



Inter-Society Color Council *News*



Issue 414 Contents

Mar/Apr 2005

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In Memoriam

Eugene M. Allen (1916—2005)

Dr. Eugene M. Allen, 88, of Bethlehem PA, retired Chemistry professor from Lehigh University, passed away at St. Luke's hospital in Fountain Hill on January 18, 2005. He was the husband of Beatrice (Hyman) Allen. The couple would have celebrated 69 years of marriage on January 23.

Born as Emmanuel Kaplan in Newark, NJ on November 7, 1916, Eugene Allen was interested in color since graduating from Columbia University in 1938. He obtained his MS in mathematics from Stevens Institute in 1944 and his PhD in chemistry from Rutgers University in 1952, with a specialty in spectrophotometry.

Dr. Allen had a very important role in the research and application of computer color-matching programs that are routinely applied today. His articles describing the mathematical methods for applying

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Kubelka-Munk equations to computer color matching laid the foundation on which all subsequent methods are based. Although others in industry had previously used and partially described such formalism, Dr. Allen's complete, matrix-based descriptions placed the methods within the grasp of a multitude of users. His 1964 generalization of colorant formulation to fluorescent materials is also salient. Dr. Allen's interest in radiative transfer theory and mathematics has extended to the application of advanced theories for explaining the interaction of light and matter that will be of interest to scientists for generations. In addition to these accomplishments, Dr. Allen authored a paper on observer metamerism that eventually evolved into a CIE standard (the "standard deviate observer") for quantifying observer differences in color matching. Also, he was the first to develop the formalism of color-mismatch regions to quantify the color mismatches that could be possible by changing illuminant or observer.

Dr. Allen earned his advanced degrees while working for Picatinny Arsenal during the war years and then at American Cyanamid from 1945 to 1967. He received the Senior Research Award from Cyanamid in 1958, enabling him to study in England for half a year on the effect of ionizing radiation on textiles. In 1967, he joined Lehigh University's Center for Surface and Coatings Research as Director of the Color Science Laboratory, and retired in 1981. In 1982 he received the Armin J. Bruning Award from the Federation of Societies for Coatings Technology in recognition of his significant contributions to the development of the science of colorimetry in the paint and coatings industries. He also was named a Fellow of the Optical Society of America. In 1983 he received the Godlove Award, the Inter-Society Color Council's highest honor. Since then he served on several ISCC committees including the Godlove Award Committee.

These plaudits do not capture two significant aspects of the man: his affinity for music and his sense of humor. On the occasion of his receiving Honorary Membership in the ISCC, some of us heard a musical piece he composed called "Elegy." Both the humor and the music emerged during his Godlove Award acceptance speech, during which he demonstrated on the piano "the effect on musical perception that would be obtained if the ears perceived by a process resembling perception by the eye."

Eugene Allen is survived by his wife Beatrice; by his son Julian of Philadelphia and daughter Marlene Galzin of Croissy-Sur-Seine, France; and by three grandchildren.

**ISCC Annual Meeting
and Special Symposium
April 24-27**

**Cleveland Airport Marriott Hotel
Cleveland, Ohio**

**See pages 6 and 7 for program details and
page 9 for hotel information**



Alan Robertson to Receive the 2005 ISCC Godlove Award

The Inter-Society Color Council (ISCC) will honor Dr. Alan Robertson with the presentation of the Godlove Award during its Annual Meeting to be held in Cleveland Ohio on April 24 - 27, 2005. The Godlove Award was named for Dr. I. H. Godlove and is the highest honor bestowed by the ISCC. It is given in recognition of a lifetime of distinguished service to the color community.

Alan Robertson is a former head of the Photometry and Radiometry Group and of the Chemical and Mechanical Standards Section of the Canadian National Research Council's Institute for National Measurement Standards. His main research specialties have been in the fields of spectrophotometry, color science and colorimetric standards with an emphasis on color difference evaluation and color order systems. He has been a leader both within the CIE and the AIC, serving as Associate Director of CIE Division 1 for many years and as AIC President from 1990-1993. He has also been involved in the negotiation and implementation of various international agreements on measurement standards.

Dr. Robertson has been a leader in the development of color difference formulae and played an active role in the establishment of the 1976 CIELAB & CIELUV color difference formulae. He pursued further advances in characterizing color differences through the development of CMC, BFD, CIE94 and CIEDE2000. Alan has served as a consultant to the CIE committees that have developed chromatic adaptation transforms and color appearance spaces.

Alan has been actively involved in standardizing color. He has a commitment to teaching the world how to do color science the correct way and that is why the push for standards that would be available to organizations outside of the CIE was so important to him. He played a critical role in establishing the relationship between the CIE and the ISO

(International Organization for Standardization). The result of this collaborative effort is that the CIE now has the authority to publish standards instead of just recommendations. Without him, the first CIE standards, S001 on Standard Illuminants for Colorimetry, and S002 on Standard Colorimetric Observers would not exist today. Alan is currently the chair of CIE TC1-57 on Standards for Colorimetry.

Joel Pokorny, University of Chicago

RIT MCSL Summer Short Course 2005: Essentials of Color Science, June 7-10, 2005

The summer short course, *Essentials of Color Science*, will be presented at Rochester Institute of Technology, June 7-10, 2005. The Munsell Color Science Laboratory (MCSL) faculty designed the course to provide participants with a fundamental understanding of the principles of colorimetry and their application to the production, control, and reproduction of color. 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 unique short course.

The four-day *Essentials of Color Science* course is made up of a series of distinct lectures and demonstrations 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 course takes place in the Franc Grum Color Science Learning Center, providing a unique teaching and laboratory experience where participants will have plenty of free time to interact with leading experts in the field. Participants will find value in each individual lecture as well as the combined experience of the entire program.

Course enrollment is strictly limited to 25 participants to assure opportunity for individual attention. Early registration is highly recommended. To receive a fully-detailed brochure or to register contact the MCSL Outreach Coordinator, Colleen M. Desimone, phone: 585-475-6783; e-mail: Desimone@cis.rit.edu; or go to the website <http://www.cis.rit.edu/research/mcsl/>.

FSCT Virtual Learning Conferences

The Federation of Societies of Coatings Technology (FSCT) has announced that its ground breaking e-learning programs will begin in 2005 with a two-part program on UV-Curable Coatings. On March 17, Aaron Lockhart, of Bayer Material Science, LLC will present "UV-Curable Coatings I: Coatings for Plastics." The second session, "UV-Curable Coatings II: Coatings for Wood," will be offered on March 31 by Ron Schowengerdt, of PPG Industries.

To learn more or to register online, visit www.coatingstech.org/Programs/Shows/Schedule.cfm. To register by phone, call 800.651.7916 from 6:00 am to 6:00 pm Mountain Standard Time. For more information, contact Education, FSCT, 492 Norristown Rd., Blue Bell, PA 19422-2350; voice: 610.940.0777; fax: 610.940.0292; email: education@coatingstech.org.

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Book Review:

Color: The Secret Influence, by **Kenneth R. Fehrman and Cherie Fehrman**

2nd Ed. (Prentice Hall, 2003) 384 pps, \$61.80

Kenneth Fehrman is a professor of interior design at San Francisco State University and Cherie is his assistant, and an interior designer in her own right. Dr. Fehrman has been a color consultant and interior designer for 24 years. Their book opens with the forthright and accurate statement that the color we see exists only in the human mind. It ends with a workbook containing sets of questions and exercises for each chapter. The book includes practical information built on the authors' extensive experience as consultants; however, their main interest is in the physical effect of color on health.

If you believe that a room with pink walls is calming for about thirty minutes and then will drive people to wildly destructive behavior; or, if you are inclined to believe that a paralyzed dog near death with complete kidney failure can be cured by exposure to blue light; this is the book for you.

The book contains interesting general information about fashion, architecture and advertising. The most important technical topics concerning color are briefly mentioned. In some cases the authors simplify complicated information, making it accessible to students; but sometimes they stumble.

On color vision defects they report, "Protanopes confuse red and orange with yellow and green. Deuteranopes confuse green and yellow with orange and red and cannot distinguish gray from purple." The differences in perception between protanopes and deuteranopes are difficult to describe, but rearranging the order of the color names is not an explanation.

Their description of laser emission is, "Laser light is coherent, a single pulse of such intensity that it will emerge from

a prism exactly as it went in." Their grasp is shaky of the Color Rendering Index (CRI), which is used to rate how accurately a particular light source renders colors that represent major color regions. They say, "A high CRI sometimes makes different colors easier to see, but standard colors may appear different than they are."

For artists there is this message, "When mixing paints, you may notice that colors are not consistent between brands. This is due to different fillers that each manufacturer uses to give the paint stability." Acrylic emulsion paints do contain stabilizers but they have no appreciable effect on the paint's color. Manufacturers do add a filler to their less expensive student lines of paint, with a loss of tinting strength; however, the main color difference between brands is due to the use of different pigments, or different versions of the same pigment.

In discussing pigments the authors report, "Some examples of new color effects are refractures (A translucent, multisurface patterning that contrasts with the color beneath it)...unobtanium (a liquid silver designed to simulate the brilliance of metallic leafing)..." This reviewer is familiar with refractive indices and refractory processes, but while both 'refractures' and 'unobtanium' pigments may exist, they are not in reference books on pigments.

Some statements must be due to oversight: "Scientists have measured all Munsell notations..."; and, "A background color of high lightness value." The authors must be among the last people on earth who believe that the disagreements between Sir Isaac Newton and Johann Wolfgang von Goethe have never been settled. Goethe misunderstood Newton's experiment and wrote a publication in 1793 to prove Newton wrong. This has been collected along with Goethe's many other treatises on color in a book that has been translated into different languages and republished several times. Many of

Continued on page 5

Celikiz Selected to Receive ISCC's Nickerson Service Award

It is with great pleasure that the Inter-Society Color Council (ISCC) announces the selection of Prof. Gultekin Celikiz to receive its Nickerson Service Award. The award will be presented during ISCC Annual Meeting at the Cleveland Airport Marriott, Cleveland, Ohio April 24-27, 2005. The presentation will take place during the ISCC's Awards Luncheon on Monday, April 24, 2005.

Founded in 1931, the Council is an organization of societies and creative individuals who work to propagate the understanding of color. The ISCC Nickerson Service Award was established in 1980 to recognize outstanding long-term contributions toward the advancement of the ISCC and its aims and purposes. The contributions may be in the form of organizational, clerical, technical, or other services that benefit the ISCC and its members. The Award is named in honor of the late Dorothy M. Nickerson, a founding member of the ISCC, its Secretary from 1938 to 1950, and its President from 1954 to 1956.

Prof. Celikiz joined the ISCC in 1959 and now becomes the 20th recipient of the Nickerson Service Award. Past recipients of the award are: Fred W. Billmeyer, Jr.; Dorothy Nickerson; S. Leonard Davidson; George B. Gardner; Harry K. Hammond, III; Ruth M. Johnston-Feller; Walter Granville; Joyce S. Davenport; Bonnie Swenholt; Terry Commerford; Allan B. J. Rodrigues; Ann Campbell Laidlaw; Louis A. Graham; Danny C. Rich; Hugh S. Fairman; Paula J. Alessi; Romesh Kumar; Ellen C. Carter; and Ralph Stanziola.

Prof. Celikiz, now emeritus, has been a faculty member at the Philadelphia University for 38 years. Celikiz received a B. S. degree from Robert College, Istanbul, Turkey, a B. S. in textile engineering from Philadelphia University and an M. S. degree from Georgia Institute of Technology. His teaching subjects include General and Physical Chemistry. He also initiated the following courses at the University: Color Science, Colloid Chemistry, Physical Chemistry of Dyeing and Instrumental Methods of Analysis.

Since 1995 Tek, as he is known to most friends, has been serving as Editor of the *ISCC News*. Also he was an active member of Problem Committee 25 – Determination of the Strength of Colorants. The committee published three reports: "A General Procedure for the Determination of Relative Dye Strength by Spectrophotometric Transmittance Measurement", "A General Procedure for the Determination of Relative Dye Strength by Spectrophotometric Measurement of Reflectance Factor", and "Reproducibility of Dye Strength Evaluation by Spectrophotometric Transmittance Measurement." These three papers along with other papers in the field of color were edited by Gultekin Celikiz and Rolf G. Kuehni and published by the American Association of Textile Chemists and Colorists, a member body of the ISCC.

Gultekin Celikiz was active in the Eastern Analytical Symposium, serving on its Board for a number of years. He was also a member of the Society for Applied Spectroscopy and the Coblentz Society.

The ISCC meets annually for project committee reports,

seminars, workshops, and lectures. In addition to general interest programs on color, the Council has three Interest Groups to present programs and establish projects of importance within specific areas of color science. These are Fundamental and Applied Color Research, Industrial Applications of Color, and Art, Design and Psychology.

Please join us in honoring Gultekin Celikiz at the ISCC Awards Banquet. To register for the ISCC Annual Meeting, please contact the ISCC Office, 11491 Sunset Hills Road, Reston, VA 20190, (703) 318-0263 - telephone; (703) 318-0514 - fax; iscc@compuserve.com - e-mail; or visit the ISCC website at <http://www.iscc.org>.

Ellen Carter

AATCC and [TC]2: Printing 2005: A Digital Reality

New York City will be the site for the 2005 Digital Printing Symposium jointly sponsored by The American Association of Textile Chemists and Colorists AATCC and the Textile/Clothing Technology Corp. ([TC]2). It will be held May 24-25 at the New School University, 65 Fifth Ave. at 13th St. Optional tours of printing facilities will be offered on May 26.

The program, chaired by Brooks G. Tippet, Pantone Inc., has been developed for brand owners, designers, digital printers, manufacturers, product developers, and retailers.

Presentation topics will include color and market trends, an overview of traditional printing, file and pattern management, digital print head technologies, fabric preparation and after treatment, digital color and design workflow, optimizing color output at printer, and finishing equipment designed for inkjet printing. Additional presentations will focus on inkjet sampling as a sales tool, inkjet printing for short run production, and user success stories.

A portion of the program will be devoted to brief infomercials from printing equipment manufacturers as well as ink and software suppliers. Thursday will feature optional tours of printing facilities where participants will see digital printing equipment in operation. Confirmed tour stops include Digital Printing Systems in Orangeburg and First2Print in New York City.

Further details will be available as additional topics and speakers are confirmed. Check for updates because they will be posted on the AATCC website, <https://www.aatcc.org/workshops/Printing2005.cfm>.

Book Review, Continued from page 4

Goethe's observations, even when not mentioning Newton, were meant to contradict Newton's work.

The Fehrmans say, "Who was right Newton or Goethe? This tough question is still controversial today" Apparently the generations of accumulating knowledge and inventions based on Newton's observations carry no weight with the authors. Goethe is immortal for his poetry, and many of his observations about color are of interest, but his theories have borne no practical fruit.

Joy Turner Luke, Studio 231

PROGRAMS

**ISCC 2005 Annual Meeting and
Special Symposium on Automotive Color and Appearance Issues
Cleveland Airport Marriott Hotel, Cleveland, Ohio
April 24-27, 2005**

ISCC 2005 Annual Meeting, April 24-25

Program Chair: Dr. Joanne Zwinkels, National Research Council of Canada

Sunday Morning, April 24

- 7:30 – 8:30 a.m.** Registration and Continental Breakfast,
8:30 - 8:40 a.m. Welcome, Joanne Zwinkels, President of ISCC
8:40 - 10:00 a.m. **Project Committee 54** on Colors of Maximum Contrast
Mr. Hugh Fairman and Mr. R. Stanzola, Chairs
10:00 – 10:30 a.m. Refreshment Break,
10:30 a.m. **Interest Group III: Art, Design and Psychology**
Ms. Marcia R. Cohen, The Atlanta College of Art, Chair
10:30 – 12:30 p.m. *"How color science helps designers to communicate,"* **Dr. Alan Robertson**, National Research Council of Canada
"Car color culture," **Sally Erickson**, Center for Creative Studies, College of Art and Design, Detroit
 TBD, Cleveland Institute of Art

Sunday Afternoon, April 24

- 12:30 – 2:00 p.m.** Lunch - on your own
2:30 p.m. Depart by bus from hotel to Cleveland Museum of Art
3:00 – 5:00 p.m. Group tour of Phillips Collection
5:00 – 7:30 p.m. Wine & Cheese reception at Cleveland Institute of Art
 Tour of Industrial Design Exhibition
7:30 – 8:00 p.m. Return by bus to hotel

Monday Morning, April 25

- 7:30 – 8:30 a.m.** Continental Breakfast
8:30 – 8:40 a.m., **Interest Group I: Basic and Applied Research**
Mr. Milt Hardt, Color Communications Inc., Chair
8:40 – 9:10 a.m. *"SAE J1545 metallic color tolerancing,"* **Jeff Alspach**, Dupont
9:10 – 9:40 a.m. *"Ultrathin aluminum pigments for waterborne coatings,"* **Guy Decelles**, Eckart
9:40 – 10:10 a.m. *"NRC Reference instrument for visual appearance characterization of gonioapparent materials,"*
Dr. Jian Liu, National Research Council of Canada
10:10 – 10:30 a.m. Refreshment Break
10:30 – 11:00 a.m. *"Investigating the effect of image size for color reproduction of cultural heritage,"*
Mahdi Nezamabadi, RIT
11:00 – 11:30 a.m. *"Accelerated acid etch for automotive clearcoats,"* **Jeffrey Quill**, Q-Panel Lab Products, and
J. Boisseau and Donald Campbell, BASF Corp.
11:30 – 1:30 p.m. **Business and Awards Luncheon, Presentation of Godlove and Nickerson Service Awards**

Monday Afternoon, April 25

- 1:30 – 1:35 a.m.** **Interest Group II: Industrial Applications of Color**
Mr. Gary Regulski, DuPont, Chair
1:35 – 2:05 p.m. *"New products for accelerated weathering of paints,"* **William Lucas**, Atlas Testing
2:05 – 2:35 p.m. *"Setting up color tolerances using color equations and visual data for auto interior polypropylene colors,"* **John Campbell**, Americhem
2:35 – 3:00 p.m. Refreshment Break
3:00 – 3:30 p.m. *"Lead-free pigments for coatings: possibilities and limitations,"* **Dr. Romesh Kumar**, Clariant Corp.
3:30 – 4:00 p.m. *"Optimizing the Saunderson Coefficients based on measurement geometry,"* **Yoshio Okumura**, RIT
4:00 – 4:30 p.m. *"Quinacridone pigments: synthesis and use in automotive coatings""* **Daphne Rice**, Sun Chemical

**ISCC Special Symposium on
Automotive Color and Appearance Issues
April 26-27, 2005**

Symposium Chair: Mike Henry, PPG

Tuesday Morning, April 26

- 7:30 – 8:30 a.m.** Registration and Continental Breakfast
Vendor Fair (Superior/Erie Room)
- 8:30 – 8:40 a.m.** Welcome
M. Henry and J. Zwinkels
- 8:40 – 9:10 a.m.** “Automotive color measurement overview,” **Jeff Alspach**, Dupont
- 9:10 – 9:40 a.m.** “New application technologies’ impact on color and appearance,” **Vince Dattilo**, PPG
- 9:40 - 10:10 a.m.** **Poster Paper Plugs**
- 10:10 – 10:30 a.m.** Refreshment Break and Vendor Fair
- 10:30 – 11:00 a.m.** “Advances in aluminum pigment,” **Russ Ferguson**, Silberline
- 11:00 – 11:30 a.m.** “Can we measure what we see? If you cannot measure it, how do you know it is real?”
Jon Nisper, X-Rite
- 11:30 – 12:00 p.m.** “Color evaluation between different materials: “What do you mean I can’t use numbers?”
Christine Utter, GE Plastics
- 12:00 – 1:30 p.m.** Lunch on your own

Tuesday Afternoon, April 26

- 1:30 – 1:35 p.m.** Welcome Back
Mike Henry, PPG
- 1:35 – 2:05 p.m.** **Keynote Presentation:**
“Color and the World of Automotive Interiors: Realities of the Automotive Business and What That Means for Color Professionals,” **Beth Miakinin**, GM
- 2:05 – 2:35 p.m.** “Visual appraisal: new light booth design,” **Dave Albrecht**, GTI Lighting
- 2:35 - 3:35 p.m.** **Poster Paper Session**
Refreshment Break and Vendor Fair (Superior/Erie Room)
- 3:35 – 4:45 p.m.** **Panel Discussion: Problems and Issues Forum**
Invited speakers from morning session
- 4:45 – 5:00 p.m.** **Announcement of Poster Paper winners**
Mike Henry, PPG: and J. Zwinkels, NRC

Wednesday Morning, April 27

- 7:30 – 8:00 a.m.** Continental Breakfast
- 8:00 – 8:10 a.m.** Welcome
Mike Henry, PPG
- 8:10 – 8:40 a.m.** “Effect color formulation,” **Henri Debar**, IsoColor
- 8:40 – 9:10 a.m.** “Color measurement of interference pigments,” **Dr. Werner Rudolf Cramer**
- 9:10 – 9:40 a.m.** **Keynote Presentation:**
A new approach for car coatings appearance prediction from neutral networks to 3D visualization,” **Christophe Dauga**, Color Viz
- 9:40 – 10:00 a.m.** Refreshment Break
- 10:00 – 10:30 a.m.** “Formulating with opaque color shifting interference pigments using additive color theory,”
Kent Coulter, Flex Products
- 10:30 – 11:00 a.m.** “Interference color measurement,” **Dr. Gerhard Roesler**, Gretag Macbeth
- 11:00 – 11:30 a.m.** “Effect pigments instrumentation - a review and projection”, **Jack Ladson**
- 11:30 a.m.** Symposium adjournment
Mike Henry, PPG

Color Research and Application

In This Issue, April 2005

It is with sadness that we open this issue with a memorial to Fred W. Billmeyer, Jr., founding editor of this journal. He died peacefully December 12, 2004 after a long battle with Parkinson's disease. Since he was my Ph. D. advisor and mentor, I personify one of the more than 1000 people in color science, who have been touched in a special way by Professor Billmeyer. I am honored to have known him.

Principal component analysis is a tool that has been used in color technology for over 50 years. But like many other items, it was borrowed from engineering disciplines. Thus many color professionals have not studied this technique. For this reason, we open this issue with "A Review of Principal Component Analysis and its Application to Color Technology" by Di-Yuan Tzeng and Roy S. Berns. In this review, principal component analysis is described. Then Drs. Tzeng and Berns present examples of its use for colorant estimation, spectral data reduction, and defining multi-dimensional confidence regions for colorimetric scatter data.

Our next two articles evaluate appearance issues. A number of color appearance models were developed and extended during the 80s and 90s. Two that have been discussed widely in this journal are the Nayatani model and the Hunt model. A more complete collection of models is included in the book *Color Appearance Model* by Mark Fairchild. In 1997 the CIE technical committee compromised on two models CIECAM97 (s) for simplified and (c) for complex. Both of these models combined many ideas from the earlier models into one more unified approach. As people began using the CIECAM97s, users found that even for the simplified model, they needed more guidance on the values of parameters for certain common situations. Last year CIE Division 8 published its first technical report, which describes a simplified color appearance model for use with color management systems. Known as CIECAM02, this color appearance model is a simplified version of CIECAM97s that deals with a number of shortcomings in the CIECAM97s model such as reversibility. In "Testing the Robustness of the Forward and Reverse Modes of CIECAM02," C. J. Li and M. Ronnier Luo discuss the robustness of the forward and reverse modes of the model.

While the CIECAM97s model is appropriate for many color management situations, there are times when the conditions are more extreme and require parameters not adjustable in the CIECAM97s. In particular, the CIECAM97s model does not include rod responses. Thus for light levels where rods play an important role, it may not be the best choice. For these situations one might use one of the earlier models. The next article, "An Evaluation of the Hunt94 Color Appearance Model under Different Light Sources at Low Photopic and Low Mesopic Light Levels" examines one of the earlier models under more extreme conditions. The authors, Lei Deng, Linsheng Chen and Mark S Rea, applied three modifications to the Hunt94 model to improve the predictions at a

photopic light level of 10 cd/m², but were still unable to predict color appearances at low mesopic light levels such as 0.1 cd/m².

For our next article we take a new look at the basics. Readers are aware that there are three primary factors that influence the colors we perceive. Three factors are the illumination, the material, and the observer's response functions. When any one of these factors changes, the perception of a colored material changes. Therefore if one is trying to have two materials or colored objects match under all conditions, it is ideal to have a spectral match. This is often not possible. For consistent response manufacturers seek to minimize unwanted changes by selecting colorants for products that limit metamerism. In this article, "Design and Study of a Color Sensitivity Function," the authors, Xichang Wang, Yanjun Gong, and Dongcao Song, model three kinds of functions that can be used to determine how sensitive a colored material will be to a change in illuminant or observer.

Color pictures made with inks or paints are susceptible to change over time because part of the incident light is absorbed into the material to produce the colored effect. Our next article, "Color Pictures Using Dielectric Films" describes a different way of producing colored images by using a thin dielectric film on a reflective surface. Besides being resistant to color degradation, these images are particularly difficult to copy since they are created using interference rather than the more typical light absorbing colorants. Thus they are useful for security applications. Aaron Hawkins, Ran Wang, Ghassan S. Sanber, Joshua L. Beutler, and Stephen M. Schultz describe the principles behind dielectric images and outline how they were fabricated on a silicon substrate. They also evaluate a full-color image on a silicon wafer.

While the Munsell color system was widely used for the whole twentieth century, another color order system used by architects, designers, and other individuals is known as the RAL Design system. This system, developed by the German Institute for Quality Assurance and Labeling (RAL), is embodied in the *RAL Design Color Atlas*. Readers of this journal may not be as familiar with the RAL System as the Munsell system. Thus in our next article, "Location of Munsell Colors in the RAL Design System," Leyla Öztürk introduces this system. Since there is no practical conversion between the RAL and Munsell systems, it would be useful to determine the RAL equivalents of certain Munsell colors so that one could express Munsell colors using the nomenclature of the RAL Design System and to investigate the possibility of the usage of the adjectives of the Munsell Color system in the RAL Design system also.

Staying in the area of interior design for our next article, H. S. Lee, S. J. Chang, and E. J. Kim describe the "Formulation of Interior Design Color Palette Based on the Regression Analysis of Digital Color Samples." With more and more design work being done on computers, the CMYK digital color model has come into widespread use. In this article the authors explore a methodology for producing custom color palettes for specific design projects.

Continued on page 9

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In the December 2004 issue of this journal Raphael Huertas and his co-authors, A. Yebra, M. M. Pérez, M. Melgosa, and A. I. Negueruela contributed an article on the color variability of wine in a wine glass. This article generated discussions, which are included in the Communications and Comments section of the current issue. Ralph Pridmore submitted the communication, "Color Variability of Wine in a Glass, and General Comments on Contrast Effects." Then R. Huertas, M. Melgosa, and A. I. Negueruela respond with more discussion and additional data in "Color Coordinates of Wine Samples with Different Thicknesses."

We close this issue with three book reviews. Rolf Kuehni reviews the *Science of Color, 2nd Ed.* edited by Shevell. Rajeeb Ramanath discusses *Computational Colour Science Using MATLAB* by Westland and Ripamonti, and Elaine Becker tells us about the 7th Edition of *ASTM Standards on Color and Appearance*.

Ellen Carter, Editor
Color Research and Application

IS&T Archiving 2005

April 26 - 29, 2005

Hilton Washington Hotel, Washington DC

More than 60 technical papers arranged in a single-track format will promote the exchange of information across various specialties. The three-day conference program, chaired by Robert Buckley (Xerox) and Franziska Frey (RIT), features invited presentations and peer-reviewed papers by recognized experts with extensive experience in this field. Techniques for preserving, cataloging, indexing, and retrieving images and documents in both digital and human readable format are subjects to be covered in detail. Archiving 2005 will benchmark systems that might be in place to preserve our digital and hardcopy information for the future, as well as identify those areas where systems and technology are not yet up to the task and further research is of high priority. Accordingly the interfacing of digital and hardcopy preservation strategies, issues of format obsolescence, and storage media technology are of particular interest.

The meeting will build on the success and the enthusiasm created by last year's Archiving conference and confirms the timeliness and relevance of this meeting designed to bring together a diverse group of attendees from academia, industry, museums, libraries, government institutions, and not-for-profit organizations.

Each day begins with a keynote address:

- Wednesday - Deanna Marcum, associate librarian for library services, US Library of Congress, "The Views of Archiving from the Library of Congress"

- Thursday - Clifford A. Lynch, executive director Coalition for Networked Information, "Archiving, Stewardship, Curation: From the Personal to the Global Sphere;"

- Friday - Helen Shenton, head of Collection Care, British Library, "Real Time, Deep Time, Life Time—Spanning Digital and Traditional Collections Life Cycles"

Oral papers are grouped around current themes such as, Rethinking Repositories, Hard Copy Permanence, Imaging and Digital Imaging, Digital Archiving: Metadata, Formats for Digital Archiving; and Migration: Methods and Tools. Special Focal Papers and Case Studies sessions promise to be highlights of the meeting. The conference will end on Friday with a special session on "Breaking News from the Multi-million Book Projects."

The Interactive Poster Session on Thursday afternoon will provide the opportunity for presenters and attendees to mingle and discuss results presented using a variety of media formats.

Eleven tutorials will be offered in 3 tracks on Tuesday, the day prior to the opening of the papers program. Attendees may choose to follow a single track all day or personalize their course program to meet their individual educational or professional needs.

Details including paper abstracts, tutorial course descriptions, and meeting and hotel reservation forms are available at www.imaging.org

ISCC 2005 Annual Meeting Hotel Information

Marriott Cleveland Airport

4277 West 150th St.

Cleveland, Ohio 44135

Tel: 216-252-5333 Toll-Free: 1-800-228-9290

<http://www.marriott.com>

Cost: \$85 per night; Attendees should mention ISCC or the Inter-Society Color Council

Directions for Travel From Cleveland Airport (CLE) to Hotel

- 1-216-265-6000
- Hotel direction: 2 mi NE
- Driving directions: Take I-71 North to West 150th St. Exit.
- Bus service, fee: 12 USD (one way)
- Subway service, fee: 1 USD (one way)
- Estimated taxi fare: 12 USD (one way)

Color Association's Forecasting for Interiors 2006-2007

During a recent forecasting committee meeting, there was a strong emphasis on hard surfaces and a growing preference for shine and gloss. Thus, the brilliant effects of enamel are likely to more and more make it a hot commodity. Kiln Enamel, a Brooklyn enterprise, is already making hipsters take note with their stylish collection of jewelry and home accessories.

CALENDAR

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

Ms. Cynthia Sturke
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11491 Sunset Hills Road, Reston, VA 20190
703-318-0263 tel 703-318-0514 fax
iscc@compuserve.com website: <http://www.iscc.org>

2005

- Mar 7-11** **ASPRS 2005 Annual Conference**, Baltimore, Maryland, <http://www.asprs.org/baltimore2005/index.html>
- Mar 9-10** **AATCC and IFAI's Outdoor Performance Materials 2005**, Hilton University Place, Charlotte, NC, 919-549-8141, www.aatcc.org
- March 15-17** **Color Technology and Design, Detroit Colour Council, Detroit, MI**, <http://www.detroitcc.org/>
- April 7-11** **NAPIM Convention** - Hyatt Coconut Point, Bonita Springs, FL, <http://www.napim.org/>
- April 12-14** **IESNA Trade Show and Conference**, J. Javits Convention Center, New York, NY, www.LIGHTFAIR.com
- April 17-20** **TAGA 2005 Toronto**, Marriott Eaton Centre Hotel, Toronto, Ontario, Canada, 412-268-2313, www.taga.org/images/150-7.jpg
- April 20-22** **CPMA's 2005 International Color Pigments Conference: Innovation in Color Technology**, Hyatt Regency, Baltimore, MD, 703-684-4044, <http://www.pigments.org>.
- April 24-27** **ISCC 2005 Annual Meeting and Symposium, "Automotive Color and Appearance Issues,"** Cleveland, OH, 703-318-0263, www.iscc.org.
- April 26-29** **IS&T Archiving Conference**, Radisson Hotel Old Town, Alexandria, VA, 703-642-9090, <http://www.imaging.org/conferences/archiving2005/>
- Apr 29-May 3** **CMG's Spring International Conference**, Baltimore, Maryland, USA, 703-329-8500, http://www.colormarketing.org/visitors/cmg_events/cmg_events.htm
- May 3-5** **AATCC Spring Committee Meetings**, Radisson Inn-RTP, Research Triangle Park, NC, 919-549-8141, <http://www.aatcc.org/>
- May 8-13** **AIC 05 Granada, 10th Congress of the International Colour Association AIC Colour 05**, Conference and Exhibition Centre, www.ugr.es/local/aic05
email: eurocongres@eurocongres.es.
- May 10-12** **CORM 2005, Challenges in Radiometry and Photometry: Identifying and Overcoming the Challenges facing Industry in the Measurement of Optical Radiation**, NIST Boulder, Boulder, CO, 319-295-4340, www.CORM.org.
- May 9-11** **Philadelphia Society for Coating Technology, The Eastern Training Conference and Show – 2005**, King of Prussia, PA. Contact Wayne Karus, wkraus@ptd.net.
- May 12-21** **CIE Divisional and Technical Committees Meetings, Lighting in the XXI Century**, Leon, Spain, email: leon05@ceisp.com.
- May 18-20** **Research Methods in the 21st Century: A Toolkit for Competitive Advantage**, Federation of Societies for Coatings Technology, New Orleans Marriott, New Orleans, LA, 610-940-0777, <http://www.coatingstech.org/>
- May 23-26** **IS&T Beijing International Conference on Imaging: Technology and Applications for the 21st Century**, Fragrant Hill Golden Resources Commerce Hotel, Beijing, China, 703/641-9090, <http://www.imaging.org/conferences/beijing/index.cfm>
- May 24-25** **PRINTING 2005: A DIGITAL REALITY**, a symposium sponsored by AATCC and [TC]2 at the New School University, 65 Fifth Ave. at 13th St., 919-549-8141
<http://www.aatcc.org/>
- June 15-17** **ASTM E12, Color and Appearance**, Hilton Reno Resort; Reno, NV, www.astm.org

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|------------------|--|
| Oct 4-5 | Color Technology , Detroit Colour Council, http://www.detroitcc.org/calendar.htm |
| Oct 6-7 | VEHICLE DISPLAY 2005, 12th Annual Symposium on Vehicle Displays , SID, Dearborn, Michigan, 408-977-1013, http://www.sid.org/ |
| Oct 14-18 | CMG's Fall International Conference , Color Marketing Group, Vancouver, British Columbia, Canada, 703-329-8500, www.colormarketing.org |
| Oct 25-27 | 2005 AATCC International Conference & Exhibition , Hyatt Harborside, Boston, MA, 919-549-8141, http://www.aatcc.org/ |
| Nov 11-12 | ISCC/IS&T Special Topics Meeting, "Precision and Accuracy in the Determination of Color in Imaging," Scottsdale, Arizona, 703-318-0263, http://www.iscc.org |
| 2006 | |
| Jan 22-25 | ASTM E12, Color and Appearance , Embassy Suites Hotel, Ft. Lauderdale, FL, (610) 832-9585, www.astm.org |
| Apr 7-11 | CMG's Spring International Conference , Color Marketing Group, Denver, Colorado, 703-329-8500, www.colormarketing.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, Editor, papers given at technical sessions.

..... \$75*

Guide to Material Standards and Their Use in Color Measurement (ISCC TR-2003-1). The Guide, developed by ISCC Project Committee 51, provides an introduction to material standards and their use for the standardization of color measuring instruments.

..... \$50*

*Plus shipping and handling

Spot the Spaceship

The idea of a cloak of invisibility that hides objects from view has long been confined to the more improbable reaches of science fiction. But electronic engineers have now come up with a way to make one. Nature News (online 28 Feb 2005) reports that Andrea Alù and Nader Engheta of the Univ. of Penn. say that a 'plasmonic cover' could render objects "nearly invisible to an observer." Their idea remains just a proposal at this stage, but it doesn't obviously violate any laws of physics, the article continues. The referenced paper is at <http://arxiv.org/abs/cond-mat/0502336>.

For Sale, Painting by Birren

The painting by Faber Birren, which was reproduced in his article "A Sense of Illumination" in Color Research and Application, Volume 2, Number 2, Summer 1977, page 73, is available for sale. The owner, Allan Wittman, (then Publisher of the Wiley-Interscience journals) bought it from the artist. If you know anyone interested, contact ALLANWITTMAN@JUNO.COM or call (516) 791-3779.

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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Mar/Apr 2005

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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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| Ciba Specialty Chemicals | www.cibasc.com | 302-633-2042 |
| Color Communications, Inc. | www.ccicolor.com | 773-638-1400 |
| DuPont Performance Coatings | www.dupont.com | 248-583-8345 |
| Flex Products, Inc. | www.colorshift.com | 707-525-7337 |
| GretagMacbeth, LLC | www.gretagmacbeth.com | 800-622-2384 |
| Hewlett-Packard Company | www.hp.com | 650-857-6713 |
| Hunter Associates Laboratory, Inc. | www.hunterlab.com | 703-471-6870 |
| IsoColor Inc. | www.spc-software.com | 201-935-4494 |
| Konica Minolta | www.konicaminolta.us | 201-574-4000 |
| Labsphere, Inc. | www.labsphere.com | 603-927-4266 |
| Pantone, Inc. | www.pantone.com | 201-935-5500 |
| PPG Industries, Inc. | www.ppg.com | 724-274-3532 |
| Prime-Color, Inc. | watprime@hotmail.com | 908-272-5759 |

ISCC Member Bodies

American Association of Textile Chemists and Colorists (AATCC)
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American Society for Photogrammetry & Remote Sensing (ASPRS)
The Color Association of the United States, Inc. (CAUS)
Color Marketing Group (CMG)
Color Pigments Manufacturing Association (CPMA)
Council on Optical Radiation Measurements (CORM)
Detroit Colour Council (DCC)
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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ISCC 2005 Annual Meeting & Special Symposium on Automotive Color and Appearance Issues

Cleveland Airport Marriott

Cleveland, OH

April 24 - 27, 2005

| Registration Fees: (USD) | Until Mar 15 | After Mar 15 |
|---|--------------------------------|--------------------------------|
| ISCC Annual Meeting Only, April 24-25 Includes Annual Mtg, Wine & Cheese Reception, Awards Luncheon, Continental Breakfasts and Breaks. | \$325 <input type="checkbox"/> | \$350 <input type="checkbox"/> |
| Symposium Only, April 26-27 Includes Symposium, Continental Breakfasts and Breaks | \$225 <input type="checkbox"/> | \$250 <input type="checkbox"/> |
| ISCC Annual Mtg & Symposium, April 24-27 Includes all Sessions, Wine & Cheese Reception, Awards Luncheon," Continental Breakfasts and Breaks. | \$525 <input type="checkbox"/> | \$550 <input type="checkbox"/> |
| Students (must have valid student ID-copy included with registration) Annual Mtg <input type="checkbox"/> Symposium <input type="checkbox"/> Annual Mtg & Symposium <input type="checkbox"/> | \$100 <input type="checkbox"/> | \$100 <input type="checkbox"/> |
| Exhibit Table (*includes 1 full registration to Annual Mtg & Symposium) | \$800 <input type="checkbox"/> | \$825 <input type="checkbox"/> |
| Exhibit Table (**includes 1 registration to Symposium only) *Full Registration Fee includes attendance to all Sessions, Wine and Cheese Reception, Awards Luncheon, Continental Breakfasts and Breaks. **Includes Symposium Sessions, Continental Breakfasts & Breaks. | \$500 <input type="checkbox"/> | \$525 <input type="checkbox"/> |

Cut-off Date for registration: April 14th, 2005. No refunds after this date.

On-site registration will be available.

Last Name/ First Name _____
 Badge Name _____
 Affiliation _____
 Address _____
 City _____ State _____ Country _____ Postal Code _____
 Tel. (Include Int'l Code) _____ Fax: _____
 E-Mail _____ Country of Citizenship _____
 Accompanying Person (s) _____

Accompanying Person(s) Registrations: (Not entitled to attend sessions)

Wine and Cheese Reception, April 24th Evening \$ 20

ISCC Annual Awards Luncheon, April 25th \$ 30

Total Amount Due \$ _____ **USD**

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For further information and meeting updates, please check our website: www.iscc.org