Inter-Society Color Council *News*

Issue 461 Winter 2013

President's Report

This is my first report as the President of the ISCC, and I am looking forward to the next two years of activity with the ISCC. Before I go any further I want to thank our previous President Dr. Frank O'Donnell for his leadership and service over the last two years. During Frank's tenure he guided the organization through a difficult economic environment, and helped the ISCC leadership work through some tough decisions as an organization. In addition to Frank, I also want to thank our outgoing BOD members Dr. Leslie Harrington, and Jim Roberts for their efforts and support over the last three years.

As most of you are aware the ISCC has been shrinking in membership over the last decade. Our current annual membership is less than half of what our membership was ten years ago, and the organization's key source of budgeted income is membership dues. So as membership participation declines so does the organizations revenue source. The board of the ISCC has been monitoring this trend for several years, and has made budgetary adjustments along the way to keep the organization in financial good health. Last year the board had to make the difficult decision to significantly reduce our expenses structure. As a result of the decision to make budget reductions, starting in 2013 the ISCC will not longer have Cynthia Sturke as an employee for the first time in 15 years. She has been a valued resource during her time with the organization, supporting most of the membership activity, conferences, and many board-meeting activities. She will be missed, but definitely not forgotten as we work through the details of supporting her activities with volunteer efforts.

So as a member you will see changes that help the organization function without a physical office, and help us operate efficiently in a more virtual capacity. Some of the changes are already in flight. For example we have a new phone number, mailing address, and hosting domain for our web presence. Here is the new contact information for the ISCC:

Address:
7820B Wormans Mill Rd. Suite #115
Frederick MD 21701
Phone & Fax: (866) 876-4816
Email: isccoffice@iscc.org

Other changes the board are discussing include automating more of the membership services, modifying the future dues structure, and potential format changes to our annual meetings will take more time to work through as we have volunteers willing to work on the details.

On the topic of membership participation our organization is in need of more volunteer hours and ideas about how to make the operations of the ISCC easier. At this time we have several leadership positions open, and also need help with membership services moving forward so if you are interested in being more involved please let me know.

Scot Fernandez, *ISCC President*

Table of Contents

ISCC EXECUTIVE OFFICERS

ISCC BOARD OF DIRECTORS

International Colour Association 12th AIC Congress

July 8-12, 2013: The Sage: Gatehead, UK

The AIC Congress is held every four years and is the only international color conference that promotes all facets of color.

The main theme of the 2013 conference will be *Bringing Colour to Life*, in the practical sense of color production and reproduction, in the sense of color in nature, and the ways in which color can be used sustainably now and in the future.

For the latest details and information, visit `www.aic2013.org` or email `info@aic2013.org`.

Nickerson Award Ceremony

For the formal presentation of the Nickerson Award at the Annual Meeting in Manchester, recipient Rob Buckley was present only by telephone. The technology cooperated, and Rob was able to listen to the citation (read by Mike Brill) and then give an acceptance speech. The award itself was put into the safe keeping of fellow Rochester area resident Dave Wyble for future delivery to Rob.

The physical presentation of the award was carried out a few weeks later at an informal meeting at Barry's Old School Irish, a small friendly pub in downtown Webster, NY. Unfortunately the photography from the evening was unsuitable for publication. Still, a good time was had by all, and the 2012 Nickerson Award made it safely to its new home.

Congratulations once again Rob!

Member Body News: CORM

The Council for Optical Radiation Measurements (www.cormusa.org) has published their Spring 2012 newsletter, number 98, at the link below. In this issue, you will find information on their upcoming meeting in Gaithersburg MD on May 7-9, 2013. Also included are several articles from various National Metrological Institutes (NMIs) detailing their activities on the measurements of lighting and optical properties of materials.

www.cormusa.org/uploads/ORN097_Spring2012.pdf

The ISCC Godlove Award

The Godlove Award is the most prestigious award bestowed by the Inter-Society Color Council (ISCC) to honor long-term contributions in the field of color. The Award was established in 1955 in memory of Dr. I. H. Godlove. Usually awarded biannually at the Annual Meeting, time constraints have extended the nomination period through August 2013.

Godlove candidates will be judged by their contribution to any field of interest related to color. The candidate's contribution may be direct, it may be in the active practical stimulation of the application of color, or it may be an outstanding dissemination of the knowledge of color by writing or lecturing, based on original contributions. Candidates need not have been active in the affairs of the ISCC, but they must be either current or former ISCC members. All candidates must have at least five (5) years of experience in their particular field.

A Godlove Award Nomination form may be obtained from the ISCC office. The past and present membership of the ISCC boasts a number of individuals deserving of such recognition and this award requires your participation in the process. Please take the time to consider and nominate a worthy candidate for this honor.

Download: `www.iscc.org/pdf/2102godlove.pdf`

Included in the nomination should be:

1. The nominee's name and contact information.
2. A citation giving in a sentence or two the specific reason for the award's bestowal.
3. A narrative up to one page in length covering the nominee's contribution and its significance.
4. A resume or vita and a publication list for the nominee, as well as any other useful material.
5. Source of the nomination. Give the name and contact information of the person(s) who prepared the nomination.

Note: Confidentiality is of the utmost importance. The nominee should be unaware of the nomination.

Eric Zeise
Godlove Award Chair *eric.zeise@kodak.com*

From the Editor: two years gone by...

It is hard to believe that this issue marks the start of the third year of newsletter publication since the handoff from Mary McKnight. It has been an interesting, frustrating, rewarding, and sometimes even fun experience. This not a lone effort, as there are a great many helpers out there who feed me ideas and help with the logistics of publication and distribution. For that help I am very grateful; I know I can count on everyone to keep up with that help, which is so very much needed.

A new design for this newsletter is in the works. Your input is needed!

We will be moving to a new design in the coming months. The current format has been in place for many years (since before your editor even joined the ISCC!) If you are interested in contributing to that design effort, please let me know. While we all enjoy the ISCC for its unique blend of science, technology, art, and design, few members, especially this technologist, would claim expertise across all these fields. So if you have design skills, please take this request to heart!

From the Webmaster: A new world, and yet not so new**

As another part of the goal to make the organization more self sufficient and self sustaining, the web site has been moved to a professional hosting service. Careful observers will know that for about 15 years, the ISCC site (www.iscc.org) has been hosted on the servers of the Center for Imaging Science within the Rochester Institute of Technology in Rochester NY. Continued access needed for web editing required that an RIT employee be responsible for those edits. For the web editing duties to ever change hands, this requirement would unreasonably limit the choice of a qualified individual.

We sincerely thank RIT's Center for Imaging Science and the Munsell Color Science Laboratory for their steadfast support over the last 15 years.

Do not worry needlessly though; your webmaster has no plans to abandon his duties any time soon. Indeed, like the newsletter request above, I look forward to new innovations, and would welcome design assistance for the web pages as well.

Dave Wyble, *Webmaster*

** With few exceptions, you should notice no content difference with the new hosting.

HUE ANGLES

(Send contributions to mbrill@datacolor.com)

Solution to Last Issue's Cryptogram

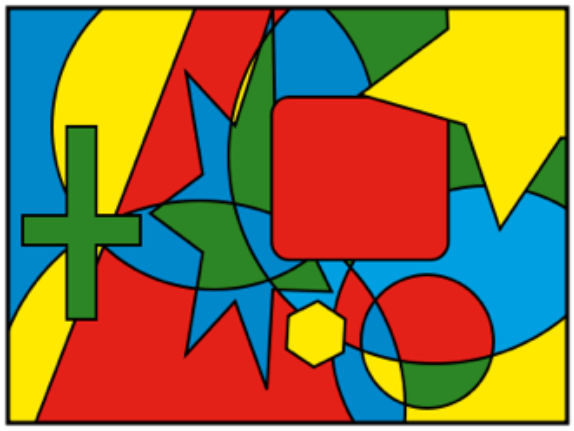
And the answer [1] is…

"Within your lifetime will, perhaps,
As souvenirs from distant suns
Be carried back to earth some maps
Of planets and you'll find that one's
So hard to color that you've got
To use five crayons. Maybe, not."

The poet was Marlow Sholander. He was my freshman calculus professor at Western Reserve University (before it united with Case Institute of Technology). I don't know when he wrote it, or why. He was known for chain smoking and for phrases like, "There are no Gausses in this class"---proved by lofting epsilons and deltas over our heads. But he said not a word about the four-color-map theorem. It was only a conjecture and not a theorem when I knew Sholander. The proof would come in 1976 and be published in 1977 [2,3]. Even then, the proof was questioned because it required a computer. In fact, it was the first major theorem that was proved using a computer.

For new initiates: The four-color map theorem says that, no matter how you carve up a plane into connected (contiguous) areas, to assure that no two abutting regions have the same color, you don't need more than four colors. "Abutting" means sharing a boundary of at least two points, so, e.g., Arizona and Colorado (which share only one point) could have the same color on a U.S. map.

You won't find the theorem bandied about by geographers. The maps are entirely in the minds of mathematicians, e.g. the following from Wikipedia:



Why spend a career trying to prove (or disprove) something about four-color maps? To put it abstractly, I think it allows you to hold (and maybe control) certainty in the palm of your hand. The intoxication of knowing exactly what could *not* have come from a distant planet—no matter how far away—is the essence of Sholander's poem.

I would not have guessed he had it in him, and it was not he who got me excited about what was then the four-color conjecture. Years before, my tiny sixth-grade class trooped across the soccer field to Brentwood High School, invited to partake in a flight of fancy led by a 12th-grade prodigy. This prodigy inundated us with fun and challenges from constructing flexagons and polyhedra to reading *Fantasia Mathematica*---which contains a story about an impossible five-color map. We made three visits after school, as I recall.

The others in my class returned and made flexagons. I spent every boring class moment for the next six years trying to disprove various "easy" truths like the four-color-map problem. And math classes didn't have boring moments anymore.

The name of the prodigy? Jef Raskin, who started the MacIntosh project at Apple Computer. The rest is history, as Wikipedia will attest (in a different article). Some years after our visits, I chanced to meet him again, and he said he'd outgrown the childish pursuits he had started me on.

How strange that it was the dry, hierarchy-obsessed professor who carried the wonder to distant planets through his poem!

Michael H. Brill
Datacolor

1. The only solver was Paul Centore.

2. Appel, Kenneth; Haken, Wolfgang (1977), "Every Planar Map is Four Colorable Part I. Discharging", *Illinois Journal of Mathematics* **21**: 429–490.
3. Appel, Kenneth; Haken, Wolfgang; Koch, John (1977), "Every Planar Map is Four Colorable Part II. Reducibility", *Illinois Journal of Mathematics* **21**: 491–567.

Color Research and Application

IN THIS ISSUE, February 2013

Before discussing the articles in this first issue of 2013, I would like to take the opportunity to welcome two new members to the Editorial Board of this journal. They are Dr. Rejéan Baribeau, who works at the Institute for National Measurement Standards of the National Research Council of Canada, and Dr. Li-Chen Ou who is an associate professor at the Graduate Institute of Applied Science and Technology of the National Taiwan University of Science and Technology.

Following up on several articles we published last year on work related to Commission Internationale de l'Éclairage (CIE) technical committee 1.69, we open this issue with a report on the "Visual assessment of light source color quality." TC 1.69 has been searching for a possible metric to evaluate all types of white light sources beyond the CIE Color Rendering Index. In the article Peter Bodrogi, Stefan Brueckner, Tran Quoc Khanh, and Holger Winkler report on experiments in which observers scaled nine properties of color quality of various light sources. Six factors were extracted from the analyses: memory, preference, brightness, fidelity, gamut and difference. The importance of each and the relationships between, as well as the observers' consistency in rating each of these factors are discussed.

There was a time when most displays (with the exception of airplane cockpits) were being used indoors where lighting could be fairly easily controlled or adjusted. However, this is no longer true. We pull out of our pockets small displays and expect to see the images well any place we happen to be. However, the lighting in the form of a veiling glare often interferes. In our next article Yung Kyung Park, M. Ronnier Luo, Changjun Li, Youngshin Kwak, Du-Sik Park, and Chang Yeong Kim discuss "Correcting the Veiling Glare of Refined CIECAM02 for a Mobile Display." They developed a "refined" CIECAM02 algorithm, and compare its performance to other algorithms for predicting the effect of veiling glare.

In the October 2011 issue of this journal Kaida Xiao, Sophie Wuerger, Chenyang Fu, and Dimosthenis Karatzas presented "Unique hue data for colour appearance models. Part I: Loci of unique hues and hue uniformity." Now in this issue Dimitris Mylonas has joined these authors to present "Part II: Chromatic Adaptation Transform." When displays are viewed with room lights on, the illumination is a mixture of the ambient lighting and the display itself. The mixed illumination can produce significantly different results than when either light source is used separately. In this article they present an optimized parameter for chromatic adaptation under mixed illumination conditions that produces more accurate results in unique hue reproduction.

In colored images, getting people's complexions right is one of the highest priorities. Facial tones have been studied for more than sixty years. In our next article Huanzhao Zeng and M. Ronnier Luo examine the "Colour and Tolerance of Preferred Skin Colours on Digital Photographic Images." In their study the same panel of observers rated the preferred skin colors Caucasian, Oriental, and African races. They found not only the preferred color center for each race, but also studied the variations and hue and chroma tolerances of the observer skin color preference.

In our next article is a reminder that how one designs an experiment, is an important factor influencing the results. In the example study, observers are asked to set the preferred color of ambient illumination by adjusting the color temperature of the illumination. However, in this study the focus is on the methodology more than the result. Asta Logadottir, Steve Fotios, Jens Christoffersen, Soren Stentoft Hansen, Dennis Dan Corell, and Carsten Dam-Hansen predicted that the result would be affected by the available stimulus,range, the anchor (initial setting before adjustment), adaptation time before onset of adjustment action and type of control dial. "Investigating the use of an adjustment task to set preferred colour of ambient illumination" the authors remind experimenters that they should carefully consider in further work using single interval CCT adjustment the following factors: stimulus range: the range(s) available to test subjects, anchors, ie., the CCT experienced before the adjustment is carried out; adaptation time before adjustment; and the relationship between control setting and variation in CCT.

In the last issue Paul Centore presented presents "An Open-Source Inversion Algorithm for the Munsell Renotation." Now in this issue, he uses that algorithm to calculate "Shadow Series in the Munsell System." Shadows are an important part of any

continued on next page

"In This Issue" continued from previous page

image, and when an artist or graphics designer is trying to present realistic images, the correct coloration of shadows in an important component. Centore explains that his article can be seen as a rigorous refinement and extension of Ralph Evans's investigations in the late 1960s. At that time lack of computing power led to the need to several simplifying assumptions that are no longer necessary. These calculations also lead to some other interesting conclusions such as new values for ideal black and ideal white.

For our next article we go to China, where the trend is for many people to move to cities. There has been a building boom, and over the last 20 years many cities have urban color plans. This has been discussed in earlier articles by Aiping Gou (see for example Color Research and Application 2008;33:68-76). Now Dr. Gou concludes that it is not enough to plan colors by themselves. People living in the city are concerned more about space and how to move in it than color in a built environment. In "A Study on the Method of Urban Color Plan Base on Spatial Configuration" she reports the color should be arranged to make the urban space indicating and attracting by emphasizing the pivots and grade of space dynamic, and further, to leave more creative possibility to designers**.** She suggests that the color plan should first emphasize the space available and its use, and secondly the relationship among points, lines, and areas which define the color spatial relationships.

For our last article we move to the field of textiles. Many fabrics have been optically whitened for a more striking look. However, will this effect last? Mustafa Tutak, Oguz Demiryurek, and Sueda Bulut use a Xenon arc light to approach the effect of daylight. In "Analysis on the CIE Whiteness of Optical Whitened Polyester Woven Fabrics" they report on the performances (the change in whiteness index and tint) of plain and twill woven polyester fabrics whitened under specific working parameters.

The World Color Survey by Paul Kay, Brent Berlin, Luisa Maffi, William R. Merrifield, and Richard Cook is reviewed by Angela M. Brown and Delwin T. Lindsey. Also the new 2nd edition *Computational Colour Science Using MATLAB* by Stephen Westland, Caterina Ripamonti, and Vien Cheung is briefly noted.

Ellen Carter
Editor, Color Research and Application

Wishing you a colorful New Year!

Calendar

Mar 4-5	**4th IAPR Computational Color Imaging Workshop**, Chiba, Japan dippix.tp.chiba-u.jp/CCIW2013/
Apr 2-5	**IS&T Archiving Conference**, Washington, DC www.imaging.org/ist/conferences/archiving
Apr 9-11	**AATCC International Conference**, Hyatt Regency, Greenville SC www.aatcc.org/ic/
Apr 14-16	**100th Anniversary of the CIE,** Paris, France www.cie.co.at
May 7-9	**CORM 2013 Annual Technical Conference**, Holiday Inn Gaithersburg, MD. cormusa.org
May 19-24	**SID's Display Week 2013**, Vancouver BC, www.displayweek.org
April 18-19	**Yves La Grand Color Vision Symposium**, Paris, France
May 10-15	**VSS 2013 Annual Meeting**, Naples, FL www.visionsciences.org
June 23-27	**OSA - Imaging Systems and Applications**, Arlington, VA www.osa.org/is/
Jun 26-27	**ASTM E12** meeting at NIST HQ in Gaithersburg, MD
July 5-6	**CIE Division 1 Meeting**, Leeds, United Kingdom
Jul 8-12	**AIC Colour 2013** "Bringing Colour to Life" in Newcastle Gateshead, United Kingdom
Nov 4-8	**IS&T Color Imaging Conference**, Hotel Albuquerque, Albuquerque NM. www.imaging.org/ist/conferences/cic
Dec 5-6	**AATCC Textile Testing Workshop** Research Triangle Park, N.C. aatcc.org/events/workshops/ITT.htm
Dec 12-13	**ASTM E12** meeting at Hyatt Regency Riverfront in Jacksonville FL

Metameric Blacks: A Color Curious Column

Ever wonder ... "If No Light Falls On an Object Does It still Have a Color?"

Like the philosophical question about the sound of a tree falling in a forest, this is a question of perception. Since color is a visual perception and light is the stimulus that produces visual perception of objects, then with no light there is also no color. At least there is no color that belongs to that object. We might still perceive color due to the dark noise in our visual system. For example, when we are in a completely darkened room for a long period of time (so that we completely adapt), the perception is not one of black (which only exists as a related color), but one of a noisy (or grainy) dark gray.

It is, of course, possible to perceive color without visual stimulation, but such colors would not be associated with specific objects in our environment since we couldn't see them. Dreams are one example. We can have clear color perceptions of imagined objects when we are dreaming. And, yes, people do perceive dreams in color. Although for some

people it is difficult to recall dreams and some people do claim that their dreams are only in black and white. Another non-visual color perception comes from pressure on the eye. If you press gently at the corner of your eye you will see some bright flashes due to this pressure. These are known as pressure phosphenes. It is not very good for your eyes to press on them, so I don't recommend doing this experiment more than once and even then be very gentle. One could also consider afterimages as non-visual color perceptions since they result from the removal of the light stimulus rather than its presence.

These types of questions can never be answered definitively. That's what makes them philosophical in nature. It is fun to ponder them and discuss the possible answers with others. Such thoughts and discussions can lead us into greater insights about ourselves and the world around us. Another one to ponder from The Gateless Gate ... "The wind is flapping a temple flag, and two monks were having an argument about it. One said, 'The flag is moving.' The other said, 'The wind is moving.' They argued back and forth but could not reach the truth. The sixth patriarch said, 'It is not the wind that moves. It is not the flag that moves. It is your mind that moves.' The two monks were struck with awe."

Content of this column is derived from The Color Curiosity Shop, an interactive website, now 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 <mdf@cis.rit.edu> or use the feedback form at <whyiscolor.org>.

Mark D. Fairchild
Rochester Institute of Technology

Preserving van Gogh's priceless masterpieces

The chrome yellow pigment that renowned post-Impressionist artist Vincent van Gogh favored in priceless masterpieces like *Sunflowers*, the *Yellow House* and *Wheatfield with Crows* is especially sensitive to certain types of light and should be protected to prevent darkening. That's the conclusion of a series of studies in ACS' journal *Analytical Chemistry*, which could help preserve masterpieces by van Gogh and contemporaries like Gauguin, Cézanne and others.

The article concludes that curators should make sure that masterpieces, like Vincent van Gogh's *Sunflowers*, above, stay out of some kinds of light.

Image credit: National Gallery of Art

Source: ACS News Service Weekly PressPac: November 14, 2012

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.aviantechnologies.com	603-526-2420
BYK-Gardner USA	www.byk.com/instruments	301-483-6500
CERAM Research Ltd.	www.ceram.com	+44(0)1782 764428
Datacolor	www.datacolor.com	609-895-7432
Gamma Scientific	www.gamma-sci.com	800-637-2758
Hallmark	www.hallmark.com	816-274-5111
Hunter Associates Laboratory, Inc.	www.hunterlab.com	703-471-6870
IsoColor Inc.	www.isocolor.com	201-935-4494
X-Rite Incorporated	www.xrite.com	616-803-2113

We could still use your help!

ISCC has positions in the organization that need filling: from Directors to a Membership Secretary, to others that we can help identify depending on your skills and desires. Contact Nomination Chair Frank O'Donnell, fxodonnell@sherwin.com

ISCC News Issue #461, First Quarter 2013

Editor: Dave Wyble

(585)259-5956 dave@wyble.org

Editor Emeritus: Prof. Gultekin Celikiz

(215)836-5729 gcelikiz@yahoo.com

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)