



Inter-Society Color Council News

Issue 453

Sep-Oct 2011

President's Report

I hope the summer went well for all of you and that you survived both the hurricanes and the economy.

Plans for the Special Topics Meeting by ISCC/IS&T/SID are progressing well. This will be held on the Saturday November 12th 2011 after the CIC19 conference in San Jose. The full list of speakers can be found elsewhere in this Newsletter. Francisco Imai and his team have put together a really exciting program and I am looking forward to attending. Our annual meeting will be held during the lunch at this meeting.

Your board of directors will meet in teleconference this month to discuss ways of modernizing the society's bylaws to reflect more accurately the current membership. I will discuss the outcome of this meeting in the next newsletter.

Frank O'Donnell, *The Sherwin Williams Company*
President, ISCC



2011 Annual Meeting

This year's annual meeting is taking a bit of a different course than in the past. Your board of directors has been studying and evaluating the current annual meeting format, and if attendance at recent meetings is any indication, there are adjustments to be made. Initially, we concluded that we cannot sustain the traditional format (interest groups and an education session) every year.

Therefore this year the annual meeting will take the form of a one-day Special Topics meeting in conjunction with IS&T's CIC19. The speakers and registration details are in this newsletter.

For our annual meeting luncheon on Saturday, we will have the pleasure and privilege of awarding two Society awards: the Nickerson Service Award, and the Godlove Award. These important awards recognize contributions to the color community both within and outside the ISCC. Details on the background of these awards as well as all past recipients can be found on the ISCC web site: www.iscc.org.



The Sainte Claire Hotel, San Jose, California

CIC19 will take place at the architecturally-charming, historic Sainte Claire hotel, which is on the prestigious list of Historic Hotels of America. The hotel is located in the heart of downtown San Jose, just steps from local transportation and the city's sights. Please join us!

Table of Contents

President's Report	1
Nickerson Award Call for Nominations	1
ISCC Membership News	2
ISCC/IS&T/SID Special Topics Meeting	3
Hue Angles: Dances with spectra	4
Color Research and Application:	
In this Issue October 2011	5
Color article: OSU pigment discovery	7
Color article: "Catching the Light"	7
Canadian Colour Research Association	8
IS&T Color Imaging Conference	8
Metameric Blacks: Crayon colors?	9
Member body news: AATCC	10
ISCC Calendar	11
ISCC Sustaining Members & Member Bodies	12
ISCC Member Bodies	12

ISCC EXECUTIVE OFFICERS

President	<i>Dr. Francis X. O'Donnell</i> The Sherwin Williams Company 610 Canal Road Cleveland, OH 44113 216-515-4810 fax: 216-515-4694 fxodonnell@sherwin.com
Secretary	<i>Ms. Ann Laidlaw</i> Xrite Incorporated 1108 Grecale Street Greensboro NC 27408 USA 616-803-2678 fax: 336-274-1971 ALaidlaw@XRite.com
Treasurer	<i>Dr. C. Cameron Miller</i> Nat'l Inst. of Standards and Technology 100 Bureau Drive, Stop 8442 Gaithersburg, MD 20899 301-845-4767 fax: 301-975-4713 c.miller@nist.gov
President Elect	<i>Mr. Scot R. Fernandez</i> Hallmark Card Inc. 2501 McGee Kansas City MO 64141 USA 816-545-2462 fax: 816-274-7367 sfern2@hallmark.com
Past-President	<i>Dr. Maria Nadal</i> Nat'l Inst. of Standards and Technology 100 Bureau Drive, Stop 8442 Gaithersburg, MD 20899-8442 301-975-4632 fax: 301-869-5700 maria.nadal@nist.gov

ISCC BOARD OF DIRECTORS

2008-2011	Mr. Henri DeBar	IsoColor, Inc. 631 Central Avenue Carlstadt, NJ 07072 201-935-4494 fax: 201-935-9404 hdebar@isocolor.com
	Dr. Michael H. Brill	Datacolor 5 Princess Road Lawrenceville, NJ 08648 USA 609-895-7432 fax: 609-895-7461 mbrill@datacolor.com
	Dr. David Wyble	RIT Munsell Color Science Laboratory 54 Lomb Memorial Dr Rochester, NY 14623-5604 585-475-7310 fax: 585-475-4444 wyble@cis.rit.edu
2009-2012	Mr. Nathan Moroney	Hewlett-Packard Company 1501 Page Mill Road, MS 1160 Palo Alto, CA 94304 650-236-2825 fax: 650-857-4320 n8@hp.com
	Mr. Jim Roberts	BYK-Gardner USA 9104 Guilford Road Columbia, MD 21046 443-838-1935 fax: 301-483-0800 Jim.Roberts@altana.com
	Dr. Leslie Harrington	The Color Association of the US 15 W. 39th Street, Studio 507 New York, NY 10018 212-947-7774 fax: 212-594-6987 lharrington@colorassociation.com
2010-2013	Dr. Nancy Kwallek	UT School of Architecture 1 University Station B7500 Austin TX 78712 USA 512-471-6249 fax: 512-471-0716 n.kwallek@mail.utexas.edu
	Mr. John Conant	Aerodyne Research, Inc. 45 Manning Road Billerica MA 01821-3976 USA 978-663-9500 fax: 978-663-4918 jconant@aerodyne.com
	Dr. Art Springsteen	Avian Technologies LLC P.O. Box 716 Sunapee NH 03782-0716 USA 603-516-2420 fax: 603-526-2729 arts@aviantechnologies.com

ISCC Member Survey

Your Board of Directors is preparing a comprehensive survey to aid in strategic planning of the future of the organization. Look for this in email or hardcopy sometime in the coming months. PLEASE take the time to thoughtfully answer the questions. We truly value and require your open and honest opinions regarding the ISCC.

ISCC 2012 Annual Meeting

The planning for the 2012 Annual Meeting has begun. The target month will be July in the greater Boston area. The current plan is to hold a traditional meeting with interest groups, and education session, and an annual awards banquet luncheon.

If you would like to help please contact any of the committee members below. The details on particular sessions are in development, but if you would like to present your work contact the relevant Interest Group chair.


Meeting Committee:

John Conant: jconant@aerodyne.com
Art Springsteen: arts@aviantechnologies.com
Dave Wyble: wyble@cis.rit.edu

ISCC Interest Group Chairs:

Basic and Applied Color Research
Ann Laidlaw: ALaidlaw@XRite.com
Industrial Application of Color
Jim Roberts: jim.roberts@altanachemie.com
Art Design & Psychology
OPEN (use wyble@cis.rit.edu)

LinkedIn Group Reaches Milestone

In the last few days we have surpassed 100 members in our online community! While this is very good news, membership is not enough without participation. The groups is configured such that any member has permission to initiate a  discussion. This could be as simple as an announcement of interest, or a philosophical discussion on the meaning of color, or even the future direction if ISCC. If you think it is interesting, then someone else probably will too – dive in!

To join, visit www.iscc.org and click the button that will direct you to the group page. You will need a LinkedIn account.

Henri Debar, *IsoColor Inc, ISCC Publicity Chair*

**ISCC/IS&T/SID Special Topics
Meeting: Revisiting Color Spaces
Saturday, November 12**



This one-day meeting will honor the 15th anniversary of the publication of sRGB and create an opportunity to discuss currently used color spaces from the perspective of the scientific and technological advances of the past 15 years. The meeting will also consider industrial needs for color specifications and standards for interchange in light of the emergence of new imaging technologies such as HDR imaging and multi-primary displays.

sRGB—Work in Progress

Ricardo Motta, NVIDIA Corp. (USA)

OSA-UCS System: Color-Signal Processing from Psychophysical To Psychometric

Color Claudio Oleari, University of Parma (Italy)

Design and Optimization of the ProPhoto RGB Color Encodings

Geoff Woolfe, Canon Information Systems Research Australia Pty. Ltd. (Australia)

Adobe RGB: Happy Accidents

Chris Cox, Adobe Systems, Inc. (USA)

Lunch (included with registration)

Inter-Society Color Council 80th Annual Meeting and Luncheon

Recent Work on Archival Color Spaces

Rob Buckley, University of Rochester/NewMarket Imaging (USA)

Modern Display Technologies: Is sRGB Still Relevant?

Tom Lianza, X-Rite, Inc. (USA)

Is There Really Such a Thing as Color Space? Foundation of Unidimensional Appearance Spaces

Mark Fairchild, Munsell Color Science Lab/RIT (USA)

HDR and UCS: Do HDR Techniques Require A New UCS Space?

Alessandro Rizzi, Università degli Studi di Milano (Italy)

Digital HDR Color Separation Images

John McCann, McCann Imaging (USA)

The day will close with a speaker panel discussion.

Registration fee includes lunch, two coffee breaks, full technical program, and handouts. Non-member registration includes ISCC membership through December 2012.

Fee before/after October 9th:

\$250/\$300	IS&T/SID members
\$325/\$375	non-members
\$100/\$100	students

To **register** for this and any other IS&T conferences, visit **www.imaging.org**. You can register for the ISCC Annual Meeting separate from CIC if you can only attend the Saturday program. We encourage everyone to support our Member Body IS&T, and stay the whole week for what promises to be a great program.

HUE ANGLES

(Send contributions to mbrill@datacolor.com)

Sometimes an out-of-towner can encourage you to explore your own neighborhood. Here's how Mark Fairchild acted on such encouragement.

Dances with spectra ... and some famous historical figures from color

Through a sequence of fortunate events instigated by Michael Brill, I recently found myself deep in the archives of the George Eastman House International Museum of Photography and Film. Michael asked me to poke around and write something for *Hue Angles* on what I found.

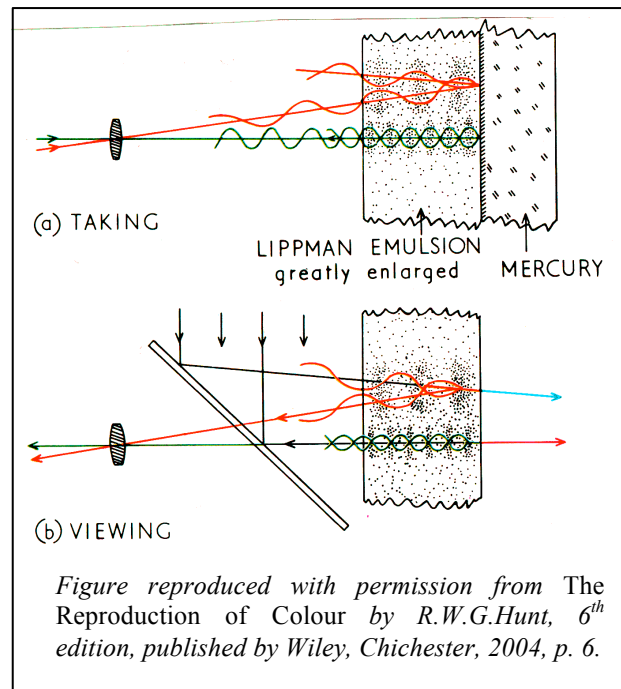
Prior to my visit, I had to narrow the topic to provide some focus for the archivist. We decided that Lippmann photography would be of interest to many in the ISCC and I was aware that the Eastman House had several very special examples of Lippmann plates. This is where the dance with spectra began.

I was hosted by the Photo Collection Archivist, Joe Struble, who took me underneath the museum, provided wonderful conversations about old color technologies, instructed me on how to properly handle priceless photographic artifacts, and fetched the sought-after Lippmann plates from the vast underground archives. We were also joined by Mark Osterman, the Eastman House's resident guru on early photographic materials and processes. Mark discussed the Lippmann technology and shared tips for best viewing the images. One key to his instruction was that I would need to "dance with" the lighting and plates in order to line everything up just right to see some amazing spectral images. That dance also led me down a path of intersections with several historical greats in the color photography universe.

It starts at the *Palais de Versailles* where Gabriel Lippmann once stood with a complex camera system collecting one of the earliest spectral images ever made. I was holding the very same photographic plate that Lippmann placed in his camera doing that dance to allow essentially the same spectra present in France on that 19th-century day to fall upon my eyes. Pretty cool stuff.

The Lippmann process used an extremely fine-grain panchromatic emulsion (a black and white emulsion sensitive to all visible wavelengths) very similar to those used for holography today. The plate was placed in the camera with glass side toward the lens and then a layer of mercury was placed behind the plate to form a very good mirror in contact with the emulsion. This arrangement sets up standing light waves in the emulsion. The

interference patterns were recorded as layers of exposed silver. This means the exposures essentially created interference filters at each location across the image. The plate is then viewed in white light and only the appropriate wavelengths are reflected from the stacked layers of silver in the emulsion. The result is a nearly perfect spectral reproduction of the scene. Interestingly, Lippmann won the Nobel Prize in Physics in 1908 for this invention.



The accompanying image illustrates the capture and display processes schematically. In part b, the diagonal line represents a half-silvered mirror, and the viewer is supposed to look at the leftward-going rays, which may be seen either through the depicted lens or through a prism.

The color appearance was stunning. Dancing was indeed required to get the light, the plate, and my eyes all in the proper position, but when that tango was just right, the images were fantastic. While more light than one typically finds in a museum would have helped, it was easy to see vivid greens of foliage, purples and oranges of flowers, and a blue sky that looked accurate and not the over-saturated color we have come to expect from consumer imaging systems. Well worth the dance!

(continued next page)

(Hue Angles, continued from previous page)

Dancing continued when we discussed the provenance of that plate and others. The plate was given to Josef Eder by Lippmann. Eder wrote the classic treatise, *History of Photography*, (translated into English by Edward Epstein) that includes a wonderful contemporaneous discussion of the Lippmann process. As I was shown the Eastman House copy of the book, I realized that I had that same edition on my shelf at home (passed to me by a retiring scientist). The dance continued when Eder gave his photography collection, including Lippmann's Versailles plate, to none other than George Eastman, beneath whose wonderful home on East Avenue in Rochester the archives sit. The plate was displayed at Kodak until the museum's creation in 1949.

Other dancers in this story included Frederick Ives, his son Herbert, and Howard Wood. The Iveses had also been experimenting with the Lippmann process and a similarly interesting process based on diffraction rather than interference. I also saw some of these interference color photographs (another potentially spectral imaging system although those were trichromatic) that Ives, Ives, and Wood had perfected and patented. Several of the Lippmann plates I viewed came from the Ives family, and there were also diffractive plates that came from Wood. Frederick Ives is well known for inventing systems of trichromatic color photography, while his son Herbert is noted for developing early facsimile and television systems. Wood, their colleague at Johns Hopkins, was known for exploring fluorescence and discovering the "blacklight effect" as well as developing IR and UV photography. I will have to relive that particular dance another day, but for now I discovered a new-to-me type of photographic process.

I will most certainly return to the archives one day--perhaps to learn more about diffractive color imaging or to explore original Kodachrome plates that were actually a two-color system (long before the time of Edwin Land). Thank you, Michael, for turning on the music for this dance and helping me find some new treasures in my own back yard!

Mark D. Fairchild

Rochester Institute of Technology

[I wonder if Mark's dance trope emerged from a Ph.D. trauma: Emil Wolf, who chaired his dissertation committee, queried him about spectra during his defense. The "dances with" trope and a certain movie title would be a standing wave, if not a standing ovation, in Prof. Wolf's direction. MHB]



Color Research and Application IN THIS ISSUE, October 2011

The International Commission on Illumination (CIE) in Publication 159:2004 recommends a color appearance model for color management systems, known as CIECAM02. Our first article in this issue suggests a possible improvement to CIECAM02. In "Unique Hue Data for Colour Appearance Models. Part I: Unique Hues and Hue Uniformity," Kaida Xiao, Sophie Wuerger, Chengyang Fu, and Dimosthenis Karatzas report on psychophysical experiments to assess unique hue of a large number of observers. They suggest that their predicted unique hue angles provide a more reliable standard for color management applications when the precise specification of these salient colors is important and that changing the hue angles to those that more accurately reflect normal observers would improve the CIECAM02 model.

Our last issue opened with an article discussing the tailoring of the illumination spectrum to minimize damage to art works without decreasing the enjoyment of the observer by filtering out unwanted parts of the illuminating radiation. [see "Lighting the World's Treasures: Approaches to Safer Museum Lighting" by Dirk *et al.* Vol. 36 Issue #4, 2011]. In this issue Roy S. Berns takes a different approach in "Designing White LED Lighting for the Display of Art: A Feasibility Study." Working on the idea that white LED lighting is good for art conservation because it does not emit UV and IR radiation and the visible radiation is reduced as compared with continuous-spectrum equivalent lights, Dr. Berns examines how much can be accomplished by changing from continuous sources to LED sources for museum lighting. He examines two questions 1) Can a 3-primary LED source be designed to be equivalent to common museum lighting? and 2) Can one design an LED source to achieve specific color-appearance attributes?

For our next article we move from observing works of art to viewing televisions. The newer wide color gamut liquid crystal display televisions are capable of producing bright, saturated colors. However, when showing movies or other material

(continued next page)

(CR&A, continued from previous page)

which has been produced under the EBU or SRGB systems, the skin tones of the actors appear too saturated. Hung-Shing Chen, Te-Mei Wang, Shih-Han Chen, and Jin-Sin Liu developed a “Skin-color Correction Method Based on Hue Template Mapping for Wide Color Gamut LCD” to resolve this problem. Their procedure involves three processes: hue segmentation, hue template mapping, and then hue interpolation. They show that by using the proposed algorithm is it possible to correct the transmission to show vivid color pictures while keeping facial skin-colors as natural as possible.

Following up on another article from the last issue [Using Weighted Pseudo-Inverse Method for Reconstruction of Reflectance Spectra and Analyzing the Dataset in Terms of Normality by Babaei *et al.*], we have another article on reconstructing spectral data in this issue. In “Applying Metamer Sets to Investigate Data Dependency of PCA Method in Recovery of Spectral Data,” Saeideh Gorji Kandi and M. Amani Tehran investigated the influence of color similarities or color differences between the recovered spectra and principal component data sets on the reconstruction error. They show that there are two important factors that influence the quality of the spectrum recovered. The most influential factor is the characteristics of the data set used for obtaining principal component vectors. However, the characteristic of the sample is also important and can lead to the fact that some spectral data cannot be recovered even using different data sets.

The “Additivity of Colour Harmony” is the topic for our next article. Through out the centuries artists have sought harmony in their work. But now with the advent of color computer aided designs, and computers to help customers select colors for their home environment, color harmony has become an issue to more people than just artists. In the last couple of years we have had articles on how to select harmonious pairs of colors, groups of three colors, and emotional responses to color combinations. In this issue, Li-Chen Ou, Patrick Chong, M. Ronnier Luo, and Carl Minchew report on experiments conducted in Great Britain and the United States to compare observers’ evaluations of the harmonious combination of colors and the values predicted by a model derived by the authors. Their model is based on the assertion that a three-color combination can be seen as a combination of three color pairs, each contributing additively to the overall harmony.

Colored contact lenses have become increasingly popular. In order to obtain a better and more realistic appearance, Jorge Alexis Herrera, Meritxell Vilaseca, Jochen Düll, Montserrat Arjona, Elena Torrecilla, and Jaume Pujol studied the color and texture of real irises, ocular prostheses, and colored contact lenses using a high resolution multi-spectral imaging system. They then analyzed the reproduction of iris color by ocular prostheses and colored contact lenses. In addition they analyzed the resulting color spatial distributions of the materials. Their results are described in our next article, “Iris color and texture. A comparative analysis of real irises, ocular prostheses, and colored contact lenses.”

In our final article Ángel Tolosa, Natividad Alcón, Marcela Picó, and Inma Iñigo compare two regulatory standards for safety signs: ISO 16069s and UNE 23035-1s using three different evaluation methods of determining the luminance decay time. In “A Revision of the Luminance Decay Time Estimation Methods for Photoluminescent Products,” they report that the ISO 16069s method has shown good correlation with real decay time, but that UNE 23035-1 presented severe deficiencies calculating decay times in the lower part. However, they report that it is possible to correct the deviation of estimated decay time values compared with real measured by using a linear model, and recommend revising the UNE 23035-1 standard.

We close this issue with two book reviews and announcements about two publications from the International Commission on Illumination (CIE). First, Eileen Korenic reviews the second edition of *Colour and the Optical Properties of Materials* by Richard J. D. Tilley. Then C. L. Hardin tells us about *Through the Language Glass: Why the World Looks Different in Other Languages* by Guy Deutscher. The CIE has two new technical reports. *CIE 195:2011 - Specification of Colour Appearance for Reflective Media and Self-Luminous Display Comparisons* describes the findings of TC1.27, and *CIE 196:2011 - CIE Guide to Increasing Accessibility in Light and Lighting*, which was written for lighting designers and engineers, as well as scientists of light, color, and vision to assist them in taking account of the needs of older persons and persons with disabilities following ISO/IEC Guide 71.

Ellen Carter

Editor Color Research and Application

OSU pigment discovery expanding into new colors – including orange

By David Stauth, OSU Science Writer
 Technical contact: Mas Subramanian,
 mas.subramanian@oregonstate.edu

CORVALLIS, Ore.— Chemists at Oregon State University have discovered that the same crystal structure they identified two years ago to create what may be the world's best blue pigment can also be used with different elements to create other colors, with significant potential in the paint and pigment industries.

First on the list, appropriately, is a brilliant orange pigment – appropriate for the OSU Beavers whose team colors are black and orange, and a university in a “Powered by Orange” advancement campaign.

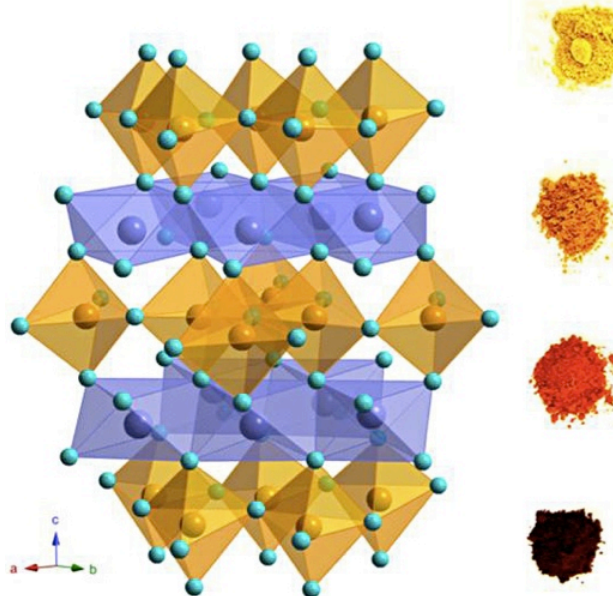


Image courtesy Oregon State University

But the broader potential for these pigments, researchers say, is the ability to tweak essentially the same chemical structure in slightly different ways to create a whole range of new colors in pigments that may be safer to produce, more durable and more environmentally benign than many of those that now exist.

Among the possibilities, they say, are colors that should be of interest to OSU's athletic rival 40 miles down the road at the University of Oregon— yellow and green.

“The basic crystal structure we're using for these pigments was known before, but no one had ever considered using it for any commercial purpose, including pigments,” said Mas Subramanian, the Milton Harris Professor of Materials Science in the

OSU Department of Chemistry.

“All of these colors should share the same characteristics of being extremely stable, durable, and resistant to heat and acid,” he said. “And they are based on the same crystal structure, so minor adjustments to the technology will produce very different colors and very high quality pigments.”

OSU has already applied for a patent on this technology, samples are now being tested by private industry, and the latest findings were published recently in *Inorganic Chemistry*, a journal of the American Chemical Society. The research has been supported by the National Science Foundation.

This invention evolved from what was essentially an accidental discovery in 2009 in an OSU lab, where Subramanian was exploring some manganese oxides for interesting electronic properties. At one stage of the process, when a sample had been heated to almost 2,000 degrees Fahrenheit, the compound turned a vivid blue.

The story continues here: <http://bit.ly/qTzkdj>

Interesting color article:

Catching the Light: “Doing Art” and Education

Published* in *Leonardo*, the Journal of the International Society for the Arts, Sciences, and Technology (MIT Press), this article draws upon the author's experience as a painter and visual art consultant in a public elementary school. It describes how “doing art” applies to the artistic thought process. The artwork of Joseph Beuys provides an historical perspective. The author shows how Beuys' use of three-dimensional form parallels her own work with color; like Beuys, she identifies an educational value behind “doing art.” She also reviews cognitive-science literature in light of her experience. She hopes that this paper will encourage



scientists to design research projects to explore the artistic thought process and ultimately demonstrate the relevance of how we learn to what we learn.

For more information, contact the author:

Margot Grallert: grallertm@verizon.net.

* *Leonardo*, April 2009, **42**, No. 2, pp 138-144

Canadian Colour Research Association Inaugural Meeting

The inaugural meeting of the Canadian Colour Research Association (*working title*) was held at OCAD University in Toronto, Ontario on June 1, 2011. A gathering of over 45 artists, architects, designers, scientists, academics, students and other individuals who have an academic or professional interest in the subject were on site at OCADU to help establish the organization.

A key objective of the organization is affiliation with the AIC (Association Internationale de la Couleur), the international body that encourages and disseminates research/new knowledge creation in all aspects of colour theory and application, across diverse fields including science, art, design and industry.



Keynote speaker Jennifer A. Veitch, Ph.D., from the National Research Council, opened the event with a talk entitled, "Contemporary Issues Concerning Colour and Well-Being". The establishment of the organization was discussed, a motion to formally create the group was unanimously approved, and officers were elected.

The elected executive committee is:

- Doreen Balabanoff, President
- Glenn McArthur, Vice President
- David Griffin, Treasurer
- Dorie Millerson, Secretary
- Nicole Collins, Member-at-large
- Robin Kingsburgh, Member-at-large
- Vivian Lo, Member-at-large
- Kirsten Webb, Member-at-large

The Executive Committee met in late July to formulate plans for the long-term development of the organization, including a website for membership development and dissemination of information and plans. Future events and meetings will be announced once the committee has developed Bylaws and considered other first steps.

The new President, Doreen Balabanoff, brought an application for membership to the AIC Executive at the Zurich Interim conference in June, and received enthusiastic congratulations for developing the group. They look forward to welcoming the Canadian Colour Research group to the AIC once it has been active as is clearly well-established.

New members at the inaugural meeting and the Executive Committee members have discussed possible names, and will seek a bilingual name - the

AIC Executive suggested referencing the Canadian Society for Colour, a former AIC member group no longer in existence, led by distinguished Professor and former AIC President Alan Robertson. The new organization will settle on a name in the near future - there is strong consensus that the term 'Research' should be included in the title.

An online site with information and methods/payment options for becoming a member will be forthcoming shortly.

Membership inquiries should be directed in the meantime to Doreen Balabanoff or Glenn McArthur (email below).

We are looking forward to meeting many colour experts...

Doreen Balabanoff, *President*
dbalabanoff@ocad.ca

Glenn McArthur, *Vice President*
gmcarthur@faculty.ocad.ca

Color Imaging Conference Preliminary Program Released

IS&T and SID had released the preliminary program to CIC19, the 19th Color and Imaging Conference, to be held November 7-11, 2011 in San Jose, CA. As in the past, the conference has two days of short courses followed by three days of technical sessions that will include three keynotes, an evening lecture, and a vibrant interactive papers session. An endearing symbol of the meeting is the Cactus Award, given each year to the author(s) of the best interactive paper presentation.



This year's keynotes include:

- *Color Responses of the Human Brain Explored with fMRI*, Kathy Mullen, McGill University
- *Human Demosaicing Algorithm*, David Brainard, University of Pennsylvania
- *The Challenge of our Known Knowns*, Robert W. G. Hunt, consultant, and Michael Pointer, University of Leeds and the University of the Arts, London (UK)

The Wednesday evening talk will be *Exploring the Fascinating World of Color Beneath the Sea*, by David Gallo of the Woods Hole Oceanographic Institute.

For more information visit the IS&T website: imaging.org.

Metameric Blacks: A Color Curious Column

Ever wonder ... "how many different color crayons are there?"

It's back to school time and what is more colorful this time of year than fresh new boxes of crayons (and happy parents)? According to Crayola there are currently 120 colors of their crayons. Amazingly, in over 100 years that Crayola has been making crayons, they have created more than 400 different colors! You can read some more about the history of their crayon colors on the Crayola website www.crayola.com/colorcensus/history/. There are also other fun activities and facts about crayons there.



Right now, the biggest box of crayons that Crayola sells has 120 crayons of different colors. Not too long ago you could get a Telescoping Crayon Tower with 150 different crayons. I bought one a couple of years ago and it might still be possible to find some. The accompanying image shows a little experiment I did with cyan, magenta, and yellow crayons, a plate, and a stovetop. The resulting color mixing is intriguing.

Crayola is just one of many brands of crayons. There are at least 25 different companies that make crayons sold with more than 100 different brand names. Of course some of those companies make crayon colors that are the same as one available from Crayola, but I'm sure there are some other colors out there. It's probably safe to guess that there are at least 200 different crayon colors out there in the world, and maybe even more. Interestingly the

Munsell Color Company once produced crayons with Munsell designations. I have also included a picture of those I put together for an article on Munsell in *American Scientist* a few years back. [E.R. Landa and M.D. Fairchild, "Charting color from the eye of the beholder," *American Scientist*, **93** 436-443 (2005).]



Content of this column is derived from *The Color Curiosity Shop*, an interactive website 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 [<mdf@cis.rit.edu>](mailto:mdf@cis.rit.edu) or use the feedback form at [<whyiscolor.org>](http://whyiscolor.org).

-Mark D. Fairchild

Inter-Society Color Council

Office Manager: Ms. Cynthia Sturke
11491 Sunset Hills Rd.
Reston, VA 20190
Tel (703) 318-0263
Fax (703) 318-0514
Web: www.iscc.org
Email office: isccoffice@cs.com



Member Body News

AATCC Announced Workshop and Symposia

RESEARCH TRIANGLE PARK, N.C., USA, August 11, 2011— Explore the role of color on fabric at the **AATCC Color Management Workshop**, November 2-3.

Color plays an important role in consumers' purchasing decisions. Communicating color throughout the textile supply chain is imperative to get the color envisioned by the designer and demanded by the consumer.

Attend AATCC's Color Management Workshop, and hear world renowned color experts discuss color principles and the effect of lighting; factors to consider when developing your color palette and how these choices affect cost, fashion, durability, and dyeing reproducibility; how to implement a digital color program with your supplier; how to control shade from concept to production; and much more.

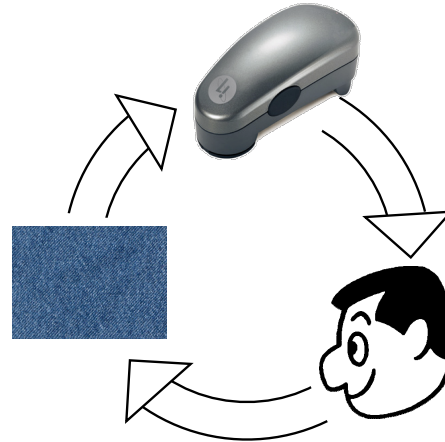
This workshop is designed for merchandisers, retailers, manufacturers, product developers, color approval managers, specifiers, and designers. Past participants have praised the workshop's "excellent real-world applications," and the speakers' "wide range of knowledge."

Presentations include:

- *Fundamentals of Color Theory and Measurement* David Hinks, North Carolina State University
- *Dye Selection for Desired Fastness Requirements* Nelson E. Houser, M. Dohmen USA
- *Color Communication Best Practices* Sandra L. Johnson, Color Solutions International
- *Color Communication: Getting Your Message Across* Roland L. Connelly, Sr., X-Rite Inc.
- *Supplier Conformance - Why Don't my Numbers Match Yours?* Ken Butts, Datacolor
- *Tracking Color Performance* Keith D. Hoover, JCPenney
- *Managing Color on Multiple Textile Substrates* Andrew Fraser, Chico's
- *Your World, Your Process: Applying What You Have Learned* Jean Hoskin, Macy's Merchandising Group

Breakout sessions will focus on illumination and observer issues; sample analysis and measurement technique; creativity with trends and virtual development; what is color matching; production evaluation and control; and how to do the right color right. Participants will have an opportunity to have their color questions answered during the presentations and breakout sessions.

Complete details on the program and registration: www.aatcc.org/events/workshops/



AATCC will also offer back-to-back symposia combined into a three-day event in Long Beach, California, December 7-9.

Denim and Fashion Garment Washing: What's New, Innovative, & Sustainable will be held on December 7th and the morning of the 8th. Sessions will focus on design & development; emerging technologies and applications; and garment washing trends.

Performance & Outerwear: Optimizing through Innovation will begin on the afternoon of December 8th and run through the 9th. Session topics will cover sustainability & innovation; optimizing product performance; and fashion and brand developments. Attendees will have the opportunity to register to attend either or both of the programs.

Bryan Swarn, president & CEO of Phenetix Urban Athletic Wear Co., will make the keynote presentation, titled, "Phenetix: Creating Outer Wear for Your Inner Style." Swarn was honored at AATCC's 2011 International Conference as the first recipient of AATCC's Young Entrepreneur Award. He will share his company's history, goals, and vision.

Complete details on the program and registration: www.aatcc.org/events/symposia/

Note from the Editor – The SS ISCC Changes Course

This is going to sound like a broken record, but without material, there is no newsletter. We have a few dedicated regular contributors, and after that I rely on YOU. When you are surfing the web or perusing your favorite journal or trade rag, it is always helpful for me to get little pointers and snippets. Remember, if it is color-related and interesting to you, it is probably interesting to many other ISCC members.

In particular, calendar events take a lot of time to collect. If anyone is interested, I could use an assistant editor who is only in charge of the calendar.

Dave Wyble
Editor, ISCC News

ISCC News Issue #453 Sep/Oct 2011

Editor: Dave Wyble

(585)475-7310 wyble@cis.rit.edu

Editor Emeritus: Prof. Gultekin Celikiz

(215)836-5729 gcelikiz@yahoo.com

Newsletter Team

Cynthia Sturke, Mary McKnight, Mike Brill, and YOU!

All submissions must be in English. Please submit materials by the 15th of each even numbered month.

September/October 2011 Calendar

- | | |
|---------------------|--|
| Sept 11-14 | NAPIM Graph Expo 2011 , Chicago, IL, www.graphexpo.com |
| Sept 18-21 | IES Street and Area Lighting Conference . New Orleans, LA, www.ies.org |
| Sept 16-20 | Color Marketing Group 2011 International Conference , Crown Plaza Riverwalk Hotel, San Antonio, Texas. www.colormarketing.org |
| Sept 23-24 | 3rd Annual Conference of the Society for Color and Appearance in Dentistry , Wyndham Downtown Chicago, www.scadent.org/about-2011-meeting |
| Oct 2-6 | IS&T NIP Conference , Minneapolis www.imaging.org/ist/conferences/nip |
| Oct 16-20 | IES Aviation Lighting Seminar . Wilmington, NC, www.ies.org |
| Oct 18-20 | NPIRI Technical Conference , Itasca, IL, www.napim.org |
| Oct 30-Nov 1 | IES Annual Conference . Austin, TX, www.ies.org |
| Nov 2-3 | AATCC Color Management Workshop , Research Triangle Park, NC www.aatcc.org/events/workshops/ |
| Nov 2 – 3 | OSA Solid State and Organic Lighting Omni Austin Hotel Downtown, Austin, Texas www.osa.org/meetings/topical_meetings/soled/ |
| Nov 7-11 | CIC19, Society for Imaging and Technology , San Jose, CA, www.imaging.org/IST/conferences/cic |
| Nov 12 | ISCC topical meeting on color spaces , San Jose, California, (Co-located with CIC19) |
| Nov 14-17 | ASPRS 2011: Fall Pecora Conference , Herndon, Virginia, www.asprs.org/pecora18/ |
| Dec 7-9 | AATCC Denim and Outdoor Performance Wear Symposium , Long Beach CA. www.aatcc.org/events/symposia |



2012

- | | |
|------------------|---|
| Jan 22-26 | IS&T/SPIE Electronic Imaging Conference , San Francisco, CA www.imaging.org/ist/conferences/ei |
| Feb 1 - 2 | E12 Color and Appearance Hyatt Regency Atlanta; Atlanta, GA US. Astm.org |
| Jun 3 – 8 | SID Display Week , Boston MA. www.sid.org/ConferencesExhibits.aspx |

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.

Avian Technologies	www.avianttechnologies.com	603-526-2420
BYK-Gardner USA	www.byk.com/instruments	301-483-6500
Datacolor	www.datacolor.com	609-895-7432
Hallmark	www.hallmark.com	816-274-5111
Hewlett-Packard Company	www.hp.com	650-857-6713
Hunter Associates Laboratory, Inc.	www.hunterlab.com	703-471-6870
IsoColor Inc.	www.isocolor.com	201-935-4494
Chester F. Carlson Center for Imaging Science	www.cis.rit.edu	585-475-5944
X-Rite Incorporated	www.xrite.com	616-803-2113

Thank You!

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)