



Inter-Society Color Council *News*

Issue 416 Contents

July/August 2005

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President's Column

Summer has finally arrived and it is wonderful to enjoy the longer daylight hours and warmer temperatures. For many of us, this is also prime vacation time to relax at the cottage or just spend more time with our family and friends. I also revel in the constantly changing display of colors in my perennial garden and the wildflower meadow at our lakefront property. However, I have not been remiss in my duties as ISCC President and have been working hard with the other members of the Board to plan the upcoming ISCC meetings and events.

We had a very successful Annual Meeting and Special Topics Conference on Automotive Color and Appearance Issues in Cleveland with over 90 attendees. Kudos go to Special Topics Conference Chair, Mike Henry of PPG, and ISCC Office Manager, Cynthia Sturke, for their tireless efforts and enthusiasm in putting together an outstanding meeting. Meeting highlights were included in the last issue of the Newsletter and special thanks to David Battle and Mike Brill for preparing the comprehensive meeting reports. The ISCC Webmaster, Dave Wyble, has put together a slide show from photos that Cynthia Sturke took at the Cleveland meeting. Take a few minutes to check out this site: www.iscc.org/Cleveland2005/slides.php to view the recipients and presenters at the ISCC 2005 Awards Luncheon. We plan to make this web slide show a regular feature for all our meetings. This way, we will have plenty of photographs to choose from when we prepare our 100th anniversary commemorative history in 2031. Ellen Carter is planning a special CD to mark our 75th anniversary meeting in 2006 in Ottawa. See the special notice in the Newsletter requesting photo contributions. Please check your photo albums and archives.

In 2006, the CIE Standard Colorimetric Observer is also observing its 75th anniversary. To celebrate this occasion, the ISCC and the Canadian National Committee of the CIE are hosting an Expert Symposium on 75 Years of the CIE Standard Colorimetric Observer, 16-17 May, at the National Research Council of Canada historic Sussex drive Laboratories in Ottawa. This venue is in the heart of Canada's capital city and close to the city centre, the Parliament Buildings and several national museums. The Symposium will anchor a week of special events starting with the ISCC Annual Meeting, 14-15 May, and ending with the annual business and technical committee meetings of CIE Division 1 on Vision and Colour, 18-19 May. The conference web-site for this week-long jubilee celebrations has been set up at: www.jubilee2006.org so check this site for updates on meeting program, hotels, and registration. The first Call for Papers for the

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ISCC EXECUTIVE OFFICERS

President	<i>Dr. Joanne C. Zwinkels</i> National Research Council of Canada M-36, Montreal Road Ottawa, ON K1A 0R6 Canada 613-993-9363 fax: 613-952-1394 joanne.zwinkels@nrc.ca
President-Elect	<i>Dr. Robert Buckley</i> Xerox Corporation MS 0128-30E 800 Phillips Road Webster, NY 14580 585-422-1282 fax: 585-265-7441 rbuckley@xeroxlabs.com
Secretary	<i>Mr. John McCann</i> McCann Imaging 161 Clafin Street, Belmont, MA 02478 617-484-7865 fax: 617-484-2490 mccanns@tiac.net
Treasurer	<i>Mr. Hugh Fairman</i> 503 Bradley Court, Princeton, NJ 08540 609-430-1630 fax: 609-4301618 resourceiii@erols.com
Past-President	<i>Dr. Danny Rich</i> Sun Chemical Research 631 Central Avenue, Carlstadt, NJ 07072 201-933-4500x1144 fax: 201-933-5658 richd@sunchem.com

ISCC BOARD OF DIRECTORS**2003-2006**

Mr. David Battle	GretagMacbeth LLC P.O. Box 14026 79 T.W. Alexander Dr., 4401Bldg, Ste 250 Research Triangle, NC 27709-4026 919-549-7575 fax: 919-549-0421 battle@gretagmacbeth.com
Dr. Maria Nadal	NIST 100 Bureau Drive, Stop 8442 Gaithersburg, MD 20899-8442 301-975-4632 fax: 301-869-5700 maria.nadal@nist.gov
Mr. Sy Commanday	Techmer PM, LLC 1168 Palmour Drive Gainesville GA 30501 770-287-3929 fax: 770-287-0665 scommanday@techmerpm.com

2004-2007

Ms. Britt Nordby	Degussa, Inc. 2 Turner Place P.O. Box 365 Piscataway, NJ 08855 732-981-5433 fax: 732-981-5033 britt.nordby@degussa.com
Dr. Frank O'Donnell	The Sherwin Williams Co. 601 Canal Street Cleveland, CA44113 216-515-4810 fax: 216-515-4694 fxodonnell@sherwin.com
Dr. Michael Vrhel	ViewAhead Technology 18200 NE Union Hill Rd., Ste. 120 Redmond, WA 98052 425-882-7918 fax: 425-882-4708 michael.vrhel@viewahead.com

2005-2008

Mr. Nurhan Becidyan	United Mineral & Chemical Corp. 1100 Valley Brook Avenue Lyndhurst, NJ 07071 201-507-3300 fax: 201-507-1506 anbecidyan@umccorp.com
Mr. Jerald A. Dimas	Color Communications, Inc. 4000 West Fillmore Street Chicago, IL 60624 773-638-1400 fax: 773-638-5718 jerdim@ccicolor.com
Mr. Stephen Glasscock	Hallmark Cards, Inc. 2501 McGee Kansas City, MO 64108 816-274-4457 fax: 816-274-3867

Symposium is included in this issue of the Newsletter. The world famous Ottawa Tulip Festival will commence on May 21 so you might want to extend your stay in Ottawa to take in the millions of colorful tulips and festivities (see www.tulipfestival.ca).

This issue of the Newsletter also includes the preliminary program for the ISCC Special Topics Conference on Precision and Accuracy in the Determination of Color in Images, 11-12 November, 2005 in Scottsdale, Arizona following the annual IS&T-SID Color Imaging Conference. The Co-Chairs for this event are Danny Rich and John McCann. Register early to avoid disappointment.

Finally, I would like to wish everyone a wonderful summer and I look forward to seeing many of you at Scottsdale in November and welcoming you to Ottawa in May 2006.

Dr. Joanne Zwinkels, National Research Council of Canada

ISCC/CIE Expert Symposium “75 Years of the CIE Standard Colorimetric Observer”

In 2006, both the CIE Standard Colorimetric Observer and the Inter-Society Color Council (ISCC) will observe their 75th Anniversaries. To celebrate the occasion, the ISCC and the Canadian National Committee of the CIE are hosting an Expert Symposium on the Standard Colorimetric Observer, May 16-17, 2006 at the National Research Council in Ottawa, Canada. The Symposium will anchor a week of events starting with the Annual Meeting of the ISCC and ending with meetings of CIE Division 1, “Vision and Colour.”

The Standard Colorimetric Observer is ubiquitous when it comes to measuring, specifying and designing products that involve light and color. Its use is so pervasive in everyday life that the Symposium will appeal to a wide range of professionals, from those who are responsible for color and color appearance to those who are research and development specialists in the area—just about anyone with an interest in colorimetry and color measurement.

The goals of the Symposium are to recall the many advances that have been made since the introduction of the Standard Colorimetric Observer, to understand the current state of colorimetry and colour appearance, and to provide guidance on directions for future work. Specific topics include:

- Standard Colorimetric Observer
- Color matching functions
- Color appearance
- Temporal and spatial issues in colorimetry
- Color differences and tolerances
- Color management
- Instruments and standards

For more information, visit the Symposium website at <http://www.jubilee2006.org>. Authors are invited to submit two-page extended abstracts of their proposed contributions by January 15, 2006. See the Call for Papers on the website for details of the submission and review process.

Call for Papers: The 2006 International Congress of Imaging Science: Linking the Explosion of Imaging Applications with the Science and Technology of Imaging

May 7-12, 2006

The 2006 International Congress of Imaging Science -- ICIS 06 -- will be held May 7-12, 2006, at the Hyatt Regency Hotel in Rochester, New York. Researchers working in various imaging industries and disciplines are invited to submit abstracts for presentations at this congress prior to November 1, 2005. In addition to the much anticipated "Frontiers in Imaging" Symposium, technical sessions at this event will focus on the following scientific tracks:

- Digital and Analog Image Capture
- Hardcopy and Photographic Printing
- Display Technologies
- Image Science

This event will provide a forum for imaging professionals around the globe to share the latest research and innovations across a broad range of digital and analog imaging disciplines.

For more information about the 2006 International Congress of Imaging Science, please refer to the attached Call for Papers or visit the conference Web site at: www.imaging.org/conferences/icis2006.

Corporate History, Personal Vision

In Issue 415, after the article introducing Datacolor as an ISCC Sustaining Member, the Editor promised a history of Datacolor. He saw potential reader interest because several well-recognized ISCC members had been important in that history. In particular, Ralph Stanziola (See "ISCC Elects Ralph Stanziola Honorary Member, in Issue 415) figured prominently. Here, then, is a short corporate history.

After Hugh Davidson and Henry Hemmendinger developed the analog COMIC (colorant-mixture computer), a natural step was to bring the technology to digital computers. Companies like Kollmorgen wanted to build their own computers for color control, but several visionaries saw that DEC and HP were in the business of building computers, and a better niche for a new company was to apply existing computers to the color-matching problem. Such visionaries founded Applied Color Systems (ACS) on April 1, 1970 in Princeton, New Jersey, with the goal to apply color systems in industry—blending computerization with precise color instruments.

Two of ACS's founders, Donald Hall and Ralph Stanziola, have maintained active roles in the field of color. Hall was President of ACS for a number of years, and Stanziola began as Vice President, remained a consultant and instructor for ACS Color Technology Seminars, and still acts in these roles for Datacolor. Other principals were Bob Leahy (the first President) and Ron Cronise. Ralph had worked for Davidson

& Hemmendinger, and later as a sales manager for Kollmorgen's color systems division.

ACS began as a one-room operation off Nassau Street, whose floor sagged so much that it tipped over the coat-rack. At that time, ACS sold color-matching software on a time-sharing basis to paint, plastic, and textile companies, using two PDP-10s (owned by Applied Logic Systems, ALS in Princeton). Money from this venture was used to develop stand-alone color-matching products. ACS bought units of Color-Eyes from Kollmorgen, sent sample measurements to a teletype, printed 16 reflectance values on paper tape, fed the tape into the timesharing system, and retrieved color-matching formulas.

Soon ACS moved to a larger facility, a basement (formerly owned by ALS) at Princeton airport. ACS then acquired its first full-system customer—US Steel's color styrene plant in Haverhill, Ohio. ACS courted US Steel by using the timeshare to prove to them they could get good answers. For the US Steel system, ACS used a PDP-11/20 and a Hardy spectrophotometer. The next such customer was a small color-concentrate business in Rhode Island. By this time ACS needed more space, and so moved to larger facilities on Route 1, across from what is now the Palmer Inn.

In 1981, ACS became a wholly owned subsidiary of Armstrong World Industries, Inc., and built ACS's (now Datacolor's) present facility on land they bought.

That brings us to a second thread in the history. Ernst Rohner founded a company called Pretema in the late 1960s, with the same objectives as ACS. Following a policy of diversification, Brauerei Eichhof (now Eichhof Holding AG) acquired Pretema in 1980, and the name was changed to Datacolor AG (Zurich, Switzerland).

In 1988, corporate raiders were about to take over Armstrong, at which point a competitive bid to buy ACS ensued. Eichhof bought ACS from Armstrong and merged it with Datacolor to become ACS-Datacolor. Don Hall was the President, and stayed until 1992, when he left to found Color and Appearance Technology.

Another thread in the history began in the United Kingdom, where in 1969 Instrumental Colour Systems (ICS) was established as a sales organization for manufacturers of color measuring instruments and technology. In 1990, Don Hall presided over ACS-Datacolor's merger with ICS, at which point the company name changed to Datacolor International. Subsequently, "International" was dropped.

Datacolor has come a long way from ACS's one-room operation that sold time-shared computer solutions. It's time to remember the folks who brought the vision into being and kept it in focus. Ralph and Don, our hats are off to you!

Michael H. Brill (with help from Ralph Stanziola and Don Hall)

Historical Articles Welcome

The ISCC welcomes submissions of articles related to the historical beginnings of color related companies within our membership. The article should be 400-600 words in length and will be reviewed for future ISCC Newsletters.

Meeting Report: Detroit Colour Council, May 17, 2005

The Detroit Colour Council held its 2nd Quarterly Program Meeting of 2005 on May 17 at the Sheraton Detroit Novi in Novi, Michigan. The speaker was Mr. Vince Dattilo, Manager of the Global Applications Technology Platform for PPG Industries. He was introduced by Cynthia Templeman of Toyota, DCC Program Committee Co-Chair. His presentation addressed "Advances in Applications Technology," in line with the DCC program committee's goal to address production and application realities of colored materials used in automotive manufacturing. Kurt Beyerchen of Nissan Motors, spoke about "Troubleshooting Injection Molded Plastic Parts" during the February meeting.

Mr. Dattilo gave the attendees of the ISCC Symposium on Automotive Color and Appearance Issues in April a taste of his approach to the paint application process by comparing the spray process to baking M&M cookies. He used the same analogy in his DCC presentation to illustrate that certain fixed inputs for the process, like cure time and atomization, cannot be changed without impacting the quality of the color match and appearance. A cookie recipe that calls for a bake time of 12 minutes at 350 degrees does not deliver the same result for cookies baked at 650 degrees for 6 minutes. This analogy lends perspective to desires to redesign paint lines with faster line speeds and fewer applicators and offset those changes with higher oven temperatures.

The presentation touched on five major themes:

Logic – The applications process makes sense...it's not magic!

Thinking with Simplicity – "Occam's Razor" all else being equal... the simplest options are most often the best.

Synergy Effect – Success or failure is geometric; the benefits of using the prescribed process will be greater than the effort expended.

Systems Thinking – Always begin with the end in mind

Applying the Ten Fundamental Applications Concepts

Mr. Dattilo's tenth fundamental application concept was titled, "The ACE of Spray." ACE of SPRAY is really an acronym that sums up the important points of an application process. They are:

Atomization

Chemistry of the coatings

Evaporation

Sequence of the process

Percent non-volatiles

Ramps of the ovens

Airflows and turnover at cure

Y=f(x) Logical, systematic thinking

He reminded everyone that paint application is dependent on both the physics of atomization and the chemistry of the coatings. If you ignore the ACE of Spray, then your cook-

ies might just get burnt!

The next meeting of the DCC will be held on September 15, 2005, at Michigan State University's Management Education Center in Troy. This will be the DCC's 26th annual Panel Discussion Conference. We are planning to examine the exterior color harmony issue in-depth with industry experts speaking on design, material behavior, trouble-shooting body and parts color match, color specification and paint shop managers' expectations. Look for an announcement on the DCC website at www.detroitcc.org.

Mike Henry

*President, 2005 Detroit Colour Council
Cleveland, OH*

C2C(r)/CITDA 2006 Design Competition for Students

The American Association of Textile Chemists and Colorists (AATCC) announces its second annual C2C(r)/CITDA design competition developed by its Concept 2 Consumer(r) (C2C) Interest Group and the Computer Integrated Textile Design Association. AATCC is expanding the competition by inviting submissions from institutions with textile design programs and those with art, interior design, and fashion merchandising programs. The aim of the competition continues to be the promotion of innovative product development.

The theme of this year's competition is "Shades of Comfort," and the contest has been divided into two main categories, with each category broken down into two subcategories:

- Print Design - students are asked to create a digitally rendered textile print collection
 - Interior Design-Decorative Pillows or Throws
 - Apparel Design-Children's Casual Wear, 2-6x; Spring/ Summer Season
- Product Design - students are asked to create a textile print collection and an actual end product
 - Interior Design-Decorative Pillows or Throws
 - Apparel Design-Children's Casual Wear, 2-6x; Spring/ Summer Season

Entries will be evaluated on colors, textures, appearance, reproducibility, and overall presentation.

Undergraduate and graduate students are encouraged to enter. Entries must be received on CD by December 1, 2005. Five finalists in each subcategory will be asked to submit story boards and final products for judging. Winning entries will be awarded \$1,000 for First Place and \$500 for Second Place, in each subcategories. Winners will be announced at AATCC's C2C(r) Interest Group meeting, held in conjunction with the AATCC Committee Meetings in May of 2006.

For complete competition guidelines and entry forms, see www.aatcc.org or contact Suzanne Holmes; e-mail holmes@aatcc.org; telephone 919-549-3537.

CAD RETEC 2005

September 25-27, 2005
New Orleans, Louisiana

Color & Appearance RETEC 2005, Sponsored by the Color & Appearance Division of SPE, will be held at The Fairmont New Orleans, New Orleans, Louisiana, September 25-27, 2005. Chairman Earl W. Balthazar III asks on the conference web page, [www. http://www.specad.org/meetings/2005retec/index.htm](http://www.specad.org/meetings/2005retec/index.htm), "What better location for the premier technical conference devoted to the technology of color and appearance of plastics than the most colorful city in the continental United States?"

This year's topics will include papers on color instrumentation and technology, colorants and additives for plastics, as well as test methods. The conference offers not only the opportunity to learn about the state of technology in plastics coloring, but also to network with the leaders of the industry. Further, if you have a business that supplies the plastics industry in the area of color and appearance, please give serious consideration to exhibiting at this RETEC. This is an excellent way to give exposure and visibility to your products and services.

For more information and a preliminary program see the web site given above or contact the chairman at retec-chair@specad.org, or phone: (817) 466-8413

CAUS Presents Color Symposium 2005

September 15 - 16, 2005

"Color Surround," an intimate event for creative professionals and color enthusiasts, will take place on September 15 and 16, 2005. This symposium will provide a forum to explore current and future trends in color, art and design. Attendees will interact with a panel of remarkable designers and executives, featuring: Joshua Davis, digital design pioneer; Dan Nation, product developer and entrepreneur; Sandra de Ovando, avant-garde florist; Thomas Fernez, owner-designer of Thomas Paul home accessories; Victor Luis, president of Baccarat; and Denyse Schmidt, modern quiltmaker. We will also visit the studio of Clodagh, renowned for their high-end interiors and architecture. This multi-faceted experience will also include a lecture on symbolism, a workshop on iconography and a Broadway musical.

Presentations and discussions will be held in The Color Association's loft office in New York City, where attendees will also have a chance to browse our unique archive of forecasts, textiles and magazines that date back to 1915.

Registration fees are as follows: members \$500, non-members \$800. Fee includes all panels, tours and workshops, a Broadway show, 2 breakfasts and 2 lunches. Registration is limited to 25. To register, please download the registration form. Click here. For more information, please call (212) 947-7774 or email caus@colorassociation.com.

AIC Meeting Experience, Granada, Spain or My Latest Activities Regarding Color Vision Confusion

The AIC Colour '05 Conference, in Granada was the biggest ever, with 36 countries represented, and 450 plus delegates. I spoke on the history of prejudice against people who have inherited color vision confusion and pointed out that by contrast, they have been beneficial to society in odd and unexpected ways. I also encouraged others dealing with color measurements, color perception and development of color coded information, like graphic designers, to become more active in trying to solve the mystery of this condition or at least, not place additional stumbling blocks to people who have the condition. The benefits of the changes that have been advocated in color use are apparent. For example, at registration one of my long-standing suggestions was used. The EXIT signs were green against a black background. The usual red against black is useless for many.

During the conference, I met Dr. Josep Giribet, a professor of video and computer graphics at the Pompeu Fabra University in Barcelona. He intended to speak on his personal system for painting with colors, as he is "green color blind" (if there really is such a thing). He has wanted to paint in color for years, but his color scheme was mainly gray, brown and black. He began by adding blue and orange to his palate. (Those two colors can be seen by just about anyone). And now he claims he has a system that allows him to use colors like everybody else. We decided that we could make a significant contribution to the field by preparing an educational video using Josep's artwork and video expertise to show the following:

1. What colors are most often confused and which are favored.
2. How Joseph tried to find translations so he could function "normally" through his system, and where he seems to have succeeded with his system, and where he got "lost".
3. Information on the genetic factor.
4. The significance of sensitivity to light and shading contrasts to those who have the condition.
5. Interviews with men who are not artists but have the condition.

In Spanish, this condition is called daltonismo, although hardly anyone knows that daltonismo was named for the British John Dalton, the father of the Atomic Chart for chemistry. He was the first to document his own color vision problem that kept him from doing chemistry in 1794.

An educational video is sorely needed. None exists. It would benefit art and graphics students. It would benefit parents. It would benefit anyone who has the condition. It could be used in industry. It should also return a profit- the market for it is open.

Odeda Rosenthal

**Call for Papers
ISCC/CIE Expert Symposium
“75 Years of the CIE Standard
Colorimetric Observer”**

**National Research Council of Canada
Ottawa, Ontario, Canada**

Organized by the
**Canadian National Committee of the CIE
and the
Inter-Society Color Council**

The year 2006 marks the 75th Anniversary of the CIE 1931 Standard Colorimetric Observer. It seems an opportune time to reflect on all that has been accomplished in the area of colorimetry, the current status of our understanding, and to provide guidance to CIE Division 1 on what work they should undertake in the future in the area of colorimetry. Thus, the Inter-Society Color Council (ISCC) and the Canadian National Committee of the Commission Internationale del' Eclairage (CNC/CIE) are hosting a CIE Expert Symposium in celebration of this very important 75th Anniversary.

Papers are being requested for the two-day ISCC/CIE Symposium, “75 Years of the CIE Standard Colorimetric Observer,” to be held May 16-17, 2006, Ottawa, Canada. It will feature both Invited and Contributed Papers. Ample time will be allocated for round-table discussions. A Poster Session will also be included.

Papers should deal with one of the following subjects:

- Standard Colorimetric Observer – past, present, and future
- Color matching functions
- Color appearance
- Temporal and spatial issues in colorimetry
- Color differences and tolerances
- Color management
- Instruments and standards

Please submit two-page extended abstracts of their proposed contributions in English using the Submission Paper Form to be found at the website of the Symposium, www.jubilee2006.org.

Extended abstracts should be sent **by e-mail or post no later than January 15, 2006** to the Chair of the Technical Program of the Symposium:

Dr. Alan Robertson
National Research Council
1200 Montreal Road
Ottawa, Ontario K1A 0R6
CANADA
E-mail: alan.robertson@nrc-cnrc.gc.ca

Authors will be notified of acceptance of their abstract by **February 15, 2006**. **Final camera-ready copy will be due at the Symposium**. The Symposium Proceedings will be available after the meeting.

**IS&T/SID's 13th Color
Imaging Conference**

Scottsdale, Arizona, November 7 - 11, 2005

For the 13th year in a row, IS&T/SID will hold a conference for color scientists, engineers and technologists—anyone with an interest in color imaging—in Scottsdale, Arizona. This year's conference, CIC-13, will be held at the SunBurst Resort from November 7 to 11, 2005 and will be chaired by Po-Chieh Hung and Michael H. Brill.

Two hallmarks of the CIC are its single-track format and the Interactive Poster Session, designed to encourage the exchange of ideas across specialized areas in the field. The CIC traditionally has attracted a diverse set of papers—all tied together by the theme of color and color images. Recent conferences have featured sessions on color and lighting in computer images, high dynamic range images, color image quality, color printing, color appearance, image analysis, digital motion pictures and color image applications. Participants have heard papers on topics such as color in medical imaging, multi-spectral image capture, digital camera color sensor design, camera image processing, mesopic vision, and color constancy. We continue to emphasize the industrial application of color imaging.

Special features this year include the following:

- Keynote presentations by Dr. Louis D. Silverstein of VCD Sciences, Inc. on “Color Displays: From Pixels to Perception” ; by Dr. Hiroaki Kotera of Chiba University, on “Intelligent Image Processing.” ; and by Dr. Paul Hubel of Foveon, on “The Changing Landscape of Digital Camera Technology.”
- Evening address by C. David Tobie: “Shortcuts and Detours: How Photographers Actually Manage Color.”
- The interactive sessions again this year will include oral “spotlight” talks. Authors of papers in the interactive session will present brief oral previews of their posters in a special Spotlight session.
- A special session to commemorate Hans Neugebauer's seminal contributions to color imaging.
- A Late-Breaking-News session.

Preceding the papers program at the conference is a tutorials session. We are pleased to welcome back Robert Hunt, who will repeat his in-depth tutorial on Basic Color Science and Imaging on November 7th and 8th. In addition, on Tuesday, November 8th, a variety of tutorials will be offered on advanced topics in color imaging, such as color appearance, multi-spectral imaging, spatial color vision, color displays and color management.

Immediately following the papers program at the same site will be the ISCC's Special Topics Conference, “Precision and Accuracy in the Determination of Color in Imaging.” Additional information on the ISCC/IS&T Conference is on page 7 of this newsletter.

For further information, see the conference web site <http://www.imaging.org/conferences/cic13/index.cfm>.

Michael H. Brill, Datacolor

ISCC – IS&T Special Topics Conference

Precision and Accuracy in the Determination of Color in Imaging

Scottsdale, Arizona
November 11-12, 2005

Since the early 1970s the ISCC has sponsored specific topics conferences. As the first several such conferences were held in the dead of winter on the grounds of the restored area in historic Williamsburg, these conferences have come to be known as the Williamsburg Conferences. These conferences last only a couple of days and are highly focused on a current topic in color.

This year, the ISCC has joined with the IS&T, the Society for Imaging Science & Technology, to offer one of these special topics conferences immediately following their annual Color Imaging Conference, as described in the adjoining column.

This conference will focus on the issues relating to measuring the color properties of printed and displayed images. As international standards, such as those created by the International Color Consortium (ICC) and the International Organization for Standards (ISO) Technical Committee 130 on Graphic Arts have become widely applied, users are finding that measurements made in two different locations or with two different instruments – both meeting the requirements of the CIE, ICC and ISO – do not exhibit adequate agreement for the intended application of those measurements. The question of setting product or process tolerances and writing contracts between supplier and user of colored images requires an understanding of the errors associated with the measurements. This issue is also present in non-image applications, such as plastics, textiles and paints, but has risen to a critical stage in the graphic technologies.

This conference has pulled together some of the world's best scientists, engineers and technologists to report on various issues in critical color measurement and to provide insights into the state-of-the-art in color measurements and standardization for color measurement.

The sessions, which will run from Friday afternoon through Saturday afternoon are titled: The Problem of Fluorescence, Repeatability, Reproducibility, Traceability and Standardization in High Dynamic Range Imaging.

Patrick Emmel, Clariant, will present the keynote address for the first session, The Problem of Fluorescence. Other contributors will include Danny C. Rich, Sun Chemical, Claudio Puebla, Axiphos, and Jack Ladson, Color Science Consultancy.

On Saturday morning, the keynote address for the Repeatability, Reproducibility, Traceability Session will be given by Maria Nadal, National Institute of Standards and Technology. Other contributors will include Dave Wyble,

RIT Munsell Color Laboratory, Danny Rich, Sun Chemical, Charles Leete, Collaborative Testing Service, and Tuo Wu, Hewlett Packard.

For the Session on Saturday Afternoon, Standardization in High Dynamic Range Imaging, the keynote address will be presented by John McCann. Other contributors will include Rejean Baribeau, National Institute for Measurement Standards, National Research Council of Canada, and Jeff DeCarlo, Hewlett Packard.

If you must make critical color measurements in your business or research you cannot afford to miss this once in a life-time opportunity to participate in this special topics conference. For further information including a more detailed program and registration information, please watch the ISCC web site, www.ISCC.org, or the IS&T web site, www.imaging.org. Updated information will be displayed as it becomes available. Also, please feel free to call the ISCC Office at 703-318-0263 for information.

Danny C. Rich, Sun Chemical

ISCC Planning Special CD for 75th Anniversary Meeting

Next year is the 75th anniversary of the ISCC and the 75th birthday of 1931 CIE Standard Observer. To commemorate these events, ISCC is planning a special anniversary CD. All ISCC members as well as other interested individuals are invited to contribute "historic photos" for the CD.

Photographs may be submitted in either "hard-copy" or electronic format. Electronic format is preferred; any of the usual formats is acceptable, e.g., jpeg, tif, etc. Hard-copy photographs will be returned to the submitter after being optically scanned; however, the submitter will assume the risk of loss.

Please submit your photos in electronic format to Ellen Carter at Ellen.Carter@alum.rpi.edu or at 1001 North Vermont Street, Suite 809 Arlington, Virginia 22201. Please send "hard-copy" photographs to Mary McKnight, NIST, Mail Stop 8615, Gaithersburg, MD 20899-8651.

Please either call Cynthia Sturke, ISCC Office Manager, 703-318-0263, or email her, iscc@compuserve.com, or email Ellen Carter, if have questions regarding the special anniversary CD.

All registrants for the ISCC 2006 annual meeting in Ottawa will receive a copy of this special anniversary CD. ISCC members will also be able to order copies of this CD when they renew their annual membership.



Color Research and Application In This Issue: Vol. 30, Number 4, August 2005

We begin this issue with a "Talking about Color ..." column. Ralph Evans introduced the concept of brilliance as a fundamental attribute of color stimuli. Brilliance became a central thread to Evans' work. Yet to this day the concept of brilliance has not received the attention many think it deserves. Thus, Rodney L. Heckaman and Mark D. Fairchild make it the topic for discussion in this issue's talking about color column.

Our first article is on color vision. It is known that the first step in color vision is response by the cones in the eye, and that opponent processing is widely accepted as the general framework for processing color. However, there is no consensus on exactly how this is done. Dr. Lane Yoder presents an original, reasonably straightforward model of color vision based on photon absorptions in the three classes of cones. The model and resulting color space are presented in "Relative Absorption Model of Color Vision." The model makes detailed predictions of known color and neural phenomena and the model's simplicity shows that color does not require complex processing of spectral information.

Color and shape are primary elements used in object recognition. Humans do this unconsciously all the time, but how can computers do this with images? Can they classify images and recognize objects? It is necessary to develop an effective image retrieval system. But shape can change with the point of view of the object. Color-image indexing ignores the spatial relationships. Histograms are invariant to translation and rotation around a viewing axis, thus provide a spatial robustness. Often histogram intersection has been used as an effective technique for color-image indexing. Our next article, "Evaluation of Image Similarity by Histogram Intersection" reports on experiments developed to test the design of image-similarity models. In this article Michelle Lee, John Xin, and Steven Westland report on the investigation of whether the choice of color space and the number of bins affects the ability of the histogram-intersection technique to make prediction of similarity.

Our next article deals with computer graphics for a different purpose. The shade and brightness of a painted surface changes according to viewing angle. This becomes even more significant in automotive applications where metallic and special effect pigments are commonly used. Digitized information on exterior color of automobiles is used for selection, quality control and inspection. Atsushi Takagi, Akihiro Watanabe, and Gorow Baba describe the "Prediction of Spectral Reflectance Factor Distribution of Automotive Paint Finishes." Their measurement method for the reflectance of a paint finish allows accurate prediction of reflectances before the actual vehicle is produced, even when complex effect pigments are involved.

Next let us look at reflectance in a different way. In 1993, Hawkyard first developed an iterative method for generating reflectance functions from a set of tristimulus values. Since then other methods have also been developed. Recently Dupont made a comprehensive comparison of methods of generating reflectance functions and concluded that the Hawkyard Method was one of the best. However, questions remained, and the tedious iteration was a limiting factor. In our next article Ge Wang, Changjun Li, and M. Ronnier Luo discuss "Improving the Hawkyard Method for Generating Reflectance Functions." In this article the authors discuss the issue of convergence and then modify the method to make it an analytical method.

"A Preliminary Comparison of Color Differences to Textile Color Acceptability using Average Observers" is our next topic. In production quality control, professional experts are examining the color of materials. Most of the color difference metrics are developed around the observations of acceptability by those experts. But how does this correlate to what the consumer sees? Heather Mangine, Kathryn A. Jakes, and Charles J. Noel looked at four color difference equations: CIELAB, CMC, CIE 94 and CIEDE2000 and compared them to what the average observer accepted.

Dr. Yoshinobu Nayatani wrote the next article in the journal. He tells us "Why Two Kinds of Color Order Systems Are Necessary." The two types of systems have different uses and applications. One of the types of color order systems is related to the CIE photometric and colorimetric system. The second type of system is used in the field of color design and systematic selections of color combinations. In this article Dr. Nayatani goes on to discuss chromatic strength.

Our final article is in the area of food color. The illumination in stores is important to the color perception. Nowhere is the perceived color more important to the customer than at the meat counter of a grocery store or meat market. The customer, rightly or wrongly, judges the quality and freshness of the meat by its color. In "Meat Color in Retail Displays with Florescent Illumination," Carlos Sáenz Gamasa, Begoña Hernández Salueña, María José Beriain Apesteguia, and Guadalupe Lizaso Tirapu report on a study of the color of beef as a function of lighting and time after the meat was cut (immediately and up to 7 days later).

We close the issue with four book reviews. Rajeev Ramanath discusses *Color: An Introduction to Practice and Principles*, 2nd Ed. by Rolf Kuehni. Nancy Jo Howard tells us about Steven Bleicher's book *Contemporary Color Theory & Use. Digital Image Display* by Gheorghe Berbecel is the topic of Lindsay MacDonald's review. *Color Chemistry. Synthesis, properties, and applications of organic dyes and pigments*, 3rd revised edition by H. Zolinger is discussed by Thomas Lazar. Also, we briefly mention the availability of the new CIE publication CIE x026:2004 - Proceedings of the

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CIE Symposium '04 on LED Light Sources: Physical Measurement and Visual and Photobiological Assessment.

Ellen Carter

Editor, *Color Research and Application*

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4. A copy of the newly published ISCC Technical Report "Guide to Material Standards and Their Use in Color Measurement (ISCC TR-2003-1).
5. **AND a New benefit available to Sustaining Members Only:** You are eligible to place a 1/4 page black and white ad in our Annual Meeting Program Book - free!.

Please contact either Dave Battle 919-549-7575 (battle@gretagmacbeth.com) or Cynthia Sturke, ISCC Office Manager 703-318-0263 (iscc@compuserve.com) for further information. You may also download an application form from the ISCC website.

AATCC Acquires Assets of CITDA

AATCC, the international association for the textile design, processing, and testing industry, has purchased selected assets from the Computer-Integrated Textile Design Association (CITDA). These assets include the CITDA name, logos, members list, website, and CITDA Student Scholarship Competition.

In 2001 AATCC launched its Concept 2 Consumer (C2C) activities, which have become a primary Interest Group of AATCC. Through events, publications, and subcommittees working on specific projects of importance to the industry, C2C is helping bridge the gap between the textile design and manufacturing communities. By acquiring these CITDA assets, AATCC, through C2C, will be in an enhanced position to bring new programs and activities to the industry.

CITDA operated for several years on a completely voluntary basis without a paid professional staff. The CITDA Board of Directors has realized that more management attention is now required to support their diverse activities. Through this transition of assets, AATCC aims to continue the important activities of CITDA and provide the necessary management support needed to keep these activities vibrant.

The Lady and Red

David Mehegan wrote in the Boston Globe, June 15, 2005, about the lady and red. He noted that for all the overuse of the word "passion," when it comes to clothing, Americans prefer not crimson, carmine, vermilion, or scarlet, but beige or pastels. It is considered so declassé, so flossy, so vulgar, he said.

But as he reported, people didn't always feel that way, as Amy Butler Greenfield found while working on her new book, "A Perfect Red: Empire, Espionage, and the Quest for the Color of Desire." For centuries, the lust and quest for the source of a mysterious deep red dye known as cochineal fired the dreams and struggles of European colonial powers. It was also the substance used to dye the British uniforms in the Revolutionary War.

The story continued that "for millennia, the color red was identified with fire, desire, and power. It was the color of kings and the wealthy. But deep red dyes were hard to find. There was ocher and cinnabar, often used in inks and paints, but they didn't work well in dye for cloth and were fantastically costly. Then came the 16th-century Spanish conquest of Central America, and the conquistadors discovered an extraordinary red dye cultivated by Mexican Indians. They called it grana cochinilla, or cochineal.

Once imported to Europe, cochineal thrilled clothmakers and the wealthy consumers of rich cloth. They had to have it. But Spain controlled the source and the price, and cochineal became a more important commodity than gold. Sixteenth- and 17th-century English sea raiders would lie in wait for Spanish ships laden with it, bound from Mexico to the port of Seville.

While they lusted after cochineal and paid dearly to have it, most Europeans didn't know what it was, and the Spaniards guarded the secret like nuclear technology. Was it a mineral, like cinnabar? Or possibly a berry? In fact, cochineal is a tiny insect, *Dactylopius coccus*, which lives and feeds on the opuntia cactus, in southern Mexico. Dried and ground, it produced the deepest and most colorfast red dye to be found in nature."

Mehegan quoted Butler Greenfield as saying, "I was going through the ships' registers. When they came in, merchants would have to sign for [the cargoes] in the corner. Going through those pages day after day, I didn't run into much chocolate. We think of it as important today, but it wasn't to the great imperial planners. What I kept finding was the word 'grana,' or 'grana chochilla,' which is cochineal. Gradually I realized that I was seeing literally tons of this dyestuff being unloaded, and this fascinated me."

ISCC 2005 Annual Meeting Photos on Web Site

Dave Wyble, our ISCC webmaster, has created a slide show with many photographs from the ISCC 2005 meeting in Cleveland, OH, on the ISCC web site, www.ISCC.org. Click the "Annual Meeting" tab on the home page to see the listing. Please feel free to send him photographs in electronic format from future meetings.

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>

2005

- Sept 15** **Exterior Color and Appearance Harmony Symposium**, Detroit Colour Council, <http://www.detroitcc.org/>
- Sept 19-21** **Print Quality Symposium - 2005 TAPPI**, Wyndham Baltimore Inner Harbor, Baltimore, MD, 770-209-7399, mquinlin@tappi.org
- Sept 19-22** **International Nonwovens & Technical Conference**, INDA and TAPPI, Millennium Hotel, St. Louis, MO, 919-549-3535, www.inda.org
- Sept 25-27** **SPE Color and Appearance Division, RETEC 2005**, New Orleans, LA, RETEC 2005 817-466-9106, www.specad.org
- Sept 25-27** **Coating Wood and Wood Composites: The Changing Future, FSCT**, Marriott Charlotte Executive Park, Charlotte, NC, 610-940-0777; fsct@coatingstech.org, www.coatingstech.org.
- 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 16-20** **Frontiers in Optics 2004 / Laser Science XXI**, Optical Society of America/American Physics Society, Hilton Tucson El Conquistador Golf and Tennis Resort, Tucson, AZ, 202-223-8130, <http://www.osa.org/meetings/annual/>
- Oct 21-23** **OSA Vision Meeting**, Optical Society of America, Doubletree Hotel, Pat Broyles, Tucson, AZ, 520-322-3800 ext. 202, <http://www.osavisionmeeting.org/2005/overview.php>
- Oct 25-27** **2005 AATCC International Conference & Exhibition, Hyatt Harborside, Boston, MA**, 919-549-8141, <http://www.aatcc.org/>
- Nov 6-9** **Western Coatings Societies Symposium & Show, FSCT**, Westin Casuarina Hotel & Spa, Las Vegas, NV, 610-940-0777; fsct@coatingstech.org, www.coatingstech.org.
- Nov 7- 11** **IS&T/SID's Thirteenth Color Imaging Conference**, The SunBurst Resort, Scottsdale, Arizona, 703-642-9090, <http://www.imaging.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>
- Dec 4-6** **PIA/GATF Color Management Conference**, Pointe Hilton Tapatío Cliffs Resort, Phoenix, AZ, 412-259-1755 <http://www.gain.net/conference/brochure/index.cfm?ConferenceID=550>

2006

- Jan 8-11** **IESNA Annual Conference**, Marriott Marquis Hotel, New York City, NY, 212-248-5000, http://www.iesna.org/programs/meetings_calendar.cfm
- 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
- May 1-5** **Prospecting for Geospatial Information Integration, ASPRS**, The Imaging and Geospatial Information Society, Reno Hilton Hotel, Reno Nevada, 301-493-0290, <http://www.asprs.org>

May 9-11	CORM 2006 Annual Conference, Industry and National Metrology Institutes: Partners in Light Measurement Problem Solving , National Institute of Standards and Technology Gaithersburg, MD, 440-542-8042, http://www.corm.org/CORM2006_information.shtml
May 7-12	2006 International Congress of Imaging Science (ICIS 2006) , Hyatt Regency Hotel, Rochester, New York, 703-642-9090, www.imaging.org/conferences/icis2006 .
May 13-15	ISCC 2006 Annual Meeting , Ottawa, Canada, 703-318-0263, www.ISCC.org , ISCC@compuserv.com
May 16-17	CIE Expert Symposium on the Standard Observer , Ottawa, Canada, www.jubilee2006.org
May 17-18	CIE Division I Meeting , Ottawa, Canada. www.jubilee2006.org
Jun 25-28	CORM Fifth Oxford Conference on Spectrometry , National Physical Laboratory, UK, www.corm.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



ELECTRONIC COLOR EVALUATION

Consumer Testing Laboratories, Inc. is a leading independent laboratory specializing in the testing and evaluation of consumer products. We are seeking a candidate to manage our **Electronic Color Evaluation Department** for our Color Laboratory in Bentonville, Arkansas. The candidate must have 3+ years of experience in color science, the use of spectrophotometers and software specific to shade matching and color evaluation. The candidate must also be proficient in visual and numeric color evaluation. Previous experience working with digital color imaging software and a manufacturing background, including textile dyeing is preferred. Must have a minimum of one year supervisory experience – will have 10+ direct reports. Bachelor’s degree in textiles is highly desired, but not required. Permanent U.S. work status is required. Competitive salary, benefits and re-location package offered. Interested applicants please send resume and salary requirements to: Consumer Testing Laboratories, Inc., P.O. Box 300, Bentonville, AR 72712, Attn: Human Resources; fax: 479-204-8585 or e-mail in Word format to: jobs@consumertesting.com. Consumer Testing Laboratories is a drug free workplace and equal opportunity employer.

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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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Editor: Prof. Gultekin Celikiz
 tel: 215-836-5729 fax: 215-836-0448
iscc@compuserve.com

Associate Editor: Cynthia Sturke
 tel: 703-318-0263 fax: 703-318-0514
iscc@compuserve.com

Assistant Editor: Mary McKnight
 tel: 301-975-6714 fax: 301-990-6891
mary.mcknight@nist.gov

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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Flex Products, Inc.	www.colorshift.com	707-525-7337
GretagMacbeth, LLC	www.gretagmacbeth.com	800-622-2384
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Pantone, Inc.	www.pantone.com	201-935-5500
PPG Industries, Inc.	www.ppg.com	724-274-3532
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ISCC Member Bodies

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 American Society for Photogrammetry & Remote Sensing (ASPRS)
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 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)

ISCC News Editor

Prof. Gultekin (Tek) Celikiz
iscc@compuserve.com

1309 Paper Mill Rd, Erdenheim, PA 19038-7025
 tel: 215-836-5729 fax: 215-836-0448

ISCC Office Manager

Cynthia J. Sturke, Office Mgr.
iscc@compuserve.com
<http://www.iscc.org>

11491 Sunset Hills Road, Reston, VA 20190
 tel: 703-318-0263 fax: 703-318-0514