



# Inter-Society Color Council *News*

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Jan/Feb  
2006

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Firstly, I would like to wish everyone a healthy and prosperous New Year. To ensure that 2006 is a great year, start making your plans to come to Ottawa, Canada the week of May 14 to attend the ISCC annual meeting and Expert Symposium on 75 Years of the CIE Standard Colorimetric Observer. These week-long jubilee events will be held at the National Research Council of Canada (NRC) Sussex Drive Laboratory, which is located close to the heart of the City overlooking the picturesque Ottawa River and Rideau Falls. The Expert Symposium has been organized together with the International Commission on Illumination (CIE) and the Canadian National Committee of the CIE (CNC/CIE). The week will start with our two day annual meeting with presentations by the three Interest Groups, Education Committee and two Project Committees. This will be followed by the two day CIE-ISCC Expert Symposium with presentations from an international who's who of leading researchers in the field of colorimetry. The response to the Call for Papers for the Symposium has been outstanding with over 40 papers submitted. The members of the Technical Program Committee are now busy reviewing these submissions and the final technical program of talks and poster presentations will be available at the Symposium web-site in late February.

The program for the annual meeting is also taking shape and the Interest Group sessions already have several exciting talks scheduled. The abstracts for these sessions are due January 31 so if you are interested in presenting your latest color-related work, either as a paper or poster contribution, please see the 2<sup>nd</sup> Call for Papers in this issue. To ensure ample opportunity for networking and socializing with meeting attendees, we have planned two welcoming receptions, an ISCC Awards Banquet at the conference hotel and a Symposium banquet at the Museum of Civilization. The registration form for these events is enclosed in this issue of the Newsletter and the early bird registration rates are available

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up until April 12 so register early to avoid disappointment. To encourage attendance to the full week of jubilee events, there is a reduced fee for attending both the annual meeting and the Symposium and there is no fee for attending the CIE technical committee and business meetings on the Thursday and Friday. For your convenience, reservation for the ISCC/CIE block of rooms at the Sheraton hotel can be made at the conference web-site: [www.iscc.org/jubilee2006/general.html](http://www.iscc.org/jubilee2006/general.html).

I also have an update on our Special Topics Conference on Industrial Color Challenges. This conference will be co-sponsored by one of our Member-bodies, the American Association of Textile Chemists and Colorists (AATCC) and the proceedings of this event will be published by the AATCC and jointly held with the ISCC. Please stay tuned for the Call for Papers for this event and updates on the technical program. The Co-Chairs of this event are Sy Commanday and Frank O'Donnell. The location and dates for this event will be announced in the next issue of the Newsletter.

I also take this opportunity to thank our hard-working Chair of the ISCC By-Laws Committee, Jim King, who prepared several proposed changes to the ISCC By-Laws to provide guidance, clarification and updates on current ISCC policies and procedures. These changes have now been formally approved by both the Board and the Member-bodies. This activity was Jim's final task as Chair of the By-Laws Committee and we wish him all the best in his retirement. Jim was an enthusiastic member of the ISCC for almost 30 years, both as a student and teacher, and his presence at Board meetings will be sadly missed.

Finally, I would like to wish everyone a wonderful start to the New Year and I look forward to welcoming you to Ottawa in May 2006.

*Joanne Zwinkels, National Research Council (NRC), Canada*



NRC Sussex Laboratory, Ottawa

**Member Items:****John McCann Made Honorary  
IS&T Member**

John McCann was granted honorary membership in the Society for Imaging Science and Technology. It is the highest award bestowed by the Society. The award recognizes outstanding contributions to the advancement of imaging science and/or engineering.

John has always been interested in color and vision. He spent a summer at Polaroid working for Nigel Daw and Edwin Land on red and white photography and continued part-time until graduation from Harvard, working on Retinex color theory. After graduation he joined Polaroid Vision Research Laboratory working under Land for 18 years. At Polaroid his work began with photography, progressed to paper collages with controlled illumination, then to computer-controlled images and electronic imaging. He established Polaroid's first digital imaging laboratory (1975) and developed and patented efficient algorithms for making spatial comparisons among all pixels in an image, an early form of pyramid processing.

After 35 years at Polaroid, John retired as senior laboratory manager to work with his wife Mary as an imaging consultant.

John has been an active member of IS&T, chairing the Annual Meeting and Electronic Imaging Symposium and, with Annette Jaffe, organizing the first Color Imaging Conferences. John held many IS&T offices and is currently Secretary of the ISCC. See [www.imaging.org/membership/h\\_and\\_a/current.cfm](http://www.imaging.org/membership/h_and_a/current.cfm) for more details.



Sabrine Susstrunk presents John McCann with IS&T Honorary Membership at the 13th Color Imaging Conference in Scottsdale, AZ

**IS&T Service Award Given to  
Robert Buckley**

The IS&T Service Award, which is given in recognition of service to a Chapter, or to the Society, was awarded to Bob Buckley for his support of the Color Imaging and Archiving Conferences.

Bob has been involved in the Color Imaging Conference since its inception in 1993, serving on the organizing committee in its first year and co-chairing it in its second. His involvement with the conference has spanned a number of roles, including tutorials and posters co-chair. For CIC 11 and CIC 12, he served first as Technical Program and then as General Co-Chair. His participation over the years has notably influenced the format of the conference. Most recently, he has served as founding co-chair of the first two IS&T Archiving Conferences.

Rob is currently a Research Fellow in the Xerox Imaging & Services Technology Center. He has been with Xerox since 1981, when he joined the Xerox Palo Alto Research Center after receiving a PhD in Electrical Engineering from MIT.

Rob is well known in the external color community. He pioneered the use of uniform color spaces for gamut mapping and image compression, and while at Xerox developed object-optimized compression and rendering technologies. He is active in the JPEG 2000 standards committee and CIE Division 8, and is the President-Elect of the Inter-Society Color Council. For more information see [www.imaging.org/membership/h\\_and\\_a/current.cfm](http://www.imaging.org/membership/h_and_a/current.cfm).



Sabrine Susstrunk presents Bob Buckley with the IS&T Service Award at the 13th Color Imaging Conference in Scottsdale, AZ

## A Little-Known Color Effect

Here is a demonstration to try at home. Line a box with matte white paper, divide it by a white partition into two rooms, and cut two holes in the box, one looking into each of the rooms, so you can look through both holes simultaneously, one for each eye. Also cut a window in each room so it can't be seen directly, but allows light to reflect off the white paper. Cut a long, thin hole in the partition so it appears a small circle to each eye when the partition is in place between your two eyes. Arrange a closable flap on the partition hole. Place a filter over each window—e.g., a yellow filter over one window and an orange filter over the other. Illuminate the windows with a single light source that is free to move so as to balance brightness. (See the figure). After each eye adapts to its own room's light (about 20 seconds), open the partition hole so each eye sees light from the other room. By moving the light source, adjust the partition-hole images so they have equal subjective brightness. For many filter choices, you can observe the following:

1. Each room appears achromatic in its own adaptation state.
2. Each partition-hole image is brighter than the surrounding color.
3. The partition-hole colors are subjectively complementary to each other.

This demonstration was created more than 40 years ago by Hüseyin Yilmaz (1). The demonstration's reciprocity of "A looking at B" versus "B looking at A" is an attractive way to look for symmetries in the visual system.

Helson's rule (2), that complete adaptation requires less than 93 percent colorimetric purity, might constrain the chromaticities for which Observation 1 will work. To reflect such a limit, one could replace predictions "1, 2, and 3" with "IF 1, THEN 2 and 3." Thus, IF each room appears achromatic in its own adaptation state (the definition for complete adaptation), THEN each room is brighter when seen with the eye that is adapted to the other room; AND the partition-hole colors are subjectively complementary to each other.

Although the haploscopic condition here is not so simple as some viewing conditions, it seems to encourage discounting of the prevailing lights (each room looks achromatic in its own adaptation state). Because

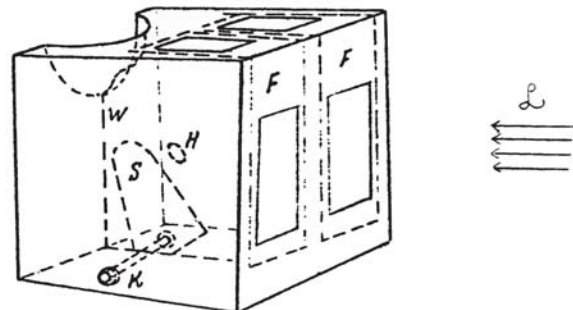
the partition hole is in the median plane of the viewer's face and close to the viewer, the images of the partition hole do not overlap.

The complementarity is startling, but not incredible. If the filters are both reddish, the partition hole images appear desaturated but still complementary—probably not in the red-green direction, but in the direction of color difference between the lights. For more similar lights, the complementarity asserts itself more weakly. Judd's model (3) of chromatic adaptation (underlying the adaptation part of CIELUV) predicts the complementarity. Is Judd's model alone?

This demo has not yet been repeated for trained observers and many illuminant pairs, but several classes of MIT students marveled at it when I set up the demo in the 1970s. Using his own version, Yilmaz himself impressed viewers from the 1960s (when he gave courses in Northeastern University) to 1990 (at SPIE in Santa Clara). And most recently, Zhaojian Li, an undergraduate student of Mark Fairchild, used it as a class project.

### References:

1. H. Yilmaz, "Color vision and a new approach to general perception," in E. E. Bernard and M. R. Kare (eds.), *Biological Prototypes and Synthetic Systems*, p. 126 ff. (New York: Plenum Press, 1962).
2. H. Helson, "Fundamental problems of color vision," *J. Exper. Psychol.*, **23** (1938), 439-476.
3. D. B. Judd, "Hue, saturation and lightness of surface colors with chromatic illumination," *J. Opt. Soc. Am.* **30** (1940), 2-32.



Actual realization of the two-room experiment. H, S, K, F, and W indicate Hole, Shutter, Knob, Filter and Wall. Top and front windows may be calibrated so as to illuminate the wall and the floor equally. L represents light source. (Figure printed with permission from Hüseyin Yilmaz.)

Michael H. Brill, *Datacolor*

## CIC 14: Call for Papers

The Society for Imaging Science and Technology and the Society for Information Display have announced the call for papers for CIC 14. This Color Imaging Conference (CIC 14) will be held November 6-10, 2006 in Scottsdale, Arizona. Raja Bala and Marc Mahy, General Chairs, are requesting contributions to the technical program. Draft papers (oral or interactive) are due by April 16, 2006.

The technical topical areas are:

- Scientific Disciplines: color appearance, color vision, vision adaptation, computer vision, psychophysics, color constancy, color difference, uniform color space, measurement
- Engineering Disciplines: color management, characterization, calibration, halftoning, gamut mapping, color transformation, color spaces, color standards, novel imaging products
- Color Image Synthesis/Analysis: computer graphics, color rendering, 3-D object characterization, image understanding, image recognition, color in machine vision, mathematical analysis, image processing, image quality assessment, multi-spectral imaging, image compression, color in culture, color preferences
- Applications: medical imaging, LED-based imaging, high dynamic range imaging, graphic arts, printing, scanning, displays digital photography, television, multimedia, visualization, virtual reality, communications, image retrieval, database applications, digital motion pictures, archiving, color design, architecture, textiles, painting.

Complete details are available on the IS&T website, [www.imaging.org/conferences/CIC14](http://www.imaging.org/conferences/CIC14).

## Colors of National Symbols

The 7th International Symposium of the Slovenian Colorist Association, (together with the 2nd International Symposium on Novelties in Graphics and the 37th International Symposium on Novelties in Textiles) will be held June 15-17, 2006 in Ljubljana, Slovenia. The topics of the symposium include: color as an element of national symbols, colors of flags and legal regulations, heraldics from the view of color science, color science, dyes and pigments, materials and production processes of national symbols, numerical evaluation of color, theory and equipment. See [www.ntf.uni-lj.si/isnt2006](http://www.ntf.uni-lj.si/isnt2006) for more information.

## Call for Papers: 2006 AATCC International Conference

Papers are solicited for the 2006 AATCC Conference, a co-located event with ATME-1 at the Megatex exhibition. The conference will be held at the Georgia World Congress Center in Atlanta, October 31-November 2. Subject areas include advances in dyeing, biotechnology and textiles, CAD/CAM and design technologies, coatings and laminates, color science, trends, communication, and management, consumer issues/product quality, digital asset management, digital textile printing, design to production workflows, dyeing/finishing troubleshooting, environmental/safety issues, flammability, improving ROI on technology and personnel, and expenditures, mass customization, medical/biomedical textiles, new technologies, novel fibers/chemical materials, performance finishes, printing innovations, protective textiles, smart textiles, supply chain management, technical/garment design issues, textile care developments, textile design technology, textile testing, virtual fit and body scanning, visual store merchandising, and yarn and fabric preparation.

Abstracts for oral presentations are due February 28, 2006. Abstracts for poster presentations can be accepted until May 5, 2006. For additional information and submittal forms, please see [www.aatcc.org/ice/docs06/Call for Papers06.pdf](http://www.aatcc.org/ice/docs06/Call%20for%20Papers06.pdf).

## L'ORÉAL Art and Science of Color Prize

The L'ORÉAL Art and Science Foundation invites participants for their Art and Science of Color Prize. The theme for the 2006 contest is the meeting of science and art in color. Prizes are presented irrespective of age or nationality. The Gold Prize is presented to one person or one group (consisting of 3 persons or less), with it an award of Euro 30,000. The Silver Prize is presented to one person or one group (consisting of 3 persons or less), with it an award of Euro 20,000. The Bronze Prize is presented to one person or one group (consisting of 3 persons or less), with it an award of Euro 10,000. Winners will be invited to the award ceremony to be held in the autumn of 2006 in Japan. Send materials as designated in the web site, <http://www.art-and-science.com>, to the Foundation in Japan. The deadline for submitting an application is March 31, 2006. For additional information, see the web site or contact [lasf@gol.com](mailto:lasf@gol.com).

**R·I·T Munsell Color Science  
Laboratory Offers Industrial Course  
*Essentials of Color Science*  
June 6-9, 2006**

This four-day course is made up of a series of 16 distinct sessions delivered by leading experts in the topical areas. The lectures are designed to form a coherent course that introduces the fundamental concepts of color science, describes various applications, and introduces cutting-edge research areas in color science. The descriptions included are concisely summarized; please see our website for full descriptions: [www.mcsl.rit.edu/outreach/courses.php](http://www.mcsl.rit.edu/outreach/courses.php).

The MCSL faculty and staff are internationally recognized educators and researchers in many fundamental and applied areas of color science and are uniquely qualified to present this distinctive short course. Please learn more about their qualifications and contact them with questions at: [www.cis.rit.edu/mcsl/people/staff.php](http://www.cis.rit.edu/mcsl/people/staff.php).

To receive a fully-detailed color brochure, please contact: [desimone@cis.rit.edu](mailto:desimone@cis.rit.edu) or call 585-475-6783.

**On the Visual Perception of Bees**

In an experiment designed to provoke thinking about differences in visual perception between bees and humans, ecologist Lars Chittka of the University of London and artist Julian Walker showed bumblebees four famous paintings, one of them Van Gogh's Sunflowers. Whereas people see three basic colors—red, yellow, and blue—bees see blue, green, and ultraviolet. A nest of bees found Van Gogh's blue signature most attractive. The authors reported online in the journal *Optics & Laser Technology*, July 2005.

**ISCC Office Updates Email Address  
[isccoffice@cs.com](mailto:isccoffice@cs.com)**

The ISCC Office has updated our Compuserve Email address! Now you can contact the office directly at [isccoffice@cs.com](mailto:isccoffice@cs.com). The old address will still work for a while but please update your address book with our new email address. And...if your email changes, please inform the office so we can keep our database current. Thanks!

**ISCC 2006 Annual Meeting  
Second Call for Papers**

All ISCC interest groups are soliciting papers for the ISCC 2006 Annual Meeting, Ottawa, Ontario, Canada, May 14-15, 2006. The meeting is co-located with the ISCC-CIE Expert Symposium. The emphasis is on the standardization of color measurement, but contributions in other areas of color are welcome.

**Interest Group I: Basic and Applied Research**

Interest Group I centers on research in all fields of color, such as color vision, color order systems, standardization of measurements, and instrumentation.

**Interest Group II: Industrial Application of Color**

Interest Group II focuses on the technical challenges and possible solutions that face industries in the commercial application of color. Topics include color reproduction, color management, quality control practices, color tolerancing, color and appearance measurement issues, best formulation practices or other related industrial color application challenges.

**Interest Group III: Art, Design and Psychology**

Interest Group III probes the use of color in areas for which affect is key, ranging from advertising to artistic expression.

**Poster Session**

The Poster Session encompasses the topics of all three Interest Groups and provides a forum to demonstrate research results in a more intimate setting. Poster presenters are encouraged to incorporate visual aides such as instrumentation, laptops, and samples. Student submissions are encouraged; a \$100 prize will be awarded to the best student poster. (Proof of full-time student status is required.)

**Abstract Submission**

Please send your one-page abstract and a brief biography to the appropriate session chair, listed below. Abstracts are due January 31, 2006.

Interest Group I: Milt Hardt, Chair IG-I

[milhar@ccicolor.com](mailto:milhar@ccicolor.com), (773) 475-2576

Interest Group II: Jerry Dimas, Chair IG-II

[jerdim@ccicolor.com](mailto:jerdim@ccicolor.com), (773) 638-1400

Interest Group III: Mike Brill, Acting Chair IG-III,

[MBrill@datacolor.com](mailto:MBrill@datacolor.com), (609) 895-7432

Poster Session: Karen Braun, Poster Chair,

[karen.braun@xerox.com](mailto:karen.braun@xerox.com), (585) 422-6380

## Tentative Program for ISCC/CIE Symposium on 75 Years of the CIE Standard Observer

Approximately 40 papers have been submitted for the ISCC/CIE Symposium to celebrate the 75<sup>th</sup> Anniversary of the CIE 1931 Standard Observer, to be held at the National Research Council in Ottawa, Canada. The submissions are now being reviewed by the Technical Program Committee for relevance, originality, quality, clarity and style. Authors will be informed by February 15 whether or not their paper has been accepted and a final program will then be developed.

Based on the submissions received, the tentative program for the Symposium is:

### Monday, May 15, 2006

Evening Reception at the Sheraton Ottawa Hotel

### Tuesday, May 16, 2006

Continental breakfast

Welcoming address

Opening remarks

The origins and history of the CIE Standard Observers, *Françoise Vienot*:

Open problems on the validity of Grassmann's Laws, *Michael Brill*

Other papers on the Standard Observers

Refreshment break

Physiologically-based color matching functions, *Andrew Stockman*

Other papers on color-matching functions

Lunch

CIE recommendations and standards on colorimetry: what next? *János Schanda*

Other papers on instruments and standards

Refreshment break

Papers on temporal and spatial issues in colorimetry

### Poster session

Symposium Banquet at the Canadian Museum of Civilization

### Wednesday, May 17, 2006

Continental breakfast

CIE color appearance models: their past and future, *Robert Hunt*

Color appearance in image displays, *Mark Fairchild*

Refreshment break

Other papers on color appearance

### Poster session

Lunch

Color difference formulae: past, present and future, *Ronnier Luo*

Other papers on color differences and tolerances

Refreshment break

The use of the CIE 1931 Standard Observer in digital color management, *Todd Newman*

Other papers on color management

Roundtable discussion

Closing remarks

Full details of the Symposium can be found at [www.Jubilee2006.org](http://www.Jubilee2006.org).

## ISCC 2006 Invoices

You should expect to see your ISCC 2006 Dues Invoices arrive in the mail shortly. The fees have been modified to reflect the method you choose to receive your newsletter. Following are the new 2006 rates:

	<u>Via E-Mail</u>	<u>Hardcopy</u>
Domestic Individual Member	\$75.00 USD	\$90.00 USD
Canadian Individual Member	\$75.00 USD (\$100 Canadian)	\$90.00 USD (\$115 Canadian)
Foreign Individual Member	\$75.00 USD	\$100.00 USD
Student Member	\$10.00 USD	\$15.00 USD
Retired Member	\$10.00 USD	\$15.00 USD
Library – Domestic	\$75.00 USD	\$90.00 USD
Sustaining	\$750.00 USD	\$750.00 USD

Updating your contact information on this invoice is very important, as we will be publishing a 2006 Directory. Please keep in mind that it is your responsibility to inform the ISCC Office of any contact information change. As always, check the ISCC website [www.ISCC.org](http://www.ISCC.org) for upcoming meetings.

## Color Research and Application In This Issue, February 2006

This first issue of 2006 contains eight articles covering the usual areas such as color naming, color perception, color spaces, instrumental measurement, calculation of color differences, color associations in architecture and virtual reality. But also included are the more diverse areas of virtual reality. Where should we start?

First, we lead off with an article by Hans G. Völz. Dr. Völz presented some of his work on calculating large color differences at the 2004 annual meeting of the German Society of Color Science. The article contained in this issue is an outgrowth of that presentation. In “Euclidization of the First Quadrant of the CIEDE2000 Color Difference System for the Calculation of Large Color Differences” Dr. Völz develops a Euclidean line element from which he can derive new coordinates of lightness, hue and hue angle. These then can be used for large color differences. Another interesting section of this article includes proposals for the eventual improvement of the CIEDE2000 equations.

Calculating color differences presupposes the availability of numerical values (usually in terms of CIE tristimulus values) measured from the reflectance spectra of specimens. In order to ensure that people using different instruments will have consistent measurements, a reference instrument is designated and then other instruments are adjusted to produce readings similar to the reference instrument by the use of one or a group of transfer standards. Traditionally up to twelve ceramic tiles, which were first developed by the British Ceramic Research Association (now usually known as the BCRA tiles), have been used. Can we do better than this? Are the BCRA tiles optimal? Alan Ingleson and Michael H. Brill examine these questions. “Methods of Selection of a Small Reflectance Set as a Transfer Standard for Correcting Spectrophotometers” has the goal of establishing an algorithm for choosing an optimal transfer standard, then examining the algorithm, and the benefits of using optimized reflectance subsets versus BCRA tiles.

When we want to determine colorimetric data from physical measurements of materials, we presume we know how the light coming from the material (either reflected, transmitted or emitted) stimulates the observer’s vision. Since everybody has at least slight

variations in the way they see color, the International Commission on Illumination (the CIE) endorses two standard observers, the 1931 2° observer and the 1964 10° observer. Each standard observer has its own set of color matching functions. When these color matching functions were first developed, the specific experimental conditions for very valid reasons limited the size of field of view. The conditions, which were used to determine these color matching functions historically, do not represent natural viewing conditions for an observer who normally has a full field of view of approximately 180 by 130°. Last year in this journal, Xin Hu and Kevin W. Houser reported on “The UNL Trichromatic Colorimeter” which could be used to measure color matching functions [Volume 30, pp. 209-220, 2004]. Now in this issue they examine “Large-Field Color Matching Functions.”

As I mentioned earlier, when we consider human perception, we reduce the data stimuli measured throughout the visible spectrum to a limited number of variables, usually three. What about the reverse process? Our next authors, Rolf G. Kuehni and Rajeev Ramanath examine the degree to which real and synthetic sensor systems can distinguish between stimuli and can reconstruct the original spectra from three variables. In addition, they ask, “Which is more important, distinguishing between two spectra or reconstructing the original spectra?” In “Sensing Spectral Stimuli: Sensor Functions and Number” they conclude that evolutionally it was more important to be able to distinguish between two spectra.

While we are on the topic of reflectance modeling, we have another article in this area. In “Surface Reflectance Modeling of Real Objects with Interreflections for Augmented Virtuality,” Takashi Machida, Naokazu Yokoya, and Haruo Takemura describe a new method for densely estimating the non-uniform surface reflectance properties of real objects that may have interreflections and different textures. These issues are especially important when one wants to mix virtual images with real objects, such as in some movies. Generally there are two approaches to this issue: image based renderings and polygon-based modeling. In this new method the authors first measure the three dimensional objects, then seek to optimize the light positions, then finally estimate the object surface reflectance properties.

*Continued on page 9*



*Continued from page 8*

For over fifty years there have been studies of human color naming or color terms. More recently it has been asked, "Can a computer do this task?" Our next article is in the field of computer vision. There have been attempts to develop a color-naming system that could assign names in the same way a real human observer does. However, a comprehensive data set was needed. Robert Benavente, Maria Vanrell, and Ramon Baldrich have produced "A Data Set for Fuzzy Colour Naming." In their article they describe the experiment used to develop the data set and its analysis, and give the location where researchers may obtain the data set. What color do you think it is?

In 1905 A. H. Munsell first published *A Color Notation*. The Munsell system included the parameters of hue, value, and chroma based on visual perception. It was not until decades later the numerical system developed by the CIE system came into existence. The best way to translate between the two types of systems has been a topic for research ever since. In this issue, we have the article "Conversion between the Reflectance Spectra and the Munsell Notations." The authors, Hannu Laamanen, Timo Jaaskelainen, and Jussi Parkkinen present a novel transformation between reflectance spectra and Munsell coordinates. It is interesting that one can develop an achromatic response function and two chromatic response functions in accord with the opponent color theory when the linear part of this transformation is applied to the basis functions.

When you think of a hospital or a church or restaurant, do certain colors come to mind? If so, why? Color can lead you to action (for example, stopping at a traffic intersection) or change your mood. For our final article of this issue Naz Kaya and Melanie Crosby look at "Color Associations with Different Building Types." They report on an experimental study of what color conveys in buildings. Using college students as subjects, they determined that associations exist and certain colors were preferred for certain building types and why. The results may help designers convey the intended message in a building environment.

In the Communications and Comments section of the Journal, we have a letter from Dr. Robert Hunt

about the article "An Evaluation of the Hunt94 color appearance model under different light sources at low photopic to low mesopic light levels" by Deng, Chen, and Rea [30:107-117, 2005]. Then we have a response from Dr. Mark Rea concerning Dr. Hunt's letter.

This month we include reviews of the books *Light Vision and Color* by Arne Valberg and the 2<sup>nd</sup> Edition of *Dimensional Color* by Lois Swirnof. For these reviews we thank Janos Schanda and Barbara Martinson respectively. We also briefly mention four new publications from the International Lighting Commission (CIE). They are: CIE Publ. 166 - Recommended Practice for Tabulating Spectral Data for Use in Colour Computations, 167 on Cognitive Colour, S-015 on Lighting of Outdoor Work Places and its complementary standard S-016 Lighting of Outdoor Work Places - Lighting Requirements for Safety and Security.

In the area of recent and upcoming events, Jack Ladson and I contribute a report on the ISCC 2005 Annual Meeting and Special Symposium on Automotive Color and Appearance Issues. We also have announcements on the forth coming CIE Expert Symposium on Measurement Uncertainty and the Symposium on Light and Color, and a short report about Alan Robertson receiving ISCC's 2005 Godlove Award.

*Ellen Carter*

*Editor, Color Research and Application*

### **Sustaining Members Receive Additional ISCC Benefit**

The ISCC Board of Directors voted to entitle each Sustaining Member to a quarter-page item (with a hot-link to their website) in our ISCC Newsletter once per year. The item must be informational and not promotional. Items must be sent to the ISCC Office for publication.

Other benefits given to Sustaining Members are: up to 10 copies of the ISCC newsletter, a link to their website on the ISCC website, contact information on the back cover of each newsletter, a complimentary ¼ page advertisement in our annual meeting program each year, and for new Sustaining Members (and other ones who did not receive a copy) a copy of the newly published ISCC Technical report, "Guide to Material Standards and their Use in Color Measurement.

## CALENDAR

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

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**ISCC Office**  
**11491 Sunset Hills Road, Reston, VA 20190**  
**703-318-0263 tel 703-318-0514 fax**  
[isscoffice@cs.com](mailto:isscoffice@cs.com) website: <http://www.iscc.org>

### 2006

- Mar 18-22** **NAPIM Convention**, La Costa Resort & Spa, Carlsbad, CA, 732-855-1525  
[www.napim.org](http://www.napim.org)
- Mar 19-21** **TAGA 2006**, Vancouver, Four Seasons Hotel, Vancouver, British Columbia, Canada, 585-475-7470, [www.taga.org](http://www.taga.org)
- April 4-6** **Color Technology and Design**, Detroit Colour Council/Coatings Research Institute, Eastern Michigan University, [www.detroitcc.org](http://www.detroitcc.org)
- Apr 7-11** **CMG's Spring International Conference**, Color Marketing Group, Denver, Colorado, 703-329-8500, [www.colormarketing.org](http://www.colormarketing.org)
- Apr 18-20** **Color Pigments 2006 - A Global Perspective**, Color Pigments Manufacturers Association, Inc., 703-684-4044, Hotel InterContinental, Chicago, Illinois, [cpma@cpma.com](mailto:cpma@cpma.com), [www.pigments.org/index.php?id=61](http://www.pigments.org/index.php?id=61)
- Apr 25-27** **Coating and Graphic Arts Conference and Exhibit - 2006 TAPPI**, Atlanta Marriott Marquis Atlanta, Georgia, [www.tappi.org](http://www.tappi.org)
- May 1-5** **Prospecting for Geospatial Information Integration**, asprs, The Imaging and Geospatial Information Society, Reno Hilton Hotel, Reno Nevada, 301-493-0290, [www.ASPRS.org](http://www.ASPRS.org)
- May 2-4** **AATCC Spring Committee Meetings**, Research Triangle Park, NC, 919-549-8141, [www.aatcc.org/AATCCinfo/committees/committees.cfm](http://www.aatcc.org/AATCCinfo/committees/committees.cfm)
- May 9-11** **CORM 2006 Annual Conference, Industry and National Metrology Institutes: Partners in Light Measurement Problem Solving**, NIST, Gaithersburg, MD, 440-542-8042, [www.corm.org](http://www.corm.org), [CORM2006\\_information.shtml](http://CORM2006_information.shtml)
- May 7-12** **2006 International Congress of Imaging Science (ICIS 2006)**, Hyatt Regency Hotel, Rochester, New York, 703-642-9090, [www.imaging.org/conferences/icis2006](http://www.imaging.org/conferences/icis2006)
- May 14-15** **ISCC 2006 Annual Meeting**, Ottawa, Canada, 703-318-0263, [www.ISCC.org](http://www.ISCC.org), [isscoffice@cs.com](mailto:isscoffice@cs.com)
- May 16-17** **CIE Expert Symposium on the Standard Observer**, National Research Council, Ottawa, Canada, [www.iscc.org/jubilee2006](http://www.iscc.org/jubilee2006), [isscoffice@cs.com](mailto:isscoffice@cs.com)
- May 18-19** **CIE Division I Meeting**, Ottawa, Canada, [www.bio.im.hiroshima-cu.ac.jp/~cie1](http://www.bio.im.hiroshima-cu.ac.jp/~cie1)
- May 23-26** **IS&T Archiving Conference**, Ottawa, Canada, 703-642-9090, [www.imaging.org/conferences/archiving2006/](http://www.imaging.org/conferences/archiving2006/)
- Jun 4-9** **SID 2006 International Symposium, Seminar, and Exhibition**, Moscone Center, San Francisco, California, USA, 212-460-8090 ext. 202, [www.sid2006.org](http://www.sid2006.org)
- Jun 14-16** **ASTM E12, Color and Appearance**, Sheraton Centre Toronto; Toronto, ON CAN, 610-832-9500, [www.astm.org](http://www.astm.org)
- Jun 15-17** **7th International Symposium of the Slovenian Colorist Association: Colors of National Symbols**, Ljubljana, Slovenia, [isnt2006@ntf.uni-lj.si](mailto:isnt2006@ntf.uni-lj.si), [www.ntf.uni-lj.si/isnt2006](http://www.ntf.uni-lj.si/isnt2006)
- Jun 25-28** **CORM Fifth Oxford Conference on Spectrometry**, National Physical Laboratory, UK, [www.corm.org](http://www.corm.org)

**2006, Continued**

- Jul 5-7** **10th International Conference on Information Visualization - IV06**, University of London, London, UK, Tel.: (Int... +44) 207 815 7476, [www.graphicslink.co.uk/IV06/](http://www.graphicslink.co.uk/IV06/), [banisse@lsbu.ac.uk](mailto:banisse@lsbu.ac.uk)
- Aug 26-27** **Gemological Research Conference**, San Diego, California, [www.symposium.gia.edu](http://www.symposium.gia.edu)
- Aug 27-29** **4th International Gemological Symposium**, San Diego, California, [www.symposium.gia.edu](http://www.symposium.gia.edu)
- Sept 17- 22** **NIP22: International Congress on Digital Printing Technologies, IS&T**, Hyatt Denver Convention Center Hotel, Denver, Colorado, 703-642-9090, [www.imaging.org](http://www.imaging.org)
- Oct 8 -12** **Frontiers in Optics 2006, The 90th OSA Annual Meeting Laser Science XXII**, Rochester Riverside Convention Center, Rochester, New York, 202-223-8130, [www.osa.org](http://www.osa.org)
- Oct 13-17** **CMG's Fall International Conference**, Color Marketing Group, Atlanta, GA, 703-329-8500, [www.colormarketing.org](http://www.colormarketing.org)
- Oct 24-27** **"Colour in Culture and Colour in Fashion," AIC 2006**, Interim Meeting, Misty Hills Country Hotel and Conference Centre, Johannesburg, South Africa, [www.colourgroupsa.org.za](http://www.colourgroupsa.org.za)
- Nov. 1-3** **International Coatings Expo, ICE 2006**, Federation of Societies of Coatings Technology, (FSCT), 610-940-0777 email: [fsct@coatingstech.org](mailto:fsct@coatingstech.org), [www.coatingstech.org](http://www.coatingstech.org)
- Nov 6-10** **Color Imaging Conference, CIC14**, Society for Imaging Science and Technology (IS&T) and the Society for Information Display (SID), Scottsdale, Arizona, +1-703-642-9090, [www.imaging.org/conferences/cic14/](http://www.imaging.org/conferences/cic14/)

**2007**

- Jan 23-25** **ASTM E12, Color and Appearance**, Embassy Suites Hotel; Ft. Lauderdale, FL, [www.astm.org](http://www.astm.org)

**Publications Available from ISCC Office**

**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. Discusses and explains ten myths about color. .... \$5 ea or 20 copies/\$50.00

**Proceedings-9th Congress of the International Colour Association, AIC Color 01 Rochester**, Allan Rodrigues, Ed., papers given at technical sessions... \$75\*

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

\*Plus shipping and handling

**Job Wanted: ISCC Member Seeking Employment**

Color Scientist is seeking a job position as a Color Researcher in innovative color companies and academic institutions. The scientist has worked as a color management engineer for a major printing company for three-half years in Japan and has a M.S. Color Science degree from Munsell Color Science Laboratory at Rochester Institute of Technology. His special expertise is not only in modeling the brilliant colors of modern artist paints and printing inks, but also in developing the visualization tools of color effects.

The scientist's contact information and website for introduction is: [www016.upp.so-net.ne.jp/yoshiepic/](http://www016.upp.so-net.ne.jp/yoshiepic/)

Yoshio Okumura

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Tel: 585-734-7233

**Advertising Policy**

The ISCC advertising policy for the ISCC News is as follows: Pre-paid color-related advertising will be accepted 30 days in advance of the publishing date.

The rates are:

\$ 100	business card-size ad
\$ 250	1/4 page ad
\$ 500	1/2 page ad
\$ 1,000	full page ad

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 first of each even numbered month. Materials submitted later may be printed in the following issue.

## ISCC Sustaining Members

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Color Communications, Inc.	<a href="http://www.ccicolor.com">www.ccicolor.com</a>	773-638-1400
Datacolor	<a href="http://www.datacolor.com">www.datacolor.com</a>	609-895-7432
DuPont Performance Coatings	<a href="http://www.dupont.com">www.dupont.com</a>	248-583-8345
Flex Products, Inc.	<a href="http://www.colorshift.com">www.colorshift.com</a>	707-525-7337
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Hewlett-Packard Company	<a href="http://www.hp.com">www.hp.com</a>	650-857-6713
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PPG Industries, Inc.	<a href="http://www.ppg.com">www.ppg.com</a>	724-274-3532
Prime-Color, Inc.	<a href="mailto:watprime@hotmail.com">watprime@hotmail.com</a>	908-272-5759

## ISCC Member Bodies

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)  
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 Federation of Societies for Coatings Technology (FSCT)  
 Gemological Institute of America (GIA)  
 Graphic Arts Technical Foundation (GATF)  
 Illumination Engineering Society of N. America (IESNA)  
 National Association of Printing Ink Manufacturers (NAPIM)  
 Optical Society of America (OSA)  
 Society for Information Display (SID)  
 Society of Plastics Engineers, Color & Appearance Div.(SPE)  
 Society for Imaging Science and Technology (IS&T)  
 Technical Association of the Graphic Arts (TAGA)

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# REGISTRATION FORM



ISCC 2006 ANNUAL MEETING  
May 14-15, 2006

75<sup>TH</sup> ANNIVERSARY SYMPOSIUM  
May 16-17, 2006

National Research Council of Canada, Ottawa, Canada

Name \_\_\_\_\_ Badge Name \_\_\_\_\_  
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 Accompanying Person (s) \_\_\_\_\_

**Registration Fees: include all sessions, ISCC Awards and/or Symposium banquets, daily breakfasts, lunches and coffee breaks, welcome reception, and bus transportation to meeting venue. (Circle choices)**

	Before April 12th	After April 12th
ISCC Annual Meeting Only, May 14-15	\$350 USD	\$400 USD
Students*	\$125 USD	\$125 USD
Symposium Only, May 16-17	\$375 USD	\$425 USD
Students*	\$250 USD	\$300 USD
ISCC Annual Meeting & Symposium, May 14-17	\$675 USD	\$750 USD
Students*	\$375 USD	\$425 USD
Symposium Proceedings (CD-ROM) & Preprint of selected chapters of CIE Book**		\$ 80 USD
		Subtotal: \$ _____ USD

\* Student registration must be accompanied by proof of status as a full-time student.

\*\* "Colorimetry: Understanding the CIE System" to commemorate the 75<sup>th</sup> Anniversary of CIE colorimetry.

**Accompanying Person (s) Registration Fees: does not include sessions**

ISCC Annual Meeting Wine and Cheese Reception, May 13 Evening	\$ 20 USD
ISCC Annual Meeting Awards Banquet, May 14 Evening	\$ 50 USD
Symposium Wine and Cheese Reception, May 15 Evening	\$ 20 USD
Symposium Banquet at Museum of Civilization, May 16 Evening	\$ 75 USD
Number of accompanying persons: _____	Subtotal: \$ _____ USD

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Registrations must be received by the ISCC Office by **May 5, 2006**. After that date, attendees will need to register on-site. Registration fees are fully refundable if cancellations are made in writing by **April 12**. After this date, refunds are subject to a \$75 USD cancellation fee. However, substitutions may be made at any time at no charge. For information on travel documents, consult the web-site page: [www.iscc.org/jubilee2006/general.html](http://www.iscc.org/jubilee2006/general.html).

Inter-Society Color Council

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