



# Inter-Society Color Council News

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## Mar/Apr 2006

*The ISCC and the CIE  
Celebrate the 75<sup>th</sup>  
Anniversaries  
of the  
Inter-Society Color Council  
and the  
CIE Standard Colorimetric  
Observer*

*May 14-17, 2006  
NRC, Ottawa, Canada*

Early Bird Registration Deadline: April 12<sup>th</sup>  
Regular Registration Deadline: May 5<sup>th</sup>

The ISCC and the CIE will be jointly celebrating their 75<sup>th</sup> anniversaries in Ottawa, Canada at the National Research Council (NRC). These week-long jubilee events will kick-off Saturday Evening, May 13<sup>th</sup> with a Wine and Cheese Reception at the Sheraton Ottawa. This is followed by the two-day annual ISCC meeting, May 14-15. The Technical Program features an exciting line-up of oral presentations in all three Interest Group Sessions, and interactive Education Committee and Project Committee meetings inviting audience participation. A Social Hour on May 14<sup>th</sup> will precede the ISCC's Awards Banquet, both to be held at the Sheraton. All bus transportation to and from the hotel to the NRC will be provided for your convenience and all continental breakfasts, lunches and Awards banquet are included in your Annual meeting registration fee. Extensive information is available on the meeting website [www.iscc.org/jubilee2006/](http://www.iscc.org/jubilee2006/) and details of the preliminary program schedule are given in this newsletter on page 7. Check the ISCC website: [www.iscc.org](http://www.iscc.org) for further updates regarding the program. All ISCC Annual Meeting Registrants will receive our 75<sup>th</sup> Anniversary Commemorative ISCC Pin (illustrated above) and the CD.



**ISCC EXECUTIVE OFFICERS**

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*Continued from page 1*

The CIE Expert Symposium will kick-off Monday Evening, May 15 with a Wine and Cheese Reception at the Sheraton Ottawa. The two-day Symposium, May 16-17, features an outstanding technical program of invited and contributed papers and posters from internationally renowned speakers with ample time for round-table discussions. The Symposium banquet will be held on the evening of May 16 in the magnificent Riverview Salon of the Canadian Museum of Civilization. Again, all bus transportation, continental breakfasts, lunches and banquets are included in your Symposium registration fee. (See details of this Symposium on page 6 of this newsletter.) A discounted registration fee is available for people taking advantage of attending both these jubilee events.

Ottawa sits high atop a bluff above the confluence of the Ottawa, Gatineau, and Rideau Rivers and the gently rolling Gatineau Hills as a northern backdrop. With the Gothic Parliament buildings rising above the city and the Rideau Canal cutting its way through Ottawa, you just might feel as if you have been enjoyably transported to another place and time. To add to your enchantment with Ottawa, the city will be ready to celebrate their Annual Tulip Festival ([www.tulipfestival.ca](http://www.tulipfestival.ca)). So bring your cameras, put on your walking shoes and tiptoe through the tulips of Ottawa and celebrate the world of color. We hope to see you there.

*Ms. Cynthia Sturke, ISCC Office Manager, and Dr. Joanne Zwinkels, National Research Council (NRC), Canada*

**VOTE -- ISCC 2006 Ballot -- VOTE**

Following are biographies of the candidates for President Elect, Secretary, Treasurer and the Board of Directors of the ISCC. According to the procedure begun last year, all members of the ISCC will have an opportunity to vote for president elect, secretary, treasurer and up to three directors. You have thirty days in which to return your vote to the ISCC Office, by email ([isscoffice@cs.com](mailto:isscoffice@cs.com)), fax or mail, whichever method is easiest for you. A ballot form is provided with this newsletter. **April 30, 2006 is the deadline.**

**Candidates for the 2006 ISCC Ballot**

**President-Elect:** *Maria Nadal*—Maria is a physical chemist and head of the color measurement team at the National Institute of Standards and Technology of the United States, located in Gaithersburg, MD. She has a BS degree in Chemistry from the University of Puerto Rico and a PhD in Physical Chemistry from the University of Colorado. She has just completed a 3-year term on the ISCC Board of Directors.

**Secretary:** *Jack Ladson*—Jack is a former President of the ISCC and is currently the owner of Color Science Consultancy and a participant in Resource III consulting group.

**Treasurer:** *Hugh Fairman*—Hugh is the current Treasurer of the ISCC where he has served faithfully for many years. He is currently active in Resource III consulting group.

**Director (2006-2009)**

*Jim Roberts*—Jim graduated from Worcester Polytechnic Institute in 1975 with a BS in Chemical Engineering/Life

Sciences, co-major. He started his professional career with Cabot Stains in Chelsea, MA as a paint formulator. He was with Cabot until 1983 and continued on working in tennis court track coatings as Chief Chemist for Sporte. In 1989 he moved to Duron Paints where he worked as a paint formulator and then Director of Color Systems. That position gave him great exposure to industrial color matching issues and solutions. He continues with that same line of work today as the POS Technical Manager for BYK-Gardner USA (now known as AltanaChemie). At Altana, Jim is responsible for building and supporting color matching databases and software with a number of retail companies. He is active with the Color Marketing Group, where he currently serves as the Chairman of the TechKnow Committee. Jim is also currently vice chairman of ISCC Interest Group I and will become chairman following the 2006 Annual Meeting.

*Sandy Austin*—Sandy has a BA in economics from George Washington University and a Master's in City Planning from the Graduate School of Design at Harvard University. She was the director of and taught at GWU's Landscape Design program, specializing in basic design theory for landscape designers, architects, and horticulturalists. Sandy left there to write (*Color in Garden Design*, Taunton Press), to photograph, and to teach independently. She has taught courses in color and design at the Smithsonian, the US National Arboretum and the US Botanic Garden, as well as other arboreta and public gardens. Sandy has her own business called, Horticolour.

*Scot Fernandez*—Scot joined the Imaging and Digital Workflow team at Hallmark Cards Inc. in 2003 as a Publishing Engineer. In his current assignment he shares research and development responsibilities for color/imaging systems. To date he has supported the integration of a distributive inkjet proofing solution that simulates a multi-channel litho environment for greeting cards. Current research interests include soft proofing of multi-channel files, as well as virtual simulation for secondary print processes, and artwork reproduction. Prior to joining Hallmark, Scot completed his education at Rochester Institute of Technology (RIT) with a B.S. in Imaging and Photographic Technology, an M.S. in Color Science, and an M.S. in Imaging Science. His graduate research was completed within the Munsell Color Science Laboratory (MCSL). The emphasis of his graduate research included the evaluation of observer preferences for "preferred" color reproduction intents across varied cultural backgrounds, as well as the performance evaluation of iCAM as a complex image difference model against observer preferences for color reproduction. His professional affiliations include the Inter-Society Color Council (ISCC), Photographic Marketing Association (PMA), Society for Imaging Science and Technology (IS&T), and the International Color Consortium (ICC).

### ISCC Email Address

Please notice that the preferred ISCC's office email is now [isccoffice@cs.com](mailto:isccoffice@cs.com). Please change your email address books to note this change.

## Preliminary Announcement: CORM 2006 Annual Conference

The 2006 annual CORM Conference, "Expert's Symposium on Light Measurement Techniques and Instrument Calibration Techniques and Uncertainties" will be held May 9 - 11, 2006, at the National Institute of Standards and Technology, Gaithersburg, MD. The conference organizers are Mr. Jason Chonko of Keithley Instruments and Mr. Tim Moggridge of Instrument Systems, Ltd.

The conference will be structured to promote interaction between the optical radiation industry and the National Metrology Institutes (NMIs) such as the National Institute of Standards and Technology (NIST), National Research Council (NRC) of Canada, and National Center for Metrology (CENAM) of Mexico.

The technical sessions are:

- Imaging Photometry and Colorimetry
- Spectral and Photometric Flux and Intensity of LEDs, Lamps and Luminaires
- Ultraviolet Lamps
- Detector Responsivity
- Electronic Displays

An NMI representative will present available solutions, or technology status, development, and ideas for improvement. A question and answer period involving industry, NMIs, and audience participation is scheduled to stimulate discussions of technological solutions and innovation.

This approach requires substantial early input from industry regarding problems and issues. The conference organizers, Mr. Jason Chonko of Keithley Instruments and Mr. Tim Moggridge of Instrument Systems, Ltd. request submission of abstracts relating topics of interest to industry and NMI's. Submit your abstracts to the appropriate session chair listed above.

See the CORM web page, [www.CORM.org](http://www.CORM.org) for more information.

## Detroit Colour Council

In 2006, the DCC will continue their modular training approach. The topic last year was exterior color harmony. This year the theme is interiors. The training will focus on creating value by altering materials to create finishes that were, until now, only achievable with expensive materials or processing. In May, DCC will offer "The Look Toolbox". This material focused module will discuss some possibilities that will enhance the appearance of materials and create aesthetic value for customers. The September panel discussion, an engineering module, will discuss the constraints to innovative design. The November program, a product module, will discuss the process of achieving an expected outcome of a marketable design.

See [www.detroitcc.org/index.htm](http://www.detroitcc.org/index.htm), the DCC web site, for more information.

## ISCC 2006 Annual Meeting Poster Session

There's still time to submit poster abstracts for the ISCC 2006 Annual Meeting, Ottawa, Ontario, Canada, May 14-15, 2006. The meeting is co-located with the CIE Expert Symposium and celebration of 75th anniversary of the Standard Observer. The emphasis will be on the standardization of color measurement, but contributions in all areas of color are encouraged. The Poster Session encompasses the topics of all three Interest Groups: Basic and Applied Research, Industrial Application of Color, and Art, Design, and Psychology. This session provides an interactive forum to demonstrate research results in a more intimate setting. Poster presenters are encouraged to incorporate visual aides such as instrumentation, laptops, and samples.

Student submissions are encouraged; a \$100 prize will be awarded to the best student poster. (Proof of full-time student status is required.) Please send your one-page abstract to Karen Braun, Poster Session Chair at [kbraun@crt.xerox.com](mailto:kbraun@crt.xerox.com). For more information, contact Dr. Braun at (585) 422-6380.

**The deadline for submissions is April 6th, 2006.**

## Student Travel Grants ISCC 2006 Annual Meeting

The ISCC Education Committee is providing a limited number of Student Travel Grants to assist students traveling to the ISCC Annual Meeting in Ottawa in May 2006. To be eligible for this grant, students must submit a letter of recommendation from their supervisor including affirmation that they are a full-time student, and an estimate of their travel costs. Preference will be given to students who also include a title and abstract for a paper or poster presentation. Deadline for applying to this program is April 8, 2006. Be sure to include proof of status as a full-time student with your application. Applications should be sent to:

The ISCC Office:  
c/o Cynthia J. Sturke, Office Manager  
11491 Sunset Hills Road  
Reston, VA 20190  
tel: 703-318-0263 fax: 703-318-0514  
[iscc@iscc.com](mailto:iscc@iscc.com) or [csturke@aol.com](mailto:csturke@aol.com)

Students will be informed of ISCC travel support by April 11, 2006.

## Author's Correction

In "A Little-Known Color Effect", ISCC News # 419, the last sentence should read: "And most recently, Zhaojian Li, a graduate student of Roy S. Berns, used [the two-room experiment] as a project in a class taught by Mark Fairchild."

## AATCC Foundation Presents Perkin's Sesquicentennial Celebration

AATCC research and administrative committees will hold their regular spring meetings May 2-4 at the Radisson Hotel in Research Triangle Park, NC. In conjunction with the committee meetings, the AATCC Foundation Inc. will host a special celebration of the sesquicentennial of William Henry Perkin's discovery of mauveine, the first synthetic dye.

Perkin's discovery was an accident. He was attempting to produce artificial quinine to combat malaria. Instead, his experiment produced mauveine. This discovery revolutionized the worlds of fashion, industry and chemical research. For the first time, a dye could be used to produce a uniform shade, something that dyes made from natural elements did not produce. His discovery also sparked new interest in industrial application of chemical research and led to the development of explosives, perfumes, photography, modern medicine, and the plastics industry of today.

The AATCC Foundation will celebrate Perkin's discovery on Tuesday evening, May 2, with a reception where participants will have the opportunity to see the traveling exhibit from DyStar titled, "The Colors of Time: A History of Colors in Textiles." Immediately following dinner, the celebration will continue with a presentation by Deborah Kraak, a free-lance art historian and curator specializing in textiles, costumes, and period interiors. Her presentation is entitled, "Purple Reign." Kraak will address the history of purple, from ancient times to the present day, including the color's complex association with power, status, spirituality, sexuality, magic, mourning, compassion, and perfection. The story will be told through evocative images including textiles, costumes, accessories, mosaics, archeological treasures, paintings, purple manuscripts, fashion plates, photography, and an array of contemporary objects of material culture.

Attendance at the Perkin celebration is by advance registration only. Tickets must be reserved and purchased by April 24. To reserve and purchase tickets, contact Tricia Day at [dayt@aatcc.org](mailto:dayt@aatcc.org) or 919-549-3534.

## Requirements for US Resident's Entry Into Canada

US citizens do not require a visa to enter Canada but require photo identification, such as a current, valid driver's license, AND proof of US citizenship, such as a passport or certified copy of the citizen's birth or naturalization certificate. (A passport can be used for both ID and proof of citizenship.) Alien permanent residents of the US must present their Alien Registration Card, commonly called a "Green Card." Please note that a driver's license does not qualify as proof of citizenship, but can be used as photo identification. Business travelers may also be asked to show: 1) a company letter of support, and 2) proof that the traveler can effect departure from Canada at the end of the stay. Please see [http://travel.state.gov/travel/tips/regional/regional\\_1170.html](http://travel.state.gov/travel/tips/regional/regional_1170.html) for more information.

## Recipient of the 2006 Macbeth Award Prof. David Brainard

The recipient of the 2006 Macbeth Award is Prof. David Brainard of the University of Pennsylvania. The award recognizes Prof. Brainard for his application of Bayesian methods to problems in color appearance and for his contribution as a principal author of the Psychophysics Toolbox, a set of software tools that assists vision researchers in performing vision experiments and color modeling.



His research interests include human vision, machine vision, and computational modeling of visual processing, with a primary focus on how the visual system uses the information available in the light signal incident at the eye to estimate object properties. His published work is notable for its contributions to both color science and color engineering. He is probably best known for his fundamental work on color appearance. In particular, a 1997 paper he co-authored introduced a statistical framework for thinking about color perception as a Bayesian estimate of the properties of the light spectral power distribution and the surface reflectance functions. This has been an influential paper and has been cited over 200 times.

Professor Brainard is currently the Chair of the Psychology Department and Co-Director of the Vision Research Center at the University of Pennsylvania. He is a Fellow of the Optical Society of America and a member of the board of editors of the *Journal of Vision*. He received his undergraduate education at Harvard and his graduate degrees from Stanford, an MS in Electrical Engineering and a PhD in Psychology. Before joining the faculty at the University of Pennsylvania, he was a Professor of Psychology at the University of California at Santa Barbara from 1991 to 2001.

At this year's ISCC Annual Meeting, Prof. Brainard will deliver an address on *Bayesian Models of Color Appearance* during the Interest Group III – Art, Design and Psychology session on Sunday, May 14.

About the Macbeth Award: The Macbeth Award was established by Mr. Norman Macbeth, Jr. to honor the memory of his father, Mr. Norman Macbeth. It is presented to a member or former member of the Inter-Society Color Council for one or more recent outstanding contributions in the field of color. The 2006 Macbeth Award committee members are Mark Fairchild, Manuel Melgosa, Lou Silverstein, Margaret Walch, and Robert Buckley (chair). The Award will be presented at the Awards Banquet on May 14 at this year's 75th Anniversary Annual Meeting of the ISCC in Ottawa.

(Picture supplied by University of Pennsylvania)

## Mary McKnight, Recipient of the 2006 Nickerson Award

Mary McKnight worked as a researcher at NIST for about 25 years. She was a senior research chemist in the Building and Fire Research Laboratory. Among other things she conducted research on service life prediction of coatings and led a multi-NIST laboratory project on predicting appearance of fabricated objects using material microstructure and formulation parameters.

She received a Ph. D. in physical chemistry from the University of Nebraska. Prior to her career at NIST she was a chemist in the Avery International Research laboratory. She is a member of CORM; ASTM E12, where she chaired the Symposium and Workshop subcommittee and was secretary of the Multi-dimensional Aspects of Appearance Subcommittee; and ASTM D01 where she served as Chairman of D01 on paints, coatings, and related materials for four years. She was one of the directors of the Society for Protective Coatings and a member of the Federation of the Societies of Coatings Technology.

Within ISCC she helped organize meetings at NIST in Gaithersburg, MD and served on the Board of Directors from 2000 to 2003. Since her retirement, she has become increasingly involved with ISCC, and is currently in charge of the year-round time-consuming job of organization and layout of the ISCC News.



## Member Item: Marcus and Johnson Receive ASTM Awards

ASTME12 awarded Norbert L. Johnson the Richard S. Hunter Award and Robert Marcus the ASTM service award during its January 2006 meeting.

The Hunter award is intended to honor and recognize those individuals who exemplify the personal and professional characteristics displayed by Mr. Hunter. Norb, who has been an active member of ASTM Committee E12 since August 1975, was given the award for leadership of the E12 committee and of the E12.03 and E 12.04 subcommittees, technical contributions to the development of standards, mentoring of new members and commitment to the goals of E12.

The ASTM Service award is given for outstanding service to a committee, outstanding contribution to the development of standards and other committee activities. E12 awarded Bob the Service Award for his many E12 leadership positions, (Secretary from 1988-1992 Membership Secretary from 1992-1994, vice-chairman from 1994 to 2000 and finally six years as Chairman) and leadership resulting in significant E12 accomplishments. These include development of 13 new consensus standards, significant growth in committee membership, and streamlining of committee meetings.

## ISCC 2006 - The 75th Anniversary Annual Meeting Preliminary Schedule

**May 14 – 15, 2006**  
**NRC Sussex Laboratory**  
**100 Sussex Drive, Ottawa, Canada**

### Saturday, May 13, 2006

18:00–19:30 *Wine & Cheese Reception*, Sheraton Ottawa Hotel

### Sunday, May 14, 2006

09:30–09:45 Bus transportation from hotel to NRC Sussex

09:45–10:30 *Continental breakfast and Registration*, NRC Council Chambers

#### 10:30 – 11:00 **PROJECT COMMITTEE 54**

Colors of Maximum Contrast, *Hugh Fairman*

#### 11:00–12:30 **EDUCATION COMMITTEE**

The Color Curiosity Project, *Dr. Mark Fairchild, RIT*

Presentation and Discussion

12:30–13:30 *Lunch*, NRC Council Chambers

#### **INTEREST GROUP III –**

##### **ART, DESIGN & PSYCHOLOGY**

Session Chair: **Ms. Georgia Kalivas, FIT**

13:30–14:00 Color science-based models for evaluating color harmony, *Dr. M. Ronnier Luo, University of Leeds*

14:00–14:30 Using color to transmit information, *Dr. Sharon McFadden, Defence R&D Canada*

14:30–15:00 Title (TBD), *Stephen Gritt, National Gallery of Canada*

15:00–15:30 *Refreshment Break*

15:30–16:15 Bayesian models of color appearance, *Dr. David Brainard, University of Pennsylvania and Recipient of ISCC 2006 Macbeth Award*

16:15–16:45 Title to be announced, Prof. Georgia Kalivas, Fashion Institute of Technology

17:05–17:20 Bus transportation to hotel

18:00–19:00 *Social Hour*, Sheraton Hotel

19:00–21:00 *ISCC Awards and Business Banquet*, Sheraton Hotel

Presentation of Nickerson and Macbeth Awards



### Monday, May 15, 2006

07:30–07:45 Bus transportation from hotel

08:00–08:30 *Continental breakfast*

08:30–08:35 ISCC 2006 Announcements and Logistics: Dr. Joanne Zwinkels

#### **INTEREST GROUP II – INDUSTRIAL APPLICATIONS OF COLOR**

Session Chair: **Jerald Dimas**, Color Communications, Inc.

08:35–09:05 Improving inter-instrument agreement through profiling, *Tim Mouw, X-Rite Inc.*

09:05–09:35 Comparison of portable and bench top spectrophotometers using the RIT reproducibility data, *Dr. Danny Rich, Sun Chemical Corporation*

09:35–10:05 In-line fiber optic color spectrophotometer for process control, *Jaime Gómez, Equitech International*

10:05–10:30 *Refreshment break*, NRC Council Chambers

10:30–11:00 Reliable digital workflow, *Dr. David Battle, GretagMacbeth*

11:00–11:30 To profile or not to profile: The User's question, *Chuck McLellan, Datacolor*

11:30–12:00 On-line, non-contact color measurement solutions, *Frank Koger, X-Rite Inc.*

12:00–13:00 *Lunch*, NRC Council Chambers

#### **INTEREST GROUP I – COLOR RESEARCH**

Session Chair: **Milt Hardt**, Color Communications Inc.

Session Vice-Chair: **Jim Roberts**, BYK-Gardner

13:00–13:30 Ten Commandments for standardized model making, *Dr. Michael H. Brill, Datacolor*

13:30–14:00 Standardized procedures for improved color measurements, *Dr. J. Zwinkels, National Research Council*

14:00–14:30 Recent developments of the NIST colorimeter, *Dr. Maria Nadal, NIST*

14:30–15:00 *Refreshment break*

15:00–15:30 Comparison of methods of parametric decomposition, *Zhaojian Li, RIT*

15:30–16:00 Comparison of methods for verifying the accuracy of color measuring instruments, *Dave Wyble, RIT*

16:00–16:30 The color of retroreflective payment marking materials, *Dr. Cameron Miller, NIST*

16:35–16:50 Bus transportation to hotel

**ISCC/CIE Expert Symposium**  
**75 Years of the CIE Standard Colorimetric Observer**  
**Preliminary Program**

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

**May 15 – 17, 2006**

**Monday, May 15, 2006**

17:00–19:00 Reception at the Sheraton Ottawa Hotel

**Tuesday, May 16, 2006**

07:30–07:45 Bus transportation from hotel to NRC Sussex

08:00–09:00 Registration & continental breakfast

09:00–09:05 Welcoming address

09:05–09:10 Opening remarks

**SESSION 1: Standard Observers**

09:10–09:45 Origins and history of the Standard Observers, *Françoise Viénot*

09:45–10:20 Open problems on the validity of Grassmann's Laws, *Michael H. Brill*

10:20–10:45 Refreshment break

**SESSION 2: Colour Matching Functions**

10:45–11:20 Physiologically-based colour matching functions, *Andrew Stockman and Lindsay T. Sharpe*

11:20–11:40 Colour matching based on fundamental spectral sensitivity functions, *Péter Csuti*

11:40–12:00 Individual difference of color matching functions and its cause, *Y. Nakano, Y. Nakayasu, H. Morita, K. Suehara, J. Kohda and T. Yano*

12:00–12:20 Test of the transformation of primary space: forward- and inverse-matrix methods, *Boris Oicherman, Ronnier Luo and Alan Robertson*

12:20–12:40 Studies on colorimetry, the Stiles-Crawford Effects I & II, and fiber optics properties in the laboratory of W.S. Stiles at the NPL, Teddington, *Jay M. Enoch*

12:40–13:40 Lunch

**SESSION 3: Instruments and Standards**

13:40–14:15 CIE recommendations and standards on colorimetry, what next, *János Schanda*

14:15–14:35 A new method for calibrating colorimeters, *Maria Luisa Rastello*

14:35–14:55 Development of the NIST detector-based color temperature scale, *George Eppeldauer and Yoshi Ohno*

14:55–15:15 Full 3D BSDF spectroradiometer, *F. Leloup, T. De Waele, P. Hansalaer and M. Pointer*

15:15–15:35 An active vision system for 3D surface colour measurements, *A. Balsamo, A. Chimienti, R. Nerino, G. Pettiti, M.L. Rastello and M. Spertino*

15:35–16:00 Refreshment break

**SESSION 4: Temporal and Spatial Issues**

16:00–16:20 Spatial and chromatic properties of negative afterimages, *L. Beke, Györe, A. Lénár and P. Bodrogi*

16:20–16:40 Additive colour mixing model based on human color vision, *Takako Nonaka, Morimasa Matsuda and Tomohiro Hase*

**SESSION 5: Miscellaneous**

16:40–17:00 The colour of the Canadian flag, *Alan R. Robertson*

17:05–17:20 Bus transportation to hotel

18:00–18:20 Bus transportation from hotel to Canadian Museum of Civilization

18:15–19:00 Cash bar

19:00–21:00 Banquet

21:30 Bus transportation to hotel

**Wednesday, May 17, 2006**

07:30–07:45 Bus transportation from hotel

08:00–09:00 Continental breakfast

**SESSION 6: Colour Appearance 1**

09:00–09:35 CIE colour appearance models: their past and future, *Robert W.G. Hunt*

09:35–10:10 Color appearance in image displays, *Mark D. Fairchild*

10:10–10:30 Color appearance of aged observers, *Gábor Kutas, Youngshin Kwak, Peter Bodrogi, Du-Sik Park, Seong-Deok Lee, Heui-Keun Choh and Chang-Yeong Kim*

10:30–11:00 Refreshment break

**SESSION 7: Colour Appearance 2**

11:00–11:20 Standards for color legibility, *Thomy Nilsson*

11:20–11:40 Scaling of comfort for a colored scene and development of a color comfort meter, *Ken Sagawa, Soichi Takazawa, Tatsuo Saito and Toshikazu Doi*

11:40–12:00 Span of colors similarities of the low vision, *Nana Itoh and Ken Sagawa*

**12:00–3:30 POSTERSESSION**

*Pick up a Gourmet Lunch Box in the Library and Speak to the Poster Presenters*

Conspicuity of blinking LED lights with various temporal frequency and duty ratio, *Miyoshi Ayama, Takano Fujama, Hitomi Fujii, Gennji Yanamoto, Norihiro Ikeda and Masanori Nagata*

Local contrast for no-reference colour quality assessment, *B. Bringier, N. Richard and C. Fernandez-Maloigne*

Mathematical properties of the RGB chromaticity diagram inconsistent with the three-cone theories of color vision, *Vitaly V. Gavrik*

*Continued on page 8*

*Continued from page 7*

Trials on integrating spatial information in color appearance models, *Mohamed-Chaker Larabi, Olivier Tulet and Christine Fernandez-Maloigne*

Intransitive colour matching and metamerism, *Alexander D. Logvinenko*

Device dependent linear relative CIELAB data lab\* and colorimetric data for corresponding colour input and output on monitors and printers *Klaus Richter*

The colorimetric capability developed at NIM-Romania, *Mihai Simionescu and Amadeu Seucan*

About a method to predict M-cone and L-cone photopigments from colour-matching functions, *Françoise Viénot*

#### **SESSION 8: Colour differences**

13:30 – 14:05 Colour difference formulae: past, present and future, *M. Ronnier Luo*

14:05 – 14:25 Evaluation of color difference formulae for color rendering metrics, *Wendy Davis and Yoshi Ohno*

14:25 – 14:45 Color matching functions for a perceptually uniform RGB space, *Joanna Marguier and Sabine Süssstrunk*

14:45 – 15:05 Looking for potential indicators of human tetrachromacy, *Zoltán Jakab and Klára Wenzel*

15:05 – 15:25 Establishing the statistical limits of “normal” chromatic sensitivity, *John L. Barbur, Marisa Rodriguez-Carmona and Alister Harlow*

15:25 – 15:50 Refreshment break

#### **SESSION 9: Colour Management**

15:50 – 16:25 The use of the CIE 1931 Standard Observer in digital colour management, *Todd Newman*

#### **SESSION 10: Conclusions**

16:25 – 17:15 Roundtable discussion

17:15 – 17:30 Closing remarks

17:35 – 17:50 Bus transportation to hotel

## **GIA School of Business Launches Free Online Demo Course**

The Gemological Institute of America (GIA) created an online demonstration course whereby prospective students can sample the online learning environment and course work of the GIA School of Business. The demo course shows examples of the business school’s actual online courses and selected lectures, case studies, presentations, and syllabi.

GIA offers a Jewelry Business Management (JBM) diploma program to teach students who may want to start their own businesses or become executives in the industry. GIA also announced that it will begin a Bachelor of Business Administration program in October 2006.

Visit [www.schoolofbusiness.gia.edu](http://www.schoolofbusiness.gia.edu) to enter the GIA School of Business’ new demo course or call 760-603-4000, ext. 4001 for more information.

## **In This Issue, Volume 31, Issue #2, April 2006**

We open this issue with a rare treat – a guest editorial by John Hutchings. His editorial is on an even rarer topic. Can we hurt people using color? In the article, “Talking about Color,” Dr. Hutchings discusses color and ethics. Whose business is it to be concerned about color ethics, if there is such a thing?

Moving on to the articles in this issue, we first take up the topic of color constancy. Generally, we perceive a white object to be white no matter whether it is illuminated by north sky daylight, fire light, or another illuminant. This trait known as color constancy is useful because it helps us identify objects successfully among other things. In 1905 von Kries first modeled this adaptation. Agreement between the colors when shifted by a change in lighting is by no means perfect, but general agreement may be found. Some researchers have said it is perfect only for unphysical illuminants or reflectances. In the article, “Investigating von Kries-like Adaptation using Local Linear Models” Steven Hordley, Graham Finlayson and A. Alsam explore the conditions when it is exact and when it is good enough. The applications go beyond studying the visual system. Researchers in computer vision and digital photography want to design algorithms that render their visual systems color constant.

There are many situations when it is important to the user that the color on the display matches what was intended. Numerous articles have been published concerning the characterization of displays for high color fidelity. However, in the past most articles covered CRT displays. Now liquid crystal displays (LCD) are popular for flat panels. However, the technology is different. Therefore new issues may be emphasized for optimal characterization. CRT characterization assumed invariance across the gray levels and independent primaries. Some LCDs meet these criteria and can be characterized with traditional methods. In our next article Senfar Wen and Royce Wo discuss possible techniques to use when these criteria are not met. In “Two-Primary Crosstalk Models for Characterizing Liquid Crystal Displays,” they propose a higher order characterization method, which improves the fidelity of the color on LCDs.

Next let us take a step back in time ... about 60 years, to look at a color atlas with which some readers may not yet be familiar. Our next article “The Villalobos Color Atlas: An Analysis” introduces a color system developed by Cándido Villalobos Domingues and his son Julio Villalobos. With 7273 samples, their color atlas *Atlas de los Colores*, published in Buenos Aires, Argentina in 1947, represented the most ambitious collection of systematic object colors to that date. Megan Brown, Rolf G. Kuehni and David Hinks describe and analyze the system. Some of the goals of the Villalobos system were complementary hues, perceptual equidistant samples, constant hue planes, constant perceptual lightness planes, constant relative saturation surfaces, completeness, and low cost. Since copies of the atlas are

*Continued on page 9*



*Continued from page 8*

quite rare, take this opportunity to look at some examples from this major undertaking.

Our next three articles all deal with the same general field – textiles, but they come from three countries, France, Iran, and the United Kingdom. A practical problem in the industry is how to produce the right color by getting dye to adhere on the fabric for the lowest cost. How does one know when the appropriate level has been reached? In the past the simple ratio of Kubelka-Munk absorption to scattering at the wavelength of maximum absorption has been used with varying levels of success. In this issue N. Ahmed, D. P. Oulton, and J. Taylor take another approach to using the Kubelka-Munk equation for determining the fixation rate of reactive dyes. In “The Use of Reflectance Measurements in the Determination of Fixation of Reactive Dyes to Cotton” they describe a solution by developing a scaleable model that uses the simple Kubelka-Munk function at other carefully chosen wavelengths and a reference fabric sample as an accurate indication of the amount of fixed dye.

The other two textile articles deal with the appearance. The appearance of a textile material depends not only on the spectral distribution of the light seen by the observer, but also on the angular distribution of the light. Thus the yarn orientation and woven texture such as twills are an important factor affecting the appearance. From France, A. Moussa, D. Dupont, D. Steen, X. Zeng, and M. Elias report on an “Experimental Study of Back-scattering Spectrum of Textile Structures.” They describe a goniospectrometer and the measurements they made; review the theory of scattering and the effect roughness has on the angle of scatter; then the application of scatter models to textile materials. Then they present a comparison between the experimentally measured materials and the theoretical study to see the correlation between the two and discuss the discrepancies.

The other article dealing with appearance of textiles considers the background on which the textile material is placed. In “Appearance Variations of Textile Materials Due to Different Near-Gray Backgrounds,” Farnaz Agahian and Seyed Hossein Amirshahi not only discuss the effect of background, but also look at the effectiveness of the CIECAM97s color appearance model to predict these appearance effects. They found that observers’ experiences of the color were significantly different than those predicted by the CIECAM97s model.

Our next article looks at the model that simplifies and replaces CIECAM97s for many applications. In 2004 the Commission Internationale de L’Eclairage (CIE) published a technical report from Division 8 entitled “A Colour Appearance Model for Colour Management Systems: CIECAM02.” It is based on CIECAM97s and consists of a chromatic adaptation transform and equations for computing a set of perceptual attribute correlates. For the past year or so, users have been busy implementing the equations given in this report, which may not be as simple as it first seems. Please see a review of this publication by Danny Rich later

in this issue. Here Michael H. Brill discusses an “Irregularity in CIECAM02 and Its Avoidance.” The problem that Dr. Brill discusses emerges only with extreme blue adaptation and is present to a lesser extent in CIECAM97s, but not in some other models such as RLAB that proceed from chromatic adaptation to power-function directly.

Our final article in this issue is a “Clarification of the Differences between VAC and VCC Methods in the Helmholtz-Kohlrausch Effect” by Noshinobu Nayatani and Hideki Sakai. While one of these authors has published numerous articles on his research concerning the variable chromatic and achromatic methods of examining the Helmholtz-Kohlrausch effect, the concepts are often difficult and confusing. The article in this issue is a useful explanation of practical colorimetry and photometry. It would be helpful to use this article as a reference when working with the previous articles on this subject.

In our review section, in addition to the CIE Publication review cited above, we have three book reviews. First is a review of *Brain and Visual Perception: The story of a 25 Year Collaboration* by D. H. Hubel and T. N. Wiesel. This is written by Joel Davis. Next is a review of an older book, *Visual illusions and effects: A collection* by da Pos and Zambianchi. H. A. Sedgwick tells us about this bilingual book that is a scholarly source describing and illustrating visual illusions. The third book review is on the second edition of a book, which we missed reviewing the first edition. Sandra Austin tells us that *Mastering Digital Printing* by Harald Johnson is a practical reference for the photographic or graphic artist interested in learning how to use digital technology. Also, we have brief announcements from the CIE that two of their standards, S010 on Photometry and S012 on Daylight Simulators, have been co-published as ISO/CIE standards with the ISO numbers 23539 and 23603, respectively. In addition there is a new CIE publication from Division 8 identified as *Publ. 168:2005* and entitled *Criteria for the Evaluation of Extended-Gamut Colour Encodings*.

There are two international meetings that we want to bring to the reader’s attention. First, the organizers have invited everyone to the AIC Interim Meeting, which is being held in South Africa. Second, the CIE has put out a call for papers for the 26<sup>th</sup> Session of the CIE to be held in Beijing, China, in 2007. Don’t miss the submission date to join the group of presenters at this quadrennial meeting.

*Ellen Carter*

*Editor, Color Research and Application*

### **Pictures from the 50th Anniversary ISCC Annual Meeting**

In conjunction with preparing the ISCC 75th Anniversary CD, ISCC is requesting information and/or copies of photographs taken during the 50th Anniversary Annual Meeting, and in particular any formal picture of the attendees, officers, etc. Please email, call or send materials to Cynthia Sturke at the ISCC office.

## 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**  
[isscoffice@cs.com](mailto:isscoffice@cs.com) website: <http://www.iscc.org>

### 2006

- April 4-6** **Color Technology and Design**, Detroit Colour Council/Coatings Research Institute, Eastern Michigan University, [www.detroitcc.org](http://www.detroitcc.org)
- Apr 7-11** **CMG's Spring International Conference**, Color Marketing Group, Denver, Colorado, 703-329-8500, [www.colormarketing.org](http://www.colormarketing.org)
- Apr 18-20** **Color Pigments 2006 - A Global Perspective**, Color Pigments Manufacturers Association, Inc., 703-684-4044, Hotel InterContinental, Chicago, Illinois, [cpma@cpma.com](mailto:cpma@cpma.com), [www.pigments.org/index.php?id=61](http://www.pigments.org/index.php?id=61)
- Apr 25-27** **Coating and Graphic Arts Conference and Exhibit - 2006 TAPPI**, Atlanta Marriott Marquis Atlanta, Georgia , [www.tappi.org](http://www.tappi.org)
- May 1-5** **Prospecting for Geospatial Information Integration, asprs**, The Imaging and Geospatial Information Society, Reno Hilton Hotel, Reno Nevada, 301-493-0290, [www.ASPRS.org](http://www.ASPRS.org)
- May 2-4** **AATCC Spring Committee Meetings**, Research Triangle Park, NC, 919-549-8141, [www.aatcc.org/AATCCinfo/committees/committees.cfm](http://www.aatcc.org/AATCCinfo/committees/committees.cfm)
- May 9-11** **CORM 2006 Annual Conference, Industry and National Metrology Institutes: Partners in Light Measurement Problem Solving**, NIST, Gaithersburg, MD, 440-542-8042, [www.corm.org](http://www.corm.org), [CORM2006\\_information.shtml](http://CORM2006_information.shtml)
- May 7-12** **2006 International Congress of Imaging Science (ICIS 2006)**, Hyatt Regency Hotel, Rochester, New York, 703-642-9090, [www.imaging.org/conferences/icis2006](http://www.imaging.org/conferences/icis2006)
- May 14-15** **ISCC 2006 Annual Meeting**, Ottawa, Canada, 703-318-0263, [www.ISCC.org](http://www.ISCC.org), [isscoffice@cs.com](mailto:isscoffice@cs.com)
- May 16-17** **CIE Expert Symposium on the Standard Observer**, National Research Council, Ottawa, Canada, [www.iscc.org/jubilee2006](http://www.iscc.org/jubilee2006), [isscoffice@cs.com](mailto:isscoffice@cs.com)
- May 18-19** **CIE Division I Meeting**, Ottawa, Canada, [www.bio.im.hiroshima-cu.ac.jp/~cie1](http://www.bio.im.hiroshima-cu.ac.jp/~cie1)
- May 23-26** **IS&T Archiving Conference**, Ottawa, Canada, 703-642-9090, [www.imaging.org/conferences/archiving2006/](http://www.imaging.org/conferences/archiving2006/)
- Jun 4-9** **SID 2006 International Symposium, Seminar, and Exhibition**, Moscone Center, San Francisco, California, USA, 212-460-8090 ext. 202, [www.sid2006.org](http://www.sid2006.org)
- Jun 14-16** **ASTM E12, Color and Appearance**, Sheraton Centre Toronto; Ontario, Canada, 610-832-9500, [www.astm.org](http://www.astm.org)
- Jun 15-17** **7th International Symposium of the Slovenian Colorist Association: Colors of National Symbols**, Ljubljana, Slovenia, [isnt2006@ntf.uni-lj.si](mailto:isnt2006@ntf.uni-lj.si), [www.ntf.uni-lj.si/isnt2006](http://www.ntf.uni-lj.si/isnt2006)
- Jun 25-28** **CORM Fifth Oxford Conference on Spectrometry**, National Physical Laboratory, UK, [www.corm.org](http://www.corm.org)
- Jul 5-7** **10th International Conference on Information Visualization - IV06**, University of London, London, UK, Tel.: (Int... +44) 207 815 7476, [www.graphicslink.co.uk/IV06/](http://www.graphicslink.co.uk/IV06/), [banisse@lsbu.ac.uk](mailto:banisse@lsbu.ac.uk)

**2006, Continued**

- Aug 26-27** Gemological Research Conference, San Diego, California, [www.symposium.gia.edu](http://www.symposium.gia.edu)
- Aug 27-29** 4th International Gemological Symposium, San Diego, California, [www.symposium.gia.edu](http://www.symposium.gia.edu)
- Sept 17- 22** NIP22: International Congress on Digital Printing Technologies, IS&T, Hyatt Denver Convention Center Hotel, Denver, Colorado, 703-642-9090, [www.imaging.org](http://www.imaging.org)
- Oct 8 -12** Frontiers in Optics 2006, The 90th OSA Annual Meeting Laser Science XXII, Rochester Riverside Convention Center, Rochester, New York, 202-223-8130, [www.osa.org](http://www.osa.org)
- Oct 13-17** Fall International Conference, Color Marketing Group, Atlanta, GA, 703-329-8500, [www.colormarketing.org](http://www.colormarketing.org)
- Oct 19-20** CIE Expert Symposium on Visual Appearance, Paris/France [www.mnhn.fr/cievisualappearance](http://www.mnhn.fr/cievisualappearance)
- Oct 24-27** "Colour in Culture and Colour in Fashion," AIC 2006, Interim Meeting, Misty Hills Country Hotel and Conference Centre, Johannesburg, South Africa, [www.colourgroupsa.org.za](http://www.colourgroupsa.org.za)
- Nov. 1-3** International Coatings Expo, ICE 2006, Federation of Societies of Coatings Technology, (FSCT), 610-940-0777 email: [fsct@coatingstech.org](mailto:fsct@coatingstech.org), [www.coatingstech.org](http://www.coatingstech.org)
- Nov 6-10** Color Imaging Conference, CIC14, Society for Imaging Science and Technology (IS&T) and the Society for Information Display (SID), Scottsdale, Arizona, 703-642-9090, [www.imaging.org/conferences/cic14/](http://www.imaging.org/conferences/cic14/)

**2007**

- Jan 23-25** ASTM E12, Color and Appearance, Embassy Suites Hotel; Ft. Lauderdale, FL, [www.astm.org](http://www.astm.org)
- Jul 4-11** The 26th Session of the CIE, Beijing, China, [www.cie.co.at/news/news76.pdf](http://www.cie.co.at/news/news76.pdf)

**Publications Available from ISCC Office**

**Color and Light** by Fred W. Billmeyer Jr. & Harry K. Hammond., III. Authorized reprint from: ASTM Manual 17, Copyright 1996, ASTM International, 100 Bar Harbor Dr., W. Conshohocken, PA 19428. \$5 ea or 20 copies/\$50.00

**Demystifying Color** by Bob Chung, 11 pages. Discusses and explains ten myths about color. .... \$5 ea or 20 copies/\$50.00

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

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

\*Plus shipping and handling

**Oxford V Conference 2006**

The 5th Oxford Conference on Spectrometry will be held June 26-28 in Teddington, UK. The program outline is:

- Monday June 26 "Spectrophotometry: UV, visible, IR, reflection, transmission, scales, uncertainties"
- Tuesday June 27, "Appearance: methods and materials and Fluorescence: methods and applications"
- Wednesday Morning June 28, "Advances in Technology: instruments and materials;

See [www.oxford-v.npl.co.uk](http://www.oxford-v.npl.co.uk) for more information.

**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.

Issue #420

Mar/Apr 2006

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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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## 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)  
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 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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## 2006 ISCC Ballot

### Election of Executive Board (2006-2008)

Maria Nadal	President-Elect	( )
Jack Ladson	Secretary	( )
Hugh Fairman	Treasurer	( )

### Election of Board of Directors (2006-2009 term)

Vote for THREE candidates

Sandy Austin	( )
Scot Fernandez	( )
Jim Roberts	( )

**Return of Ballot: Please return the completed ballot to the Inter-Society Color Council Office ASAP as these ballots need to be tabulated before the May 13th Board of Directors meeting.**

**Please respond by fax: (703)-381-0514, Email: [isccoffice@cs.com](mailto:isccoffice@cs.com) or by US Mail:  
Inter-Society Color Council, 11491 Sunset Hills Road, Reston, VA 20190.**

**It is important to sign the cover sheet of your fax or your ballot when returning your vote.**

**Thank you.**



# REGISTRATION FORM



ISCC 2006 ANNUAL MEETING      75<sup>TH</sup> ANNIVERSARY SYMPOSIUM  
 May 14-15, 2006                      May 16-17, 2006

National Research Council of Canada, Ottawa, Canada

Name \_\_\_\_\_ Badge Name \_\_\_\_\_  
 Organization/ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State/Prov \_\_\_\_\_ Country \_\_\_\_\_ Postal Code \_\_\_\_\_  
 Tel. (Include Int'l Code) \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-Mail \_\_\_\_\_ Country of Citizenship \_\_\_\_\_  
 Accompanying Person (s) \_\_\_\_\_

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

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

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

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

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

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

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 Reston, VA 20190, USA  
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Registrations must be received by the ISCC Office by **May 5, 2006**. After that date, attendees will need to register on-site. Registration fees are fully refundable if cancellations are made in writing by **April 12**. After this date, refunds are subject to a \$75 USD cancellation fee. However, substitutions may be made at any time at no charge. For information on travel documents, consult the web-site page: [www.iscc.org/jubilee2006/general.html](http://www.iscc.org/jubilee2006/general.html).

Inter-Society Color Council

Tel: 703-318-0263 Fax: 703-318-0514 Email: [isccoffice@cs.com](mailto:isccoffice@cs.com)