Inter-Society Color Council *News*

Issue 445 May-June 2010

Lighting in Artistic, Commercial, and Retail Spaces Meeting Report

On March 2 and 3 this year, a group of about thirty five scientists, engineers, and museum professionals met in Gaithersburg, Maryland, to share on the topic of "Lighting in Artistic, Commercial, and Retail Spaces." This meeting was jointly sponsored by ISCC and CORM, and located on the facilities of the National Institute of Standards and Technology (NIST). The two days consisted of three technical sessions and a tour of the related NIST laboratories.

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The first session was chaired by Steve Weintraub of Art Preservation Services. This session, *The Use of Lighting in Commercial and Artistic Spaces*, presented the full range of use and analyses of lighting in museums and commercial applications. Gordon Anson began the day discussing his experience lighting museum exhibits. Many creative solutions were shown for a wide variety of museum spaces and all genres of artwork. Chris Maines followed with the description of a portable micro-fading tester. This instrument could intensely illuminate a very small area and then accurately quantify the change in color of the sample. To follow this, Carl Dirk explained methods to design illuminants whereby artwork damage could be avoided. Steve Weintraub discussed the difficulties of balancing the divergent goals of preservation and exhibition. The best way to preserve artwork would be to never show it at all, but that clearly does not meet the goals of most artists. Finally, Paul Gregory wrapped up the presentation showing the end product of applying lighting in the commercial field. He displayed several fascinating large-scale applications, each with a detailed description of the design both from an engineering point of view as well as focusing on the experience of the end user. The session closed with a panel discussion where these five speakers fielded audience questions.

The afternoon session, chaired by Dave Wyble, of Rochester Institute of Technology, was titled *Vision and Aesthetics*. These speakers were recruited by Wendy Davis, of NIST, who was unable to attend the actual presentations. The first talk, authored by Mark Rea and Jean Paul Freyssinier, was presented by Jean-Paul Freyssinier. Their work combined two metrics of lighting evaluation: color rendering index and gamut area index, to better predict the actual experience of observers in the retail lighting field. Next, Yoshi Ohno presented an improved

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Update: ISCC Topical Meeting

(Princeton, NJ, June 16)

Standards: What they are—What will they be?—What *should* they be?

UPDATE!! We now have an Evening Focal Paper:

3D Image Safety: Ergonomics of 3D images and their standardization, by Dr. **Hiroyasu Ujike**, National Institute of Advanced Industrial Science and Technology, AIST, Japan. Dr. Ujike is the chair of CIE Technical Committee TC1-67: The effects of dynamic and stereo visual images on human health.

After our day of color standards, come hear about the hazards and design imperatives of the new 3D and immersive displays. Register through the form attached to the brochure at www.iscc.org/meetings/ST2010/

See you in Princeton!

CAUS Virtual Internship Program

The Color Association of the United States has announced a virtual internship program for June 7, 2010 through August 16, 2010. The program is designed to deepen an attendee's color knowledge while developing and enhancing research, analysis, team collaboration and presentation skills.

Attendees will be assigned a color family team (green team, yellow team, blue team etc) and work within a virtual environment to develop in-depth knowledge and address critical color questions within that realm. Upon completing the color-family knowledge collection and analysis requirements, the next step is a thematic work team to address critical color questions within that realm.

For an application form, please see *http://www.colorassociation.com/virtual-internshipapplication/*.

HUE ANGLES

(send contributions to mbrill@datacolor.com)

This column might seem an excuse for a tangent on mathematics, but be patient—-the color-related topic will re-appear…

The Peculiar Distribution of Last Color Names

Here's a color-related experiment you can do with the phone book: Record the number of people whose last names are colors. The distribution is far from uniform. The 2010 Residential White Pages for Princeton/Suburban-Trenton NJ shows the following incidence of last names that are color names: Brown (555), White (228), Green (154), Gray (73) [Grey (3)], Black (47), Blue (14). As a check on the geographic specificity of this result, we tried *Marquis Who's Who in the World 2001* and got a similar ranking: Brown (140), White (51), Green (30), Black (25), Gray (23) [Grey (2)], Blue (4). Neither source has any last names Red, Orange, Yellow, Indigo, Violet, Cyan, or Magenta. We didn't try any other color names. Why does this regularity exist?

Mathematicians have taken such observations as points of departure for century-long theorizing. For example, in 1881, Simon Newcomb [1] noted, "that the ten digits do not occur with equal frequency must be evident to any one making use of logarithmic tables, and noticing how much faster the first pages wear out than the last ones. The first digit is oftener 1 than any other digit, and the frequency diminishes up to 9." Benford rediscovered the tendency (henceforth called Benford's law) in 1938. Others [2] have given theoretical explanations, and it is discussed in the context of the mathematics of fractals [3]. The probability of first digit d works out to $\log_{10}(1 + 1/d)$, which summed over d gives 1. **Proof of plausibility:** Require the probability density function of a continuous number to be scale-invariant [constant in $\log_{10}(x)$]; note that implies a/x is the density function in x. The integral of a/x diverges, so consider first *only over one decade, from* 10^m *to* 10^{m+1}, and then realize the numbers don't change when 1 decade is expanded to n decades. Over one decade of x (10^m to 10^{m+1}), the probability density is $f(x) = 1/x$, and the probability of first digit d is $\log_{10}(d+1) - \log_{10}(d) = \log_{10}(1 + 1/d)$; Finally, realize that, although starting or stopping in the middle of a decade produces an artifact, the artifact gets vanishingly small when the number of decades n gets larger and larger. Another view of this argument and its limitations appears in [4].

You can confirm Newcomb's observation by an experiment with a phone book: Tally the first digits of street-address numbers, and observe that Newcomb, Raimi, et al. were right. You can stop after one or two pages…

By the way, Benford's law is not just a curiosity, but is now used in detecting fraudulent random-guess data in income tax returns and other financial reports (http://www.rexswain.com/benford.html, and also [5]).

A related effect is called Zipf's law (http://en.wikipedia.org/wiki/Zipf's_law), which has the same form in a variety of venues: The most frequent word in a natural language occurs about twice as often as the second-most-frequent word, about three times as often as the third-most-frequent word, etc. The same kind of relationship applies to the populations of cities in a country versus their population ranking.

Can such roots be found in the peculiar distribution of last color names? The last-color-name distribution is similar to Zipf's law, but the decrease is too steep. Have we forgotten some common last-color-names that would fill in the gaps? Perhaps a cross-cultural study (e.g., performed by previous authors of this column) might fill in some of the gaps or give a key insight. We hope any such insights might find happier uses than detecting tax evasion.

Michael H. Brill and Karen E. Linder

1. S. Newcomb, Note on the frequency of use of the different digits in natural numbers, *Amer. J. Math.*, **4**, 39-40 (1881).

2. R. A. Raimi, The peculiar distribution of first significant digits, *Sci. Amer.* **221**, 109-120 (December, 1969).

3. B. Mandelbrot, *Fractals: Form, Chance, and Dimension*, W. H. Freeman, 1977.

4. http://mathworld.wolfram.com/BenfordsLaw.html

5. T. P. Hill. The first-digit phenomenon, *American Scientist* **86**, p. 358 (July-August 1998).

Continued from page 1

color rendering index being worked on at NIST. He also described the Spectrally Tunable Light Source facility, which was a part of the tour, described below. Terry McGowan followed with a practical reminder of what it means to actually work in the retail lighting field. Applying the lighting metrics to the myriad of available fixtures, as well as the navigation of new energy saving legislation can be a daunting task. Gersil Kay closed this session on the benefits of engaging light designers early in an architectural project, the same time when construction or ventilation engineers are beginning to have input. Mostly this requires communication that lighting can impact the productivity, safety, comfort, and even profit.

The second morning started with tours of a variety of NIST laboratories. Details of the tours are presented below.

The final session, *Practical and Measurement Aspects of Lighting*, was chaired by Cameron Miller of NIST. The first talk, by Cameron Miller, traced the history of the candela from its roots as a visual metric using actual candles to its current physical definition realized in NIST laboratories. He discussed transferring that standard to other instruments, using detector- and source-based methods. Finally, he warned of spectral mismatch between the calibration lamp and the source lamp for the application. Nick Lena followed with an interesting review of sources, measurements, and color. This in-depth presentation covered a host of topics valuable to anyone interested in color and lighting. Mike Grather closed the session with a description of IES files, which communicate the parameters of a particular light source. These profiles provide the input to modeling software used by architects and designers.

Dave Wyble, Rochester Institute of Technology

Given the breadth of attendees, three diverse people were asked [by Dave Wyble] to submit their impressions of the tours. These reviews follow:

One expects to be impressed by the ultimate cryogenic radiometer or protocols that take all day to measure a small set of BCRA tiles, but not so much by psychophysics at a lab like NIST. At a time when dozens upon dozens of researchers have proliferated their computers and the Internet with multi-megabyte-sized Excel spreadsheets of colorimetric models for illuminants - some real; some imaginary – it's refreshing to see that someone is still interested in "ground truth." Of course I slightly overstate the case, but Yoshi Ohno's high-intensity LED room remains my highlight. And it does so for exactly this reason. While it is useful and important to measure the human response to common household objects under different illuminant SPDs, the issues in art museums or anywhere in which aesthetics and cultural preference become major components in the visual experience requires that simulations be as real as scientifically possible to construct. We tend to undervalue lighting when it comes to refined aesthetic judgments, thinking that aesthetics is a common and trivial subject. That it is something anyone can do, and we're all equally good at it. It also is assumed to be far less complex than it is. Aesthetics is not just about beauty. It is not by any argument that simplistic, and it can be learned, refined and expanded. It is facilities like Ohno's that pose questions like - can we measure this experience? Maybe not. Maybe it's too elusive. I'm sure Ohno thinks it may be too complicated. But it's still worth a try. That's what impressed me. It's a window of a sort into something really deep.

Jim Druzik, Scientist, Getty Conservation Institute

Cameron Miller leading a NIST laboratory tour.

I enjoyed the NIST labs tour very much, and thanks to our gracious hosts for explaining their equipment, processes, calibrations, etc. I was intrigued by the Vision Lab, of course. This is a great opportunity to assess visual response to variations in lighting. (Since I'm greedy, I'd like to be able to assess other sources - non-LED - as well.) It was interesting both to be in the environment as the object colors changed, and to be outside, observing the scene.

Ann Campbell Laidlaw, Global Supply Chain Program Manager, X-Rite Incorporated

Most attendees of the tour through seven NIST laboratorieswere experts on luminaires or on the technical aspects of metrology. My interests were more general. Most of us have our spectrophotometers and radiometers calibrated at laboratories whose measurements are traceable to NIST. The tour was an opportunity to learn exactly how the ultimate measurements are obtained. This is the place where the buck stops.

We were shown separate massive instruments that measure visible, ultra-violet and infra-red wavelengths. Although measurements at 5 or 10 nanometers are usually reported to clients, measurements are taken at single wavelengths, and the measurements made by each of these instruments overlap, making it possible to check that the three instruments, one of which is even in a separate location, are producing the same results. The care necessary to eliminate all factors that could affect a measurement was impressive. As an example, in a laboratory that contains spectrophotometer spheres of various sizes, there was a sphere large enough to hold a couple of men. As it was constructed it proved impossible to cover the inside of the sphere with a perfectly even coating of barium sulfate. The thickness of the coat was slightly greater toward the bottom of the sphere than at the top. There had to be a way to compensate for the small difference in reflection due to the difference in coating thickness. Surrounding the main instruments was a forest of smaller instruments that controlled for such variables.

We were told that the statement, "Traceable to NIST," as you might guess, has different degrees of meaning. Some companies hire NIST to calibrate their instrument, incurring a large expense, and then calibrate your instrument to theirs. Sometimes there is a path passing back to NIST through several companies. Accuracy may depend on the length of that path.

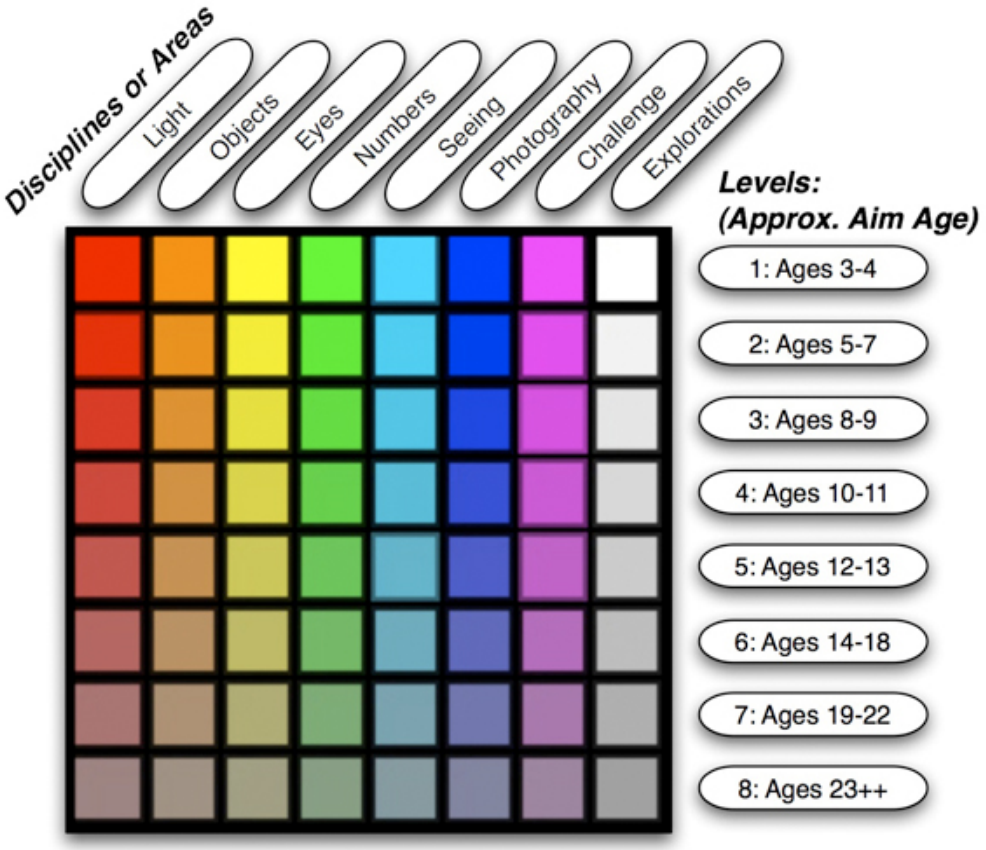
The hush and concentration that accompanied the tour through the first six laboratories turned into animated discussion in the last, where visual studies are done. The three-sided room contained couches, tables holding artificial fruit and food, and a Macbeth Color Checker. The entire ceiling contained sets of LED lights, which were sufficiently diffuse to make the room seem to be lit from a single source; but the operator could select and tune various groups of LED lights to simulate different types of daylight, fluorescent and incandescent illumination. Several of us at a time sat in the partial room, the light in the main room was turned off, and we experienced the changes in the appearance that occurred as the different types of light illuminated the objects. We saw in a few minutes the changes that in everyday life take place over an extended period. After we had experienced the effect on color of different types of illumination, the saturation of the illumination was reduced or increased. We watched our skin tones shift, but everyone focused on the red square in the Color Checker, where small color variations were most evident.

NIST's laboratory ceiling with LED lights

Among other results, studies in this laboratory demonstrated again that most people like the saturation of object colors slightly increased over their appearance in natural illumination; however, above a certain point, objects begin to look unnatural, while below the natural level things look increasingly greyish. This was also discovered years ago when the dyes used to produce color photographs were selected. After study the goal became not realism, but dyes that would increase the saturation of natural colors somewhat. Colored film did not attempt to reproduce what is naturally seen, but a purer version of natural colors i.e., not how that blue fabric actually looks, but an ideal blue. People liked those photographs and bought that film.

Joy Turner Luke, Studio 231

Metameric Blacks: A Color Curious Column



Welcome to a new regular column in *ISCC News*, *Metameric Blacks*. In each issue, this column will discuss a curious question on a color topic from the perspective of science education. The source for these questions will be *The Color Curiosity Shop*, which in turn harvested the questions from school children around the world.

The Color Curiosity Shop is an interactive website allowing curious students of all ages to explore color and perhaps become interested in pursuing a science education along the way. It can be found at www.whyiscolor.org. Each column will feature a single module (question and answer) from the website and a related image. (My apologies to those viewing the hardcopy with B/W images; I'll try to select images that work in color and B/W but that won't always be possible.)

This time the image is the icon and navigation map for *The Color Curiosity Shop*. The icon is an 8x8 array in which each column (hue) represents a discipline such as perception, chemistry, or math. Each row (chroma) represents a different level from preschool at the top to grad school at the bottom. It provides the map for explorations in color and our future explorations in this column. Stay tuned and check out www.cis.rit.edu/fairchild/WhyIsColor/misc.html for more details on the icon and project as a whole.

I also welcome any comments or suggestions on both the column and the webpage. Email me at mdf@cis.rit.edu or use the feedback form that you can find at www.whyiscolor.org. Also feel free to send me new questions on curious topics that you would like to see addressed in this column.

About the name of the column; Günter Wyszecki proposed the metameric black hypothesis in 1953. He explained that spectral curves exist that integrate to zero tristimulus values and therefore can be added to any spectral curve to create a metameric match to the original (*e.g.*, a new and different curve with the same tristimulus values). Thus I chose the name *Metameric Blacks* to suggest that the column might seem like nothing, but could be carrying some important information. Enjoy!

Mark D. Fairchild, Center for Imaging Science, Rochester Institute of Technology

CALL FOR PAPERS, 2010 ISCC ANNUAL MEETING

Plans proceed for the 2010 ISCC Annual Meeting, to be held at the campus of North Carolina State University in Raleigh, NC on **October 7-8**. The meeting will include non-concurrent sessions of all three interest groups, an educational session and a business and awards luncheon.

Papers are being accepted (**deadline 30 June 2010**) in each of the ISCC's Interest Groups (IGs). Contacts and papers so far are listed below:

IG1 Basic and Applied Color Research, Ann Laidlaw, Chair, ALaidlaw@XRite.com.

Michael H. Brill (Datacolor), "The Feynman paint-mixing problem, redux"

Carol Tomasino Revels (The Gap, Inc.), "Describing color differences: How good are your color comments?"

IG2 Industrial Applications of Color, James Roberts, Chair, jim.roberts@altanachemie.com

Ann Laidlaw (XRite): "Color tolerances in black and white"

Daniel B. Gazda (Wyle Integrated Science), et al., "Colorimetric solid phase extraction (CSPE): Using color to monitor spacecraft water quality"

Gabriele Kigle-Böckler (BYK-Gardner GmbH), "Objective mottling control at the line with new and innovative testing technologies"

IG3 Art, Design and Psychology, Barbara Martinson, Chair, bmartins@umn.edu.

Rolf G. Kuehni, "Three chromatic primaries and the color circle: a brief history"

For the education session, contact David Wyble at wyble@cis.rit.edu. Already scheduled are two one-hour tutorials:

David Hinks and TBD designer (NC State), "Color management of textiles"

Allan Rodrigues and *Larry Steenhoek* (Dupont Performance Coatings), "Measurement and specification of specification of gonioapparent color"

The Technical chair is Dr. Michael H. Brill (MBrill@datacolor.com) and General chair is Dr. David Hinks (david_hinks@ncsu.edu). Please contact Ann Laidlaw (ALaidlaw@XRite.com) if you have questions regarding this meeting. The nearest airport is RDU and hotel information will be provided closer to the meeting date.

Color Research and Application IN THIS ISSUE, June 2010

This issue opens with two articles that mention von Kries in their titles. So, I thought you might like to be reminded just who von Kries was. Johannes Adolf von Kries (1853-1928) was a professor of physiology in Freiburg, Germany. He is well-known for his work in color vision, where he formulated a theory of vision in which rods are used at low light levels and 3 cones at higher light levels. Also he was considered a disciple of Helmholtz and edited the 3rd Edition of Helmholtz's *Physiological Optics*.

"Von Kries versus Color Constancy" is the topic of our first article. Color constancy is the phenomenon that the appearance of objects is largely preserved across illuminants. It seems that corresponding colors are associated with almost the same reflectance, implying that the von Kries quotients are then essentially illuminant-independent. However, observations dating back to 1912 show that the visual system is able to compensate only for illuminant spectra associated with desaturated colors. In addition, lamp manufactures have learned that only smooth power functions preserve appearance. This shows us that things are not so simple and apparently the von Kries hypothesis applies only under restrictive conditions. In our first article, Kees van Trigt derives the conditions for which the illuminant-independent behavior of von Kries quotients is good and discusses the ramifications of these proofs.

There have been a number of chromatic adaptation transforms proposed in the literature. But which one is best? In our next article, "Two New von Kries Based Chromatic Adaptation Transforms," Simone Bianco and Raymondo Schettini propose two von Kries-based chromatic adaptation transforms that outperform or are statistically equivalent to the existing ones on all the corresponding color datasets available. These transforms are found by numerical optimization based on Particle Swarm Optimization. The key idea in their procedure is the simultaneous use of all the corresponding color data sets available and the predictions of the corresponding colors done using already defined CATs. They evaluate errors with the Wilcoxon signed-rank test.

For our next article we go to the area of displays and the factors that affect the appearance of images on the display. Seo Young Choi, M. Ronnier Luo, Michael R. Pointer, Changjun Li, and Peter A. Rhodes describe a series of experiments that they conducted to determine the "Changes in Colour Appearance of a Large Display in Various Ambient Conditions." They were particularly interested in the effect of veiling glare. Also, they tested the combined effect of changes in stimulus and surround sizes by varying viewing distance. They used the results of this series of experiments to evaluate the CIECAM02 color appearance model. This evaluation resulted in their suggesting an adjustment to the parameter used in predicting colorfulness in the CIECAM02 model.

Our next article also describes experiments where observers are evaluating color images, but in this case the images are from digital cameras and the evaluation is for color preference. The images are divided by topic, such as people, scenery, food, artificial environments, etc. In the article, "Influences of Psychological Factors on Image Color Preferences" Po-Sung Hung and Shing-Sheng Guan examine which of six psychological factors influence the preference of various types of images. The psychological factors are Color Memory, Color Comfort, Colorfulness, Color Harmony, Color Image, and Concerned Area. They find that different factors play an important role for different categories of images.

Moving on to textiles, our next article can be useful to textile colorant formulators who desire to add value to their enhanced precision in determination of dye concentrations of bi-component dye mixtures without a need of time consuming illuminant dependent recipe prediction. Ali Shams-Nateri and Ehsan Ekrami discuss the use of first derivative ratio spectrum of Kubelka-Munk function for concentration determination of binary mixtures in "Dye Binary Mixture Formulation by Means of Derivative Ratio Spectra of the Kubelka-Munk Function." To quote the authors, "The proposed derivative method is simple, accurate and suitable for quantitative analysis of samples dyed with binary mixed shades."

Our final article of this issue deals with shade guides. Shade guides are the most widely used method in dentistry for determining the color of natural teeth. The tooth in question is compared visually to a series of prepared sample tabs ranging from about 16 to 36 in number. However, natural tooth color varies widely in multiple directions in color space. Cara Cocking, Marcus Oswald, Stephen Helling, Peter Rammelsberg, Gerdard Reinelt, and Alexander Hassel decided to use discrete optimization in order to im-

prove shade guide development. They studied whether it would be better to maximize the coverage area in color space or to minimize the coverage error. In "Using Discrete Optimization for Designing Dental Shade Guides" they describe their method of obtaining coverage error and coverage figures. While their application is in dentistry, the described technique could be used not only for dental shade guides development, but for any purpose requiring coverage of as many colors as possible while keeping the number of reference colors manageable.

We close this issue with a meeting report and briefly mentioning both a new CIE publication and an upcoming meeting. The International Commission on Illumination (CIE) recently published the technical report culminating the work of CIE TC 1.56 on Improved Color Matching Functions. The publication is entitled CIE Publication 185:2009 - Reappraisal of Colour Matching and Grassmann's Laws. Also in this issue, Michael Brill reports on the 17th IS&T/SID Color Imaging Conference held last November, and the Jose Caivano tells us about the 2010 AIC Interim Meeting AIC 2010: Color and Food: From the Farm to the Table to be held in Mar del Plata, Argentina in October.

Ellen Carter
Editor, Color Research and Application

AATCC Announces Two Awards

AATCC will honor Cornell University professor S. Kay Obendorf with the Olney Medal, its highest award, and University of Rhode Island professor Martin John Bide as the 2009 recipient of The Harold C. Chapin at an Awards Luncheon on May 19, during the Association's 2010 International Conference at the Georgia World Congress Center (GWCC) in Atlanta, Ga., USA. That morning at the conference, Obendorf will deliver the traditional Olney Medal Address on "Improving Personal Protection through Novel Materials."

Obendorf's scholarly work provided critical advances in textile chemistry and fiber science and contributed toward a better understanding of the surface chemistry of fibers and films and their performance.

Martin Bide, a member of AATCC since 1982, has served with honor and distinction in the technical, publications, and administrative functions of the Association, including President of the Association from 2007 through 2008.

Call For Nominations for the 2010 ISCC Nickerson Award

The Nickerson Service Award is presented by the Inter-Society Color Council to honor long term contributions towards the advancement of the Council and its aims and purposes. The contribution may be in the form of organizational, clerical, technical, or other services that benefit the Council and its members. The candidates must be members of the Council and must have been active in the affairs of the Council.

Nominations should include the following information:

1. The name and full address of the nominee.

2. A sentence or two giving the specific reason for the award's bestowal. This will normally form the basis for the citation presented to the successful nominee.

3. A narrative (up to one-page) of the nominee's contribution and its significance.

4. A curriculum vitae and a publication list for the nominee, as well as any other material deemed useful.

5. The name of the person or Member Body or Award Committee who prepared the nomination with appropriate contact information.

Note: Confidentiality of the nomination is of the utmost importance. The nominating individual/group must ensure that the nomination is not disclosed to the proposed nominee. If any of the above information cannot be obtained without risking disclosure, the information should be omitted from the nominating letter.

Nominations should be sent to the Chair of the Nickerson Service Award Committee:

Ann Laidlaw
ALaidlaw@XRite.com
X-Rite Incorporated
1108-A Grecade Street
Greensboro NC 27408 USA
t +1 (616) 803-2678 f +1 (336) 271-3281

The deadline for receipt of nominations is July 1, 2010.

CALENDAR

Please send any information on Member-Body and other organization meetings involving color and appearance functions to:

Ms. Cynthia Sturke, ISCC Office Manager
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11491 Sunset Hills Road, Reston, VA 20190
703-318-0263 tel **703-318-0514 fax**

isccoffice@cs.com **website:** www.iscc.org

2010

May 16-20	**ANTEC 2010**, Society of Plastic Engineers, Marriot World Center, Orlando, Florida, www.4spe.org/conferences/antec-2010
May 18-20	**AATCC's International Conference (IC)**, Georgia World Conference Center, Atlanta, Ga., USA, www.aatcc.org/ic/index.cfm
May 23-28	**SID 2010 International Symposium, Seminar, and Exhibition,** Washington State Convention and Trade Center, Seattle, WA, www.sid.org/conf/sid2010/sid2010.html
Jun 1-4	**Archiving 2010,** Society for Imaging Science and Technology, Den Haag, The Netherlands, www.imaging.org/ist/conferences/archiving/index.cfm
Jun 14-18	**Joint Meeting of ISCC/ASTM E12/CIE Div. 1, Standards: What they are--What will they be?--What should they be?** Friend Center at Princeton University, Princeton, NJ, www.iscc.org/meetings/ST2010/
Jun 14-18	**CGIV 2010: 5th European Conference on Colour in Graphics, Imaging, and Vision,** Society for Imaging Science and Technology, Joensuun Yliopisto and University of Eastern Finland, www.imaging.org
Jun 29-Jul 2	**OEPT 2010, 2nd International Symposium on Optical Engineering and Photonic Technology,** Orlando, Florida, USA, www.2010iiisconferences.org/OEPT
Sep 19-23	**NIP26, International Conference on Digital Printing Technologies,** Austin, Texas, Society for Imaging Science and Technology Society for Imaging Science and Technology, www.imaging.org/IST/conferences/nip/
Sep 24-25	**Bridging the Gap, Pioneering the Future,** The Society for Color and Appearance in Dentistry (SCAD), Newport Beach, California, www.scadent.org
Oct 7-8	**Annual Meeting of the ISCC,** College of Textile, North Carolina State University, isccoffice@cs.com
Oct 19-21	**2010 NPIRI Conference**, National Association of Printing Ink Manufacturers, Sanibel Harbour Resort, Ft. Myers, Florida, http://74.0.252.227/publicarea/techconf2010/techconf10CFP.aspx
Nov 8	**ICC-DevCon 2010**, Sheraton Gunter Hotel, 205 E. Houston Street, San Antonio, Texas, www.color.org/DevCon/devcon10.xalter
Nov 8-12	**CIC18, 18th Color Imaging Conference**, Society for Imaging Science and Technology, San Antonio, TX, 703/642-9090, www.imaging.org/ist/Conferences/cic/index.cfm

CALENDAR, Continued

2011

Feb 2-3	**ASTM E12, Color and Appearance,** Baltimore Marriott Waterfront, Baltimore, MD www.astm.org/COMMIT/COMMITTEE/E12.htm
Jun 7-10	**2011 AIC Midterm Meeting, Interaction of Color and Light**, Zurich, Switzerland, Organizer: Pro/colore, www.aic2011.org

PANTONE Fashion Color Report for Fall 2010

Pantone's report features the top 10 colors for women's fashion for fall 2010, along with designer sketches, quotes and headshots. For a link to the report, see www.pantone.com/pages/pantone/Pantone.aspx?pg=20710&ca=4. According to the February press release, "Mindful of consumers' need for practicality, plus their desire for newness, designers offer many options for women to extend and embellish their wardrobes this fall," said Leatrice Eiseman, executive director of the Pantone Color Institute. "Building on the color palette from spring, this season's offerings include innovative takes on fundamental basics, as well as transporting, lively colors that conjure images of travel and adventure, whether real or aspirational."

Pantone's top 10 colors for women's fall fashion

Publications Available from ISCC Office

ISCC 76th Annual Meeting Program and Abstracts, ISBN 978-1-4243-4273-0 $25.00*

Color and Light by Fred W. Billmeyer Jr. & Harry K. Hammond., III. Authorized reprint from: ASTM Manual 17, Copyright 1996, ASTM International, 100 Bar Harbor Dr., W. Conshohocken, PA 19428.

$5 ea or 20 copies/$50.00

Demystifying Color by Bob Chung, 11 pages. $5 ea or 20 copies/$50.00

ISCC 75th Anniversary Commemorative CD and Pin $30*

Guide to Material Standards and Their Use in Color Measurement (ISCC TR-2003-1) $50*

*Plus shipping and handling

Advertising Policy

The ISCC advertising policy for the ISCC News requires pre-paid color-related advertising 30 days in advance of the publishing date. The rates are:

$100 business card-size **$250 1/4 page**

$500 1/2 page **$1,000 full page**

The editor reserves the right to determine the acceptability of the advertising. A 20% discount is available for a yearly contract.

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

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