



Inter-Society Color Council News

Issue 465

Winter 2014

Board of Directors Corner

My name is Ann Laidlaw, and I am bringing you this issue's Board of Directors' column. I joined the ISCC in 1986, served as Membership Secretary from 1990-95, and am currently the ISCC Secretary



(since 2011). I'm a consultant in the area of industrial measurement and communication of color and lighting, and most of my experience has been with textile and apparel companies and their supply chains. I worked with X-Rite Inc, GretagMacbeth, SheLyn, and Burlington Industries, and have been active with other organizations including CORM, SPE, and DCC. I'm interested in lighting, color communication, color difference metrics, sample measurement issues, and

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how to leverage maximum benefit out of these solutions for retailers and their supply chains. I received my BS in Textile Science from Univ California, Davis, and MS in Color Science from Clemson University.

We want to thank our out-going directors, Nancy Kwallek and John Conant, for their service on the Board. As a result of this year's elections, John will remain on the Board as President-Elect and Nancy will be serving on the AIC Executive Committee beginning this year. Also we would like to welcome our two newly elected members of the Board of Directors: Kim Vlaun and Paula Alessi, who will serve terms from 2014 through 2016. We also appreciate Art Springsteen, who will be finishing an extended term in 2015.

The ISCC recently balloted and approved updated By-Laws to reflect changes in our organization (and many other organizations). These revisions reflect the reduced participation of Member Bodies (only 3 were current in 2013), the lack of Project or Problem committees, and the reduced attendance at meetings and conferences. The revision also supports our transition to electronic voting, web meetings, and other changes that may be appropriate. All items previously decided by Member Body vote will now be transferred to a vote by Individual Members. The ISCC will continue to support the activities of our Member Bodies through publicizing meetings and other activities. In addition, we hope that Member Bodies will share information regarding ISCC with their members. Member Bodies will no longer pay dues to the ISCC; instead, individuals who are active in a Member Body may join ISCC. In addition, the dues structure for ISCC has been reduced, to reflect the efficiency of using electronic delivery for newsletters, ballots, etc.

One of the main activities the ISCC is organizing this year is the Color, Light, and Appearance Week to be held at the National Institute of Standards and Technology (NIST) in June. Part of the activities of the week will be a Symposium on

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Board of Directors Corner continued

Wednesday, including the ISCC Annual Luncheon. Please watch for additional announcements about this week in this Newsletter and on the ISCC website under "What's New" or by entering <http://www.iscc.org/meetings/ST2014/>. We hope to see you there.

The ISCC depends on volunteer members to contribute technical, administrative, and creative ideas and energy. We hope new and existing members will participate actively to help shape the new ISCC.

Ann Laidlaw, *Secretary, RoLyn Group*

Meet Your Fellow ISCC Members

Meet Kim Vlaun, who was just recently elected to serve on the ISCC Board of Directors. Kim has been drawing and painting since an early age. In 1982 he began an independent study of color related to realistic painting. Shortly thereafter he began to focus on education, as painting classmates would come up to him to ask for advice on color or how he had arrived at the colors in his paintings, initially to which he couldn't provide definitive answers. Since then, he has been eager to assist aspiring realist painters, focusing on the resolution of color education problems and the development of effective teaching methods and tools.



Mr. Vlaun became an ISCC member in 1986 while a graduate student of fine art painting. He has served on the artists' materials project committee to which a report was submitted. He said that being a member of the ISCC has been invaluable in his color education research and development work and thus would like to assist in making it even more so for its members by bringing the ISCC into the twenty-first century, which would entail further utilization of the internet.

AIC Has Declared March 21st to be International Colour Day



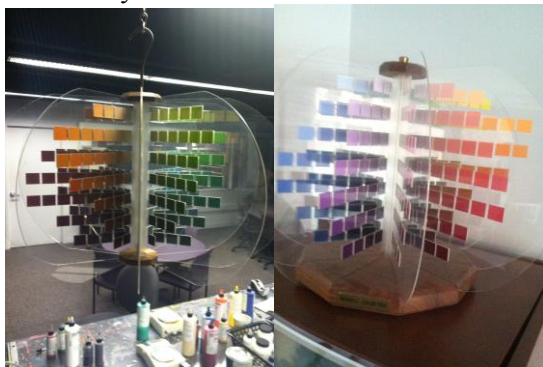
INTERNATIONAL COLOUR DAY

21 MARCH

ESTABLISHED BY AIC - INTERNATIONAL COLOUR ASSOCIATION

The International Colour Association (AIC) feels that color and light are very important contributors to our daily lives as they influence our perception of reality. This is worth celebrating! So on March 21st we will create memorable color activities all around the world and share them. March 21st was chosen as the day for this celebration because it is the equinox, where night (hours of darkness) and day (hours of light) are approximately equally long in all human cultures around the world. AIC has asked all of its members to celebrate this day in a special colorful way that means something to their culture. ISCC, as long time members of AIC, has embraced this opportunity by planning several ways to celebrate color as part of our lives in the USA.

First, we would like to celebrate International Colour Day by remembering Albert H. Munsell's contribution to color order systems with his 1921 introduction of the Munsell Color Order System. Please enjoy these photos of some slices of the Munsell system.



Next, ISCC would like you to participate in two surveys as part of our celebration of International Colour Day. **Please complete both surveys by March 1, 2014 so we can post the results on International Colour Day.** For hardcopy newsletter subscribers, please fill out each survey and send it to the ISCC office at the address below.

Survey #1 Name the Most Popular Color

Name the Most Popular Color in Your Work

Have you ever thought about what the most popular color is in your everyday work? The ISCC would like to know! This is an informal survey, and just for fun, so please do not stress over your answer. Since the ISCC is based in the United States, it would be nice to express the results in terms of a color order system or color chart that is indigenous to the US. Please fill in the following:

My most popular color (use only one of these types) is:

_____ Munsell Notation
 _____ Pantone Color
 _____ Macbeth
 _____ ColorChecker patch
 _____ Other

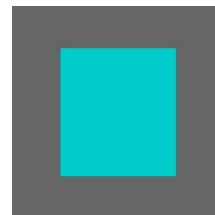
If you wish to take this survey electronically, please go to
<https://www.surveymonkey.com/s/LQ25YBZ>

Survey #2 Blue or Green?

The ISCC Color Name Test

This is a simple and fun experiment about how different people name a color..

Do you think this color is more blue or green (you must choose only one or the other)?



1. Select one of the colors

- ☐ Blue
☐ Green


2. Are you male or female?

- ☐ male
☐ female

If you wish to take this survey electronically, please go to
<https://www.surveymonkey.com/s/QH63WB3>

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AIC International Colour Day continued

Furthermore, we have asked  to prepare a doodle, a special version of their logo (at <http://www.google.com>) – check out their home page on March 21st to see if they did!

Finally, on March 21st ISCC will post a web page dedicated to the historical color contributors from the United States highlighting the beginnings of color in our country. Many thanks to some of our Board members for offering to put this page together! So please make sure you visit the ISCC website as part of your celebration of International Colour Day on March 21, 2014!

Color, Light & Appearance Week at NIST

Plans are coming together for *Color, Light, & Appearance Week (June 16-20, 2014) at NIST*. The meeting registration form is enclosed with this issue of ISCC News. We believe the week will be an enjoyable opportunity to meet new people and exchange information about many national and international activities in the field of color.

On Monday several of the CIE Division 1 technical committees will hold meetings. Already the chairs of TC 1-71 Tristimulus Integration, TC 1-73 Real Color Gamuts, TC 1-75 A Comprehensive Model of Color Appearance, TC 1-81 Validity of Formulae for Predicting Small Color Differences, TC 1-90 The Color Fidelity Index, and TC 1-93 Calculation of a Self-Luminous Neutral Scale have indicated they plan to hold meetings.

All day Tuesday will be devoted to the CIE Division 1 Main Meeting, during which work on all the current Division 1 TCs will be summarized, and new directions will be proposed and discussed. That evening there will be an informal dinner and social for all attendees.

On Wednesday the ISCC will sponsor a symposium. Please see the preliminary listing of the symposium presentations at the end of this article. The ISCC Annual Luncheon will also be held on Wednesday.

Thursday and Friday will be devoted to ASTM E12 on Color and Appearance. It will include meetings of the following subcommittees: E12.01 Terminology, E12.02 Spectrophotometry and Colorimetry, E12.03 Geometry, E12.04 Color and Appearance Analysis, E12.05 Fluorescence, E12.06 Image Based Color Measurement, E12.07 Color Order Systems, E12.11 Visual Methods, E12.12

Gonioapparent Color, and possibly E12.93 Precision and Bias.

The registration, hotel information and additional travel information will be posted on the ISCC website at <http://www.iscc.org/meetings/ST2014/> shortly. We look forward to seeing many of you at this color-filled week. So please register early. Early registration ends May 1, 2014 and note that no registrations can be accepted after the final cut-off date of June 2nd.

Preliminary List of Speakers and Titles for ISCC Bridge Session (as of Jan 27, 2014)

Evaluation of Targets for Color Calibrating Digital Color Images from Optical Bright-Field Transmission Microscope. Hong Wei, Michael Brill, and Tae Park, Datacolor, Inc. Lawrenceville, NJ USA

Review on One Aspect of Colour Quality: Visual Appreciation. Sophie Jost, Université de Lyon, Ecole Nationale des Travaux Publics de l'Etat, Laboratoire Génie Civil et Bâtiment, Vaulx-en-Velin, Lyon, France

Evaluating Spectrophotometric Uncertainty. Hugh S. Fairman, Resource III, Inc., Tatamy, PA USA; Jack A. Ladson, Color Science Consultancy, Yardley, PA, USA

Toward a Unified Nomenclature in Fluorescence Spectrophotometry. James E. Leland, Copia LLC Goshen, NH, USA

Chromaticity of White. Kevin A.G Smet., Geert Deconinck, Peter Hanselaer, University of Leuven, Ghent, Belgium

Assessing Color Rendering Without Test Samples. Lorne Whitehead University of British Columbia Vancouver, British Columbia, Canada

Slope of the Self-Luminous Gray Scale: Independent Converging Evidence. Robert C. Carter, Pennsville, NJ, USA

Color Rendering and Museum Lighting: Field Study Based on Refurbishing the Lighting of the Sistine Chapel. Janos Schanda, Péter Csuti, Ferenc Szabó, University of Pannonia, Veszprém, Hungary

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Preliminary List of Speakers and Titles continued

Toward a Unified Method for Computing Tri-stimulus Values. Changjun Li, Liaoning University of Science and Technology, Anshan, China

How to Control Color Appearance Using New 45:0 Handheld Technology. Walter Franz, Data-color AG, Switzerland

Specification of Gonioapparent Color and Appearance. Larry Steenhoeck, Jeff Alspach, Allan Rodrigues (retired), Axalta Coating Systems, Wilmington, DE, USA

xDReflect, a European Joint Research Project devoted to the metrology of the appearance of surfaces. Gaël Obien, Laboratoire Commun de Métrologie LNE-CNAM, La Plaine St Denis, France

Age- and Field-Size-Parameterized Calculations of Physiologically Significant XYZ Colour-Matching Functions. Jan Henrik Wold, Ivar Farup, Gjøvik U. College, Norway

ART AND DESIGN: Plastic arts, graphic design, industrial design, fashion and trends, architecture, interior design, packaging, photography, advertising, image and personality and cosmetology.

HISTORY AND FOLKLORE: Anthropology, archaeology, textile design, popular arts, color and identity, crafts, global culture, local cultures and restoration.

HUMAN DISCIPLINES: Psychology, perception, sociology, psychophysics, anthropology and ethnography.

SEMIOTICS AND TEACHING: Meaning of the colors, new technologies for the teaching, advertising and communication.

TECHNOLOGY AND COLOR INDUSTRY: dyes, food engineering, computing, measuring instruments, art materials and production of natural and artificial pigments.

SCIENCE AND COLOR: Physics, optics, chemistry, neurology, illumination, medicine and chromotherapy.

Please consider submitting a paper on behalf of the ISCC. For more general information on the meeting, please visit www.aic2014.org.

AIC 2014 Interim Meeting

Conference topics

Folklore expressions about color, history of color, local stories about color, ancient pigments and natural local dyes, color as an identity mean, anthropology, visual semiotic and psychology, art, popular art and crafts, restoration, global marketing in local cultures, color technology influence in culture.

The AIC 2014 Interim Meeting will be held from October 21-24 in Oaxaca, Mexico. The theme is colors and culture with the emphasis being on colors, culture and identity: present, past and future. The Mexican Association of Color Researchers (AMEXINC) will be organizing the meeting. A Call for Papers has been issued with the deadline being extended to February 21, 2014. Papers are to be submitted according to the following topics and sub-topics:

ECVP 2014 First Call for Symposia

The 37th annual European Conference on Visual Perception (ECVP) will be held in Belgrade, Serbia between August 24-28, 2014. Details of the meeting can be found at <http://ecvp2014.org>.

Registration and abstract submission will open in late January. Prior to this, we would like to invite proposals for up to 6 symposia that will form part of our conference programme.

IMPORTANT DATES**

Symposia submission open: January 25, 2014.

Deadline for proposals: March 8, 2014.

Notification of decisions March 22, 2014.

Proposals for organizing a symposium should be made by e-mail before **March 8, 2014** using the address specified below. Notification of successful proposals will be made well in advance of the general abstract submission deadline. Each symposium will be allocated a 2 hour slot, and would typically include between 4 and 6 speakers. Proposals should include a brief summary (200 words) of the topic area, an explanation (200 words) of why the session would be of particular interest to an ECVP audience (e.g., controversial or emerging topic area,

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ECVP 2014 First Call for Symposia continued

important theoretical question, new methods or techniques) and a list of confirmed speakers.

Final proposals should be sent to symposia.ecvp2014@savacentar.net

For further information and/or informal enquiries, please contact Ian Thornton at ian.thornton@um.edu.mt

This announcement was sent on behalf of the ECVP2014 organising committee:

Sunčica Zdravković

Slobodan Marković

Dejan Todorović

Oliver Tošković

Ian Thornton

Robert “Bob” Charvat Obituary

It is with heavy hearts that we inform you that long-time ISCC member Robert (Bob) Charvat passed away on January 9, 2014. Bob had been a member of ISCC from 1957 to the present. Bob was also very active in the Society of Plastic Engineers – Color and Appearance Division (SPE-CAD). Specifically, Bob was actively involved in education within the plastics industry, especially with regard to coloring of plastics technologies. Bob was a long time instructor for the SPE-CAD color seminar series. He published the textbook, Coloring of Plastics: Fundamentals in 2003. This book has become an invaluable reference guide throughout the plastics industry. Another significant education contribution was Bob’s involvement with developing and teaching as part of the Coloring of Plastics program at Terra Community College in Fremont, Ohio. This is the only educational program of its kind in the world that equips students with theoretical and practical knowledge and skills needed in the specific field of color formulation in the plastics industry. SPE-CAD has established a scholarship fund in memory of Bab Charvat. For more information, please visit the SPE website at <http://www.specad.org/index.php?navid=156>.



Summer Course

COMPUTATIONAL NEUROSCIENCE: VISION

This class will be offered from July 11 – July 24, 2014 at the Cold Spring Harbor Laboratory. The Application Deadline is March 15, 2014.

Arranged by Geoff Boynton, Greg Horwitz, Jonathan Pillow and Stefan Treue, this course is offered every two years and gives 24 graduate students and postdocs switching into this field of research the chance for intensive interchange with a diverse faculty in an intellectually stimulating environment.

The goal of the course is to introduce students (usually in the middle of their thesis project) to the processing of visual information as a model for general issues in systems neuroscience. The emphasis is on approaches with strong theoretical bases. In addition to talks by an international faculty, the course offers ample opportunity to interact with the speakers and to apply the knowledge gained in the course through hands-on projects. Please see <http://meetings.cshl.edu/courses/2014/c-vision14.shtml> for more information about the course, the faculty, and the application procedure.

2014 – Neon is In!

Did you receive neon gifts for Christmas this year? Simon Doonan thinks you should have. According to Simon, neon is in for some very good reasons. 2013 marked a year of many inexpensive products being available in fluorescent hues. Furthermore, neon colors can save lives. Black colored clothing has been filling people’s closets for far too long. A beautiful colorful fluorescent hue can nicely accessorize any black outfit with the added benefit of being so visible at night that lives can be saved on the streets.



For more information from Simon Doonan, please see <http://tinyurl.com/p9tdtet>.

Metameric Blacks: A Color Curious Column

Ever wonder ... "What is light?"

The technical definition of light from the Commission Internationale de L'Eclairage (CIE, the group that defines such things) is "Any radiation capable of causing a visual sensation directly". Loosely translated, light is electromagnetic radiation that we can see. Ultraviolet and infrared energy are also electromagnetic radiation, but we cannot see them so it is incorrect to call them "light". There is no such thing as "ultraviolet light" or "infrared light". Even though those terms are used colloquially, the more proper terms are "ultraviolet radiation" and "infrared radiation". Historically, it was recognized that light was some form of energy, but there were competing theories of its nature. Some considered light to be made up of particles, while others thought light was made up of waves.

The idea that light is made up of particles gained favor in the 1600s with the support of Sir Isaac Newton. He used the properties of light reflection and the fact that light travels in straight lines to support his theory of light particles, or corpuscles. He however had difficulty explaining light diffraction (light bending around objects) with a particle theory and that turned out to be one of the reasons the wave theory of light became more popular. Interestingly, Albert Einstein brought back particle theory to some extent with his observation and explanation of the photoelectric effect (light striking a metal surface can produce an electrical current). This helped more recent researchers to figure out that light behaves as both a particle and a wave.

Sound energy travels through the air in waves that our ears can sense and we can observe waves on the surface of water as energy we can feel. Light also shares some of these properties. For example light diffracts, or bends, around surfaces in the same way that water waves can be observed to do. Thomas Young observed this and also observed the interference of light waves (again like the interference of water waves) and was one of the proponents of wave theory. Later on James Clerk Maxwell and others were able to explain light in terms of electromagnetic theory that still serves us well in modern technology. Thus, light was shown to be a form of electromagnetic energy just like radio waves, X-rays, infrared energy, and ultraviolet energy. Ultimately, all these observations resulted in the concept of wave-particle duality, the idea that light sometimes behaves like waves (electromagnetic theory) and sometimes behaves like particles that define

discrete units of energy (known as photons). This duality allows us to describe light well enough to utilize and control it in modern technology like television systems, digital cameras, and computer displays. Most recently, the quantum-mechanical theory of light (and all electromagnetic radiation) has been further developed and formalized into what is called a quantum field theory that is often referred to as quantum electrodynamics, or QED.



Content of this column is derived from *The Color Curiosity Shop*, an interactive website, also available as both English-language and Spanish-language books, allowing curious students from pre-school to grad-school to explore color and perhaps become interested in pursuing a science education along the way. Please send any comments or suggestions on either the column or the webpage to me at <mark.fairchild@rit.edu> or use the feedback form at <whyiscolor.org>. This specific topic can be found at <<http://whyiscolor.org/Questions/1-7.html>>.

Mark D. Fairchild
Rochester Institute of Technology

Color Changes Can Determine Winner in Chameleon Battles

Chameleons not only change colors to hide from predators, but also do so as a form of social communication, and those colors can indicate who will be the winner of a fight, according to a study. Using a high-speed camera, researchers at Arizona State University found that males with brighter side stripes were more likely to start a fight, while those that changed color more rapidly and had brighter heads were more likely to win, according to the study, which was published in *Biology Letters*.

[New Scientist](#) (12/11)

HUE ANGLES

(Send contributions to mbrill@datacolor.com and see <http://hueangles.blogspot.com>))

Seeing Brightness in the Season of Little Light

I am about to talk about how we experience brightness as we struggle with the winter solstice.

Brightness is an attribute of sensation of light. It is hard to pin down, partly because it is easily confused with luminance (whose equalization across a visual boundary makes the boundary minimally distinct) and with lightness (the apparent reflectance of a non-self-luminous body).

A light's spectral content contributes to its brightness, but is not the whole story. To show that brightness doesn't necessarily increase with light intensity, Bill Thornton used to project three circles of light (red, green, and blue) on a screen, in such a way that the areas underwent mutual overlap. In his demonstrations, the whitish center (with all beams present) was invariably the least bright, and the separate red and green areas appeared the brightest.

Psychophysicists and artists have long acknowledged the contribution to brightness of geometric factors that are at least as influential as the spectral content. Ernst Mach (from whom Mach bands are named) observed that a visible region appears brighter when it is next to a darker region. Mach's phenomenon is clear when the gray screen of a turned-off TV set develops black regions when the set is turned on.

Truly, the brightness of a light depends on its spectral content and on contrast with its neighbors, but even this is not the whole story. The influences I described above can be incorporated into a vision theory that has three kinds of receptors (cones) and comparisons of spatially adjacent visual inputs, but that is just low-level vision. High-level vision---which involves recognition of whole objects and their spatial context---may also enter. Over the years we have seen some striking demonstrations of global influences in the visual field (the work of Alan Gilchrist comes to mind), but I have noticed an effect that is not widely noted. I call it the "Christmas-tree-light effect," because Robert Pepperell's painting "Christmas Scene" first drew it to my attention.

I met Pepperell and his painting at the 2012 SPIE Electronic Imaging Symposium, a conference at which I always seek the explanation of "new" visual effects by old theories. Accordingly, looking at the "Christmas Scene", I was surprised to see that the Christmas-tree lights were blurred and yet seemed brighter than they might have appeared otherwise.



Robert Pepperell's "Christmas Scene." Reprinted with permission of the artist.

Classical simultaneous-contrast models would have predicted a diminution of brightness by blurring the lights, but it seemed the opposite was true. You can see the Christmas-tree-light effect in the figure here because Robert Pepperell has graciously given permission for me to reprint it.

At this moment you may remark (as our ISCC News editor did) that my assertion of enhanced brightness is not quite supported by Pepperell's painting. Indeed, this objection is correct: I have not controlled the visual experiment by, say, Photoshopping all the tree lights to remove their blur patterns. Besides the obvious explanations of personal laziness and reluctance to upset the artist with my experiment, I respond to the objection by saying that enhancement of brightness by blur has a sound ecological story. Also, this kind of trick has been used by photographers for a long time.

Why should high-level visual processing interpret a blur around a light as evidence that the light is very bright? Well, any light seen through the eye is surrounded by blur due to light scattering by the eye. The blur is invisible if the light is very dim, but it becomes more visible as the light becomes more intense. In a dark living room, a point of light from (say) an LED is very intense, and saturates (dazzles) the visual response. The only remaining evidence of the light's brightness will then be the blur, which (as a fixed fraction of the intensity of the light) will be quite visible.

continued on next page

Hue Angles continued

And what is the photographic trick that uses the “Christmas-tree-light” effect? It is called the “star effect”¹, and involves turning each point of light into a star-shaped pattern using a periodically ruled grid called a star filter. There’s some nice Fourier-transform theory here, as well as good optics. But for purposes of the present essay, it is merely further evidence that points of light can be “enlivened” (which I interpret to mean, “enhanced in apparent brightness”) by surrounding them with patterns of lower intensity.

A parting problem: How is it that I see star patterns around points of light at night? Surely I don’t have a ruled grid in my eye that piles up Fourier components of light in an orderly way...

1. Tiffen, I., Star effects: enliven points of light – how star filters work. Print edition: Student Filmmakers Magazine, June 2008, p. 44; online edition at http://www.studentfilmmakers.com/news/Star-Effects_Enliven-Points-of-Light_How-Star-Filters-Work.shtml

Michael H. Brill
Datacolor

**IN THIS ISSUE, February 2014**

Welcome to this year’s first and newly enlarged issue of Color Research and Application. In this issue there are eleven articles on a wide range of topics ... something for everyone... plus in the communications section the beginnings of a discussion on a scientific topic.

We open with an article about digital imaging. Charles Poynton and Brian Funt survey perceptual uniformity in digital imaging. In their article, “Perceptual Uniformity in Digital Image Representation and Display” they clarify some widely misunderstood aspects of image coding to alleviate the modern misconceptions that have arisen in the field. They discuss the coding systems including sRGB (used in desktop graphics), BT.709 (used in high-

definition television, HD), Adobe RGB (1998) (used in graphics arts), and DCI P3 RGB (used in digital cinema).

Next we move to the printing industry, where there is a demand for fast, but accurate evaluation of print quality. Evaluation is usually accomplished by an operator comparing the production print to a reference print visually or with a spectrophotometer. However, Eva M Valero, Yu Hu, Timo Eckhard, Javier Hernández-Andrés, Juan Luis Nieves, Javier Romero, Markus Schnitzlein, and Dietmar Nowack propose that it is an area where multispectral capture systems can be used specifically for inline colorimetric quality control of printed samples on paper. To prove this point, they report on the “Comparative performance analysis of spectral estimation algorithms and computational optimization of a multispectral imaging system for print inspection.”

A new application, at least for discussion in this journal, is the effect of lighting conditions for indoor display of different varieties of flowers and foliage. The “Color appearance of cut flowers under illuminants of various color temperatures and illumination levels” is discussed by Eunmi Yang, Ho-Min Kang, Chang-Soon Kim, and Chun Ho Pak. They compared the observers’ evaluations of floral arrangements under various fluorescent and LED lighting systems.

From the brilliant colors of flowers, we move to Hideki Sakai’s discussion of “Gray and Grayness – Its Complexities in Color Appearance of Surface Colors.” The opponent colors of red and green, yellow and blue, and even black and white are often considered when talking about color perception and visual color spaces. However, the achromatic area between black and white i.e., gray, also deserves special attention. The listed first author for this article is Yoshinobu Nayatani, who died in 2009. He had proposed a color system that has a common reference point of gray, which in his system is as important as the six opponent colors listed above. In the research review article in this issue Dr. Sakai discusses the Nayatani Theoretical Color Order System, the attribute of grayness based on its psychological amount in a grayish color under study, and the attribute of brightness of the grayish color under a specified amount of illuminance.

In many fields including color reproduction, image processing, computer graphics, as well as the development of cosmetics, human skin color and the way skin looks with makeup is an important topic. If you do not have human skin color right, the images

continued on next page

CR&A In This Issue February 2014 continued

will not be accepted or the user of skin care products will not be happy. Our next article deals with the “Reflection Measurement and Visual Evaluation of the Luminosity of Skin Coated with Powder Foundation.” Luminosity can have different meanings in various disciplines, but in the cosmetic industry, luminosity refers to the state of being ‘luminous’, ‘brilliant’, or having “radiant” skin. Naoko Ikeda, Kyoko Miyashita, Rie Hikima, and Shoji Tominaga identify the essential components of the luminosity of skin, based on two processes: reflection measurement and visual evaluation of the skin surface from the point of view of optical reflection with instrumental and visual evaluation. They then use the luminosity scores, which are analyzed in color spaces, to identify the color region relating to luminosity perception.

From skin color, let’s stay with the body for another article. So we move to eye color, not color as perceived with the eye, but the color of our eyes as perceived by others. In an earlier article in this journal the comparative analysis of real irises, ocular prostheses, and colored contact lenses was discussed [See Vol 36: 373-382, 2011]. Now in this issue, Amália Moreno, Marcelo Coelho Goiato, Daniela Micheline dos Santos, Marcela Filié Haddad, Aldiéris Alves Pesqueira, and Lisiane Cristina Bannwart discuss the “Spectrophotometric evaluation of color change in ocular prostheses.” The transmission and reflection properties of artificial irises are important. Making an artificial iris with an aesthetically acceptable color is an important aspect of ocular rehabilitation, but keeping the established color of the iris is also important. It has been found that the color of these prostheses change over time and with exposure to chemicals, such as disinfectants. Thus the choice of materials is important. The aim of the study reported in this issue was to evaluate the influence of different disinfecting solutions on changes to the color of the artificial irises used to make ocular prostheses.

If we are covering many field of color in this issue, we do not want to miss textiles. Awais Khatri, Max White, Rajiv Padhye, and Nasar Harun Momin report on a new, simple, non-destructive and relatively faster method for determining the extent of dye diffusion by using K/S values. In the article, “The use of reflectance measurements to determination of diffusion of reactive dyes into cellulosic fiber,” they describe the method and its validation by conformation to a microscopic analysis of dyed fiber cross-section. Their method can be used in in-

dustrial dyehouses for precise determination of the dye efficiency to improve dyeing results and assisting in finding cost reductions.

Our next article is aimed at artists and designers. Guosheng Hu, Zhigeng Pan, Mingmin Zhang, De Chen, WenZhen Yang, and Jian Chen introduce “An Interactive Method for Harmonious Color Scheme Generation” using a visualization tool. They designed an interactive tool for color scheme generation that allows both novice and professional designers to attain variable combinational relationships based on users’ harmonious compositional schemes. The tool also supports various methods of adjusting the colors. In evaluating the tool, novices found it easy to use and professional designers reported that the tool also provided ease-of-use user interface for harmonic color design.

It has long been known that acceptance and enjoyment of food and beverages is influenced by its presentation. What looks beautiful is perceived as tasting better. Our next article reports on an experiment testing whether the color of the container also can affect the perceived temperature of a warmth beverage inside. Nicolas Guéguen and Céline Jacob report statistically significant differences in observers’ responses in “Coffee Cup Color and Evaluation of a Beverage’s “Warmth Quality”?” In their experiment with 120 participants, the beverage in red cups was evaluated as being the warmest. They note that the common associations between warm versus cool colors can explain the results they found.

When trying to repair and preserve historical buildings and monuments, it is important to determine not only what looks correct at the time of repair, but also materials which will keep a continuity of appearance as they age and are exposed to the natural elements. However, how to predict what materials will work well is a difficult problem. Often accelerated aging techniques in a controlled climate chamber are used to test the different variables of cycle’s moisture, heat, and pollution materials. But how to analyze the results can be an issue. Our next article describes “Canonical Biplot statistical analysis to detect the magnitude of the effects of phosphates crystallization aging on the color in siliceous conglomerates.” Adolfo Carlos Iñigo, Jacinta Garcia-Talegon, and Santiago Vicente-Tavera report that the Canonical Biplot statistical method allowed them to determine the effects on the color of the accelerated aging. Changes in color can be determined by the trends of the different groupings according to the positions of the variables in each cy-

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cle of artificial aging. The Canonical Biplot also determines the direction of the magnitude of the effects on the analyzed variables.

In our Industrial Applications section Eric Kirchner and Jyotsna Ravi discuss “Setting tolerances on color and texture for automotive coatings.” They describe how color tolerances are set in specifications to suppliers of add-on parts and to paint suppliers and introduce some of the important issues. They identify several factors that can lead to unrealistically tight tolerance settings, and therefore to incorrect rejections and unnecessary high productions costs. They suggest situations in which the tolerance should be widened and point out that instrumental color tolerances should not be tighter than what is allowed by instrumental reproducibil-

ity, repeatability and inter-instrument agreement. Finally accounting for these factors, they suggest a set of reasonable values for tolerances on color and on visual texture parameters, based on their own practical experience.

Our Communications and Comments section brings us full circle back to an issue mentioned in the first article. Michael H. Brill and Robert C. Carter pose the question “Does lightness obey a log or a power law? Or is that the right question?” Rolf G. Kuehni adds “Modeling lightness perception - another point of view.” This is followed by “Modeling lightness perception---a response to Kuehni” from Drs. Carter and Brill. More about this discussion will follow in future issues

Ellen Carter, *CR&A Editor*

Calendar

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|--------------------|---|
| Feb 2-6 | IS&T/SPIE Electronic Imaging Symposium , San Francisco, CA |
| Mar 21 | AIC International Colour Day , http://www.aic-colour.org/index_archivos/colorDay.pdf |
| Apr 1-3 | AATCC International Conference , Crowne Plaza Resort, Asheville, NC |
| Apr 1-4 | 2014 New Perspectives on Colour at AISB-50 , Goldsmiths, University of London, UK, http://doc.gold.ac.uk/~mas01kd/aisb50/ |
| Apr 23-26 | CIE 2014 – Lighting Quality and Energy Efficiency , Kuala Lumpur, Malaysia, www.cie2014@console.com.my |
| May 13-16 | IS&T Archiving Conference , Berlin, Germany, www.imaging.org/archiving |
| May 14-16 | 2014 Models in Vision (MODVIS) , St. Pete Beach, FL, http://www.conf.purdue.edu/modvis/ |
| May 16-21 | Vision Sciences Society, “VSS 2014” , Tradewinds Island Resort, St. Pete Beach, FL, http://www.visionosciences.org/st.pete_beach_info.html |
| May 22-23 | Asia Pacific Coatings Focus2014 , Shanghai, China, www.cdmc.org.cn/2014/apcf |
| Jun 1-6 | SID Display Week , San Diego Convention Center, San Diego, CA, www.sid.org/ |
| Jun 16-17 | CIE Division 1 on Color and Vision , NIST, Gaithersburg, MD, http://www.iscc.org/meetings/ST2014/ |
| Jun 18 | ISCC Bridge Symposium , NIST, Gaithersburg, MD, http://www.iscc.org/meetings/ST2014/ |
| Jun 19-20 | ASTM E12 Color and Appearance , NIST, Gaithersburg, MD, http://www.iscc.org/meetings/ST2014/ |
| Jun 24-27 | 2014 12th International Conference on New Developments and Applications in Optical Radiometry (NEWRAD 2014) , Dipoli Congress Center in Otaniemi, Espoo, Finland, http://newrad2014.aalto.fi/index.html |
| Jun 30-Jul2 | GFINC & ICISP Color Imaging and Applications , Cherbourg, Normandy, France, www.stlo.unicaen.fr/icisp/2014 |
| Jun 30-Jul2 | GFINC & ICISP Multispectral Color Science , Cherbourg, Normandy, France, www.stlo.unicaen.fr/icisp/2014/mcs2014.php |
| Aug 24-28 | ECVP 2014 Symposia , Belgrade, Serbia, http://ecvp2014.org |
| Sep 7-11 | IS&T NIP30 , Sheraton Philadelphia Downtown, Philadelphia, PA, www.NIP_DF@imaging.org |
| Sep 11-12 | X Conferenza del Colore , Università di Genova, Genoa, Italy PA, http://www.gruppodelcolore.it |
| Oct 21-24 | AIC Interim Meeting, The Color and The Culture , Hotel Misión de los Ángeles, Oaxaca, Mexico, www.aic2014.org |
| 2015 | |
| Jan 28-29 | ASTM E12 Color and Appearance , Sheraton, New Orleans, LA |
| May 19-22 | AIC Midterm Meeting, Color and Image , Toyko, Japan, www.aic2015.org |

ISCC Sustaining Members

Sustaining Members of the ISCC are organizations who support the mission and goals of the ISCC through financial or other support. With our Member Bodies, Sustaining Members also provide a critical connection to the color community. If you feel your company or organization should support the ISCC in this way, please contact the office for more information about member benefits.

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|------------------------------------|---------------------------|-------------------|
| Avian Technologies | www.aviantechnologies.com | 603-526-2420 |
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| X-Rite Incorporated | www.xrite.com | 616-803-2113 |

We could still use your help!

ISCC has positions in the organization that need filling including Directors and others. We can help identify a place for you depending on your skills and desires. Contact Nomination Chair Frank O'Donnell, fxodonnell@sherwin.com

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ISCC Member Bodies

At its foundation, the ISCC is composed of many related societies. These societies, our Member Bodies, help the ISCC through small annual dues as well as maintaining a relationship with each organization's individual members. We frequently hold joint meetings to further the technical cross-pollination between the organizations.

If you belong to one of our member body organizations, we encourage you to work with ISCC and your society to further the connection. Contacting the ISCC President is a good place to start. If your organization is not on this list and you think it should be, the ISCC office can provide you with details about membership.

Or use our new online application: www.iscc.org/applicationForm.php

American Association of Textile Chemists and Colorists (AATCC)
 American Society for Testing and Materials International (ASTM)
 American Society for Photogrammetry & Remote Sensing (ASPRS)
 The Color Association of the United States, Inc. (CAUS)
 Color Marketing Group (CMG)
 Color Pigments Manufacturing Association (CPMA)
 Council on Optical Radiation Measurements (CORM)
 Detroit Colour Council (DCC)
 Gemological Institute of America (GIA)
 Illumination Engineering Society of North America (IESNA)
 International Color Consortium (ICC)
 National Association of Printing Ink Manufacturers (NAPIM)
 Optical Society of America (OSA)
 The Society for Color and Appearance in Dentistry (SCAD)
 Society for Information Display (SID)
 Society for Imaging Science and Technology (IS&T)
 Society of Plastics Engineers Color and Appearance Division (SPE/CAD)