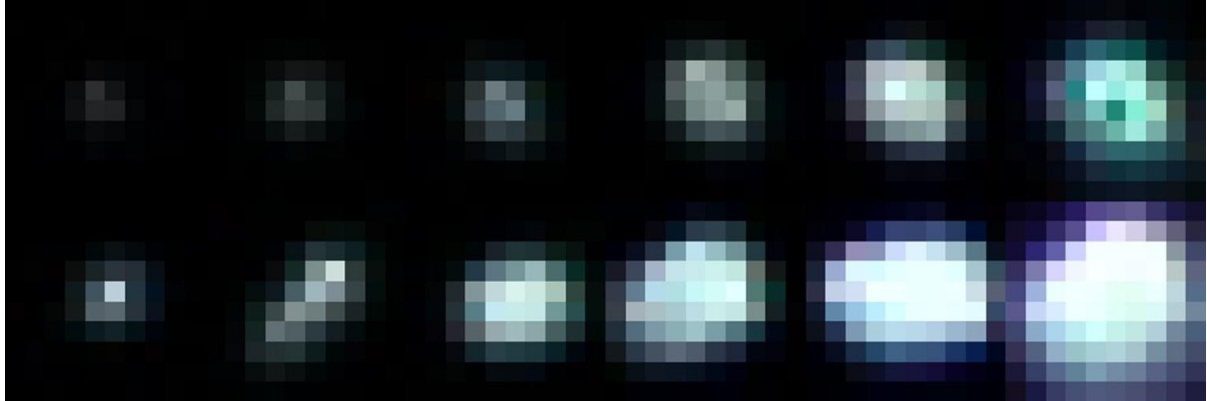


The RPS [Imaging Science Group](#) newsletter

New series 2, Issue 1 April 2025



Picture of pinholes. More details on [our web site](#) and in the Good Picture review below.

Welcome

Welcome to the relaunch of the RPS Imaging Science Group newsletter. The Imaging Science Group is the oldest of the Special Interest Groups of the RPS and over our 100+ year history there have been (at least) two series of newsletters. As this is probably the second relaunch it has become New Series 2. We plan to place the older copies that we can find online as a historical record so if anyone has past copies do let me know.

The aim is to fill future newsletters with contributions from members so do get in touch. The outline content plan as discussed with your Committee looks like this.

- Event reviews. In this issue we have a review of the recent Imaging Science Group Good Picture conference. It would be good to hear from readers about conferences or meetings they attend.
- Science in the Society. In addition to the Imaging Science Group the RPS has a Science Committee and it would be good for this newsletter to become the mouthpiece of both. This edition brings the results of the recent Imaging Science Group AGM.
- Member's projects. We hope this can become a forum to explore stuff we are working on. For this edition I have some thoughts on the International Year of Quantum Science & Technology.
- Literature reviews. Share with our membership what you are reading, explain what you have recently published or explore the publications from other RPS Special Interest Groups from an Imaging Science perspective. In this issue I will highlight the significance of the Penrose Annual in the practical implementation of Imaging Science.

This is *your* newsletter so as editor I aim to include *your* content. I am particularly interested in exploring common ground with other RPS Special Interest Groups. At a first guess this may come from Medical, Historical, Analogue and Digital Imaging, but I am happy to be surprised! In addition, I would welcome input from thoughts or events at RPS Region and Chapter level.

I look forward to hearing from you. Send me a science image for the top of the newsletter.

Dr Alan Hodgson ASIS HonFRPS, Imaging Science Group newsletter editor

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Event Review

Good Picture 2024 University of Westminster, Upper Regent Street, London, 7 December 2024

The RPS Imaging Science Group (ISG) held its 20th annual “Good Picture” symposium at the University of Westminster in London’s Upper Regent Street on Saturday, 7 December. The meeting was open to all, and the theme was “Elements of Imaging”.

A total of five lectures were presented and the first was given by Professor Adrian Thomas, an Honorary Historian with the British Institute of Radiology. Adrian described the life of Geoffrey Hounsfield and his involvement in the development of the EMI X-ray computed tomography (CT) scanner. This was seen as a paradigm shift as some consider that, up to this point, X-ray photography had not fundamentally advanced since Röntgen X-rayed his wife’s hand in 1895.

The second paper was given by Professor Toby Breckon from Durham University. Toby described imaging technologies that are being developed for use within driverless cars. He discussed how vehicles can “see” and “understand” imagery of the world around them. The talk also considered wider developments and future impacts.

The third paper was by Dr Ozgun Ozer, who introduced “Event-based Imaging”, a technique that is a novel imaging paradigm that differs from conventional frame-based cameras. Instead of capturing images at fixed time intervals, event-based cameras detect changes in light intensity at each pixel asynchronously and independently. This allows the cameras to respond faster while transmitting much less data and is thus suitable for recording transient events. Ozgun showed how the technique has opened up new possibilities both for researchers and artists. His presentation and poster display showed many attractive scientific and artistic event-images and generated much discussion into the lunch hour. One such image by Aynur Kaynak is shown here.



Artistic example of event-based imaging by photographer Aynur Kaynak, 2024

After lunch, Dr Michael Jackson from the British Society for the History of Radiology, talked about art, artefacts and arteriograms. He said the ability of images (digital or otherwise) to mislead and misrepresent is well recognised, but medical imaging might be viewed as being exempt from such concerns. The construction and interpretation of medical images are more subjective than one would suppose. Michael drew on examples from the history of art alongside radiological examinations to illustrate this. He showed examples from his book "Imagining Imaging" and proposed that the foundations of medical image construction and interpretation were laid down many years ago in artistic innovations.

The final talk was given by Dr Alan Hodgson, who described his homemade equipment for testing camera lenses using pinhole light sources emitting a variety of wavelengths. He showed test result images which generated discussion for further work.

Many thanks must go to Dr Mike Christianson of the ISG committee for planning and chairing this meeting. This meeting was one of a series that has been held annually, apart from the Covid period, since 2004. This year it coincided with the arrival of storm Darragh and the subsequent travel problems for attendees and presenters. Despite this, those that made it found the presentations to be both entertaining and educational with much discussion among the delegates.

The aim of these lectures and discussions is to provide imaging practitioners, keen amateurs and students with insights into the broad field of Imaging in all its aspects and to provide some tools and guidelines for improving output. A selection of material from previous Good Picture meetings and other ISG events is available to view on our archive website which is linked from our main RPS website and can be found at <http://www.rps-isg.org>.

Richard Stevens, Hon.Sec. Imaging Science Group

Ozgun Ozer, The University of Manchester

3 March 2024

Science in the Society

While this newsletter was being drafted there was a meeting of The RPS Science Committee. It may be possible to bring some highlights from that meeting in a later edition.

The Imaging Science Group in numbers

As of 2024, there were 105 members in our Group.

- 44% were under 65 years old. I suspect we have an interesting experience mix that would be good to see in future newsletters.
- 10% were international members, with a similar age profile. You would bring an interesting perspective to this newsletter too.

From conversations with Group members over the years I suspect that there is some overlap with other RPS Groups in our membership, creating an opportunity for joint working. Medical, Historical, Analogue and Digital Imaging are examples that immediately suggest themselves. But it would be interested to hear any other suggestions.

The Imaging Science Group AGM – 26th February 2025

At this meeting the Group Committee was elected unanimously for the coming year. The committee is listed below.

Officers

Chairman (interim): Mike Christianson

Academic Liaison: Özgün Özer

Hon. Secretary: Richard Stevens

Group Finance Officer: Mike Christianson

ISG Communications Officer and Web Editor: Kevin Howell

Ordinary and ex officio Members

Hoosain Mia Ebrahim

Ricardo Vardasca (ex officio, Imaging Science Journal Editor)

Corresponding members

In line with the Constitutional procedures, corresponding members will be nominated at the next committee meeting.

Member's projects

Fraunhofer spectra



INTERNATIONAL YEAR OF Quantum Science and Technology

The 2025 [International Year of Quantum Science and Technology](#) recognizes 100 years since the initial development of quantum mechanics. As it is a UNESCO initiative, I believe it is good practice for Learned Societies such as The RPS to consider where it can contribute to such celebrations.

This was the start of a thought experiment with 2 components.

- What has quantum science and technology contributed to photography?
- What has photography contributed to quantum science and technology?

Read on for some initial thoughts. I would like to hear your thoughts for a future issue of the newsletter.

One approach would be to consider where quantum phenomena are used to implement digital imaging. Not my personal interest but I would welcome contributions on this. My interest was to investigate where effects based on quantum phenomena have found use in photographic imaging science, predating quantum mechanics. My choice was to focus on the use of Fraunhofer spectra in several aspects of imaging science.

In 1894, Edward John Wall, then Editor of Amateur Photographer [summarised the use](#) of the Fraunhofer spectra admirably.

"If a spectrum of sun or solar light is formed it will be found crossed by numerous dark lines which are called Fraunhofer's lines and no matter what size spectrum, how large or how small, we get these lines always in the same place, and they have been designated with certain letters, and it is customary to distinguish any particular colour of the spectrum by referring to these lines, for instance, we talk of yellow of the D line, or a greenish blue of the E $\frac{1}{2}$ F, that is, the particular shade of green which is found halfway between E and F."

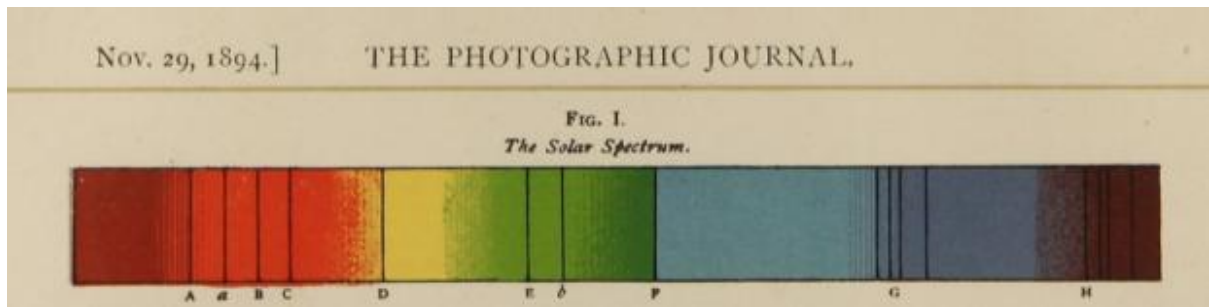
Can we consider Fraunhofer spectra as quantum science and technology? It is probably a stretch to consider it to be quantum mechanics but I believe it is an example of both quantum science and technology. Here are my reasons. Well done to UNESCO for such a broad and inclusive definition.

- Although these 19th century workers did not know it at the time these atomic spectra as we now know them were a quantised phenomenon. It was not until the quantum model of the atom was [published by Bohr](#) in 1913 (leading to his Nobel Prize) that the true cause of the line spectra was revealed. This is quantum science.
- Technologists working in the field of photography utilised these dark lines to further the development of photography. I have found two areas already, laid out below. This to me is quantum technology.

These dark lines on a coloured background also leant a certain aesthetic appeal to popular science books and can therefore be found as frontispieces to such publications. A good example from 1889 is Norman Lockyer's "[Elementary lessons in Astronomy](#)". I remember reading Patrick Moore describing this book as "never bettered".

Fraunhofer spectra in camera lens design

The fact that these lines were of constant position in the spectrum of sunlight proved very useful to designers seeking to provide colour correction to camera lenses. The earliest reference I have so far for this is from early imaging scientist [Robert Hunt in 1853](#) but there may well be more.

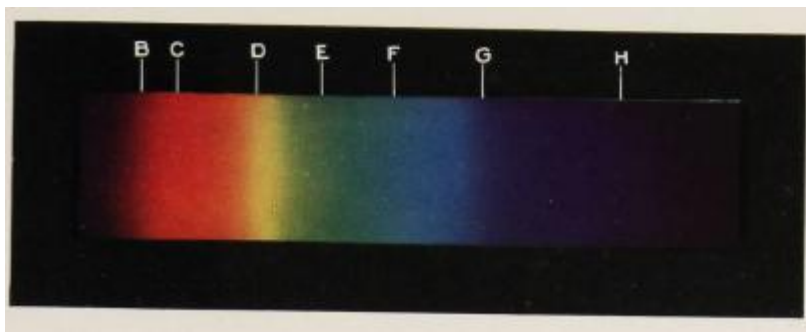


A Fraunhofer spectrum [illustration by H Dennis Taylor in 1894](#)

The later work of H Dennis Taylor contains a pictorial representation of the Fraunhofer spectra and presents us with an interesting example of technology translation. Taylor was working for T Cooke & Sons on lens design for telescopes, but his design became the Cooke Triplet used in camera lenses. The background to this work can be found in the 1894 paper link above.

Fraunhofer spectra in colour photography

The early days of the development of sensitising dye technologies for photographic emulsions contain a number of references to the use of Fraunhofer spectra as reference wavelengths. The illustration below from 1905 takes this one step further, showing a 3-colour half tone print presented by colour scientist Thomas Thorne Baker.



Fraunhofer spectrum annotation in a [half-tone print presented by Thomas Thorne Baker in 1905](#)

In addition to the above there are some other areas where imaging scientists have used photography to record the dark lines for scientific purposes. Astronomy is one obvious cross-over area. However, my favourite on this is early imaging scientist François Arago who in 1839 [proposed using the daguerreotype process to investigate the nature of light](#).

How can we as imaging scientists contribute to this UNESCO initiative? I propose two practical contributions.

- I propose to present an online Zoom event with a recording for later viewing on the topic of Fraunhofer spectra in photography, exploring further the topics above.
- If there is interest we could run an in-person event to further discuss the topic.

If other members have content to offer, let me know and we can make one or other into a mini colloquium event. Email in on the front page of the newsletter.

Alan Hodgson

Literature reviews

Penrose's Pictorial Annual

I have a professional interest in the imaging science behind the reproduction of photographic images on the printed page, an overlap area between photographic science and graphic arts. Over the years I have found it useful to look back at the evolution of these technologies as they have moved over time from one medium to another. One resource that I am currently reading and researching is Penrose's Pictorial Annual.

This publication first appeared in 1895 and continued until the 1982 and it charts the advancement of the reproduction of photography in print. Copies can be found in various libraries. The National Arts Library at the V&A has a set and the Museum of Printing has produced [this](#) index of the volumes. I am studying the copies in the archives of the [Manchester Central Library](#).

This is a resource that does not translate well into a digital version as it contains plentiful illustrations that show the current technologies of photo reproduction in a particular year. Some are bound directly into the book but others on more specialist papers are tipped in (bookbinding term for an insert, often on a different substrate). However, for those who cannot get to a copy there are a number of good summaries available.

From an RPS perspective an overview of the publication appeared in [The Photographic Journal](#) of 1964. In book form I suggest "Printing in the 20th century: A Penrose Anthology" Edited by James Moran, Northwood Publications, (London, UK) 1974. You will find [a copy available to consult](#) in the National Arts Library at the V&A and in the link above in Manchester. I have also started a forum discussion on Michael Prichard's [British Photographic History](#) which is attracting some useful comments.

The reproduction of photographs in publications did a great deal to publicise photography. This Annual shows the technologies by year and includes real examples bound into the volume. It also acts as a critique of the reproduction of photographs in journals, with photographers given space to comment on the print reproductions. Some of these critiques are informative, some are entertaining and some are just critical and parochial but all add breadth to a study.

Here are some of the imaging science areas I find in these annuals.

- The characteristics of the silver halide materials used. As an example, the spectral sensitivity of materials as employed for the reproduction of colour images, including some Fraunhofer spectra for materials such as the Lumiere Series C Panchromatic plate.
- The movement from wet collodion to dry gelatin. This was a much slower change than in other "departments" of photography. I am collecting examples of print houses that were early adopters or laggards in this transition as they provide perspectives of the image quality of the time.
- The way in which practice moved across geographic boundaries. Many of the volumes set the British illustration market in context with other geographic regions, notably US, Europe, India and Australia. This could become another metric of how imaging science evolved.
- How the different emphases on education across nations impacted the technologies.

All for now – see you next time! Don't forget to send me your content and thoughts for the next issue. At the moment we are aiming for a July publication.

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