



Inter-Society Color Council News

Issue 425 Contents

Jan/Feb 2007

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President's Column

First of all, I want to wish you all a happy and successful New Year. I am looking forward to 2007, both personally and professionally, and on behalf of the Council and what it is planning to accomplish, building on the things that were set in motion last year. The main focus of this column will be future meetings, since meetings are one of the main vehicles by which the Council achieves its goals.



ISCC President, Rob Buckley

Next month, we are co-sponsoring a Special Topics meeting on Industrial Color Challenges with the American Association of Textile Chemists and Colorists (AATCC). The meeting will be February 22-23 at the Hilton University Place in Charlotte, North Carolina. The program was published in the last newsletter and is available online at www.aatcc.org; the registration form is in this newsletter.

The Annual Meeting will be April 29 to May 1 at the Country Club Plaza Marriott in Kansas City. I am quite excited about the meeting and how it's coming together. Scot Fernandez has an update on it in this newsletter. There will be several things to look forward to at the meeting. Among them are several keynotes: one on the role of color in product innovation at Crayola, another on the development of a color-managed RGB workflow at Hallmark, and a third from the 2007 Godlove Award winner. We are also planning exhibits at the meeting.

Social events planned for the Annual Meeting include a reception at the Kemper Museum of Contemporary Art on Sunday and the Awards Luncheon on Monday. On the last day of the meeting, a visit to the Nelson-Atkins Museum of Art is planned. We have Steve Glasscock to thank for these arrangements.

The theme of the Annual Meeting is "Bridging the Creative and Production Sides of Color." If you want to submit a

**The Editors of the ISCC Newsletter
wish everyone a happy and healthy
New Year.**

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paper for the meeting, you have until the end of January. See Scot's update for details. It looks to me like a little more than half the program has been laid out, so there is still room for additional contributions.

The next meeting of the ISCC Board will be a conference call at the end of January or beginning of February: as I write this we haven't yet settled on a date that works for everyone. The main topic of discussion will be future meetings—the immediate future of course but also next year and the year after. We have several possibilities for 2008 and 2009 that are at various stages of development and maturity. They involve linking up with member bodies in the fields of color design, imaging, displays and materials.

Let me close with a personal anecdote. The American Oxonian, the quarterly magazine of the Association of American Rhodes Scholars, publishes class letters in each issue. The next issue will include a letter from my class. For it and as part of my activities since the last letter, I included a description of the ISCC.

I described the Council as “an eclectic group that includes scientists, artists, designers and engineers—all enthusiastic about color, whether it's in science, art, history, and industry.” While we all have our professional focus in color, that doesn't constrain our personal interest. Our membership reflects that, and so do our meetings, which usually operate across boundaries between the different fields that have a professional need and concern for color, which by its nature cannot be the exclusive domain of any one discipline. That's why there is an ISCC, and why I am so delighted to be part of it.

*ISCC President, Rob Buckley
Xerox Corporation*

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HUE ANGLES

Continuing onward, and waiting for reader contributions, we have...

Benham's Disk Under Colored Lights

One moment in 1973 as a graduate teaching assistant was worth all the others: A "free-for-all" laboratory at which the students could try an assortment of simple physics demonstrations. All I had to do was stand back and watch—no grading or other onerous tasks. But I wanted to get in the game. In one corner was a low-pressure sodium vapor lamp, emitting its yellow doublet line and little else. Nearby was a black-and-white sectored disk called a Benham disk (see Fig. 1), a pastime of monks and psychologists that paradoxically delivers subjective non-neutral colors when spun so the flicker is fast but still visible. I decided to unite these gadgets and question the students.

The dialogue was predictable: Are the Benham colors due to a chopping of the spectrum? [Yes.] If we try this sodium light and the colors persist, would you still think the spectrum is being chopped? [Yes, the sodium line has a doublet that can be chopped.] The separation of the doublet is only 0.6 nm, and—trust me—that's not enough to make a visible difference. [We don't trust you, but the colors should fade under the sodium light.]

Soon we had the room lights off and the sodium lamp trained on the spinning Benham disk. Did the colors look less intense? No. We were all surprised to see that the colors intensified. I even saw intense reds and greens in parts of the disk that had no hue before.

I then grabbed various colored gels, draped them over a tungsten lamp, and spun the disk. Under blue light the colors subsided. A green gel produced colors of similar saturation as for the unfiltered light. Orange intensified the colors even more than the yellow. And the red gel produced the most intense colors of all: To me they were a veritable pinwheel of reds, greens, and yellows radiating from the disk's center. The students saw intense colors too, but not in the same patterns I saw.

Should I publish this result? I was advised not to:

Flicker colors are the stuff of epileptic attacks—a veritable fugu feast for the eye, dangerous if improperly prepared. A flicker-color television patent languished because of viewer discomfort and worse; at the time the public's imagination was inflamed by the plot-critical flicker-induced seizure in Crichton's *Andromeda Strain*; later a real event, the Pokémon incident, brought home the point that flicker can induce seizure-like symptoms even in non-epileptics [1]. These

effects are particularly strong for red light [2]—as in my experiment.

So I got out of the flicker-color game...until, in 1981, visiting the lab of Fergus Campbell (Cambridge, UK), I noticed an empty lab with a Benham disk and a lamp with a strangely dark lightbulb. Within a few minutes Campbell had phoned the author of this display, and C. C. D. Shute showed up ready to discuss the colors. He had published an abstract in a recent issue *J. Physiol.* on the intensification of Benham colors under long-wavelength light. But neither he nor anyone else seemed to see the same color patterns I did in the disk. Neither of us published or presented further on this topic.

Some signs of life persist. For illumination at about 557-566 nm, Francoise Vienot *et al.* [3] found color exchanges between the two extreme rings and between the two inner rings of the disk. I think the last word has not been written about the effect of illumination on Benham colors.

And I strongly advise: *Do* try this at home. It's safe, cheaper than fugu, and doesn't require a licensed seafood chef.

Point to ponder: On a scale from 1 to Pokémon, how flicker-safe are police flashers at night?

References:

- [1] M. Nomura, *Neural Networks* **12** (1999), 347-354. Also see <http://angkor.com/cityrain/pokemon.shtml#sei>
- [2] P. Wolf and R. Goosses, *J. Neurol. Neurosurg. Psychiat.* **49** (1986), 1386-1391.
- [3] F. Vienot, J. Le Roheller, *Vision Res.* **32** (1992), 2369-2374.

Note: Fugu is a poisonous puffer fish (containing tetrodotoxin), used as food in Japan after removal of the toxin-containing parts.

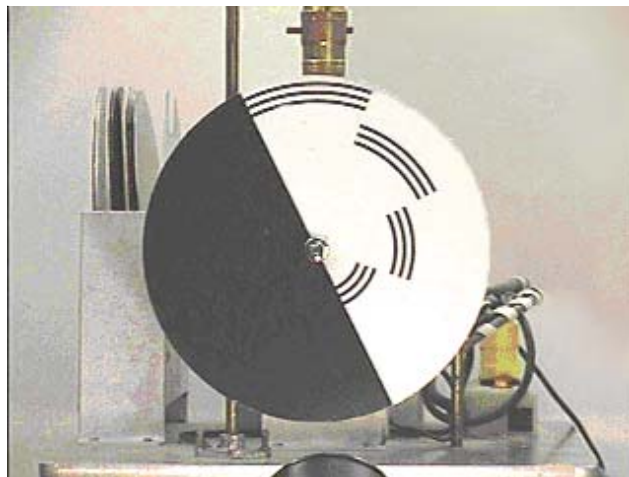


Figure 1. Benham disk.

Michael H. Brill, *Datacolor*

Member Items:

International Color Consortium

Contrary to what Google implies, the ICC which has just joined the ISCC has nothing to do with cricket or chess. The International Color Consortium was formed in 1993 with the aim of creating, promoting, and encouraging the standardization and evolution of an open, vendor-neutral, cross-platform color management system architecture and components. The ICC currently includes almost 70 member companies, including both vendors and consumers of color. Its web site is www.color.org.

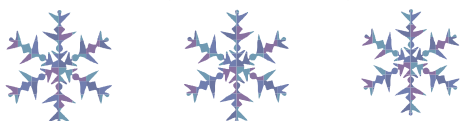
One of the most visible products of the ICC, and the one most often associated with the organization, has been the ICC profile specification, now ratified as an ISO standard (ISO 15076-1) as well as being itself referred to in many other standards. This time-tested standard is now commonly used in many graphic arts and photographic workflows as a means of specifying color for documents and images. ICC profiles are used standalone in cameras and graphics programs, and embedded inside documents and images. As a live standard, the ICC continues to actively update the specification as market needs evolve and color science advances.

At least as important as its work in defining color interchange file formats within workflows is the organizational structure of the ICC, which serves as a forum allowing companies to get together to figure out how to make their products work better with each other in order to benefit end users – at the end of the day, a more common color user experience across different products benefits everyone. Working groups within the ICC tackle color communication and workflow issues as well as more fundamental issues regarding the representation of color in a digital workflow.

The most active recent work within the ICC has taken on three main thrusts. One thrust has looked at extending the mandate of the ICC profile format to include non-print media, primarily digital motion picture requirements. Another thrust has focused on workflow and architecture-related issues, to give more precise definition to the context in which ICC profiles are used. A third direction of ongoing concern has looked at the topic of improving the commonality of user experience across color platforms from different vendors.

In joining the ISCC, the ICC hopes to build bridges to companies and organizations involved in color in other industries with the aim of improving the continuity of color experience for all of our mutual users.

William Li, ICC



Datacolor's C. David Tobie Awarded as Microsoft® Most Valuable Professional

Datacolor, an ISCC Sustaining Member, announces with great pride that C. David Tobie has been awarded as a Microsoft® Most Valuable Professional (MVP), on January 1, 2007. MVPs are awarded for their demonstrated technical expertise, willingness to help others and commitment to technical communities.

For many years, David has worked to see affordable color-management solutions put in place for graphic design, prepress, photography and digital imaging. He is best known by photographers for his writing and technical editing of texts and periodicals for the photo industry. He is currently Product Technology Manager for the ColorVision business unit of Datacolor.

As Microsoft MVP, David joins a stellar group from around the world who have shown a willingness to reach out, share their technical expertise and help individuals maximize their use of technology.

MVPs are enabled to meet Microsoft executives, network with peers, position themselves as technical community leaders through speaking engagements, and participate one-on-one in customer events and in technical content development. MVPs also receive early access to technology through a variety of programs offered by Microsoft, which keeps them on the cutting edge.

FSCT Announces Major Changes to Its Research Journal

The Federation of Societies for Coatings Technology, and ISCC Member Body, has entered into a new publishing partnership with the Oil & Colour Chemists' Association (OCCA) and Springer Science+Business Media LLC (Springer) to expand the content and delivery of FSCT's research journal, the *Journal of Coatings Technology and Research* (JCTR). Beginning in January 2007, JCTR will be published quarterly by Springer. The publication will be jointly owned by the FSCT and OCCA and will continue to be provided to the members of both organizations as a benefit of membership.

The *Journal of Coatings Technology and Research* is a quarterly forum for the exchange of original research, experience, knowledge, and ideas for those with a professional interest in the science, technology, and manufacture of functional, protective, and decorative coatings.

Starting in 2007, JCTR will also incorporate papers from OCCA's existing research journal, *Surface Coatings International Part B: Coatings Transactions*, thereby increasing the total number of papers published in JCTR. The Editor-in-Chief is Dr. Ray A. Dickie, who has been leading JCTR successfully for the last ten years.

Further information on the Journal may be found at www.springer.com/journal/11998.

R•I•T to Offer “Essentials of Color Science” Short Course

The R•I•T Munsell Color Science Laboratory will offer a short course “Essentials of Color Science” June 5-8, 2007. This 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. For a full description of course and sessions, see the website, 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. Their qualifications and contact information is at www.cis.rit.edu/mcsl/people/staff.php.

To receive a course brochure, contact Colleen Desimone, desimone@cis.rit.edu or call 585-475-6783.

Report on The 2006 AIC Interim Meeting in South Africa

The AIC 2006 Interim Meeting was held on October 24-27, 2006, at Misty Hills hotel, in the countryside near Johannesburg, South Africa. It was organized by the Colour Group of South Africa. In the history of the AIC, it was the first meeting in the African continent and the fourth meeting in the Southern hemisphere. Participants from 13 countries presented papers and held discussions on various aspects of color in culture and color in fashion. A gallery of pictures of the meeting is posted at www.colourgroupsa.org.za/aic2006/aic_information.php.

A free pdf version of the proceedings, which were also published in hardcopy and CD, can be downloaded from the AIC website, www.aic-color.org.

Barry B. Lee to Receive Verriest Medal

The International Colour Vision Society is pleased to announce that the Verriest Medal will be awarded at the 2007 biennial symposium in Belém, Brazil (July 27-31, 2007) to Barry B. Lee, Professor of Biological Sciences at the State University of New York, College of Optometry, New York, NY. This award is bestowed by the Society to honor long-term contributions to the field of color vision. Professor Lee, an innovative multidisciplinary scientist, has made significant contributions to our understanding of basic coding mechanisms in visual processing and is recognized for his efforts at bridging the gap between psychophysics and physiology. In addition, through collaborative efforts, he has been at the center of the great advances that have been made in the last 20 years in unraveling the relations between structure and visual function in the retina. More information can be found at www.ufpa.br/icvs2007.

Detroit Colour Council November 13th Meeting Highlights

The Detroit Colour Council’s fourth and final educational symposium of 2006 was held on November 13th at Cranbrook Academy of Art in Bloomfield Hills, Michigan. Colour Council president, Larry DePaoli, opened the event by recapping the modular training program for 2006, explaining the desire for companies to differentiate themselves in the automotive supplier community. This year’s DCC theme focused on achieving “The Look”. DePaoli gave a brief summary of the September conference, for which the topic was engineering challenges of implementing the innovative appearance special effects of gloss and grain.

Andrew Lund, Executive Program Manager from Toyota Motor Engineering and Manufacturing of North America provided the presentation for the November meeting. His presentation was entitled “Toyota Way - Development for the 2004 Sienna.” The presentation described the process that Toyota utilizes to engineer and reengineer its model vehicles.

Lund described the history of the Sienna and its early struggles of acceptance in the marketplace. By listening to its customers, eliminating waste and constantly striving for continuous improvement (Genchi Genbutsu practice), the Sienna evolved into the vehicle that it is today. Mr. Lund emphasized the importance of establishing a multi-disciplined team in order to assure that all aspects of development are addressed appropriately. He stated that the concept must be followed through into the manufacturing environment in order to assure that there is a comprehension of goals and objectives.

The result of focusing on customer’s expectation and stimulating continuous improvement through team design and development is a vehicle that reveals high quality with features desired by the consumer.

Mr. Lund has been with Toyota since 1994 and was the materials engineering paint manager prior to becoming the executive program manager in development planning and operations.

*Larry DePaoli, President
Detroit Colour Council*

AIC to Celebrate 40th Anniversary

The December 2006 AIC e-news reports that the AIC will celebrate its 40th anniversary on June 21, 2007. The AIC e-news also notes that during 2007, Lucia Ronchi, 8th president of the AIC, and Yoshinobu Nayatani, AIC Judd awardee, will celebrate their 80th birthdays. In addition, the e-news continues that the year 2007 will be commemorative of the 10th anniversary of William D. Wright’s death (1906-1997), and the 20th anniversary of C. James Bartleson’s death (1929-1987). Wright was the 1st president of the AIC, while Bartleson was the 4th president.

Proceedings of the ISCC/CIE Expert Symposium '06

75 YEARS OF THE CIE STANDARD COLORIMETRIC OBSERVER

The Proceedings of the CIE Division 1 and ISCC jointly organized symposium to celebrate the 75th anniversary of the CIE 1931 Standard Colorimetric Observer is now available. The symposium was held in Ottawa, Ontario, Canada, May 16-17, 2006 to discuss the many advances that have been made since the introduction of the CIE 1931 standard observer, to understand the current state of colorimetry and colour appearance, and to provide guidance on directions for future work.

The meeting was divided into seven main sessions:

- Standard Observer
- Colour Matching Functions
- Instruments and Standards
- Temporal and Spatial Issues
- Application of the Standard Observer
- Colour Appearance
- Colour Differences
- Colour Management
- Discussion, and included a Poster Session.

A general theme throughout the discussion, that summarized the hot topics of the symposium, was the need for more comprehensive colour appearance and colour difference models. The current models take into account only a relatively small number of factors that can affect the appearance of objects and images. It was recommended that models be developed that include the effect of spatial and temporal factors, that are applicable to all levels of illumination from photopic to scotopic, and that take into account both normal variations in visual functions and changes in visual functions with aging. A second theme was the assessment of visual appearance and visual differences, or more specifically, the measurement of other attributes of surfaces such as gloss, translucency and texture.

The Proceedings (CIE x030:2006; ISBN 3 901 906 51 7) contains the full text of all the presented 27 papers and 5 posters. The publication consists of 200 pages with 158 figures and 22 tables. A CD-ROM with all papers in a searchable form is included. CIE x030:2006 is readily available via the website of the Central Bureau of the CIE (www.cie.co.at). This document is available from the CIE Central Bureau in Vienna for 128.00 Euros.

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Further information may be found at the CIE website: www.cie.co.at/framepublications.html.

AATCC/ISCC Symposium "Industrial Color Challenges"

Hilton University Place, Charlotte, NC

Plans for the "Industrial Color Challenges" symposium to be held February 22-23, 2007 in Charlotte, NC are nearly complete. The symposium is being co-produced by AATCC and ISCC and will cover all facets of industrial color technology including color and marketing, multiangle color measurement, non-metameric color matching, the conditions for proper visual analysis, the benefits of quantitative color assessment, lighting issues, and more. The symposium will also provide an opportunity to network with fellow attendees and visit with technology vendors and color suppliers during an evening reception.

Please see the 2006 Nov/Dec ISCC Newsletter or the ISCC web site, www.iscc.org for the complete symposium program. Presentation abstracts are available at www.aatcc.org/workshops/colorvision.cfm.

For more information on accommodations, please see www.aatcc.org. A registration form for the meeting is included with this newsletter.

Invitation to ISCC 2007 Annual Meeting Exhibitors

The Kansas City Annual Meeting will include product displays related to the theme, "Bridging the Creative and Production Sides of Color." The Marriott will provide space in the room used for breaks and the poster session. Limited spots are available for exhibitors on a first come, first served basis. For details and reservations contact Steve Glasscock, sglass1@hallmark.com or (816) 274-4457.

Student Travel Grants ISCC 2007 Annual Meeting

The ISCC Education Committee is providing a limited number of Student Travel Grants to assist students traveling to the ISCC 2007 Annual Meeting in Kansas City, MO, April 29 - May 1. To be eligible for this grant, students must submit a letter of recommendation from their supervisor including affirmation that they are a full-time student, and an estimate of their travel costs. Preference will be given to students who also include a title and abstract for a paper or poster presentation. Deadline for applying to this program is March 16, 2007. Be sure to include proof of status as a full-time student with your application. Applications should be sent to:

The ISCC Office:
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11491 Sunset Hills Road
Reston, VA 20190
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iscc@iscc.com or csturke@aol.com

Students will be informed of ISCC travel support by March 23, 2007.

INTER-SOCIETY COLOR COUNCIL
2007 ANNUAL MEETING
April 29 – May 1, 2007
KANSAS CITY, MO

The Inter-Society Color Council (ISCC) will hold its 2007 Annual Meeting in the Heart of America in Kansas City, Missouri from Sunday, April 29 through Tuesday, May 1, 2007, at the Kansas City Marriott Country Club Plaza. Known for its fountains, boulevards, barbecue and jazz, Kansas City is also the home of Hallmark Cards. General Chairs Steve Glasscock and Scot Fernandez will be among those representing the greeting card giant at the meeting.

The 2007 theme, “Bridging the Creative and Production Sides of Color”, will explore the complexities of making color easy to use and understand while maintaining a high level of accuracy and capability, especially within reproduction systems. A highlight of the meeting will be the presentation of the Godlove Award, the Council’s most prestigious honor for lifetime achievement in the field of color.

The keynotes for this meeting will include a presentation from Eric Shuler, the Director of Product Development at Crayola, and Todd Storbeck a Senior Publishing Consultant for Hallmark Cards. Eric will be discussing the role color has as a part of the product innovation cycle at Crayola, and Todd will present Hallmark’s evolution and challenges of developing a color-managed RGB workflow for the Greeting business, which utilizes a 5-Color process ink set.

The remainder of the meeting will include presentations from each of the ISCC’s three Interest Groups, a general poster session, and an exhibitor’s area for companies to present their technology beyond a presentation. We have already had several very interesting abstracts submitted which include the Color Trends of 2008 by Scott Butterfield, a Trends Consultant for Hallmark Cards. Another talk will present Translating Colors, by Odeda Rosenthal, which will outline how an artist with color blindness has developed a system to paint in full color. Karl Guyler, a Senior Chemist at Hallmark, has also submitted an abstract that outlines a presentation that will quantify the gamut enhancement and printing stability increases associated with Stochastic screening for offset lithography. In addition to the keynotes and these presentations the final program will include a range of topics to include color management, multi-color printing, the color of paper, and proofing—both soft and hard—as well as other color-related industrial applications.

Authors are invited to submit abstracts to either the Interest Group Chairs or the General Chairs. Their contact information and author instructions are available on the 2007 Annual Meeting page of the ISCC website at www.iscc.org. Submissions are due by January 31, 2007.

For further information please contact the ISCC Office, 11491 Sunset Hills Road, Reston, VA 20109, voice (703) 318-0263; fax (703) 318-0514; email isccoffice@cs.com.

Color Research and Application In This Issue, February 2007

When thinking about the early developments leading to today's colorimetry, the names of Newton, Young, Maxwell, and Helmholtz easily come to mind. Most likely there were others too. Perhaps we might think of Palmer who predated some of Young's ideas by a quarter of a century. However, I wonder how many of our readers have ever heard of Ludwig Pilgrim? In our first article of 2007, Rolf Kuehni reports on the writing of "Ludwig Pilgrim, a Pioneer of Colorimetry." In this article, Kuehni includes two colored figures from the charts printed with Palmer's 1901 article "Über einige Aufgaben der Wellen- und Farbelehre des Lichts" (On a few exercises in wave and color theory of light).

From this look into history, we quickly move to research taking place at the present time for the rest of the issue. Our next article aims to explore the limits of memory for the hue of color lights using non-spectral colors. It has been known that memory is influenced by how readily a color can be named, and how useful the name is in discriminating the color from others in the experiment. The research described in this article, "Memory for the Color of Non-Monochromatic Lights," was partially motivated by the study of the effects of color on reading speed. Penny J. D'Ath, W. David Thomson and Arnold J. Wilkins found that there was no evidence of stable individual differences in observer's memory. The accuracy of reproducing one color was not significantly correlated with the accuracy in reproducing another color. The variability of hue memory under their experimental conditions was similar to the variability of the memory of colored surfaces under common light sources.

If a color vision disturbance is being followed or treated, a color vision test may be used to assess the level of the disturbance and whether the problem has been successfully treated. However, if there are learning effects associated with an observer's repeated exposure to the same color in a vision test, the observer result might change as a result of the observer's familiarity with the test, rather than being a true indication of improvement or degradation in the disturbance. Therefore, Anke Schröder, Michael Kreutz, Michael Meyer, and Carl Erb report on their study of "Influence of Learning Effects on the Results of the Cap-sorting Test Roth 28-hue (E) Desaturated."

Next we have a very short, but pithy article entitled "Color Matching Functions When One Primary Wavelength is Changed." In this article, which some might call a Note, Michael H. Brill and James A. Worthey show that in a group of three primaries, when the wavelength of only one primary is changed, the corresponding color matching function changes in scale but not in shape. Using the theorem discussed in the article,

the authors then go on to calculate the precise prime color sets for the 2-degree and 10-degree observer. To visualize this phenomenon clearly, readers are invited to view the animated graph available at one of the author's [J. A. Worthey] website.

Generally when looking at a colored light, if the purity is decreased, the observed color appearance of the light changes. This is known as the Abney Effect since William de Wiveleslie Abney reported on the change in hue of spectrum colors by dilution with white light in 1910. However, as one will note that adding white light also changes the luminance. This confounds the Abney Effect with luminance effects such as the Bezold-Brucke effect. In our next article, "Effect of Purity on Hue (Abney Effect) in Various Conditions," Ralph Pridmore surveys the earlier studies of the Abney effect and summarizes the inconsistencies among them. Then he presents the results of further experiments where the luminance is mainly kept constant and colors of 31 dominant wavelengths are evaluated by 31 observers.

The CIECAM02 color appearance model has been widely used in color management. It is a simplification of the earlier color appearance models and has developed a fairly wide acceptance because of its utility and ease of use. One of the parameters used in predicting appearance is the luminance of the background. However, it is difficult to use the model to predict appearance when the input color is encircled with a chromatic background. In our next article Binghua Chai, Dazun Zhao, Ningfang Liao, and Yubo Shao propose "Pre-processing to CIECAM02 Input Color with Chromatic Background" for implementing the color appearance prediction of input colors with different chromatic backgrounds. The preprocessing is based on opponent-color theory and the function was developed empirically from the experiments described in this article.

Our next three articles deal with color in various specific materials. First, we look at injection-molded plastics for automobile interiors. Injection-molded panels are produced with various textures. These textures have an influence on the color perceived when looking at the panels. Thus the variations in the measurement of the color coordinates affect the tolerances used in production. In "The Effect of Texture on Pass/fail Colour Tolerances of Plastics" Ingrid Ariño, Sofia Johansson, Ulf Kleist, Eleonore Liljenström-Leander, and Mikael Rigdahl evaluated the effect of different surface textures on the color tolerances comparing the color measurements (both including and excluding the specular component) to the observers' decisions obtained in a psychometric experiment.

Next we move to textiles. Here Ray-Chin Wu and R. H. Wardman studied the simultaneous color contrast effect. While all three attributes of color:

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lightness, chroma, and hue, are affected by the color of the surround, the lightness has the greatest impact, and the chroma the least. In "Lightness and Hue Contrast Effects in Surface (Fabric) Colours" these authors report on the relative amounts of the effects of lightness and hue and the direction of the changes that occurred. Because they used fabric samples, their results showed different magnitudes of the effects than those previously reported with smooth samples of a CRT display. They also noted that the hue contrast effect was more obvious when the induction color was close to the test (center) color.

Then for our third materials article, we examine inorganic pigments in mortars (binders) which are used in the restorations of historic buildings. The pigments studied include ultramarine blue, green earth, molybdenum orange, zinc yellow, chrome yellow, chrome green, ochre, and natural sienna. These pigments were studied in four different binders. The spectrophotometric measurements were used to assess the stability and coloring power, and the effects of time, thermal gradients, and high-energy ultraviolet radiation. The results of this work by J. Rodríguez-Gordillo, M. P. Sáez-Pérez, J. A. Durán-Suárez, and A. García-Beltrán are reported in "Chromatic Behavior of Inorganic Pigments in Restoration Mortars (Non-Hydraulic Lime, Hydraulic Lime, Gypsum and Portland Cement) A Comparative Study.

The final article in this issue is "The Analysis of Color Symbolology from the Perspective of Cultural Semiotics Focused on Korean Costume Colors According to the Cultural Changes." Jee Hyun Lee and Young-In Kim found the reds, blues and yellows most frequently used during the Chosun Dynasty acted as cultural codes with cultural significance. Then in modern times, the increased frequency of the use of pink, light blue and black represented the arrival of Western culture and the changing role of women in society. The recent use of neutral colors and grayish tones closely relate to industrialization, functionalism, and the changes of women's sex roles in societies. They are used as cultural codes to emphasize a rational masculine image rather than a feminine image.

We close the issue with several announcements, two from the Inter-Society about Upcoming Meetings, and two from Rochester Institute of Technology about courses and scholarships and an invitation for nominations for the ISCC 2007 Godlove Award.

Ellen Carter

Editor, Color Research and Application

Invisible Colors, Exhibition by Josep Giribet

The Invisible Colors exhibition of realistic acrylic paintings was open from October 6 to 22, 2006 at the Museu Comeral de l'Urgell in Tarrega, one hour west of Barcelona.

Josep Giribet spoke about his color blindness and his system for painting colors he does not really see at the recent 10th AIC Congress in Granada Spain.

A video titled "Translating Colors" was shown at the opening of the exhibition. It explains the genetics, the colors confused, the prejudice that has existed against daltonics, interviews with people who have the condition, and also contains a segment featuring Josep at work. The video was produced by Giribet, and Odeda Rosenthal who also spoke on color vision confusion at AIC 2005. Rosenthal is the author of *Coping with Color Blindness* (1997), and was responsible for the script and the direction of the video.

An exhibition portfolio book is also available. The Spanish newspaper La Vanguardia, which carried a full-page interview with Rosenthal on color blindness in July, reviews this exhibition as well. Contacts for further info: odeda@earthlink.net, Josep Giribet, josep@calidos.com

Wolfgang Budde (1919-2006)

Wolfgang Budde passed away on Saturday, December 16th in Ottawa, Canada at the age of 87. He was born and educated in Germany and began working at the National Research Council of Canada in 1958, where he remained until his retirement. The subject of his masters thesis was absolute diffuse reflectance measurements and it remained one of his major research interests. His main areas of activity at NRC were detectors, reflectance measurements, and gloss. The scope of his interests and knowledge in the field of detectors is best illustrated by his book "Physical Detectors of Optical Radiation," which is still the definitive reference book in the field. In reflectance measurements, he was a major contributor to the development of optical standards and standardizing systems for the paper industry.

Jay Rennison wrote, "I am so saddened to hear about Wolfgang's passing. He was my lab instructor in Berlin TU for the Colorimetry class taught by Prof. Manfred Richter. He spent many hours helping me understand Colorimetry. I have met with him so many times over all these years. His contributions to Division 2 and other efforts in the CIE are a huge contribution to the excellence of the work done in Division 2. I will treasure my memories of our relationship."

CALENDAR

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

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isscoffice@cs.com website: <http://www.iscc.org>

2007

- Jan 23-25** **ASTM E12, Color and Appearance**, Embassy Suites Hotel; Ft. Lauderdale, FL, www.astm.org
- Feb 2-3** **Basics of Textile Dyeing, Printing and Finishing**, AATCC, Textiles Committee Auditorium in Mumbai, India, www.aatcc.org.
- Feb 22-23** **ISCC and AATCC Joint Special Topics Conference on "Industrial Color Challenges,"** Hilton University Place in Charlotte, North Carolina, Ms. Kim Nicholson, AATCC, 919-549-3535, nicholk@aatcc.org, 610-832-9585, www.aatcc.org
- Mar 18-21** **TAGA 2007 Conference**, Omni William Penn Hotel, Pittsburgh, Pennsylvania, (412) 259-1706 Cathie Meyers at cmeyers@piagatf.org
- Apr 24-26** **An International Conference on Colour Harmony**, Sponsored by the Hungarian National Colour Committee and the International Foundation Light and Colour, Budapest, Hungary, aic.kee.hu/colour-harmony
- Apr 25-27** **"The Value of Color,"** 2007 CPMA International Conference on High Performance and Traditional Color Pigments, Baltimore, MD, Renaissance Hotel, 703-684-4044, www.pigments.org
- Apr 29-May 1** **ISCC 2007 Annual Meeting, "Bridging the Creative and Production Sides of Color,"** ISCC, Kansas City, Kansas, 703-318-0263, www.iscc.org
- May 7-11** **Identifying Geospatial Solutions, ASPRS 2007 Annual Conference**, Tampa, FL, 301-493-0290, www.asprs.org
- May 8-11** **"Optical Radiation Consensus Standards and Industry,"** Council for Optical Radiation Measurement Annual Meeting in conjunction with NIST, Gaithersburg, MD, www.corm.org
- May 21-24** **Archiving 2007**, Society for Imaging Society and Technology, Arlington, VA, 703-642-9090, www.imaging.org/conferences/archiving2007/index.cfm
- Jun 4-6** **Color Cosmetics Summit 2007**, Intertech-Pira, Hilton Singapore Hotel, Singapore, 207-781-9617, www.intertechpira.com
- Jun 27-29** **ASTM E12 Color and Appearance**, Waterside Convention Center; Norfolk, VA, 610-832-9585, www.astm.org
- Jul 4-6** **11th International Conference on Information Visualisation - IV07**, ETH Zurich, Switzerland, Ebad Banissi, 44-171.815.7476, email, banisse@lsbu.ac.uk, www.graphicslink.co.uk/IV07/
- Jul 4-11** **The 26th Session of the CIE**, Beijing, China, www.cie.co.at/news/news76.pdf
- Jul 12-14** **AIC 2007 "Color Science for Industry, "Midterm Meeting of the International Color Association**, Hangzhou, China, www.aic07.com

- Jul 27-31** **19th Symposium of the International Colour Vision Society.** University of Pará, Belém, Brazil. www.cultura.ufpa.br/icvs2007/
- Nov 5-9** **IS&T/SID's Fifteenth Color Imaging Conference,** Hotel Albuquerque, Albuquerque, NM, 703-642-9090
- 2008**
- Jan 23-25** **ASTM E12 Color and Appearance,** Embassy Suites Hotel; Ft. Lauderdale, FL, 610-832-9585, www.astm.org
- Jun 15-18** **AIC Interim Meeting, Colour – Effects and Affect,** in Stockholm, Sweden, Swedish Colour Centre Foundation, Contact: Berit Bergström, berit.bergstrom@ncscolor.com
- 2009**
- Sept 27-Oct 2** **AIC 11th Congress,** Sydney, Australia, Organizer: Colour Society of Australia, Contact: Nick Harkness, www.aic2009.org

Position Available Announcement

Sun Chemical Corporation has an immediate opening for a Color Scientist in the Color Research Laboratory in the Daniel J. Carlick Technical Center in Carlstadt, NJ.

The position reports to the Senior Color Physicist and the corporate vice president for technology. It is part of a growing global program in color technology within the world's largest producer of graphic arts materials. The successful candidate will be a self-starter with a master's degree or equivalent in color science or color engineering. He/She will contribute to color measurement technology development – especially as related to global measurement conformance, adherence to documentary standards, such as ISO and ASTM standards, and evolving trade association standards in the graphic arts. Familiarity with software development tools such as: Microsoft Excel; Visual BASIC; Matlab; Microsoft, Intel, and Apple C development environments should be considered essential.

If interested and qualified, please contact Dr. Danny Rich at danny.rich@na.sunchem.com or 201-933-4500 x1144.

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

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

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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.

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ISCC Member Bodies

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 American Society for Testing and Materials International (ASTM)
 American Society for Photogrammetry & Remote Sensing (ASPRS)
 The Color Association of the United States, Inc. (CAUS)
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 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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AATCC/ISCC Industrial Color Challenges Symposium

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