report;
- d) Science Museum Media Space Paid-For Exhibitions Tracking Report – *Revelations* (18 September 2015).

S3. a-o Media report including *Revelations* exhibition reviews by UK national press (including The Telegraph, The Guardian, British Journal of Photography) 2015-2016 and screenshots of Science Museum YouTube channel pages indicating viewing figures.

S4. Testimonial from [text removed for publication], artist, 29 May 2020.

S5. Testimonial from [text removed for publication], National Science and Media Museum, 28 January 2021.

S6. Photofusion Photography Centre: Experimental Photography Gallery, open call (2015). https://www.photofusion.org/experimental-photography-gallery/

S7. Testimony from [text removed for publication], FOAM, 27 February 2020.

S8. Testimony from [text removed for publication] independent curator and editor

S9. Testimonial from [text removed for publication], Association for Photography in Higher Education, 25 January 2021.

S10. Testimonial from [text removed for publication] APHE member, 29 January 2021.