



Inter-Society Color Council News

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November/December 2003

President's Column

The fall is rapidly disappearing behind us in the stream of time. The orange and black of Halloween is being replaced by the browns and grays of early winter. As I write this, the annual Color Imaging Conference is in full swing. There have been many excellent papers and tutorials. Your Secretary, John McCann, and I are meeting with the staff of the IS&T to develop plans for the ISCC to hold a special topics meeting in conjunction with the Color Imaging Conference in 2005 in early November. The ISCC has been an endorsing society for this conference since its inception but this will be the first time that we have actively supported the conference. Our meeting will be a little shorter than a normal Williamsburg-type meeting, about 1 ½ days and will likely focus on the requirements and uncertainties of color measurements of images. This topic will capitalize on the new information disclosed at our 2004 annual meeting.

Speaking of the 2004 annual meeting – plans for it are coming along. You should see a call for papers in this issue of the Newsletter and in your favorite trade journals early next year. The meeting is a joint meeting with the Council on Optical Radiation Measurement (CORM). The meeting is going to be held at the National Institute for Standards and Technology in Gaithersburg, MD. It is a really attractive campus filled with some of the top research personnel in the world. The meeting will last a whole week with the ISCC Interest Groups holding their meetings first, a joint poster session and project committees in the middle and the CORM conference the latter part of the week. If you stay for the whole week, then NIST is opening their labs for a self-guided tour on Friday afternoon. They will show us all of their instruments and how they develop and certify reference materials. What a terrific opportunity to meet and quiz the people who influence the colorimetry standards we rely on every day.

Continued on page 2

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There is one aspect of the 2004 meeting that will be somewhat different from a typical ISCC or CORM meeting – SECURITY. U.S. citizens may be able to register at the last minute but members from outside of the USA will not. So – start making plans to get your registration and company permissions early in the next year. There will be a mailing with registration forms and the ISCC will still take credit card registrations so give the ISCC Office a call or email and get the ball rolling as soon as possible. You will find the phone numbers and email addresses in the back of this Newsletter.

I hope that you are watching for the details of the Williamsburg-like meeting at the Fashion Institute of Technology / SUNY in New York Oct. 22-24, 2004. The general topic will be color in design and color psychology. I do not have a final program but the venue looks great.

I hope the end of the year and winter holidays are colorful as always.

Danny Rich, President of ISCC

ISCC 73rd ANNUAL MEETING

Gaithersburg, MD, May 10-12, 2004

The 2004 ISCC Annual Meeting, to be held May 10-12 at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD, is taking shape nicely, according to Danny Rich, ISCC President. The theme of the symposium is "Advances in Measurement Science for Color and Appearance." One of the highlights of the meeting is the joint poster session with CORM (Council for Radiation Measurements) Tuesday afternoon (May 10). ISCC Interest Groups will hold sessions all day Monday and Tuesday morning — please see the call for papers from the Interest Group Chairs elsewhere in this newsletter. Project committee meetings will be on Wednesday, May 12, and CORM meetings will be held May 12-14 at NIST, with a NIST laboratory tour on Friday afternoon.

The Awards Banquet will be held Monday evening and a wine and cheese reception will be held on Tuesday. Please mark your calendars and plan to attend. Additional information will appear in subsequent newsletter and will soon be found on the ISCC web site (www.ISCC.org).



-- CALL FOR PAPERS --
ISCC ANNUAL MEETING SYMPOSIUM

MAY 10 AND 11, 2004, Gaithersburg, MD

INTEREST GROUP I
BASIC AND APPLIED RESEARCH
The Role of Standards in Color

Join Dr. Joanne Zwinkels of the National Research Council of Canada in presenting your 30 minute paper.

Reserve your time following Dr. Zwinkels talk, "Development of the NRC Reference Goniospectrophotometer."

Send one-page abstracts of new research efforts dealing with the session's theme, "The Role of Standards in Color"—or more broadly, on research in all aspects of color, including new instruments, new research applications of existing instruments, and optical models.

Please send your abstract by January 31, 2004 to:

Milt Hardt, Chair, at milhar@ccicolor.com,
for questions call 773-475-2576, or

Milt Misogianes, Vice Chair, at
milt.misogianes@cibasc.com.

INTEREST GROUP II
INDUSTRIAL APPLICATIONS OF COLOR

Interest Group II presents technical challenges and solutions that various industries encounter in commercial color applications. Abstracts are being solicited for papers to be presented at the May 2004 Annual Meeting. Topics can include, but are not limited to: color reproduction, color management, quality control techniques and color tolerancing, measurement techniques, color matching, the relationship between color and other physical characteristics, or other color related industrial applications.

Please send your abstract by January 31, 2004 to:

Gary Regulski, Chair
DuPont Performance Products
945 Stephenson Highway
Troy, MI 48083
248-583-8525 Fax: 248-583-8316
gary.j.regulski@usa.dupont.com

INTEREST GROUP III
ART, DESIGN & PSYCHOLOGY

Translating Color Standards from Designer to Colorist and Back to Designer

How can the use of color standards assist Designers and Product Developers in making timely color decisions without additional stress? How can Colorists use color standards to produce colors and get approvals more quickly? We all know that color can either make or break a sale. Better color communication can assure a positive outcome. Without it, all the accurate instrumentation is meaningless. Why, because if it does not visually match, it is wrong. John A. Darsey, Jr., Vice President of Sales for Color Solutions International, will address some of these issues in his presentation "Setting the Standard Color or Getting the Color that you Originally Wanted." John served as President of the American Association of Textile Colorists and Chemists from 2001 to 2002. Currently, he serves as Chairman of the AATCC Concept to Consumer (C2C) Committee.

Please send abstracts for additional papers on these topics by January 31, 2004 to either:

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SPECIAL JOINT POSTER SESSION WITH CORM -- May 11, 2004

You also are invited to submit an abstract for the poster session to be chaired by Karen Braun, Xerox Corp., on any topic described in the Interest Groups' Calls for Papers above, which might be better represented in poster or interactive format. Please submit the abstract by January 31, 2004 to Karen Braun at kbraun@crt.xerox.com. For questions call 585-422-6380.

ISCC Welcomes New Members

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ISCC Member News

-- Awards --

Jean Bourges, president and CEO of Bourges Color International. Bourges was awarded the 2003 Naomi Berber Memorial Award. This award is given to a woman with a unique lifelong devotion to and passion about color communication in the graphic arts process. Established in 1976 by the Society of Fellows (SOF) of the Graphic Arts Technical Foundation (GATF), the Berber Award recognizes the contributions of women to the printing and graphic arts industry. To date, it remains the industry's only award that specifically honors women's achievements. To view the full press release, please visit http://www.gain.net/PIA_GATF/newsroom/archives/g1003f.html.

Three ISCC members received special recognition during the IS&T Nov. 2003 meeting in Phoenix. See <http://www.imaging.org/membership/> for press releases.

John J. McCann received the Edwin H. Land Medal in recognition of his long standing commitment to vision, research and to Retinex theory. He collaborated with Edwin H. Land in the initial Retinex formulation, and he has achieved efficient implementations, giving support to many scientists involved in Retinex-related technologies. The award is given in alternate years by IS&T and the Optical Society of America and recognizes an individual who has demonstrated from a base of scientific knowledge, pioneering entrepreneurial creativity that has had major public impact. John was with Polaroid from 1961-1996 and currently consults on the theory of colorimetry, color appearance and image processing (McCann Imaging).

Two members received a Fellowship. A Fellowship is awarded to a Regular Member for outstanding achievement in imaging science or engineering.

Mark D. Fairchild was awarded a Fellowship for leadership in the development of color appearance models and the standardization of color management systems. Mark is a Professor of Color Science and Imaging Science and Director of the Munsell Color Science Laboratory in the Chester F. Carlson Center for Imaging Science at the Rochester Institute of Technology.

Gabriel Marcu was awarded a Fellowship for his co-leadership of the Electronic Imaging Symposium Color Imaging Conference, his service on the organizing committees of other IS&T conferences, and his numerous contributions as instructor at many IS&T conferences. Gabriel was with Research Institute of Computers, in Romania, and with Graphica Computer Corporation and Array Corporation in Japan working on various projects on image and color processing. Since 1996 he is a senior scientist in the ColorSync Group at Apple Computer, Inc.

Request for Macbeth Award Nominations

The Inter-Society Color Council's Macbeth Award was established to honor the memory of Norman Macbeth and is presented biennially in recognition for one or more recent, outstanding contributions to the field of color. Those contributions shall have advanced the field of color, interpreted broadly as in the objectives of the ISCC. A candidate's merit shall be judged by his or her contributions to any of the fields of interest related to color whether or not it is represented by a Member-Body of the ISCC. While a nominee for the Macbeth Award need not have been active in the affairs of the ISCC, he or she must be a member or former member of the ISCC. If you would like to nominate a person for this award, please send a letter or e-mail detailing the candidate's contributions to:

Dr. Joanne C. Zwinkels
National Research Council of Canada
Inst. for Nat'l Measurement Standards
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Ottawa, ON K1A 0R6 Canada
Tel: 613-993-9363
Fax: 613-952-1394
Joanne.zwinkels@nrc.ca

Please include the nominee's name, address, professional affiliation (company or institution, if any), title and any other information that will help judge the candidate's merit. **Nominations must be received by December 15th, 2003.**

Correction to Hemmendinger's Obituary

The address of the Nature Conservancy (to whom donations were invited) was incorrect in the Sept/Oct ISCC Newsletter. The correct address is 4245 N. Fairfax Drive, Arlington, VA 22203.

Color Research and Application In This Issue, December 2003

Our first two articles relate to how we observe our environment. We use many visual cues to reveal information about the world around us – the shapes of objects, materials used, etc. Usually this is done unconsciously (we don't stop to analyze how we determine the clues). However, built into this analysis is an implicit assumption about the illumination that is allowing us to see the objects in our environment. We expect that the lighting is similar to light, which we have previously experienced, usually daylight or broadband lighting. This is not necessarily true. All light is not created equal. Two lights may have the same chromaticity, i.e., seem to be the same color, but due to spectral differences they may reveal colors of objects very differently. James A. Worthey leads off this issue by introducing and discussing the topic of "Color Rendering." This is the first article of several and has the subtitle "Asking the Question." A second article on this topic will follow in the next issue.

After lighting, let's consider position. Most of our attention is focused on the point at which we gaze. In this way we center the input to our visual system on the fovea of our eyes. We know that foveal vision is rich in cones; thus we will see color well when there is enough light. However, we also know that peripheral vision is important. The edges of our visual field provide important cues for warning and alerting us to changes in our environment. This could be signals of danger such as a tiger ready to pounce or more likely in the modern world a truck approaching on a side road. We know that perception of motion is important in the periphery, but what about other visual parameters? How much of a role does color play in this rod-rich peripheral vision? Miyoshi Ayama and Masato Sakurai examine "Changes in Hue and Saturation of Chromatic Lights Presented in the Peripheral Visual Field." While not the first to use the term "color zone map," in this article Drs. Ayama and Sakurai develop a series of color zone maps, in which the color appearance is plotted as a function of position in the visual field.

We often discuss color difference metrics, evaluation, and tolerancing in this journal. The most recent metric proposed by a technical committee of the International Commission on Illumination (CIE) is for industrial color differences. Generally we understand industrial color

control to involve the comparison of two simple patches of uniform color such as a product standard and a production batch for quality control. This particularly applies to industries making colored products such as textiles, coatings and plastics. However, there are many other industries such as graphic arts, color reproduction, and imaging where the color evaluation must be made on the overall appearance of an entire complex field rather than comparing two simple patches. In Division 8 of the CIE a technical committee (TC 8-02) has been working on evaluating and implementing an image color-difference metric. In the "Top Down Description of S-CIELAB and CIEDE2000," Garrett Johnson and Mark D. Fairchild provide an overview of spatial filtering combined with CIEDE2000. They discuss: 1) the benefits and pitfalls of performing the filtering in the spatial domain or the frequency domain, 2) data reduction, and 3) comparison of results of three existing color difference formulae for different viewing conditions.

From comparing colors in images, we move to an even more complex situation where we compare images with physical objects. One example where this situation might occur is when we compare an item of clothing that we have ordered via the internet with the image on the website. In this case there may be differences in the color temperature of the ambient illumination and the white point of the display, but also there are differences in illuminance levels, etc. Looking at either the image or the clothing would lead to a different state of adaptation of your visual system, and quickly switching the gaze between the two leads to incomplete adaptation to either one. Suchitra Sueeprasan and M. Ronnier Luo report on "Applying Chromatic Adaptation Transforms to Mixed Adaptation Conditions."

Our first four articles generally dealt with aspects of how we see and evaluate color. The last four articles deal with the color produced in various situations: two on displays or monitors, one on printers, and one on color in wine glasses.

In our next article, Masato Tsukada, Johji Taijima, and Hirohisa Yaguchi evaluate the color matching performance of color models on two CRT monitors with very different white points. They went on to evaluate between the CRT and color printer. In particular they apply the basic concept of color constancy to color matching in human vision using a spectral properties estimation model

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(SPEM). In the article, "Evaluation of Color Matching Performances for SPEM and Other Models" Tsukada, Tajjima, and Yaguchi describe the subjective experiments and the results obtained.

Staying with the topic of CRT monitors, at optimum brightness levels CRT monitors generally have a simple relationship between DAC (digital to analog converter) count and luminance. However, the optimum brightness level varies by monitor and it is up to the user to discover the optimum level. In our next article, "Fabrication of Brightness Optimizer for CRT Color Monitors," Hong-suk Kim, Seung-ok Park, and Sung-hyun Kim report on the process of making a simple device to optimize the brightness. This device consists of a sensor package and an electric signal processing board. Since the optimum brightness level of a monitor changes with changes in the video generator, the applied voltage, as well as with aging, the brightness level must be optimized periodically. The authors expect that following the procedures described in this article will enhance the use of calibrators and accuracy of colors produced. The repeatability and accuracy in measurement of the optimum brightness level for three different CRT monitors is evaluated.

Keeping within the broad category of color reproduction, but moving from imaging to printing, our next article deals with "Color Printer Characterization Adjustment for Different Substrates." Several factors, including substrate and inks used, printer drift and location-sensitivity, can influence a printer's response and consequently the colors produced. Some of these factors are systematic, and some not. Therefore, in order to print colors with accuracy it is necessary to characterize the printer with the inks and substrate being used. If one then changes to a different printing substrate, it is necessary to re-characterize the printer. This can be costly and time-consuming. The alternative of ignoring the change of substrate is generally unsatisfactory. Thus Mark Shaw, Gaurav Sharma, Raja Bala, and Edul N. Dalal propose a modified approach in which there is one complete characterization and then a small number of measurements for each new substrate.

For the last article let's take a look at wines. While taste is the most important parameter for the quality of wine, wines are also judged on color, clarity, and general appearance. Customer preference is a key issue in determining price. For example, how the color changes with thickness in a wine glass is important to the overall ap-

pearance. Unfortunately often the correlation between visual and instrumental color measurement of wines is not very high. Thus the use of a standard wine sampler can improve consistency. Careful measurement techniques have been developed to enhance the correlation. In the last article in this issue, "Color Variability for a Wine Sample Poured into a Standard Glass Wine Sampler," R. Huertas, A. Yebra, M. M. Pérez, M. Melgosa, and A. I. Neguenuela examine the changes in colorimetric components of three types of wines in a glass wine sampler. Their goal is not to develop a new method for color measurement of wine samples, but rather to find a quantitative description of the color changes that can be perceived when the standard conditions are employed. There are large variations of color between different points in the wine sample as viewed in the sampler. However, the authors conclude that hue, which is the main color attribute considered by observers, is nearly constant in the wine sampler.

We close this issue and the journal year with three book reviews, two publications briefly mentioned, one meeting report and the annual index. The first two books reviewed are written in Spanish. Eugene Martinez-Uriegas discusses *Fundamentos de colorimetría* edited by Capilla, Artigas, and Pujol, and Javier Romero tells us about *Tecnología del Color* edited by Artigas, Capilla and Pujol. Then Michael Brill brings another book, *In the Blink of an Eye* by Andrew Parker to our attention. Two CIE publications are briefly mentioned: Publication 151 - Spectral Weighting of Solar Ultraviolet Radiation and x025:2003 Proceeding of the CIE Symposium '02 on Temporal and Spatial Aspects of Light and Colour Perception and Measurement. In a final publication as Associate Editor, David Alman provides a report on the Inter-Society Color Council's Conference on Industrial Color Solutions. Please join me at this time in expressing appreciation to David Alman for many contributions to the journal during his tenure as the U. S. Associate Editor since 1984. I am particularly pleased to report that Dave has agreed to continue his involvement with the journal. Finally because this is the last issue of the year, we close with the annual index for the journal. Indexed items are listed under both subject and author for the readers' convenience.

Ellen Carter, Editor
Color Research and Application

Spectrophotometric Accuracy and the CIELAB Reversal

CIELAB DE* is often used to quantify spectrophotometric error. For example, after trying to correct a spectrophotometer's reflectance measurements of a tile to match those of a master instrument on the same tile, people record the degree of success in CIELAB DE* units. But CIELAB is a bad indicator of spectrophotometric success: One can reduce the magnitudes of spectrophotometric errors at each wavelength, but actually *increase* the CIELAB DE*.

Here is an example. Suppose the reflectance of a BCRA red tile measured by a standard Instrument #0 (D65, 10° field) yields tristimulus values (X_0, Y_0, Z_0) = (16.31, 8.69, 1.53). Let Instrument #1 record (X_1, Y_1, Z_1) = (16.91, 10.19, 2.13), and Instrument #2 record (X_2, Y_2, Z_2) = (18.41, 10.79, 2.73). These numbers are consistent with spectrophotometric errors that are worse at each wavelength for Instrument #2 than for Instrument #1. [A proof will be published elsewhere.] But notice that the DE* value for #1 relative to #0 is 9.18, whereas the DE* for #2 relative to #0 is 7.37. Paradoxically, CIELAB says that Instrument #1 is worse than Instrument #2!

Here is a single-number metric M that avoids the above flaw:

$$M(r_1, r_0) = \sum_{\lambda} \text{Abs}[r_1(\lambda) - r_0(\lambda)] w(\lambda), \quad (1)$$

where λ is wavelength, r_0 and r_1 are reflectance measurements by Instruments #0 and #1, "Abs" means "absolute value," and $w(\lambda)$ is a selected nonnegative linear combination of the X, Y, and Z color-matching functions. We might take $w(\lambda)$ to be the Cohen fundamental¹ of Illuminant D65.

The metric M has the following benefits:

1. Degradation of r_1 relative to r_0 at any wavelength enlarges M.
2. Less visible wavelengths receive less weight in M.

Although we make no reference in this note to visual or instrumental color-difference, workers in that arena ought to be aware that the CIELAB reversal can occur for different color-difference magnitudes, for different positions of the standard in the color solid, and for different possible CIELAB nonlinearities. The reversal is sensitive only to the relative magnitudes and

signs of the tristimulus differences about any color-center.

¹ J. B. Cohen, *Visual Color and Color Mixture*, Univ. of Illinois Press, 2001.

Hugh S. Fairman and Michael H. Brill

17 October 2003

Detroit Colour Council

September 11, 2003, Meeting Report

The topic of the Detroit Colour Council's (DCC) 24th Annual Panel Discussion Conference, held at the MSU Management Education Center in Troy, Michigan, was "SAE J1545: Color Measurement Recommendations for Automotive Parts and Materials."

Jim King of DuPont Performance Coatings, President of the DCC, opened the conference with welcoming remarks and introductions of the current officers and Board of Directors. Jeff Alspach was Program Moderator for the conference. Jeff is the Chair of the joint DCC/SAE committee, which is currently updating the J1545 standard.

The automotive color community has used the SAE J1545 standard for about seventeen years as a recommended engineering practice to aid in the determination and numerical communication of color difference, and for the resolution of acceptance or rejection compared to numerical tolerances. Section 9.2 of this practice specifically allows for future revisions due to improvements in color measurement technology and/or advances in color theory.

The joint DCC/SAE committee was formed to resume the color tolerance work of the original J1545 committee. The primary benefit will be to minimize difficulty and ambiguity in rendering color decisions through an improved understanding of the relationship of measured vs. viewed color difference. Making the decision process easier should lead to improved visual harmony across all the materials used in vehicles.

Jeff Alspach of DuPont Performance Coatings gave an overview of the committee. He covered organization, objectives and membership. He summarized the key changes of the proposed update. One is a recommendation to use an elliptical color tolerance methodology for solid colors. The standard now recommends CMC but allows for DE2000. Another

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key change was adding a recommendation for angles of measurement for gonioapparent colors.

Gerhard Roesler of Gretag-Macbeth next spoke on instrumental color measurement. He stressed the importance of the standard's recommendation for proper sampling and replication to ensure getting good measurement data. He stressed that understanding the sample and its measurement variability will always lead to correlation with a proper visual assessment.

Robert Marcus of Datacolor spoke about taking good instrumental measurement data and analyzing it. He covered when to use $L^*a^*b^*$ or L^*C^*h , and when to use CMC. He explained how to use the standard to set a proper specification with a customer.

Mike Henry of PPG spoke on visual and instrumental correlation. He emphasized the use of proper terminology and viewing conditions, both covered in the standard. He also discussed the importance of multi-angle viewing conditions and how to ensure they emulate the instrument for agreement.

The last speaker, Allan Rodrigues of Dupont Performance Coatings, described the committee's work on tolerancing methods for metallics. While the standard now allows for the measurement of metallics, work still needs to be done to understand the tolerancing of angular dependant colors. He talked about the groups experimental design and the need to create a robust, sample set of samples to evaluate the tolerancing of flake-containing colored materials.

Jim King, President DCC

ISCC 2004 Annual Meeting Student Travel Grants

Student Travel Grants applications are being accepted for student travel to attend the ISCC Annual Meeting in Gaithersburg, MD in May 2004. Two \$500 Travel Grants are available. A preference will be given to students giving presentations or posters. For further information please contact:

Prof. Margaret Miele
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AIC Colour 01 Symposia Videos -- Order Information and Form

All AIC Colour 01 meeting symposia were recorded, and videos are now available in NTSC and PAL format VHS tapes. The symposia included in the packages are:

- What is Color?
- The State of the Art and Future of Color Management
- Role of Color in the 3-D World
- How Should We Teach Color?
- The Artist and Digital Media
- How is CIE Helping Us Make Color Work?
- What is Color For?
- Color Issues for Digital Archives
- Environmental Color Design
- Spectral Imaging
- The Future of Color

The videos were digitally mastered and fully edited. They also include important discussions and papers that were NOT included in the AIC Color 01 Proceedings.

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CALENDAR

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

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

2003

Nov 12-14 **FSCTs Annual Meeting and International Coatings Exposition, "Spirit of Innovation,"** "Pennsylvania Convention Center, Philadelphia, PA, www.coatingstech.org

2004

Jan 12-14 **ASTM E12 Color and Appearance Meeting/Housing:** Embassy Suites Hotel, Ft. Lauderdale, FL, in conj. with D01/G03, www.astm.org

Jan 18-24 **IS&T/SPIE Electronic Imaging Conference 2004,** San Jose Marriott and San Jose Convention Center San Jose, California USA, www.electronicimaging.org

March 28- 31 **2004 NAPIM Annual Convention,** LaQuinta Resort, LaQuinta, CA
<http://www.napim.org/>

Apr 5-8 **CGIV 2004 - Second European Conference on Color in Graphics Imaging and Vision,** Technology Center AFIT, Aachen, Germany,
www.imaging.org/conferences/cgiv2004/

April 18-21 **TAGA/IS&T 2004 San Antonio,** Hyatt Regency Riverwalk Hotel, San Antonio, TX, Contact: TAGA at 585-475-7470, <http://www.taga.org>

April 20-22 **Color Pigments Manufacturers Association, Inc., "International Color Pigments Conference,"** Chicago, Ill. Contact CPMA, P.O. Box 20839, Alexandria, VA 22314; email cpma@cpma.com

April 25-29 **Society of Plastic Engineers/Color and Appearance Division,** Chicago ANTEC, Navy Pier, Chicago, IL, www.specad.org

May 10-12 **ISCC Annual Meeting and Symposium,** Co-sponsored by ISCC and NIST, National Institute of Standards and Technology, Gaithersburg, MD. ISCC IG meetings will be May 10 and 11; PC Meetings will be May 12

May 12-14 **CORM Annual Meeting,** NIST, Gaithersburg, MD.

May 17-19 **ASTM E12 Color and Appearance Meeting,** Gaithersburg, MD

May 23-28 **ASPRS 2004 Annual Conference, "Mountains of Data — Peak Decisions,"** Adam's Mark Hotel, Denver Colorado, <http://www.asprs.org/denver2004>

May 23-28 **SID International Symposium 2004,** Seattle, WA, <http://www.sid.org/conf/conf.html>

July 25-28 **IESNA Annual Conference,** Illumination Engineering Society of North America, Marriott Waterside Hotel, Tampa, Fl <http://www.iesna.org/>

Sept. 15-17 **CIE Expert Symposium on Image Acquisition and Display,** Budapest, Hungary

Oct 22-24 **ISSC Williamsburg Conference,** Fashion Institute of Technology, New York, New York, iscc@compuserve.com.

2005

May 8-13 **10th Congress of the International Colour Association,** Granada, Spain.
<http://www.ugr.es/local/aic05>.

Position Announcement Full-Time Tenure Track

CLASSROOM FACULTY

Science and Mathematics Department Fashion Institute of Technology

FIT's Department of Science and Mathematics seeks qualified applicants to fill a tenure-track faculty position in physical sciences. Background in color science preferred. Successful candidate must be prepared to teach courses in color science and the physical science survey. Expected to coordinate a re-organization of the physical science curriculum. Must be highly motivated and have good technology skills. Demonstrated teaching effectiveness required. Minimum 60 appropriate graduate credits required, Ph.D. preferred.

To apply, please submit a letter of interest, curriculum vitae, and three current letters of reference to:

Personnel Administration
Fashion Institute of Technology
227 W 27 Street
New York, NY 10001.

The screening process will begin immediately and continue until the position is filled.

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*

*Plus shipping and handling

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.

Request for Comments on Proposed Option for Electronic Version of ISCC Newsletter

During the October 2003 ISCC Board of Directors Meeting, it was suggested that ISCC provide members with the option of receiving the ISCC Newsletter in electronic version via email. A PDF format would be used.

Prof. Celikiz requests members' comments regarding this proposed option. Please contact ISCC at iscc@compuserve.com.

RIT Offers Graduate Scholarships

The Masters of Science Degree Program in Color Science is currently seeking highly qualified applicants for Fall 2004. Scholarships and assistantships are available for those who qualify. Funding can consist of up to full tuition assistance and a 12-month stipend (total of about \$30,000/per year). Request your graduate application today! The deadline to be considered for funding is February 15, 2004.

The Rochester Institute of Technology Chester F. Carlson Center for Imaging Science offers students a unique opportunity to earn a M.S. Degree in Color Science with the Munsell Color Science Laboratory, a preeminent academic laboratory dedicated to color science and imaging in the United States.

For more information on the scholarships, see <http://www.cis.rit.edu/mcs> or contact: Colleen M. Desimone, RIT Munsell Color Science Laboratory, 54 Lomb Memorial Drive, Rochester, NY 14623. Phone: 585-475-6783. Ms. Desimone's email is Desimone@cis.rit.edu

Issue #406

Nov/Dec 2003

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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

BYK-Gardner USA	www.bykgardner.com	301-483-6500
Ciba Specialty Chemicals	www.cibasc.com	302-633-2042
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DuPont Performance Coatings	www.dupont.com	248-583-8345
Flex Products, Inc.	www.colorshift.com	707-525-7337
GretagMachbeth, LLC	www.gretagmachbeth.com	800-622-2384
Hewlett-Packard Company	www.hp.com	650-857-6713
Hunter Associates Laboratory, Inc.	www.hunterlab.com	703-471-6870
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Minolta Corporation	www.minoltainstruments.com	201-529-6055
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PPG Industries, Inc.	www.ppg.com	724-274-3532
Prime-Color, Inc.	watprime@hotmail.com	908-272-5759
IsoColor Inc.	www.spc-software.com	201-935-4494

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)
 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)
 Technical Association of the Pulp and Paper Industry (TAPPI)

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