Colour Society of Australia

Knowledge
Inspiration
Community

COLOUR CONNECTIONS SYDNEY 2021

Colour Society of Australia National Conference

March 19-21 2021

Abstracts and Biographical Notes

Derek Grantham

The theme *Colour Connections* acknowledges the importance of multidisciplinary approaches to colour in this era of ever-narrowing specialization. Speakers were invited to consider how their own work involving colour may be of interest and of importance in other disciplines, or to critically contrast and perhaps reconcile different specialized approaches to colour within their own discipline. We encouraged participation from designers, artists and other colour practitioners whose work references scientific or philosophical understanding of colour, from colour educators whose teaching programs span the art-science divide, and from scientific, historical and other researchers who believe that their insights about colour have relevance beyond their specialized areas of interest. A Call for Abstracts was issued to CSA members and contacts in early June 2020, with abstracts due by September 25. We thank our speakers for their overwhelmingly generous response that has allowed us to present such a large and diverse program.

We would like to dedicate this Conference to the memory of long-term CSA Member Derek Grantham, who passed away in 2019. Derek was a former National President (2005 to 2009), National Treasurer and Chairperson of our Southern Division, and played a major role in organising our hugely successful last National Conference in Melbourne in 2018.

The Colour Connections Sydney 2021 Committee
David Briggs (Chair)
Virginia Furner (Secretary)
Jean Pretorius (Treasurer)
Annamaria di Cara
Kerry O'Donnell
Aly Indermühle
Babette Hayes
Wendy Greenhalf

CONFERENCE SCHEDULE

Friday March 19

9.45 am **Conference Committee** *Welcome*

History of Colour Theory and Practice

10.00 am **Renzo Shamey** (USA), *Colour Pioneers of the Islamic Golden Age*

10.30 am **Patrick Baty** (UK), *Nature's Palette: A Colour Reference System from the Natural World*

11.00 am DISCUSSION/BREAK
11.30 am **Liz Coats** (ACT), *An Early Modernist Experiment with Colour Perception*
12.00 pm **Michael Lech** (NSW), *At Home with Colour: an Introduction to the Colour Resources at the Caroline Simpson Library & Research Collection*

12.30 pm *DISCUSSION/BREAK*

1.00 pm *LUNCH BREAK*

Colour Science and Lighting Technology
2.00 pm **Stephen Dain** (NSW), *Blue Light: Nasty or Nice?*
2.30 pm **Wendy Davis** (NSW), *Leveraging Colour to Reduce the Energy Consumed by Lighting*
3.00 pm *DISCUSSION/BREAK*

Philosophy of Colour

3.30 pm **Derek Brown** (UK), *The Reality of Colour Illusion and Nearby Misperceptions*
4.00 pm **Barry Maund** (WA), *The Richness of Illusions of Colour*

4.30 pm DISCUSSION/BREAK

Colour in Light Art

5.00 pm **Aly Indermühle** (NSW), *Luminous Colour - the Enchantment of Light Art*

5.30 pm DISCUSSION and CLOSE

AM CHAIR: Dr Jean Pretorius; PM CHAIR: Professor Paul Martin

CONFERENCE SCHEDULE

Saturday March 20

Fundamentals of Colour

10.00 am **David Briggs** (NSW), *Four Key Insights About Colour*

Colour in Painting

10.30 am **Andrew Werth** (USA), *Using Color Effects in Service of an Artistic Vision*

11.00 am *DISCUSSION/BREAK*

11.30 am **Ron Francis** (TAS), *Calculating Colour in Imaginative Realist Painting*

12.00 pm **Andrew Bonneau** (QLD), *Conceptual and Empirical Approaches to Colour in Realist Painting*

12.30 pm DISCUSSION/BREAK

1.00 pm LUNCH BREAK

Colour in Digital Imaging

2.00 pm **Chelsea Lehmann** (NSW), *The Aesthetics of the Technological Image*

2.30 pm **Simon Ives** (NSW), *Streeton's Lost Landscape*

3.00 pm DISCUSSION/BREAK

3.30 pm **Tony Vladusich** (QLD), *Colours - One: A Photo Editing App Based on Human Colour Vision*

Painting Materials

4.00 pm **David Coles** (VIC), *Response to Demand - Colour Makers' Ongoing Dialogue with Artists*

4.30 pm DISCUSSION/BREAK

Phenomenology of Colour

5.00 pm **Joaquim Santos** (Portugal), *Phenomenology of Colour. Towards an Extensive Cultural Paradigm - paradeigma*

5.30 pm *DISCUSSION and CLOSE*

AM CHAIR: Dr David Briggs; PM CHAIR: Aly Indermühle

CONFERENCE SCHEDULE

Sunday March 21

Colour Education

10.00 am **Ingrid Calvo Ivanovic** (Italy), *A Study to 100+ Colour Courses for Design Education Taught during 2010-2020*

10.30 am **Ingrid Calvo Ivanovic** (Italy), *Observation, Reflection and Collaboration - Colour Design Training Itinerary, a Framework for the Future of Colour Education*

11.00 am *DISCUSSION/BREAK*

11.30 am **Craig Kirkwood** (UK), *We don't know Jack about Hue – the Colour Knowledge Survey*

12.00 pm **Maggie Maggio** (USA) and **Robert Hirschler** (Hungary), *Update on the ISCC/AIC Joint Color Literacy Project*

12.30 pm DISCUSSION/BREAK

1.00 pm LUNCH BREAK

2.00 pm **Juliet Albany** (WA), *Seeing the Colours of Home - A Primary School Resource Tool for Teachers*
2.30 pm **Paul Green-Armytage** (WA), *Colour Clues - A Colour Communication Game* (long session),

3.15 pm *DISCUSSION/BREAK*
3.45 pm **Eva Fay** (NSW), *Colour Education from the Shillito Design School, Sydney*

4.15 pm **Maria João Durão** (Portugal), *Celebrating the Harmony of Our Identities on the 'International Colour Day'*

4.45 pm *DISCUSSION* and *CLOSE OF CONFERENCE*

AM CHAIR: Sally Ryan; PM CHAIR: Mike Dixon

Pioneers of Color Science in the Islamic Golden Age (8-13th C AD)

Renzo Shamey

Color Science and Imaging Laboratory, TECS Dept., North Carolina State University, Raleigh, NC, USA

Abstract

An important period of development in scientific discovery is an era known as the Islamic Golden Age. This period covers the 8th century to about the 13th century and may be extended to around 14–16th Centuries. During this period, much of the historically Islamic world was ruled by various caliphates, and science, economic development and cultural works flourished. The land covered by the Islamic world extended from the Far East to Spain and Africa. A love of knowledge was evident in many of the important cities of the time including Baghdad, Nishapur, Cairo, Samarkand, Tabriz and Isfahan. Scholars, philosophers, doctors, and other thinkers all gathered in these centers of trade and cultural development and it was not uncommon for academics to make long arduous journeys in pursuit of knowledge. Academics, many of them fluent in Persian, Greek, Arabic and Turkic languages, exchanged ideas and translated texts into the official scientific language of the time, Arabic. Baghdad replaced and overshadowed Damascus as the capital city of the empire. The Abbasids built Baghdad from scratch while maintaining the network of roads and trade routes the Persians had established. Abbasid Caliphs established a House of Wisdom in Baghdad—a dedicated space for scholarship. The House of Wisdom increased in use and prestige, from 813 to 833 and a special effort was made to recruit famous scholars. During the Golden Age of Islam, Arab and Persian scholars—as well as scholars from other countries—were able to build on the information they translated from the Greeks and others and forged new advances in many fields. The work of many of these scholars on color involved assessing gemstones, plants and the rainbow and led to the advancement of optics and astronomy. Ibn al-Haytham is listed among the first to have used a camera obscura in his studies of light and object interaction. He was also able to form an explanation of how the eye sees. Doctor and philosopher Avicenna wrote the Canon of Medicine, and the Cure [of ignorance] and also examined color order. Biruni, in his Kitab al-jamahir used color to identify minerals and gemstones and explored ‘saturation’ to describe slight color differences between them. Ibn Rushd in Spain revived Aristotle’s works and examined the formation of colors on the

rainbow. Al-Khwarizmi, invented algebra, Tusi introduced trigonometry and expanded Avicenna's color order system and Khayyam invented analytic geometry. Meanwhile, Farisi developed experimental studies and accurately explained the formation of the rainbow colors. Some of these scholars' works were never translated into Latin and many were studied in important Western universities of the time and influenced the path of advancement in the Western society over the scientific revolution period. This presentation aims to provide a brief overview of achievements in the field of color science over this period.

Keywords: *Pioneers of Color Science, Islamic golden age*

Renzo Shamey is the CIBA professor and Director of Color Science and Imaging Laboratories at the Wilson College of Textiles of North Carolina State University. His current research areas include color perception including unique hues, examination of blackness, grayness, and whiteness and small color differences. Effort over the last 10 years has focused on the development of imaging techniques for color quality control of multicolored objects, examination of the role of texture on color differences and analysis of observer variability. He served as the president of the Inter Society Color Council, is a Fellow of the Society of Dyers and Colourists (SDC), editor in chief of the Encyclopedia of Colour Science and Technology and co-author of the "Pioneers of Color Science", Springer International.

Nature's Palette: A Colour Reference System from the Natural World

Patrick Baty

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Abstract

First published in 1814 and expanded in 1821, Patrick Syme's edition of *Werner's Nomenclature of Colours* attempted to establish a universal colour reference system to help identify, classify and represent species from the natural world. Werner's set of 54 colour standards was enhanced by Syme with the addition of colour swatches and further references from nature, taking the total number of hues classified to 110. The resulting resource proved invaluable not only to artists but also to zoologists, botanists, mineralogists and anatomists.

Until the recent publication of a facsimile copy of *Werner's Nomenclature* it was a work known to very few. However, in spite of its small size and scope, it is important for being the first of a series of colour reference systems that led to much bigger things. It progressed via a convoluted route that included sets of colours designed for French chrysanthemum growers and British horticulturalists; and that included three British Standard colour ranges, whilst taking in more specialised collections for camouflage purposes and primary schools.

In *Nature's Palette* this little work has, for the first time, been enhanced with the addition of illustrations of the animals, vegetables and minerals that Werner referenced alongside each colour swatch. There is an introduction which explains the genesis and influence of Abraham Werner's colour system, its revision by Patrick Syme and its subsequent history. In a book which includes essays by a number of contributors, there is no single argument, but as each contributor takes up the narrative from his or her own perspective, the book builds into a comprehensive narrative, demonstrating the importance of Werner and Syme (and others) in the history of the classification of colour and more broadly in the history of science.

Keywords: *Werner, Syme, mineralogy, science, history*

Patrick Baty is interested in the decoration of historic buildings. His work covers research, paint analysis, colour & technical advice and colour surveys. Projects have covered a 400-year period and have ranged widely. He has also worked in the USA.

He lectures on a variety of subjects and has published numerous articles, also contributing to and revising several books on colour and decoration. In 2017 his 'The Anatomy of Colour' was published by Thames & Hudson, who are also publishing his 'Nature's Palette' in April 2021. He and his wife run the family business *Papers and Paints*.

An early Modernist Experiment with Colour Perception

Liz Coats

Abstract

This paper will discuss some less known artist research into colour perception. As a painter who experiments with colour visual relations, I am interested in links with modernist art history that remain relevant in the present.

Almost a hundred years ago, at a time of radical cultural and political change, Russian artist, Mikhail Matiushin (1861-1934) and his colleagues in St. Petersburg, including his close friend, Kasimir Malevich, were seeking to overturn outworn traditions of imagery and to align with contemporary conditions through their art. They have been described by Western art historians as Cubo-Futurists, Constructivists and Suprematists, while their artwork and writing reveals that each of those artist revolutionaries had a personal view of their evolving activities.

Matiushin understood colour painting as organic in practice, insisting that perception cannot be separated from the body's inherent connection with nature. He speculated on humans' potential for expanding the periphery of vision and proposed that the sensory body could be modified and strengthened with visual exercises.

During the 1920s in the summer months, students from the Organic Studio led by Matiushin at the artist directed GINKhUK Institute, made watercolours in the light of landscape environments to record their direct responses to atmospheric colour. Their observations were tested and verified with colour/visual experiments in the Organic Studio laboratory.

In 1933, Matiushin, with assistance from his students, published a reference book of hand-painted colour samples to record the results of their experiments with balancing colour contrasts. While their experiments with colour perception were far-reaching, increasing persecution of avant-garde artists in Russia, and to avoid censorship, the book was promoted to architects and designers as a practical guide to selecting harmonious colour schemes in buildings.

Keywords: *colour, perception, visual art, Russia, 1910s/20s*

Liz Coats is an abstract painter who exhibits regularly in solo and group exhibitions. Since the mid-1970s, her work with colour has been intrinsically experimental, neither illustrative of things that already exist, nor demonstrative of a particular style. Her paintings explore a vein in the lineage of abstraction that brings organic and formal issues into relationship.

Liz completed a doctorate at the School of Art, Australian National University, Canberra, in 2012. Her research included an Exegesis titled: *Organic growth and form in abstract painting*, together with an enquiry into the colour visual experiments of Russian artist, musician and teacher, Mikhail Matiushin, and an exhibition of paintings. Between 2016 and 2018, Liz was a Visiting Fellow at the ANU School of Art. A detailed resume can be found at www.lizcoats.com.au. Her commercial gallery is Utopia Art Sydney.

At home with colour: an introduction to the colour-resources at the Caroline Simpson Library and Research Collection

Michael Lech

Curator, Caroline Simpson Library & Research Collection, *Sydney Living Museums*

Abstract

This presentation will provide an introduction and insight into The Caroline Simpson Library & Research Collection (CSL&RC) with a particular emphasis on its historic colour-related collections.

The CSL&RC is a specialist library with a focus on the history of house and garden design and interior furnishing in Australia. It is the library of Sydney Living Museums and supports its work of interpreting and managing places of cultural significance in NSW, but is also open to the public and provides a research resource for scholars, professionals and students.

The strength of the collection lies in its wide range of formats that goes beyond most library collections and includes historic furnishing samples, trade catalogues and sample books, personal papers and manuscripts, pictures and photographs. The presentation will highlight the color-related collections such as textile samples, original furnishing designs, paint charts and specialist colour reference sources for home interiors. It will cover the 19th and 20th centuries from the unique or rare to seemingly commonplace, each reference having something to add to the story of colour, especially in relation to houses, their interiors and gardens. Highlights of the collection include the only copy in Australia of the six-volume 'Journal of Design and Manufactures' (1849-52) that contains hundreds of tipped-in fabric and wallpaper samples; 19th century paint cards; the first edition of 'The British Colour Council dictionary of colours for interior decoration'; and hand-coloured mid-twentieth century student colour exercises from East Sydney Technical College.

[The CSL&RC was established in 1984 and renamed in 2004 in honour of Caroline Simpson OAM (1930-2003), after her outstanding collection of Australian colonial furniture, pictures and objects d'art was donated to Sydney Living Museums and an endowment established in her memory.]

Keywords: *interior design – house furnishings – paint and wallpaper*

Michael Lech is curator of the Caroline Simpson Library & Research Collection (CSL&RC) at Sydney Living Museums. Michael has curated the exhibition, Marion Hall Best: Interiors, and co-curated with Megan Martin, Dream Home Small Home, on Australia's housing crisis following World War II. Michael has written and presented on various aspects of the history of houses, interiors and domestic furnishings in Australia, including authoring a book on the extensive wallpaper collection at the CSL&RC. He is also engaged in ongoing research into the rise and development of Australia's department stores and furnishing trade.

Blue Light: Nasty or Nice?

Stephen Dain

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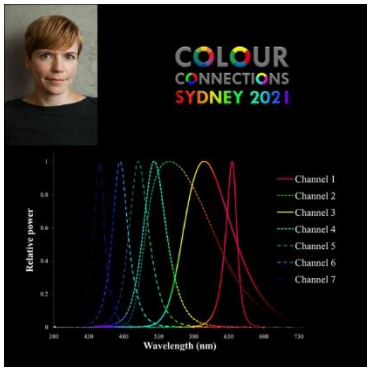
Abstract

The ability to discriminate blueness-yellowness is a far older sense than discrimination of redness-greenness. Blue has all sorts of connotations and associations in life, physical and perceptual. In recent years blue light has received a lot a bad press on three counts and the optical companies have rushed to market lenses that "block" the blue light. These are promoted i) to protect your retina against the damaging effects of blue light, particularly from your computer and office/domestic lighting, 2) to help you sleep better at night and 3) to make your use of digital devices more visually comfortable. Blue light is being promoted as "nasty". Evidence-based practice is a current mantra, particularly of the healthcare professions. In this presentation I will examine the evidence base for these claims and the need for these "blue-blocking" lenses. I will examine if this is a phenomenon particularly associated with LEDs or if it has, in reality, been part of our lives before LEDs. I will also examine of there is any downside to" blocking" blue light. Last, I will remind us what "nice" things in life we might forego without blue light.

"Moderation in all things" Aristotle. "…including moderation" Oscar Wilde.

Keywords: *blue light, computer screens, eye hazard, LEDs, lighting, retinal damage,*

Stephen Dain is an Emeritus Professor in the School Optometry and Vision Science at UNSW. He is understating a staged retirement having retired as Head of School and a full-time academic in 2006, as Director of the Optics and Radiometry and a part-time academic in 2016. He now spends his time writing papers and on national and international standards work. His interests start with colour vision but extend though public health and environmental optometry, mostly visual ergonomics and eye and face protection. He is a founder member of the CSA and was its first Secretary/Treasurer. He is an Honorary Life Member of the International Colour Vision Society and the CSA.



Leveraging Colour to Reduce the Energy Consumed by Lighting

Wendy Davis

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Abstract

Efforts to reduce the energy consumed by lighting have traditionally focused on the development of hardware that converts electricity into light more efficiently. However, there is growing recognition that simply generating light more efficiently is not sufficient – the light that is generated must also be used more efficiently. The concept of "application efficacy" considers entire life-cycle of light, from the consumption of electricity to visual perception, and focuses on the usefulness of the light emitted into an architectural environment.

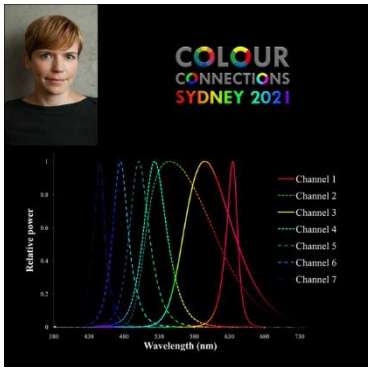
This approach to illumination design has inspired a range of innovative ideas about new ways in which light could be delivered to building occupants. While changing the temporal and spatial characteristics of illumination underpin many new possibilities, our understanding of colour can also be leveraged to increase the efficaciousness of architectural lighting. For instance, much of the light that is emitted into an architectural space is absorbed by the surfaces that it encounters before it can enter the eyes of building occupants. Since the ways in which light is absorbed by a surface depends on its colour, research has developed and tested strategies for tailoring the spectral composition of light to minimize this absorption, which can greatly reduce the energy consumed by lighting without negatively affecting the visual environment.

Similarly, opportunities to adjust the characteristics of lighting in response to the state of chromatic adaptation of occupants are being explored. The sensitivity of the human visual system changes in response to the environment – when visual sensitivity is increased, less light is required to elicit a visual response. This, coupled with the fact that some lighting technologies are able to generate light with particular colour characteristics more efficiently than light of other colours, could be exploited to reduce the energy consumed by lighting.

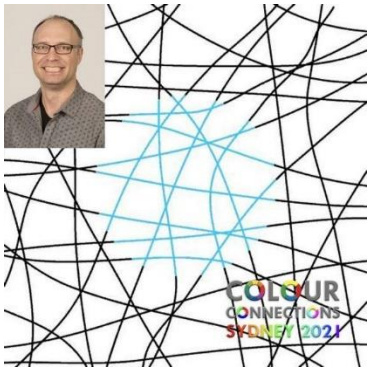
While absorption-minimizing and adaptation-responsive advanced lighting systems have been the subject of research, there are undoubtedly numerous other ways that colour can be utilized to

increase the application efficacy of illumination. This presentation will invite colour experts from all disciplines to consider (and hopefully share!) the ways in which their knowledge, understanding, and experience with colour could be used in the development of new approaches to lighting design.

Keywords: *lighting, chromatic adaptation, colorimetry, energy efficiency, vision*



Wendy Davis is an Associate Professor in Lighting and Director of Illumination Design in the School of Architecture, Design and Planning at the University of Sydney, where she leads a lighting design master's program and a research group investigating ways that emerging technologies can be used to better illuminate architectural spaces. She previously spent seven years as a Vision Scientist at the National Institute of Standards and Technology. Wendy earned her Ph.D. and M.S. degrees from the University of California, Berkeley in vision science, after completing her B.A. in psychology and physiology at the University of Minnesota.



The reality of colour illusion and nearby misperceptions

Brown, Derek H.

Centre for the Study of Perceptual Experience, University of Glasgow, Glasgow, Scotland. derek.brown.2@glasgow.ac.uk

Abstract

"Nothing answers to the standard conception of illusion" (Kalderon 2011, "Colour illusion", 773)

There are perplexing, mind-bending phenomena in which you incorrectly perceive the colours around you. That is, there are real colour illusions. There are also some "colour illusions" that aren't illusory and some that are hard to classify. I provide examples of each and begin to outline a theory of colour illusion that accommodates this picture.

On a standard conception, an illusion involves experiencing some object to have a property it doesn't have. For example, you experience something purple to be blue. While there are many cases that can be fit into this conception, in general these cases can also be interpreted in a straightforward way that avoids attributing perceptual error. This is itself interesting and important, but it also demonstrates that building a theory of colour illusion around these cases is problematic. In addition, Kalderon might be right (in the opening quote) that no colour illusion neatly fits into the standard conception. It is thus important to identify cases that break this mold, understand the ways in which they do so and understand how to accommodate them. For his part, Kalderon proposes that colour illusions 'are opportunities for being misled…by the misleading look of a thing' (774). Unfortunately, in my judgement this is also problematic. Illusions do not merely involve 'being misled' by the look of a thing, they involve perceptual error. It is thus important that we differentiate between what 'misleading looks' are and what genuine perceptual error is.

While I will not provide an exhaustive survey of the various colour illusions that have been uncovered, I will present and analyze a number of cases to illustrate that we need to move away from the traditional conception of colour illusion, but not so far away that all illusions become merely 'misleading'. I hope to demonstrate that one particularly important way to see these points is to recognize that the conceptions of illusion just mentioned are ill-suited the kinds of *perceptual*

layering found in several important examples. I hope to make this salient, and to use this issue to point toward a better theory.

Keywords: *illusion, perceptual layering, colour consciousness / experience, metaphysics of colour*

Derek H. Brown is a Senior Lecturer in the Centre for the Study of Perceptual Experience and Department of Philosophy at the University of Glasgow. He works in philosophy of mind and perception, with particular interest in philosophy of colour, perceptual constancies, 'indirect' approaches to perception, imagination, projection in perception, and perceptual demonstratives. He recently co-edited, with F. Macpherson, The Routledge Handbook on the Philosophy of Colour (Routledge, 2021). He has held visiting appointments in philosophy at the University of Pittsburgh, the University of Glasgow, and the University of Cambridge.

The Richness of Illusions of Colour

Barry Maund

The University of Western Australia

Abstract

One view of colour is a theory that may be called "The illusory theory of colour". It holds that colours are illusions: the colours we see things as having – roses, apples, birds, oceans, skies, rays of light, illumination – are illusory: those things do not have colours they appear to have. However, it is important to keep in mind that the theory is not fully captured by that negative statement. There is a positive element to the theory. The theory emphasises the illusory character of our experiences, indeed the richness of the character.

This theory offers the explanation that our visual experiences of colour have a certain character: they contain subjective qualities, properties with a certain qualitative character, which our mind 'projects' on to the physical objects in our environment. The qualities are qualities of visual objects [images] that we simply take to be [parts of] the independent physical objects. The theory, that is to say, is a form of 'Colour Projectivism'.

Many colour theorists, however, are reluctant to accept the theory: they think of the theory as too negative. They are drawn to one or other of the various Colour Relational views that are on offer. (One important example of such theorists is H. Arnkil, *Colours in the Visual World.*) At the heart of the problems with the Illusory theory of colour, is that illusions are widely conceived in negative terms: illusions – like errors – are thought of as bad things, they are things to be excised. If colours are illusions, then it means that visual perception is such that thing appear to have colours they do not have – which is to say we are committed to an error theory of visual perception. And who wants to endorse an error theory??

The short answer to this last question is that there are errors and errors. Errors need not be bad things – as long as they are systematic errors. Likewise, there are illusions and illusions. Some illusions are just oddities -- curious phenomena. But some are much more than that. One good example is a mirror. Physicists call mirror-images "virtual images", and they contrast them with "real images". I think it is a bit too quick to say they are not real, and to say they do not exist. But even if we do go along with the physicists and agree that mirror-images do not exist and are virtual, rather than real, then it would mean that some things that do not exist, and are not real, are very valuable! There can be something very positive about being virtual. Accordingly, if

colours are virtual properties, just as mirror-images are virtual images, that can be highly positive (they can be valuable, informative).

However, there is another idea that I wish to pursue. It is the idea that reality is a slippery notion. It is not that it isn't important. It obviously is. But the possibility I have in mind is that there are different ways of being real. John Austin, an Oxford philosopher, once gave this example: "a decoy duck is not a real duck; but it is a real something else".

When physicists contrast virtual images, which they say mirror images are – with real images, they mean by 'real', 'physically real'. I am inclined to think that there are other ways of being *real*. Indeed, it seems to me that there is a list of curious phenomena that might be usefully thought of in this way: rainbows, skies, mirror-images, shadows, after-images, colours.

In the January 2020 issue of *Physics World*, there is an article on Rainbows by an emeritus Physics professor at Bristol, Michael Berry. The heading for the article reads: *True but not Real.* And it has a sub-heading: In physics, asking the question "Is it real?" is a slippery slope, and the answer often depends on the level at which something is modelled.

Professor Berry begins:

> Reading Christopher Pinney's 2018 book *The Waterless Sea: a Curious History of Mirages*, I was struck by a phrase he used to describe mirages, and indeed all *illusions*: "real, but not true".

Berry is obviously taken by the phrase "real but not true". The thrust of his article is that in physics the reverse is true (at least sometimes): In physics, there are some things that are true but not real. To illustrate, he considers the example of rainbows. Rainbows are illusions but they are not merely illusions: they are illusions with complex character: they have a number of aspects. It turns out that there is complex physics at different levels that explains why rainbows have that character. Berry writes:

> When I look at a rainbow, I see beyond the Descartes–Newton ray explanation in terms of refraction, reflection and dispersion of sunlight encountering raindrops. I look for the supernumerary bows: interference fringes that allow us to see, vastly magnified, the inadequacy of the ray theory of light and its replacement by the physics of waves.

None of these levels describes the real rainbow, he states, but each of them is true. There is an important point here. One way of making the point is to apply the distinctions between being real but not true, and between being true but not real. I think there is also another way of making the point.

1. Rainbows are illusions but they are not merely illusions.

They are illusions with complex character: they have a number of aspects. It turns out that there is complex physics at different levels that explains why rainbows have that character.

2. Mirror-images are illusions (virtual images) but they have a rich character;

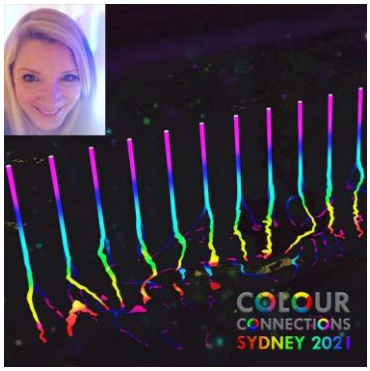
   Physics helps us understand how they have such a rich character.

3. Colours are illusions too, but they have a rich character.

   Physics helps us understand how they have that rich character.

***Keywords**: Illusion, Errors, Mirror-Images, Rainbows, Real*

Barry Maund is Senior (Honorary) Research Fellow, in Philosophy, at the University of W.A. he has published a book on colour: *Colours: Their Nature and Representation*. He has published review articles in the *Encyclopedia of Color Science and Technology* – 'The Philosophy of Colour --, and the *Stanford Encyclopedia of Philosophy* -- the entry on Color.



Luminous Colour - the Enchantment of Light Art

Aly Indermühle

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Abstract

Luminous Colour is an engaging, colourful overview of contemporary light art exploring the medium's popularity, a brief history, and why it continues to captivate the public.

Throughout history, humankind has manipulated light to evoke awe and wonder. From the god ray in the Pantheon to the artisan crafted stained-glass windows in the cathedrals of Europe, these historical enhancements of space through light have always been about the transcendental human experience. With the invention of electric light, this tradition expanded to utilitarian purposes, and ultimately grew to encompass the use of both electric and naturally luminescent materials in art.

It was not until the late 1960s that artists truly began to embrace the use of light in their practices, giving rise to a new medium, the luminous. Fuelled by psychological insights and technological advancements, artists such as James Turrell, Robert Irwin, Bruce Neuman, and Dan Flavin introduced light to the mainstream public as an art form. Their artistic creations evoked personal communication with the viewer through light and colour in a language that needed no words, an emotive response that lies deeply ingrained in human experience and subjective feedback.

Even with the advance of technology, light artists' motives to connect with the viewer through capturing and spawning uniquely personal experiences has remained the same. We can see this continuing legacy in the contemporary practices of Olafur Eliasson, Phillip K. Smith, Ivan Navarro, Leo Villareal, Jenny Holzer, Tatsuo Miyajima, Bruce Munro, David Batchelor, Spencer Finch, Carlos Cruz Diez, and Brian Eno.

A rich narrative of human experience lies intertwined within light art both past and present. Perhaps this is why luminous art inspires people around the globe to flock to colourful light shows and luminous exhibitions each year. These displays of spectacle and amazement provide an opportunity

to reflect on what it truly means to be alive by appealing to our inner child through awe and wonder and provides truly visceral experiences so different from our everyday lives.

Keywords: *light, art, color, experience,*

Aly Indermühle's professional art practice encompasses interdisciplinary art and public space engagement, including multiple high-profile artworks with Australia wide exposure. She has completed for the City of Sydney five large scale public installations on three consecutive VIVID Light events in 2016, 2017, and 2018 and was commissioned by the Australian Open to enliven spaces with her creations. Her current practice is the evolution of a rich foundational experience, beginning with ten years of Special Operations military experience in visual graphics, then operated the animation department for MTV Productions Switzerland. In 2005 she relocated to Australia and obtained her MFA at the National Art School in 2017, where she presented her exegesis, *The Language of Light - The Subjective Experience of Luminous Nonmaterial*.

Four Key Insights about Colour

David Briggs

National Art School, Julian Ashton Art School and University of Technology, Sydney

Abstract

The presentation summarizes four key insights about colour that have been addressed in recent writing, presentations, and outreach videos by the author.

1. *The colour that we see a light or an object as having is not a physical property. It is* ***the way in which we perceive*** *a physical property* - the overall amounts of long, middle, and short wavelengths present in the light or that the object is disposed to reflect **-** subject to both the state of the observer and the viewing conditions.

Colours such as red or white or green are not physical properties of lights or objects**.** Such colours are the ways in which we perceive the spectral composition of a light or the intrinsic spectral reflectance of an object, in terms of its overall long-, middle- and short-wavelength components[1]. However, the perceived colour of a given light or object is not a fixed property of that light or object. Perceived colour does not depend exclusively on spectral properties but is influenced by factors relating to the viewing environment and the individual[1]. When we use a device to "measure the colour" of a light or an object, we are using the word "colour" in a specific sense involving colour *matching*, called *psychophysical colour*. Colour measurement (*colorimetry*) specifies a stimulus that a light or object will *match*, subject to conditions including a mathematically defined "standard" human observer[1].

2. ***Hue*** *is the way in which we perceive a* ***direction of imbalance*** *among the long, middle, and short wavelength components present in a light (relative to daylight) or that an object is disposed to reflect. Our visual system does not identify individual wavelengths, but only variations in the overall balance of long, middle, and short wavelengths.*

Contrary to many popular science explanations, cone cells do not individually detect "red, green and blue wavelengths". The three cone cell types respond to all, almost all, and the short wavelengths of light respectively, and cannot detect specific wavelengths within these ranges. Instead, the three

cone cell types and their connecting ganglion cells together constitute an apparatus that responds to the overall balance of energy in light among the long-, middle- and short-wavelength parts of the spectrum[2].

3. ***We cannot mix colours***. *The unconscious assumption that colours reside and mix in paints underpins the idea that the colour green is "made of" yellow and blue, which in turn underpins the odd hue relationships of the traditional colour wheel.*

Colours do not reside in lights and paints, and so it is not the colours themselves that mix when we mix lights or paints[2]. Hence there should be no surprise at the very different results of *additive, subtractive* and *additive-averaging* mixing processes. The impression that red, yellow, and blue are "primary colours" that can't themselves be "mixed" from other colours arises when we observe the mixing of paints on the assumption that colour resides and mixes in those paints. We see and describe paints and their mixtures in terms of the perceptually pure red, yellow, and blue *unique hue* components of their colours. The fourth unique hue, green, is not seen as being a "primary" hue because it appears to be created by mixing yellow and blue[3].

4. *Just three attributes, such as hue, lightness and chroma, are sufficient to describe the* ***colours of objects****, but other colour attributes are needed to describe colours of lights, to fully describe colour appearance, and to highlight other relationships among object colour perceptions.*

Classifying colours of objects requires three dimensions or attributes, such as *hue, lightness* and *chroma*. The concept of a three-dimensional space of colours is of great benefit in practical paint mixing instruction, allowing it to go beyond "how to make violet" to how to systematically adjust colour attributes to produce a violet of, for example, a specific hue, lightness and chroma[3].

Perception of colours of objects does not arise directly from cone responses but depends on unconscious comparisons within the visual field that provides a degree of *object-colour constancy*. For example, a blue-appearing area might be perceived as a blue object under white light or as a white object under blue light, and the same object colour can be perceived in areas of the visual field that look very different and send very different light stimuli to the eye[2,3].

To describe colours of lights, to fully describe the colour appearance of an illuminated scene, and to highlight different relationships among object colour perceptions, more than three attributes of colour are needed. In addition to hue, lightness and chroma, these include *brightness, colourfulness, saturation, brilliance/blackness* and *whiteness.* Colours of objects can be classified using various alternative sets three of these attributes. Colours of lights can be classified in terms of *hue,*

brightness and either *saturation* or *colourfulness*, although for many purposes colours of lights can be considered in terms of just two dimensions, independent of their brightness[3].

(1) Briggs, D.J.C., 2020. *What is a colour? Perception or property?* https://www.youtube.com/watch?v=4x13_k5Qgn0

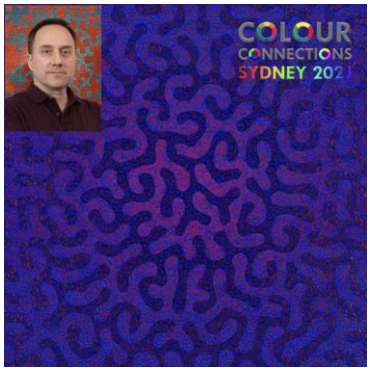
(2) Briggs, D.J.C., 2020. *Hue and its components*. https://www.youtube.com/watch?v=u2X2ZYhM4Hk

(3) Briggs, D.J.C., 2018. *Where is Color Education Now?* http://www.iscc-archive.org/Munsell2018_Presentations/Briggs-Presentation-WhereIsColourEducationNow.pdf

Keywords: *colour ontology, colour vision, colour theory, colour constancy, colour attributes*

Photo credit: Sallv Rvan

David Briggs is a painter and a teacher at the National Art School (NAS), the Julian Ashton Art School and the University of Technology, Sydney. His publications include a chapter in the Routledge *Handbook of Philosophy of Colour* and his outreach websites *The Dimensions of Colour* and *Colour Online*. David is President, NSW Divisional Chair and Colour Education Officer of the Colour Society of Australia, and is a committee member of the AIC/ ISCC Colour Literacy Project and CIE Technical Committee 1-99.



Using Color Effects in Service of an Artistic Vision

Andrew Werth

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Abstract

Color is one of the essential tools in any visual artist's tool kit. But when one's artistic inspirations are cognitive science and philosophy of mind, color usage becomes a part of the subject matter itself. In this talk I will describe how I use color effects—beyond just mixing the right color—in service of my artistic vision. My paintings consist of one or more layers, typically an underpainting and a layer of maze-like marks whose color varies in smooth gradients across the painting surface. The high spatial frequency of these marks allows me to play with optical mixing, color assimilation, and simultaneous contrast at various scales. As the viewer moves closer or further away, different effects might dominate the perception. Another frequently used visual device is *chromostereopsis*, the appearance of depth from physically adjacent colors that are far apart on the wavelength spectrum. By mixing metallic or interference paints with transparent ones, I can both boost the apparent chroma of some colors while also making the painting change appearance depending upon the viewing angle. Similarly, by using transparent glazes on top of highly reflective supports (such as aluminum composite panels), I can create interactive paintings that blaze with color when you catch the light just right. A few of my paintings exhibit a Purkinje shift, where the reds darken faster than the blues as the lighting on the painting dims, causing a kind of glowing effect. Given that my paintings are usually about ideas of The Self, consciousness, and making sense of reality, the appearance of an inner illumination provides metaphorical support for my subject matter while giving the art collector a perceptual treat to contemplate over extended viewing.

Keywords: *chromostereopsis, abstraction, illusions, perception, painting*

After a first career as a software engineer with formal degrees from Carnegie Mellon University in Computer Engineering and Information Networking, **Andrew Werth** moved to Manhattan for a self-directed an arts education that drew from many of the arts institutions in New York City, including the School of Visual Arts, The New School, and the Art Students League. Now back in New Jersey since 2005, he has been exhibiting my *organized organic abstraction* paintings at galleries throughout the New Jersey / New York / Pennsylvania (United States) area for more than fifteen years.

Calculating Colour for Imaginative Realist Painting

Ron Francis

Fine artist, Tasmania Australia.

Abstract

My goal, for as long as I can remember, is to be able to create a realistic representation of anything that I may imagine or dream. Controlling colour plays a huge role in being able to render a scene that is believable, and in this talk, I will address colour problems I've experienced from my early days up until now, and the methods I used to try to solve them.

1. **Working in RYB colourspace, and mixing complementary colours.** Red, Yellow and blue are often cited as primary colours that can be used to mix any other colour. However, it has a limited gamut and other colourants from across the spectrum are necessary to achieve a significantly larger availability of mixable colours.
   To mix a particular colour, many artists use combinations of these three 'primary' colours, with complementary colours used to lower chroma.
   An alternative method that will achieve a colour that appears identical is to choose two high chroma colourants that are close to each other, and on either side of the hue of the target colour. This can then be modified with black and white to change it's value and chroma.

2. **RGB and CMY colourspaces.** RGB is an additive colourspace that simulates adding coloured lights together to produce a new colour. It is used extensively in 3D computer graphics. Mixing pigments cannot reproduce the effects of adding lights, so those colours need to be calculated beforehand.
   CMY is a subtractive colourspace which is much closer to the way pigments behave.
   If primary colours can be defined as "what 3 colours will produce the largest gamut", CMY will produce significantly more than RYB.
   CMY can be used to predict the resulting colour produced by illuminating a coloured object

with a coloured light source, and this can be roughly estimated graphically. It can be more accurately estimated in photo editing software by overlaying the illumination colour over the local colour in multiply mode.

3. **Atmospheric Perspective:** The effect atmosphere has on distant objects. There are basically two things that affect the colour of distant objects, scattering of light by particles smaller than the wavelengths of light, (Rayleigh scattering), and Mie scattering which is caused by scattering from larger particles. Rayleigh scattering mainly scatters blue light and is responsible for our sky appearing blue and objects in the distance appearing lighter and bluer. It also accounts for sunrises and sunsets looking orange, because much of the blue light has been scattered out after travelling through much more atmosphere than at other times of the day.
   There are complex formulae for simulating the effect of Rayleigh scattering, and I use one based on the Nishita model. Mie scattering is commonly caused by dust, pollen, water droplets and smoke and can be a variety of colours. Fog is an example.

4. **Reilly Compression.** This is a method of grouping value scales to simulate lit and shaded areas. For example, a value scale of 0 – 10 (black to white), can be compressed to 0 – 5 to simulate shadows, in which case white at value 10 would become value 5 when compressed, and red at value 5 would become value 2.5. Although this system is effective, it doesn't account for changes in value caused by coloured light sources.

5. **Fresnel equations:** Calculating how much reflection the viewer will see on a glossy object. I use these equations whenever I'm painting glass, water, or any surface that has some gloss to it. The amount of reflection is determined by the angle of incidence and the index of Refraction (IOR) of the material.

6. **XYZ and xyY mathematics:** These spaces contain all colours and they allow me to experiment with under and over exposure, as well as replacing the Reilly Compression system. Exposure is controlled by translating and/or scaling XYZ along the black – white axis. Scaling it by 0.5, for example, will give the same results as using Reilly Compression to compress a 0 - 10 value scale to 0 – 5. Translating the space along the black – white axis allows me to push colours out of gamut. This can be done in either direction so that colours may too light to be in gamut, or darker than black. Also, changing the Y component in the

xyY model, is useful for changing the value of a colour without changing its hue or value.

7. **Munsell Colour space:** The Munsell Colour system is a physical grouping of colour swatches which are arranged in pages of different hues, and each hue page is sub-divided into different values and chromas. Although a colour on a computer monitor can give a fairly good indication of what colour to mix with paint, translating from XYZ to Munsell gives me physical colours swatches to match to, which in turn gives me enough accuracy to confidently test theories and ideas.

8. **A brief look at 'Lightsource'.** My app to replace previous systems used to calculate coloured light sources which incorporates Fresnel equations, exposure, conversion to Munsell, and Lambert shading.

Ron Francis is a self-trained, Tasmanian-based painter who has exhibited since 1980. After a long stretch painting trompe-l'œil murals from 1988 to 2006 he returned to fine art painting. Ron now exhibits with Scott Livesey Gallery, Melbourne, and a selection of his haunting paintings can be seen on his website at http://www.ronaldfrancis.com/

Conceptual and Empirical Approaches to Colour in Realist Painting

Andrew Bonneau

Abstract

Most people assume that painting from observation consists of just looking at the world and matching what you see. In this lecture I will show that this simply isn't the case. From at least the Renaissance, painters had a much more conceptual approach to representing the world in paint. This relates strongly to the illusion of three-dimensional volume and less than would be assumed about visual phenomena.

Painters would always train by learning to draw, which, in a large part, connects the sense of sight with the sense of touch. The very idea of an outline represents the edge of a form in space, and doesn't exist in nature. Thinking this way leads to an understanding of the world as consisting of solid volumes and a fixed light source that reveals the beauty and subtlety of form. I would argue that it wasn't until 19th century Impressionism, and the influence of photography that a more purely empirical approach began to gain prominence.

This lecture will explore some of the differences between an empirical and a conceptual approach to drawing and painting from life, which has implications for how the artist understands hue, value and chroma. Although both approaches can give a satisfying result and a convincing illusion of form and space, I will investigate some of the philosophical differences between these two ways of looking at the world and the subtle differences in result that they reveal. There will be abundant visual examples from art history (Renaissance to 21st Century) tracing the development of the illusion of form in painting, as well as visual explanations about the phenomena of how colour relates to this in a more abstract way.
I will conclude the lecture by comparing some examples from contemporary art schools that have attempted to revive traditional approaches to realist drawing and painting.

Tasmanian-born painter **Andrew Bonneau** lives and works in Cairns, Qld. He studied at the National Art School, the Charlie Sheard Studio School and the Julian Ashton Art School in Sydney, and for three years under Jacob Collins at the Grand Central Academy of Art in New York. He has been selected as finalist for many national painting awards including the Adelaide Perry Drawing Prize, the AME Bale Travelling Art Scholarship (three times}, the Moran Portrait Prize (three times) and the Archibald Prize, and has been commissioned by the National Portrait Gallery in Canberra. His website is http://www.andrewbonneauart.com/index.html

Streeton's lost landscape.

Simon Ives

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Abstract

Arthur Streeton was clear that the 'golden' painting of Gloucester Buckets sent back from London for the 1899 show had never been exhibited. Acquired by AGNSW, the painting fell into some disrepair. Recently conserved, the sunny landscape went on display in *Streeton*, at the Art Gallery of New South Wales in November 2020.

Of six Gloucester subjects itemised in the Streeton catalogue raisonné entry for 1894 there are four smaller works, and not one but two large, five foot (60 x 30 in) Gloucester Buckets compositions, listed with the titles *'Gloucester Buckets (sunny)* – In possession of the National Gallery, Sydney' (AGNSW) – and *'Gloucester Buckets (grey)'*, beside an intriguing note: 'Disappeared, not sold by artist.'

A careful illustration from an exhibition catalogue of 1894 depicts the subdued Low key "Whistlerian" painted scene from the Gloucester Buckets which was generally acclaimed in its year as a singular and powerful work and remembered as a rare piece even into the next century. *The Sydney Morning Herald* described it as 'symphonic', and as 'picture of the year' of 1894 – where had that painting gone?

The AGNSW conservation department took an Xray which imaged something out of the ordinary under a Streeton floral still life which had also come to be in the AGNSW collection. Standing out against a deep green space are two clusters of the spectacular white flower *Lilium Auratum*. The painting, like the plant, is tall, measuring nearly five feet high. The X-ray image was immediately interesting, as it does not match the visible painting. The flowers disappear and instead, turned on its side, the greyscale image exactly matches the catalogue illustration of the painting of 1894. Buried under the lilies is a long-lost painting recorded in Streetons catalogue raisonne as *Gloucester Buckets (grey)*.

It suggests that in 1909 the Australian art world gained an elegant floral still life, but simultaneously lost an acclaimed and haunting vista captured in an unrepeatable moment of his youth.

This presentation tells the story of the restoration of Gloucester Buckets (sunny) and the discovery of Gloucester Buckets (grey).

Keywords: *Streeton painting x-ray restoration pigments*

Simon Ives is a Paintings Conservator at the Art Gallery of New South Wales. He gained a Masters degree Fine Art Conservation with a speciality in easel paintings at the University of Northumbria (UK) in 1994. He has also worked at the Tate Gallery in London and the National Gallery of Australia. He has written articles on artists materials and techniques for a range of publications and is interested in innovative digital presentation of conservation analysis.

The Aesthetics of the Technological Image

Chelsea Lehmann

National Art School, Sydney, Australia

Abstract

Analytical or 'advanced' imaging techniques such as high-resolution digital scanning, X-ray, and infrared analysis can expose hitherto unknown combinations of visual detail and material information within the surface of paintings. These techniques are commonly employed in fields such as material science and art conservation. Advanced imaging techniques produce a special order of image that I refer to in this paper as a technological image. These images can be understood as 'scientific' images in that they often contain or visualise valuable scientific information, such as the whereabouts of heavy metals in a painting, which can identify certain paint pigments; or, in the case of X-ray, a previous version of a painting, concealed in the surface.

The kind of looking directed at technological reproductions is comparable to 'gazing' at a scientific image; it is a form of regard that is curious, penetrating and invokes the contentious relationship between appearance and truth so fundamental to both science and aesthetics. In this paper I explore some of the ways advanced imaging technologies and their outcomes can present, instigate, or even 'be' art by responding to selected examples of technological imaging applied to significant historical artworks. I argue that the way we perceive artworks and the way we perceive their digital counterparts in the form of technological images has been brought closer together by the capacities of advanced imaging; that is, the detailed and intimate view of paintings, magnified and multiplied, promotes new understandings of painting through an expanded access to the painted surface. Through a discussion of the *Henry VR* project at the Art Gallery of NSW (2018) and Sydney artist Janet Laurence's exhibition *The Matter of the Masters,* (2017-2018) I propose that the 'artfulness' of advanced techniques used to record and reproduce information complicates the conventional relationship between the artwork and its technological proxy, in effect producing not just a copy of the original, but a new kind of image with its own aesthetic agency.

Keywords: *painting, spectral phenomena, scientific images, technological image, aesthetics*

Chelsea Lehmann has exhibited extensively in Australia for the past two decades, and has been the recipient of several awards, grants, and local and international residencies. Her most recent exhibitions include *Persona* (Flinders Street Gallery, Sydney, 2020), *June* (MARS Gallery, Melbourne, 2019), *Bad Mannerism* (Galerie pompom, Sydney, 2018), and The Articulate Surface (UNSW Galleries, Sydney, 2018).

She is a Lecturer in Drawing at the National Art School and completed a PhD at UNSW Art & Design in 2019.

Colours - One: A Photo Editing App Based on Human Colour Vision

Tony Vladusich

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Abstract

Colours - One is a photo editing app for the Apple ecosystem that is based on properties of human colour vision. In my former life as a colour neuroscientist, I specialised in the development of mathematical and computer models of human visual perception, particularly colour perception. In 2016, I founded Complexion Software in an attempt to transfer insights from colour neuroscience to the burgeoning field of mobile software development.

How does it work? You can think of the Colours - One app like a digital prism that automatically splits up all the hues in a photo (16 hues in all). Each hue is displayed on a grayscale version of the photo to produce a beautiful color splash effect. The user can adjust the contrast color of each hue independently to produce really captivating color effects. Finally, the user can combine all the individual colors together to compose a strikingly enhanced final version of the photo.

In addition to being a fun & useful app with which to edit photos, Colours - One has allowed me to keep exploring the computational basis of human colour vision. I hope to one day publish my findings to the public domain.

Free promo codes are available to unlock the Go Premium feature of the app, which will let you edit photos from your own Apple Photos library.

Keywords: *Colour, app, vision, photo, editing*

Tony Vladusich is a former computational neuroscientist whose research focused on the computational foundations of human color perception. He worked in Australia, Europe & the US throughout his career. He switched to software development in 2016 in order to translate ideas from color neuroscience and computer graphics research into software suitable for the Apple ecosystem.

Dr Vladusich's scientific work has deep and far-reaching implications for understanding how the human brain represents the world. He published a series of 6 papers in top vision journals between 2012-2015 on his theory of gamut relativity, which provided a unified account of many phenomena in brightness, lightness, gloss & transparency perception. His theory asserts that the dimensions of visual perception correspond more closely to the computational machinery of the human brain than to the physical dimensions of the world, as commonly assumed by extant theories. Gamut relativity accounts for the phenomenon, well known to artists & graphics specialists, that grey shades correspond to points in a 2D blackness/whiteness space, rather than a 1D continuum. One corollary is that the range of perceived grey shades is relative (scene dependent) rather than absolute (scene independent).

Dr Vladusich's work on the *Colours - One* app represents a natural extension of the central ideas of gamut relativity to the perceptual dimensions underlying lightness, hue and saturation perception.

Response to demand - Colour makers' ongoing dialogue with artists

David Coles

Founder of Langridge Artist Colours. Author of *Chromatopia*.

Abstract

The relationship between painters and makers of artist's paint and how each has influenced the other in the creation of art materials is rarely discussed in art history.

The shift from making paints in the artist's studio to dedicated paint-makers (known as 'colourmen') altered the nature of paints and the colours offered.

When dedicated paint-makers appeared on the scene in the mid-eighteenth century they were able to take advantage of technologies to introduce new methods of manufacture, supply newly created pigments and alter the physical nature of paint itself. Often this was done for the creative benefit of artists, sometimes for the sole benefit of the maker.

The conversation between artist and paint maker is widely misunderstood, as if the relationship is top down, with materials being offered with no alternatives. In fact this history is built upon artist's requests and paint makers listening to these demands.

Paint makers would custom make paints specific to an artist's demands, such as more fluid or stiff. They would also, upon request, use pigments not available in their standard ranges, even if this was detrimental to the longevity of the resulting artwork. The permanence of pigments and their relationship to their binding media has always been under scientific investigation and makers have adjusted their offerings as new information came to light.

In particular, the presentation will reference the great nineteenth century colour maker George Field, and from the twentieth century Leonard Bocour of Bocour Paints, Mark Golden of Golden Artist Colors and myself with personal reflections on behalf of Langridge Artist Colours.

Artist's understanding of their working materials has varied throughout this whole period. The gap between their understanding and their use of art materials widened due to their removal from the selection and processing of the raw materials that had been a feature of paint making in the artist's studio before the eighteenth century.

But it is important to acknowledge how many paint makers have and continue to work hand in hand with artists to offer materials of the highest performance and how they are the instigators for introducing pigments and binding media that have opened up a new creative world.

David Coles is the founder and Managing Director of Langridge Artist Colours in Melbourne and author of 'Chromatopia, an Illustrated History of Colour' (Thames & Hudson, 2018). David studied Fine Art (Painting) at Bristol in the UK and then worked in London for the renowned art materials suppliers Cornelissen & Sons and Roberson & Company. He arrived in Australia in 1990 on holiday and two years later founded Langridge, now one of the world's most respected makers of artists' oil paints (http://langridgecolours.com/).

Colour: Towards an Extensive Cultural Paradigm – *paradeigma*

Joaquim Santos

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Abstract

A long human existence of observing both nature and man-made objects represents the humanization of humankind, within the context of the experience of environment. Colour by being the colour of something, may be appropriately placed at the core of human existence and thus, the magnitude of colour is vast in relation to space and time.

From Gaugin to the expressionists and further on to abstract expressionism we have seen a complex cultural paradigm that departs, somehow, from the individual, but it is a cultural building system where humankind creates interaction and simultaneously acts. And colour is at the centre of events and reveals that such phenomena are not a novelty but a long-term revelation of existence itself regardless of a segmented and nonetheless, reliable reality that an epistemology may embody.

Experience of colour-nature by being the colour of material objects should then be a magnificent source of mind building and cultural building. Land by being under our feet and sky by being over our heads comprise a sense of objectivity by being there and in which a precise position may be found in the three-dimensional world that influences our possibilities to move across it. However, the day-night motion, weather and seasons, also comprise an idea of permanent motion and, in some sense, of subjectivity, or relativity, unless we find a natural law to explain natural metamorphosis, and these are strongly revealed by colour.

The winter blue sky of Uluru and its nuances at twilight appeal to eyes and body. A vast night sky that the moonlight may give different perception of depth and extension in relation to the infinite number of stars and of small light spots of the galaxy we can seemingly reach within the realm of perception. And this moonlight effect seems true for every night sky where city lights would not have other night sky light profiles.

In contrast, in Finland, the experience of temperatures under minus twenty degrees Celsius provides a clear cloud-free blue sky over a white covered land. Where flat frozen lake surfaces combined with

low topographic elevations result in the addition of an immense magnitude of land, to the perceptual experience of time and space. Yet, irregularity of lake shores may tell a different narrative from a complete flat land where Uluru and Kata Tjuta establish a strong landmark criterion of experience, especially Uluru by its “dense” materiality in opposition to the fragmentary nature of Kata Tjuta.

Finnish forests and lakes have very different smells than those experienced in the desert surrounds of Uluru. In general, our olfactory experience is well acquainted with the smells of flowers and plants. However, when we experience immense magnitudes of space and time, timeless land and timeless sky, all experience seems to mingle in a different way.

In Finland, nature clearly displays eight seasons expressed by an intense chronology of colour and smell. The metamorphosis of land and sky proceed one after the other in majestic clock. We may clearly read the clear traces of the last ice age in the granite lake shores, or inside forests, however the rhythm of metamorphosis provided by nature appears to hide the physical presence of long-term time travel.

The magnitude of time of Uluru is different. It may rain, the sky is different then, the land has different smells and colours, but soon both will be back to the enduring magnitude of space and time. Even daily cycles of light-colour report a long term basic and deep structure that is there and that is perceived as such. The desert oaks seem silent witnesses of a long existential life that and this metamorphosis is not displayed in the spruces or birches of the forests of Finland. All silences are different and so are the magnitudes of those silences in time and space.

Since much of what we perceive is given by vision, colour seems difficult to conceive as an isolated phenomenon and the boundaries of space and time seem the hardest to inquire. Aboriginal body painting combines a painting on a mortal body, the use of everlasting stone materials and an enduring cultural tradition. There seems to be a chronological layer in which is inseparable from the present. Thus, a single painting on a mortal body seems, in some sense, as timeless as a cave painting of 50.000 years ago. Human cultural paradigms are quite complex when we think on them on a comprehensive way and the artwork is paramount. From a humanistic point of view human records never age. So, there seems to be a permanent growth of the magnitude of colour due to its active role in man-made things.

Every single artwork is a materialization of a specific paradigm in which the artist’s mind synthesizes as much as possible all psychological and cultural qualities that enables the mind to express specific conceptions of space and time. The limits of how far the artist goes determines how far the artistic

expression grows. Thus, an object tends to express universal values which stand beyond a single culture. Then the paradigm is an extensive cultural paradigm to whole forms of knowledge which make a true intelligent mind possible. Consequently, the revelation of colour and all that which is revealed by colour is deeply dense and profound and, perhaps, an epistemology/ knowledge? only has the capability of partially revealing colour meaning.

In relation to a single individual, the extensive cultural paradigm has frontiers which are difficult to define. The first frontier is somewhere before birth, and the world in which existence takes place is its expression. And the second frontier is somewhere beyond the present life, it is the ideal future which only exists in the mind. It is the possibility of being in a close or distant future according to the possibilities of the mind to forecast a non-existent world. The analysis of an artwork is the search for the true nature of this paradigm. It is the search for someone's paradigm, but also for our own paradigm, throughout which we are able to understand and therefore to create our own understanding and our own method. Every single attitude towards knowledge Is the search for a clear picture of the paradigm of the self, an Extensive Cultural Paradigm – *paradeigma*.

Keywords: *artwork, paradigm, creation, perception, culture*

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A study to 100+ colour courses for design education taught during the last decade

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Abstract

This talk presents a comprehensive analysis of 100+ colour courses taught within design programs of higher education institutions from different countries (Latin America, North America, Europe, and Oceania) during the last decade (2010-2020). The analysis was conducted as part of a doctoral research that proposes the development of a Colour Design Training Itinerary (CDTI), as a complete educational framework for the improvement of the teaching and learning of colour in the design discipline. The aim of the analysis was to define the state of the art of the inclusion of colour training within design education, to identify the main didactic strategies implemented, and to recognise the main critical aspects to face when proposing an innovative framework for colour training.

The methodology of analysis was based on desk research and consultation with teachers, resulting on a comparative study to the syllabuses of the different courses, by considering the formal aspects and the elements of the didactic strategies. The sample was composed by 103 courses which specifically included the word 'colour' on their name, and that were taught within design institutions and/or design schools. The courses analysed had a duration of between 6 and 100 hours. The syllabuses were provided, in some of the cases, directly by the teachers; in others, were available online in the institutions' websites.

Among the formal aspects that were analysed we can find: the course level (basic or advanced); duration of the course (effective and study hours); the entry profile of students (undergraduate students, postgrad students, professionals); the disciplinary specific area (communication design, interior design, fashion design, etc.); course location (city, country, online); type of institution (university, professional institute, private academy, others) and the language of the course.

Among the elements of the didactic strategies that were analysed we can find: the intended learning outcomes of each course (following the revision to Bloom's taxonomy proposed by Anderson & Krathwohl in 2001); the contents proposed by the course (classifying them first, into 2 main categories: 'Colour Fundamentals' and 'Colour Application' and, then more specifically in the

subcategories of theoretical, applied, creative and technical content); the teaching strategies of the course (theoretical lessons, practical exercises, case study, laboratory work, etc.) and, the bibliography suggested for the course (by identifying the most addressed literature sources).

The main results of the study will show that (a) most of the courses still have a strong focus on basic theoretical content, such as 'Colour Fundamentals', even though several of the courses declare to have an applied focus or are presented as 'advanced' colour courses; (b) when the courses really present an applied focus, it is usually a technical approach to colour (colour reproduction, management or measurement) instead of a creative, design-based approach. (c) According to how most of the courses have been designed, knowledge sharing between colour science and the design discipline is not bi-directional or equivalent: colour knowledge is informing design through concepts and methodologies, but design discipline is poorly informing colour science; and (d), after the study it is evident that there is a strong need to move from a content-centred approach to a student-centred focus, that could be able to dialogue with design based learning (DBL), teaching strategy at the core of the design discipline, and to embrace the most optimal learning methods for the future generations of designers (new technologies, channels, actors, active learning, among others) and the future discipline needs.

Keywords: *colour training, colour education, design education, didactic strategies, syllabus analysis*

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Observation, reflection and collaboration - Colour Design Training Itinerary, a framework for the future of colour education

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Abstract

Colour is one of the main elements of perception and design, however, the teaching and learning of colour in the design discipline -and also other project disciplines as architecture and art- is not consolidated: there is a lack of regard and inclusion of colour in contemporary design, architecture and art education, as an international current practice; most colour educators work in a non-collaborative setting, on a limited budget, with limited time and resources in the classroom; there is a lack of affordable didactic materials to complement teaching; in some cases, teachers have access to limited colour knowledge, much of which is superficial or outdated and; there is a lack of innovative and updated student-centred training methods and resources, among other issues that have been largely documented during the last three decades.

This doctoral research proposes the development of a Colour Design Training Itinerary (CDTI), as a complete educational framework (different training paths, intended learning outcomes, contents structure, methodologies, teaching and learning activities, and assessment strategies) that sets out different levels of action for the improvement of the teaching and learning of colour in the design discipline. The project is being carried out with special attention to observation and direct experience as a way to inspire the individual reflection on colour and, with this, to lifelong learning. Also, the CDTI framework is being built through consultation, involvement and collaboration with colour teachers from different countries and backgrounds. The main goal the research is to provide meaningful resources to contribute to a greater inclusion and consideration of the teaching and learning of colour, according to design and project disciplines needs in a changing world and for the future.

Keywords: *colour training, colour education, design education, colour design*

We don't know Jack about Hue – the Colour Knowledge Survey

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Abstract

What does the average person know about colour? The Colour Knowledge Survey concludes that few people can confidently identify basic principles as to the nature and behaviour of colour. The survey remains open, but the data so far collected spans a six-month period, across a broad range of participants, from professional designers through to those who profess little or no understanding of the subject. The conclusion is that colour literacy is generally poor even among those whose profession or education requires a high level of competence.

With this survey I set out to prove what I knew to be the case after some three decades as a graphic designer and software instructor: that very few people understand how colour 'works' in any practical sense. Most of the teaching I have done has not been at universities or colleges, although I have done both at times. Rather it's been through commercial training companies set up to teach software such as Adobe Photoshop or Illustrator – in workplaces, at training facilities or, lately, by way of online classroom sessions.

Regardless of the student's background, I have often struggled to explain basic principles of colour theory sufficient for them to send their work to be printed or reproduced digitally with reliable results. Furthermore, I could find little in terms of teaching resources useful to these delegates, or indeed to me as an instructor.

The survey forms a critical phase of my doctoral research into the establishment of a new, open colour system which can be used to assist the process of choosing, combining and teaching colour.

What do we really need to know? First of all, what is it that people need to know about colour in their daily lives? Like so many aspects of our professional and personal lives the hard part (the critical, scientific knowledge) has been largely taken care of. A light meter is no longer in the professional photographer's gear bag. 'White balancing', the process of correcting for ambient

lighting conditions, is done ‘in-camera’ to such a degree as to make it barely necessary to adjust in post. Your computer monitor – once monochrome, then with 8-bit, and now at least 24-bit colour, is so close to ‘true that calibration is taken as given in all but the most dedicated studios.

And yet, despite the conveniences that technology offers, we struggle for a vocabulary when we look for a harmonious colour scheme or seek a particulate hue: ‘we want a green for our office but not *that* green’. And likewise, we fail to understand why the blue and black dress we bought in the store looks white and gold when we get it home.

Art students are usually given a little more knowledge when they learn about colour *mixing* but even then, they rely on somewhat dated ideas of primary colours which are at odds with our current understanding of perception as a process of balancing opposing hues. This is exacerbated at the level of school-age children – something which the Colour Literacy Project is hoping to correct.

But for the purpose of our survey, let’s assume that it would help us all if we had a more consistent vocabulary when choosing a colour or colour scheme for a particular creative task. And furthermore, that if we understood more about the nature and behaviour of colour, we could anticipate changes in our perception under given conditions, and more confidently predict the results of mixing colour paints, pigments or inks, or changing the temperature or relative strength of lights and projections.

Method: I began by dividing my ‘audience’ into those who are completely naïve as to colour knowledge (that is, they profess no particular understanding beyond what they remember from school) and those who have some professional, semi-professional or amateur interest in colour specifically or who pursue a field which relies on visual perception. I then further divided the latter group into those engaged in (relatively) commercial practice such as graphic design or interior design, from those who work more organically as artists, teachers or academics.

For each of these groups I asked questions designed to test their understanding of colour within their domain. In truth, I asked more probing questions of those who work in commercial fields because the end result of my efforts is more likely to be of use to that group than artists or academics. Indeed, I further determined whether the delegate used certain software and the degree to which they profess competence in the use of such tools.

I also ascertained whether the delegate had formal qualifications in his or her creative field, and at what level, and if they had other qualifications in any other field. Their qualifications did not alter the questions presented to them, but this information could, I assumed, have a bearing on their overall understanding. As it happens, it had little bearing at all.

The results clearly show that, in general, most people understand little of the nature of colour, regardless of their education or profession. One's profession (or active pursuits) do, of course, have a bearing on understanding and certain questions can be predictably answered correctly by those who work with colour professionally. Likewise, it goes without saying, that anyone taking an interest sufficient to attend a conference such as this one is likely to have considerably greater knowledge than the average. And yet beyond this quite small group there is not the variation one might expect.

The survey is far from definitive given the number of caveats and variations needed to extract meaningful answers, but I think we can have confidence in the overall data notwithstanding these limitations.

Keywords: ***education, design, learning, understanding, teaching***

Craig Kirkwood is an Australian designer, photographer and software instructor living in Wales. He has been using Adobe software professionally since the 1980s and teaching others to do so for much of that time. For over twelve years he was the founder and managing director of Fearless Media, the largest creative media training company at the time with offices and facilities in every Australian capital. Since moving to the UK in 2012, he has designed and published two books of photography and continues to teach Adobe software throughout the country. He is currently completing a PhD in colour perception at Cardiff Metropolitan University and developing Lingua Colour, a new, open colour system that will make it easier to choose, teach and work with colour across digital and physical media.

Update on the ISCC/AIC Joint Color Literacy Project: Beta-Testing New Approaches to K-12 Colour Education

Maggie Maggio and Robert Hirschler

Co-Chairs, ISCC/AIC Joint Colour Literacy Project

Abstract

The long-term goal of the Color Literacy Project (CLP) is to provide an online color resource center with foundational educational material for teachers from kindergarten to university. This inter-disciplinary project was approved by the US Inter-Society Color Council (ISCC) in the summer of 2019, and by the International Colour Association (AIC) in January of 2020. The first phase, including research into existing materials and resources and identification of core topics for color education at all levels, concluded in December of 2020.

The Color Literacy Project (CLP) launched Phase Two in January 2021. The goal of the second phase is to engage teachers in the process of evaluating new and existing materials for the future resource center.

Beta-testing will take place during professional development courses at schools where the teachers are interested in expanding their knowledge of both the art and science of color for use in the classroom.

Four K-5 elementary schools volunteered to be beta-test sites for the prototype version of the program in 2021. As teachers at each school complete the course modules, they will work together to develop age-appropriate curricula for their specific classes and provide feedback to the project committee.

The courses will model methods for color exploration by providing opportunities for learning about color through a hands-on, experiential approach. Collaboration between art and science teachers, and use of the materials in STEAM (Science, Technology, Engineering, Art, and Math) will be encouraged.

This presentation will describe the planning process for the first professional development courses to be held in 2021.

Maggie Maggio is a designer, artist and art educator who has studied and worked with color for over forty years. Her personal explorations into the science of light and pigments led to the creation of workshops for artists and designers who want to incorporate the latest research in color science into their creative practice. She retired from architecture in 2015 and now spends her time guiding artists and designers in hands-on explorations of the multi-disciplinary world of color and advocating for the integration of art and science in color education programs world-wide. Maggie chairs the ISCC/AIC Colour Literacy Project.

Seeing the Colours of Home: A Primary School resource tool for teachers

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Abstract

Why? The Aim - This work arose from my paper 'Between Glare and Abysmal Dark' (2009?) and some positive feedback. Much of what I wrote then will be the backbone of teaching seeing. As a secondary teacher I taught teen boys and a few girls, kept at school by parents concerned to keep them off the street. I taught applied geography, practical skills, to read their local environment, including recognition of trees and plants and the general design styles and ages of buildings, patterns of street layout etc. This work appeared to give these boys confidence and some assurance along with a greater sense of belonging and stirred an interest in the immediate world around them.

From this experience I have come to believe that seeing might be taught to give young people, particularly at primary level, confidence and understanding of their home territory, traditionally gained from knowledgeable grandparents/parents and by roaming free, a rare experience today.

In 2019 I assembled a team after a workshop in Albany to try to test ideas and concepts regarding the need for teaching 'seeing' as opposed to just looking. Seeing implies an understanding, however tentative, of what is observed. The team have been supportive of the ideas expressed here and willing to engage and explore, they are in fact 'ground truthing' the ideas. It is still very much a work in progress. From this activity has grown the idea of developing a primary teachers resource.

Young children in many traditional societies are taught about their environment by elders, they learn to see to survive. The word see implies an understanding – 'I see your point' as a statement following a discussion is an admission of understanding. 'Seeing' as opposed to just 'looking' brings with it an intellectual and or emotional comprehension of what is seen.

The heavy reliance upon technology today means that young children are increasingly unlikely to have much interaction with their local environment, living instead in a controlled and sanitised world dominated by small screen technology and largely unaware of natural phenomena; even rain may only be regarded as an impediment to activities.

Australians generally have been largely disassociated from their environment by a colonial and modern lack of understanding and misconceptions of the place itself and the role of Indigenous people in the landscape, their intricate and highly sophisticated understanding and management of the land; compounded by the intense, placeless, urbanisation of westernised culture in coastal cities and declining regional towns. Bruce Pascoe – 'The Dark Emu' should be compulsory reading for any aspiring teacher.

Adults may be unable or unwilling to spend the time teaching young ones to see and understand about such things as soil, blue tongues, ear wigs, earth worms, cabbage whites, donkey orchids, a Blue Sun Orchid, Jarrah, bottle brush or galahs and New Holland Honey Eaters; and Manmade factors - the colours of bricks, tiles and other materials of the built environment, why some bitumen is red and some black, why is concrete usually grey, why some gardens green others brown etc.

It is believed that developing the naturally strong observation skills in the very young will deepen their living experiences and create greater opportunities for connection and commitment to the land and suburb or town in which they live. It will also benefit thro' improved lateral thinking from a better understanding of the interconnectedness of all things. It is posited that a real connection with our local environments built up during childhood and youth contributes strongly to a healthy mind set in later life.

It is important to nurture observation skills and lead children into the great range of interests that can stem from seeing what is around them – for example observing clouds and their colours can lead to weather forecasting or physics, an interest in rock colours may point to geology or chemistry, the colours of plants might lead to horticulture and so on.

The easiest, most obvious and recognisable, and arguably the most significant factor in learning our own physical setting is local colour. Everything has colour. Through seeing our local colour much can be learned and understood.

The Work

Before teaching colour, it is important to assist children with a conscious awareness of the context of colour; of sunshine and its role in our lives, where it comes from where it goes, its effects as in transparency and reflections; light and dark, shadows and mists. Only then can we develop a surer grasp on the intricacies of colour, its sometime transparency or opacity, the trellis effect etc.

Through understanding natural light in the landscape and urbanscape, daily and seasonal patterns, we become aware of the many roles of colour, the excitement of natural colour and its language, both

within the landscape and with us. Colour is never static, is always changing as light changes and with the seasons and over time. Arousing young peoples' interest in their surroundings is vitally important to developing their minds.

When we **see local colours,** we become more 'in tune' with our environment, more aware and with a greater understanding.

I have refined some principal aspects of light and dark initially presented in my Between Glare and Abysmal Dark paper, as a first step towards discovering local colours, the colours of Home.

Conclusions

The Manual itself will raise awareness of the movement and effects of light and will contain many small 'projects' and questions to assist teachers in many environments in encouraging young ones to engage more deeply with the local.

However, the major points made regarding light and its effects are distinctly Western Australian and within the State each place may need to adapt statements to reflect the local and home.

I may include an addendum to this work that relates to the nature of Obscurata the loss of colour to obscurity (greyness) but as yet need more feedback on this idea before finalising it into the Manual.

Keywords – *Teaching, Colour Context, seeing, local,*

Initially trained as an historical geographer, (Leicester, UK,) then as a secondary teacher, UWA, **Juliet Albany** taught for 8 years in WA, Melbourne and Manus Island. A period of raising children in the Kimberley outback and Darwin provided her steepest learning curve followed by a Design Degree (Curtin University). Writing her own course to graduate and practice as an Urban Designer/Town Planner for nearly 20 years working with both State and local government, and City of Perth. She ran 'Townscape' a State program assisting with Regional towns regeneration throughout WA and has had a lifelong interest in colour.

Colour Clues – a Colour Communication Game

Paul Green-Armytage[a*], Maggie Maggio[b]

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Abstract

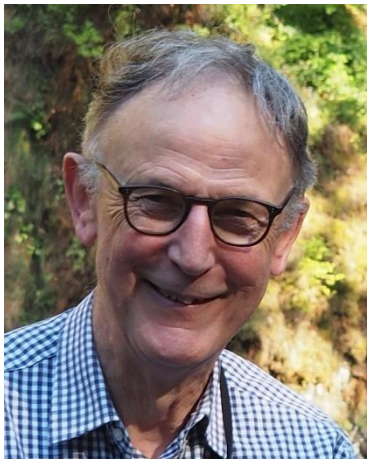
Colour Clues is a game, but more than a game. It is an exercise in looking, seeing, thinking and communicating. It is also a means of collecting information about the way we use words to describe colours. It was inspired, in part, by the *Colours of Babel*, a card game devised by Dimitris Mylonas.

The game is played by teams in partnership, and in competition with other partnerships. The winning partnership will be the one that has greatest success in communicating what colours are meant by the clues that each partner gives to the other. The game was first played in a workshop situation, but has subsequently been played successfully online as it will be during *Colour Connections*.

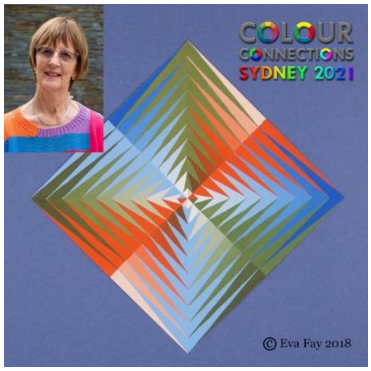
At the beginning of the session, people will be asked to download and open a file which has the colour chart and forms for entering clues and guesses. After a brief introduction people will be sent to separate Zoom 'rooms' where they will play the game. Each person will write down their clues and then read them out for others to guess which colour is meant. Points are scored for successful communication: three points for a one-word clue, two points for a two-word clue, and one point for a three-word clue.

When all in the room have read out their clues, and recorded the guesses, they add up their scores which are then announced via the Chat function. It is unlikely that it will be possible to identify a winning partnership during the session itself given the large number of participants. Participants will be asked to send in their completed forms so that the results can be analysed and a report prepared for publication on the CSA website. Participants can scan and email their completed forms to Paul at the above email address or mail them to: 55 Evans Street, Shenton Park, Western Australia 6008.

***Keywords**: Colour names; colour communication; colour games.*



Paul Green-Armytage is an Associate of Curtin University in Western Australia where he taught in the School of Design. He was awarded his PhD in 2005, the title of his thesis being “Colour, Language and Design”. He has contributed papers at many national and international conferences, several by invitation, served as a member of the executive committee of the International Colour Association (AIC) and as President of the Colour Society of Australia. He retired from teaching at Curtin in 2006 but remains active as a researcher and writer. He is currently a member of the ISCC/AIC Colour Literacy Project.



Colour Education from The Shillito Design School, Sydney 1976-1977

Eva Fay *FDIA*

Honorary Member of the Colour Society of Australia 2000

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Abstract

Phyllis Shillito (1895 – 1980) was a very influential educator, artist and designer, teaching in England until 1922, then at the National Art School in Sydney from 1925 to 1960 and at her own Shillito Design School from 1962 until her death. Shillito's eclectic curriculum borrowed progressive ideas from design schools in Ulm, Munich, Stockholm and Paris as well as from art educators H. Barrett Carpenter (English) and Maitland Graves
(American).

The course was full time over three years, specifically teaching colour, design and drawing in year one. In years two and three, there was a choice to specialise into an interior design course or into a fine arts and applied design course.

The emphasis at The Shillito Design School was to understand and learn about the theory, relationships and application of colour by training and developing our skills and our eyes to observe the infinitesimal differences and changes in the three dimensions of colour: Hue, Tone and Intensity and how to manipulate each one of these attributes.

Great attention was paid to the physical mixing of colours, learning how they behaved and developing our eyes to really "see" every nuance. Understanding the organisation of colour was critical for our ability to make informed colour choices and selections.

At this period in the seventies The Shillito Design School was unique in that it taught a cross fertilization of design disciplines so that graduates had a broad sense of the application of design. This provided them with the opportunity to resolve complex colour challenges.

This presentation gives a historical overview of one method of colour teaching that has had far reaching effects on industry. Shillito's students are spread throughout Australia and overseas as educators, artists, colourists and designers in the different design disciplines all utilizing and applying this colour education. Eva Fay will present and describe the development and theory of colour exercises and projects that she produced as a student at The Shillito Design School in 1976-1977.

Eva later went on to become a well-known colour and design educator over the next 20 years.

Keywords: *historical, colour education, Australia, Shillito*

After graduating from the Shillito Design School **Eva Fay** FDIA commenced her teaching career in 1979 in the art department at Meadowbank TAFE. Since then, she has taught students colour and design at various TAFE colleges, the University of Sydney and UTS in the departments of fine art, interior design, graphic design and architecture. In 1983 she and a fellow Shillito graduate founded the prestigious School of Colour and Design in Sydney. Eva also ran a highly successful Colour Design studio for nearly 30 years doing both residential and commercial projects throughout Australia and won the National Dulux Colour Award in 1992 for Exterior Colour Design. Eva was a founding member of the Colour Society of Australia in 1986 and was awarded Fellow of the Design Institute of Australia in 2013. Currently Eva enjoys experimenting with colour and atmosphere in painting and exhibits regularly.

Celebrating the Harmony of Our Identities on the 'International Colour Day'

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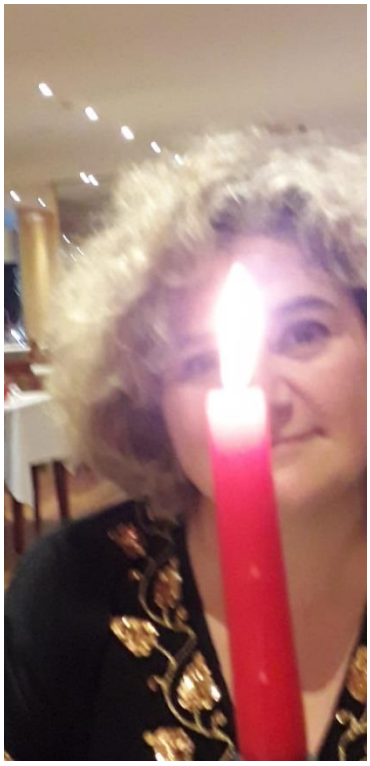
Abstract

The adoption of an international day to celebrate colour was proposed by the Portuguese Colour Association (Associação Portuguesa da Cor-APCOR) and presented by the Author- and APCOR President - at AIC Executive Meeting of the Interim Meeting in Stockholm in 2008. Later, the Author launched the International Colour Association's International Colour Day at the General Assembly of the 11th AIC Congress, organized by the Colour Society of Australia, in Sydney September 27-Oct. 2, 2009. Henceforth, colour has been increasingly celebrated by International Colour Association members on the 21st of March.

> 'Colour affects the concept of beauty, harmony and happiness. Colour conspires in the mating of most animals and favours the pollination of flowers, conditions states of the soul, creative imagination, taste of life, biological rhythms. Colour records effects of weather and meteorological and chemical factors on natural elements and species. Colour is the most privileged catalyst that operates in sensory perception, as can be seen by countless synesthetic expressions. Colour is present in artistic expression, in the formulation and communication of feelings, in the differentiation of diversities (races, nationalities, groups, ideologies ...), in artificial and natural signs, in religious worship, in mythological conception, in the construction of camouflage, in the formation of analogical thinking ...
>
> The scope with which these phenomena interfere, in particular, in the life and culture of the human being, justifies the dedication of an annual and universal framework for reflection and information that increases pedagogical action, more incisive and effective, tending to raise awareness of the importance of light and colour in the formation, maintenance and improvement of physical and mental life, in the creation of a more harmonious natural environment, in updating knowledge of scientific, technical, artistic, ecological and cultural aspects.'

The above excerpt from the proposal that the Author wrote for discussion at the AIC Executive Meeting in Stockholm 2008 encapsulates the relevance and justification for creating a day dedicated to colour.

The present intervention focuses on the principal landmarks in a process of 13 years, namely the competition and logo selection, the celebrations, and their publication in Special Reports within yearly Annual Reports, the expansion of public exposure online, and the ICD-history document that will be released this year and supports the endorsement of ICD by UNESCO. Many efforts and actions were performed by AIC members who dedicated time and creativity to strengthening identity and harmony across the globe, by celebrating the International Colour Day.



Maria João Durão graduated from Lisbon Fine Arts School (FBAL-UL). She was awarded a PhD degree with a thesis on Colour and Space and a Post-doctoral Fellowship at University of Salford-Manchester. Professor at Lisbon School of Architecture UL since 2001, she founded, directed and lectured in world pioneer Master Degree Course (MPhil) "Colour in Architecture" (FAUTL); she founded and directs "Colour Lab-FA since 2004, supervising national and international master, doctoral and post-doctoral projects. She directs the “Research Group Colour and Light” -CIAUD/School of Architecture since 2016; founded and presided the Portuguese Colour Association and is its Honorary President. She is scientific Council member of Design Doctoral Degree Course (FAUL), Doctoral Course in Architecture lecturer (FAUL) and Masters in BES (University Salford). Her artwork has been exhibited since 1989 in England, France, Japan, and Portugal and belongs to public and private collections. Her publications range the areas of art, design, terrestrial and aerospace architecture, and she regularly presents her work at international conferences.