



Inter-Society Color Council News

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**Register now for the
ISCC/CORM Meeting
NIST
Gaithersburg, MD
May 10-14, 2004
"Advances in Measurement
Science for
Color and Appearance"**

March/April 2004

President's Column

Spring is nearly upon us – the most colorful time of the year. For those of you at or below the 38th parallel you may already be in the midst of spring. It will be slightly past mid-spring at the NIST laboratories in Gaithersburg, MD by the time of our meeting but still quite pleasant in the rolling hills and horse country of central Maryland. If you have never visited Maryland in the late spring then you really must plan on coming. The program is really coming together. This is an exciting time in the history of colorimetry. Not since the 1950s has there been so much activity on improving the reliability of color measurements. You will find detailed information about our annual meeting in this newsletter.

The annual meeting is the time of year when the ISCC gives out its awards. This year we will award the Macbeth Award for specific recent contributions to field of color and the Nickerson Service award for considerable contributions to the ISCC. You will find information about both awardees in this Newsletter.

As I mentioned last month, there is one aspect of the 2004 meeting that will be somewhat different from a typical ISCC or CORM meeting – SECURITY. As a result of current political events around the world, registration will be more difficult. US citizens may be able to register within the preceding week, but those of our membership from outside of the USA will not. So – start making plans to get your registration and company permissions in ASAP.

I hope that you are starting to get excited about our fall, Williamsburg-like meeting, at the Fashion Institute of Technology / SUNY in New York City. The general topic will be color in design and psychology and should include some really terrific presentations and demonstrations

I have just seen the first call for papers for the 2005 AIC quadrennial meeting to be held in Granada, Spain. Those of you who attended the 2001 AIC meeting in Rochester, NY know what a terrific meeting this can be – covering all aspects of color from technology to psychology, from functional to aesthetic design. Please put this into your long-range plans. Also do not forget that we have another fall "Williamsburg" special topics meeting in 2005 following the annual IS&T – SID Color Imaging Conference in Scottsdale, AZ. We are hoping to provide an opportunity for the ISCC members involved in the measurement and reproduction of colored materials to exchange

Continued on page 2

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ideas with the color engineers involved in the measurement and reproduction of color images.

Danny Rich, President of ISCC

-- Cash Prizes --**ISCC 2004 Poster Session**

The ISCC is pleased to announce the establishment of three cash prizes for the best student posters presented at the ISCC/CORM Annual Meeting. As poster chairman, I encourage you to submit a short (one page) abstract of your research for the poster session at this conference. \$100 will be awarded for the best submission in each of three categories, representing the three ISCC interest groups:

- **Fundamental and Applied Research** — research in the field of color, such as color vision, color order systems, and color instrumentation
- **Industrial Application of Color** — the practical application of color science to industrial applications
- **Art, Design and Psychology** — color from the non-measurement perspective, bringing together physical sciences and arts, affording a unique perspective in how color is perceived and acted upon

Please send your one-page abstract to Karen Braun at kbraun@crt.xerox.com by April 1, 2004.

The ISCC 2004 Annual Meeting and Symposia will be held May 10-14, 2004 at NIST headquarters in Gaithersburg, Maryland. The meeting is co-sponsored by ISCC and NIST and held jointly with the CORM Annual Meeting. Please visit http://www.iscc.org/ISCC_CORM_2004.php for more information and registration information.

ISCC/CORM Registration

	Before Mar 30	After Mar 30
ISCC only	\$325	\$350
CORM only	\$325	\$350
ISCC & CORM	\$600	\$650
Students either mtg	\$100	\$100

Register for both conferences early and save \$50!

Registration fee for either meeting includes wine and cheese reception and corresponding banquet.

Cut-Off date for Mtg Registration: April 26, 2004

(Cut-off date meets NIST security requirements.)

Registration form is included with newsletter or see www.ISCC.org.

Hotel Information:

Hilton Washington DC North
620 Perry Parkway
Gaithersburg, Maryland, 20877
(301) 977-8900

<http://www.hilton.com/> and choose Gaithersburg.

For special room rate, please mention ISCC.

Cut-off date for special rate: April 8, 2004.

Color and Design Conference

Sponsored by Inter-Society Color Council (ISCC)
and Fashion Institute of Technology (FIT)

October 22-24, 2004 @ FIT Campus, NYC

Currently accepting submissions for a presentation,
a panel discussion, or a poster session
along with a brief description of your idea at:

Professor Margaret A. Miele
Department of Social Sciences
Fashion Institute of Technology
Seventh Avenue at 27 Street, Room B634
New York, NY 10001-5992

Deadline for completed submissions is April 23, 2004

Please address any questions or concerns to Prof. Miele by fax at 212.217.7095,
by phone at 212.217.8449 or by email at margaret_miele@fitnyc.edu.

Please use the form below to submit your topics and contact information

Name: _____ Title _____

Organization: _____

Address: _____

Phone #: _____ • Alternate #: _____

Email: _____

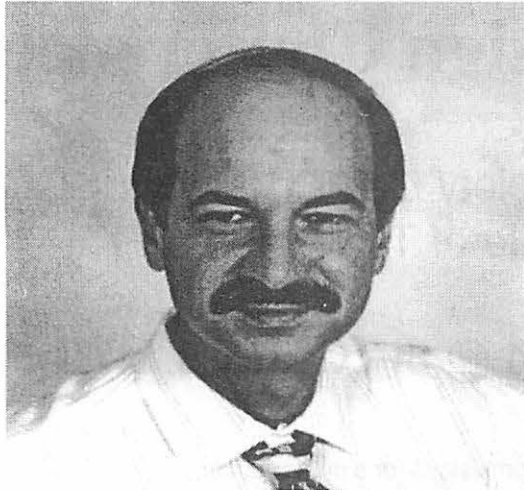
Topic #1: _____

_____ Presentation _____ Panel Discussion _____ Poster Session

Topic #2: _____

_____ Presentation _____ Panel Discussion _____ Poster Session

Topic #1 will be your first choice. Topic # 2 is not required, but a good idea for a back-up.



Louis D. Silverstein to Receive The ISCC Macbeth Award

The Inter-Society Color Council will honor Dr. Louis D. Silverstein with the presentation of the Macbeth Award during the Annual Meeting on May 10-12, 2004 at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland. The presentation will take place during the Awards Banquet at the Willow Tree Inn on Monday, May 10, 2004. The Macbeth Award was established in 1970 in memory of Norman Macbeth. It is presented biannually to a member, or former member, of the ISCC for recent important contributions in the field of color. Dr. Silverstein, founder and Chief Scientist of VCD Sciences, Inc. in Scottsdale, Arizona, will be recognized for his contributions to color rendering through liquid-crystal technology in electronic displays and image capture devices. VCD Sciences, Inc. is a scientific research and consulting firm with project specialization in the areas of applied vision, color science, and display technology.

Silverstein received his B.S., his M.S. and his Ph.D. in psychophysics and vision science from the University of Florida. After earning his Ph.D., he spent two years doing advanced research in sensory neuroscience at the University of Wisconsin as an NIH postdoctoral fellow. Prior to founding VCD Sciences, Inc., he was a Senior Research Fellow at Honeywell's Systems and Research Center and a Research Scientist at the Boeing Company. Dr. Silverstein was awarded the Alexander C. Williams Award of the Human Factors Society in 1983 for his work on the advanced cockpit color CRT display systems for the Boeing 757/767 aircraft and the Honeywell Corporate Technical Achievement Award in 1989 for the development of visual simulation methods for color liquid crystal displays.

Dr. Silverstein is the author of over 120 journal articles, book chapters, technical papers, and technical reports. Among his thirty patents are several recent innovations in liquid crystal displays and liquid-crystal-based image-capture devices. He is a Fellow of the Society for Information Display (SID). He has been a past program and general chair

of the SID international conference, has served as an Associate Editor of the *Journal of the Society for Information Display* and on the editorial board of the journal *Human Factors*, and currently serves on the editorial boards of the journals *Color Research and Application* and *Information Displays*. He currently serves on the U.S. National Committee of the CIE (USNC/CIE) and had served on the U. S. National Academy of Sciences Committee on Vision. In addition to being a Fellow of the SID, he is a member of the Human Factors Society, the Optical Society of America (OSA) and the Society of Imaging Science and Technology (IS&T).

Please join us in honoring Dr. Silverstein at our Annual Meeting.

Dr. Robert Marcus

Datacolor

AIC 2004 Interim Meeting Call for Papers

The Brazilian Color Association – ABCor - established six years ago, is honored to invite the International Color Community to the Interim Meeting 2004 entitled "Color and Paints." The meeting will be held November 3-5, 2004 in the Convention Center of the Rio Grande do Sul Catholic University – PUCRS. Av. Ipiranga, 6681, Porto Alegre - RS, Brazil. Professionals from all associations that study COLOR are welcome and we hope they can contribute, listen to and discuss this phenomenon that catches and involves us.

The theme of the meeting can be approached from the technical or artistic point of view, including the phases of production (physical, chemical, technological aspects), applications (industry, art, architecture & design), conservation and restoration, impact on the environment, historical aspects, marketing, etc. The acceptance of a paper for either an oral or poster presentation will depend on the final decision of the scientific committee. The abstract should be written in English. Please send as an attached Word file before March 31, 2004 to: jcaivano@fadu.uba.ar.

For more information on either the meeting or submitting an abstract, see <http://www.abcorpoa.org/>.

Visual Science Symposium

The Center for Visual Science will hold its 24th Symposium "Adaptive Representation and Control in Vision," June 18 - 20, 2004 at the University of Rochester.

This meeting will focus on the neural mechanisms responsible for the integration of perceptual processing and various cognitive factors related to the animal's past experience and motivational state. A limited number of travel awards and fellowship will be provided for graduate students and postdoctoral fellows.

The deadline for registration is May 1, 2004. Please see <http://www.cvs.rochester.edu/symposium.html> for more information.



Ralph Stanziola Selected To Receive ISCC's Nickerson Service Award

Mr. Ralph Stanziola will be presented the ISCC's Nickerson Service Award during the Annual Meeting on May 10-12, 2004 at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland. The presentation will take place during the Awards Banquet at the Willow Tree Inn on Monday, May 10, 2004.

Mr. Stanziola is the 19th recipient of the Nickerson Service Award. He joined the ISCC in 1962 and has been an active member since that time. He co-chaired the very successful Annual Meeting in Princeton in 1992 that celebrated the 25th anniversary of the AIC. Stanziola also co-chaired the joint meeting the Detroit Colour Council in Detroit in 1994 on Color and Quality and most recently co-chaired the very successful Williamsburg Conference on Industrial Color Problems held at his alma mater, Philadelphia University. He was instrumental in setting up the Education Interest Group when it would give tutorials and demonstrations on color technologies. He was also the first chairman of the Industrial & Applied Color Interest Group and organized several well attended sessions.

In May, 1985 Mr. Stanziola founded Industrial Color Technology, which offers a variety of services primarily directed towards the solution of industrial problems that involve color control. In 1970 he was one of the founders of Applied Color Systems, Inc. where he was the Executive Vice-President and Technical Director. He spent nine years as Technical Representative and General Sales Manager for Davidson and Hemmendinger, Inc. and later for Kollmorgen Corporation, which had acquired Davidson and Hemmendinger. Stanziola also spent nine years in Research and Technical Service for the Dyes Department of the American Cyanamid Company.

Mr. Stanziola received his B.S. degree in Chemistry from the Philadelphia College of Textiles and Science, which is now Philadelphia University. He holds three patents and has authored a number of technical papers. Stanziola developed the Color Curve System for color communication. In 1995, the Technical Association of the Pulp and Paper

Industry presented him with their Finest Faculty Award. He is a member of the Federation of Societies for Coatings Technology (FSCT) from which he received the Armin J. Bruning Award for his outstanding contribution to the science of color in the field of coatings technology. He is also a member of the American Association of Textile Chemists and Colorists (ATTCC), and the Detroit Colour Council (DCC).

Please join us in honoring Mr. Stanziola at the May ISCC Annual Meeting.

*Dr. Robert Marcus
Datacolor*

Robert Chung Appointed Gravure Research Professor

Robert Chung has been appointed Gravure Research Professor for a three-year term effective immediately. He is a veteran educator at Rochester Institute within the university's internationally recognized School of Print Media.

The Gravure Research Professor is funded by an endowment from the Gravure Association of America. The position has been created to further gravure research and to promote gravure education in the curriculum.

"In addition to his impressive credentials, Professor Chung has been actively involved in the Gravure Association," states Joan Stone, dean of RIT's College of Imaging Arts and Sciences. "His overall track record in both research and academics makes him the appropriate choice for this position."

Chung's research agenda for the next three years includes meeting with leaders in the gravure and allied industries to conduct needs assessments. He will also develop research proposals that apply scientific methodology to solve quality and productivity issues regarding gravure imaging as a competitive solution to print buyers, formulate strategies and identify allies and partners to implement various gravure initiatives, and publish research findings.

A member of the RIT faculty since 1980, Chung has most recently served as professor in the School of Print Media. Previously, he was associate director of RIT's Laboratory for Quality and Productivity in Graphic Arts.

Chung earned his M.S. in printing technology from RIT and his B.A. in industrial technology from Eastern Washington University. He also has a diploma in printing technology from Chinese Culture University in Taiwan. For further information, Contact: Paul Stella, 585-475-4950 or pbscom@rit.edu.



ISCC Preliminary Program

May 10 - 12, 2004

National Institute of Standards Gaithersburg, MD

Monday, May 10

Morning

Interest Group II:

Industrial Applications of Color

Mr. Gary Regulski, DuPont, Chair

Presentations include (in no particular order):

"Tangled Up in Blue," **Mr. Michael J.**

Bradbury, Color Solutions International

"The Use of Transformed Reflection Functions in Artificial Neural Network Match Prediction Systems," **Mr. Farhad Ameri**, Department of Polymer and Color Engineering, Amir Kabir University of Technology, Iran

"Color-View Sample Rotator," **Mr. Uwe Lethaus**, Senior Applications Manager, BYK-Gardner USA

"Uncertainty Propagation in Colorimetry,"

Dr. Edward Early and Dr. Maria Nadal, NIST

Afternoon

Interest Group I:

Basic and Applied Research

"The Role of Standards in Color"

Mr. Milt Hardt, Color Communications, Inc., Chair and **Mr. Milt Misogianes**, Ciba Specialty Chemicals, Vice Chair

Presentations include (in no particular order):

"Development of the NRC Reference Goniospectrophotometer,"

Dr. Joanne Zwinkels, National Research Council of Canada,

"Standards for Assessing the Quality of Daylight Simulators in the UV Range: Critical Comparison,"

Dr. Robert Hirschler, SENAI/CETIQT, Colour Institut of Brazil

"How to Derive an Isoluminous Color Difference for Anyone's Delta E Formula,"

Dr. Michael Brill, DataColor

"Color Matching with Amplitude not Left Out," **Dr. James Worthey**

"Recent Developments of the NIST Reference Colorimeter,"

Dr. Maria E. Nadal, NIST

"Methodologies for Relating Scratch Damage to its Appearance Properties of Polymeric Materials," **Dr. Li-Piin Sung**, NIST

Evening - Awards Banquet, Willow Tree Inn

Tuesday, May 11,

Morning

Interest Group III:

Art, Design and Psychology

"Translating Color Standards from Designer to Colorist and Back to Designer"

Georgia Kalivas, FIT, Chair and

Marcia R. Cohen, The Atlanta College of Art, Vice-Chair

Presentations include:

"Setting the Standard Color or Getting the Color that you Originally Wanted,"

Dr. John A. Darsey, Jr., Color Solutions Intl.

Afternoon

Poster session: Karen Braun, Chair

Many posters, with topics ranging from illumination and goniometry to color management software application and to effects of culture on design. Prizes will be awarded to best posters, see page 2 of this newsletter.

Wednesday, May 12

ISCC Project Committee Meetings

- ISCC Project 52 on Comparative List of Color Terms (Carter, Chair)
- ISCC Project 54 on Colors of Maximum Contrast (Fairman and Stanziola, Chairs)

(Check ISCC web page for program updates, www.ISCC.org).

CORM Preliminary Program

May 12-14, 2004

National Institute of Standards

Gaithersburg, Maryland

CORM**Wednesday, May 12**Afternoon***Advances in Retroreflectance Metrology*****Richard Austin**, Gamma Scientific, and
Norbert Johnson, 3M Company, Chairs*"The New NIST Center for High Accuracy
Retroreflection Measurements,"***Todd Heimer**, NIST*"Making Measurements with Hand-Held
Sign Retroreflectometers,"* **Paul Carlson***"From Concept to Rulemaking: The Status of
Retroreflectivity in Transportation,"***Carl Andersen**, NTSB*"Beam, Band, or ASTM E4061: Which is
Better Based on Uncertainty Analysis,"***Cameron Miller**, NIST*"Measuring the Retroreflectivity of Wet
Pavement Markings,"* **Ron Gibbons***"Daytime Color of Prismatic Retroreflective
Traffic Signs: An Investigation into the
Relationship between Instrumental
Colorimetry in the Laboratory and Field
Photometry from the Driver's Seat,"***David M. Burns**, 3M*"Color Matching: First Results - Theoretical
Summary on Colorants, Pigment, Metallic
Pigments, Pearls and Interferential Pearls,"*
Henri Debar, Isocolor, Inc.Afternoon***Advances in Color Imaging*****David Wyble**, Munsell Color Science
Laboratory, R.I.T., Chair*"Adjusting Skin Tones for Preference,"*
Karen Braun, Xerox Corp.*"Development of a Spectrally Tunable
Calibration Source for Display
Colorimeters,"* **Irena Fryc**, Guest Scientistfrom Bialystok University of Technology,
Bialystok, Poland, **Steven Brown**, and **Yoshi
Ohno**, NIST*"A Testing Procedure to Characterize Color
and Spatial Quality of Digital Cameras
Used to Image Cultural Heritage,"***Erin Murphy** and **Roy Berns**, RIT/MCS*"Wavelength Selection for Improved
Colorimetry with 3D-multispectral Laser
Scanners,"* **Réjean Baribeau**, NRC*"Spectral Imaging at the Munsell Color
Science Laboratory,"* **Roy Berns**, RIT/
MCSL**Thursday, May 13**Morning***Haze, Gloss, DOI and Appearance Attributes*****Joanne Zwinkels**, National Research Council
Canada, Chair*"Systematic and Random Uncertainty
Propagation in Color Measurement,"* **Jim
Gardner**, CSIRO*"Optical Design for Precise Geometry on
the New NIST Goniospectrophotometer,"***Will Weber**, Opti-Techure, Inc./AvianGroup
USA*"Characterization of New NRC
Goniospectrophotometer for Specular Gloss
Measurements at 20, 60 and 85 Degrees,"***J. Liu**, **M. Noël**, **J. Zwinkels** and **Y. Li**,
National Research Council of Canada**Friday, May 14**Morning***Fluorescence and Color-Whiteness,
Brightness, and Chromatic Fluorescent
Materials*****David Burns**, 3M, ChairAfternoon***Self-Guided NIST Tours***(Check the ISCC web page for program updates,
www.ISCC.org)

Color Research and Application

In This Issue, April 2004

Before we begin talking about the new articles in this issue, I must report that the color community has lost another member. This month we bid farewell to the eminent vision scientist, Russell L. De Valois. His career was cut short because of a traffic accident.

For the past year or more at the Commission Internationale de L'Eclairage (CIE) meetings of Division 1 on Color and Appearance, there has been much discussion of the calculation of colorimetric values. This may surprise some because tristimulus integration has been part of the CIE system for years. However, the recent updating of CIE Document 15 on colorimetry, the technical committees working on issuing standards based on CIE colorimetry (TC1-57), and other technical committees such as TC 1-38 on the compatibility of tabular data all have wrestled with the details of tristimulus integration. The first article in this issue goes directly to this point. Drs. Changun Li, M. Ronnier Luo and Bryan Rigg present "A New Method for Computing Optimum Weights for Calculating CIE Tristimulus Values."

On occasions when high speed color image production is required, it is particularly convenient to represent sets of reflectance spectra with a limited number of equations. These are achieved through principal component analysis. There have been several articles about and employing this method in the past. However, there is more than one way to do principal component analysis. Researchers have not made a careful distinction between the procedures, even though most use an offset to the mean curve. It is important to know the method used and whether a mean reflectance curve was employed when comparing or integrating work from several researchers. In our next article, "The Principal Components of Reflectances," Hugh Fairman and Michael Brill describe the two kinds of principal-component coordinates of a measured spectrum. One kind is obtained by a least-square best fit analysis and the second by a tristimulus match under one or more specified lights. The authors then show examples, and discuss possible new uses for principal-component analysis of reflectances.

Keeping within the area of colorimetry, our next article focuses on calibration when fluorescence is present. As has been pointed out in earlier articles, the presence of fluorescence creates special measurement considerations. This can be particularly troublesome when we do not realize that we are working with fluorescent materials. Such a case may occur when we have a white standard exhibiting fluorescence. The fluorescence may be inherent in the material or accidentally introduced by cleaning the standard with an inappropriate technique. Alicia Pons and Joaquin Campos discuss the "Spectrophotometric Error in Colour Coordinates Introduced by Fluorescence of White Calibration Tile." Their research analyzes the differences found in color coordinates when measured with a spectrophotometer using polychromatic (white light) illumination and one with monochromatic

illumination. They conclude the fluorescence effects are not negligible.

While we are reporting on measurement issues, we will add one more article. Drs. A. C. Iñigo, S. Vicente-Tavera, and V. Rives describe how they use color parameters in "MANOVA-BIPLLOT Statistical Analysis of the Effect of Artificial Ageing (Freezing/Thawing) on the Colour of Treated Granite." Since color attributes are currently used to monitor the effectiveness of preservation treatments for monuments, as well as in ageing studies, it is important to produce careful analyses of its effectiveness.

For the remainder of this issue, we will set aside the measurement of color per se, and move into areas of perception. First, lighting is a critical issue in museums. Beyond the usual needs for use of a public place, there are special issues in choosing illumination that will optimize the viewer's experience of the artwork and will not damage the artwork over long exposure times. Our next article "Museum Lighting: Optimizing the Illuminant" discusses the issues and research on observers' preferences. Michael Scuello, Israel Abramov, James Gordon, and Steven Weintraub discuss the aesthetics of viewing paintings when using lighting with different color temperatures, particularly the difference between higher color temperatures of some artificial lights and daylighting. Their research thus far has centered on color temperature. However, future work will add another relevant factor for the observer, the level of illuminance.

Next while looking at "Quantifying Variations in Personal Color Spaces," David Bimler, John Kirkland, and Kimberly A. Jameson ask the question "Are There Sex Differences in Color Vision?" In their research they addressed the specific question of whether sex differences in color perception appear in color similarity judgments. They concluded that males and females differed in their average responsiveness to particular dimensions of color space. Males place less weight on inter-stimulus separation along the red-green axis, but more weight on separation along the lightness axis.

Our next two articles by Yoshinobu Nayatani deal with a new color space. In the first article, "Proposal of An Opponent-Color System Based on Color-Appearance and Color-Vision Studies" Dr. Nayatani describes a color system with whiteness, blackness, grayness, chroma, and hue. A method for determining Munsell notations of any color in this system is developed. He goes on to discuss the ideas of vividness, tone and veiling grayness. The tone concept used in the Practical Color Coordinate System developed in Japan is also clarified.

The second article by Dr. Nayatani, "Transformation from Munsell Space to the Swedish NCS through the Nayatani Theoretical Space" seeks to clarify the conceptual differences between the three spaces. In it Dr. Nayatani provides a relationship and method for transforming between the three spaces discussed. The structural differences between the systems are explained by using the transformation on five color samples.

In this issue and the next we have shorter items in Communications and Comments. This section is set aside for short, rapid communications and also items that in earlier years might have come under the heading of "Letters to the Editor." In this issue Rolf Kuehni looks at the determination of unique hues. This takes us back to the question of putting ourselves in someone else's shoes. How can we tell if what I see as pure green is what you see as pure green? Kuehni's piece, entitled "Variability in Unique Hue Selection: A Surprising Phenomenon" raises significant questions for color appearance, color space/difference models and the philosophy of color.

We close this issue with two book reviews, announcements about the upcoming CIE Expert Symposium on LED Light Sources and the MCSL summer short course on color, a report on the 34th Annual Meeting of the Color Science Association of Japan, and an Erratum to Environmental Colouration and/or the Design Process by Smith. Dr. Eileen Korenic reviews *Art and Complexity* by Casti and Karlqvist, and Cal McCamy tells us about Rolf Kuehni's new book *Color Space and Its Divisions*.

Ellen Carter, Editor

Color Research and Application

MCSL SUMMER SHORT COURSE 2004: Essentials of Color Science

You are cordially invited to participate in the *Munsell Color Science Laboratory Summer Short Course 2004: Essentials of Color Science*, June 8-10. This all-new course has been designed by the MCSL faculty to provide participants with a fundamental understanding of the principles of colorimetry and their application to the production, control, and reproduction of color. The MCSL faculty and staff are internationally recognized educators and researchers in many fundamental and applied areas of color science and are uniquely qualified to present this distinctive course. Please join us as we teach this new course in our newly designed and constructed Franc Grum Color Science Learning Center. Course enrollment is strictly limited to 30 participants to assure opportunity for individual attention. So, please be sure to register early.

The course will consist of three days of lectures and demonstrations together with plenty of open time to interact informally with the MCSL faculty and staff. Each day is made up of four lecture/demonstrations and instructors will be available for informal discussions during the breaks and lunch, and at the end of each day.

DAY 1 (June 8)

1. Color Perception & Appearance
2. The Visual System
3. Colorimetry
4. Spectrophotometry & Spectroradiometry

DAY 2 (June 9)

5. Visual Experiments & Psychophysics
6. Color Differences & Tolerances
7. Color Appearance Models
8. Instrumental-Based Color Matching

DAY 3 (June 10)

9. Digital Color Reproduction
10. Spectral Imaging
11. Data Visualization & Rendering
12. Image Quality & Appearance

Brief Lecture Descriptions

1. *Color Perception & Appearance* (Mark D. Fairchild) This lecture will describe how humans perceive color, introduce terminology used to describe color perceptions, review color order systems, and demonstrate color appearance phenomena.
2. *The Visual System* (Ethan D. Montag) The structure and function of the visual pathway, from the eye to the brain, will be introduced demonstrating how information is processed. The limits of human visual performance also will be discussed.
3. *Colorimetry* (Roy S. Berns) This lecture will trace the origins of colorimetry from visual matching experiments, color-matching functions, tristimulus values, and chromaticities, to the more uniform color spaces of CIELAB and CIELUV.
4. *Spectrophotometry & Spectroradiometry* (David R. Wyble) This lecture will include basic operation and construction of spectrophotometers and spectroradiometers including recommended CIE geometries for reflectance and transmittance.
5. *Visual Experiments & Psychophysics* (Ethan D. Montag) Psychophysical techniques used in the quantitative assessment of visual perception will be introduced and discussed with regard to their use in color-related applications.
6. *Color Differences & Tolerances* (Roy S. Berns) This lecture will describe how best to establish color tolerances. Discussions will include weighted color-difference equations such as CMC and CIE94 and the new CIE equation CIEDE2000.
7. *Color Appearance Models* (Mark D. Fairchild) The lecture will describe the basic structure of color appearance models and provide details of the recent CIE color appearance model, CIECAM02 and demonstrate its use in image reproduction.
8. *Instrumental-Based Color Matching* (Roy S. Berns) This lecture will describe the use of spectrophotometry, color modeling (e.g., Beer-Bouguer or Kubelka-Munk.), and optimization to develop colorant recipes to match a desired color.
9. *Digital Color Reproduction* (Mitch R. Rosen) This session will describe the form and function of important Color Management System (CMS) components along with a system overview. A color reproduction chain will be demonstrated.
10. *Spectral Imaging* (Roy S. Berns) This lecture will explore current spectral imaging techniques and applications for quality-critical color reproduction (i.e., spectral color reproduction) and scientific-based digital archives.
11. *Data Visualization & Rendering* (Ethan D. Montag) This lecture will discuss how our understanding of the human visual system and color appearance can be used to produce more useful imagery with emphasis on current MCSL research.
12. *Image Quality & Appearance Models* (Mark D. Fairchild) This lecture includes an introduction to the concepts of image appearance modeling and an overview of one model, known as iCAM, being developed and tested at MCSL.

FOR MORE INFORMATION, CONTACT:

Colleen M. Desimone, (585)475-6783, email: Desimone@cis.rit.edu, www.cis.rit.edu/mcs

CALENDAR

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

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2004

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|---------------------|---|
| Mar 25 | CMG's Western Regional Meeting in conjunction with NeoCon West, Los Angeles, California |
| March 28- 31 | 2004 NAPIM Annual Convention, LaQuinta Resort, LaQuinta, CA http://www.napim.org/ |
| Mar 31-Apr 2 | ISENA Lightfair International, Las Vegas, NV |
| Apr 5-8 | CGIV 2004 - Second European Conference on Color in Graphics Imaging and Vision, Technology Center AFIT, Aachen, Germany, www.imaging.org/conferences/cgiv2004/ |
| April 16-20 | CMG's Spring International Conference, "Color Sells and the Right Colors Sell Better!" Toronto, Ontario, Canada, http://www.colormarketing.org/visitors/cmg_events/cmg_events.htm |
| April 18-21 | TAGA/IS&T 2004 San Antonio, Hyatt Regency Riverwalk Hotel, San Antonio, TX. Contact: TAGA at 585-475-7470, http://www.taga.org |
| April 20-22 | Color Pigments Manufacturers Association, Inc., "International Color Pigments Conference," Chicago, Ill. Contact CPMA, P.O. Box 20839, Alexandria, VA 22314; email cpma@cpma.com |
| April 25-29 | Society of Plastic Engineers/Color and Appearance Division, Chicago ANTEC, Navy Pier, Chicago, IL, www.specad.org |
| May 3 | Detroit Color Council, Chrysler Museum, Auburn Hills, MI |
| May 10-12 | ISCC Annual Meeting and Symposium, Co-sponsored by ISCC and NIST, National Institute of Standards and Technology, Gaithersburg, MD. ISCC IG meetings will be May 10 and 11; ISCC PC Meetings will be May 12 |
| May 12-14 | CORM Annual Meeting, NIST, Gaithersburg, MD. |
| May 17-19 | ASTM E12 Color and Appearance Meeting, Gaithersburg, MD |
| May 17 | CMG's Northeastern Regional Meeting, New York City, New York |
| May 23-28 | ASPRS 2004 Annual Conference, "Mountains of Data — Peak Decisions," Adam's Mark Hotel, Denver Colorado, http://www.asprs.org/denver2004 |
| May 23-28 | SID International Symposium 2004, Washington State Convention and Trade Center, Seattle, WA, http://www.sid.org/conf/conf.html |
| April 5-8 | CGIV 2004: The Second European Conference on Color in Graphics, Image and Vision, Technology Center AGIT, Aachen, Germany, http://www.imaging.org/conferences/cgiv2004/. |
| June 15 | CMG's Central Regional Meeting in conjunction with NeoCon World's Trade Fair, Chicago, Illinois |
| June 18-20 | 24th Center for Visual Science Symposium, "Adaptive Representation and Control in Vision", University of Rochester, Rochester, NY http://www.cvs.rochester.edu/symposium.html. |
| July 25-28 | IESNA Annual Conference, Illumination Engineering Society of North America, Marriott Waterside Hotel, Tampa, Fl http://www.iesna.org/ |
| August 7-8 | First Symposium on Applied Perception in Graphics and Visualization, Co-sponsored by and co-located with ACM SIGGRAPH, Los Angeles, California. |
| Sept 9 | Detroit Color Council, Panel Discussion on Correlation of Numeric and Visual Readings in Plastics and Textiles, MSU Management Education Center, Troy, MI |
| Sept 13-17 | AATCC's 2004 International Conference & Exhibition, a co-located event with ATME-I 2004, Palmetto Expo Center in Greenville, SC, http://www.aatcc.org/ice/ |
| Sept. 15-17 | CIE Expert Symposium on Image Acquisition and Display, Budapest, Hungary |
| Oct 1 | CMG's Canadian Regional Meeting |
| Oct 4-6 | Color Cosmetics World Summit 2004, Hotel Concorde La Fayette, Paris, FRANCE, Email: dmaiore@intertechusa.com, or www.intertechusa.com. |

CALENDAR, Continued

- Oct 10-14** OSA, Frontiers in Optics 2004/Laser Science XX, Rochester Convention Center, Rochester, New York, <http://www.osa.org/meetings/annual/>
- Oct 22-24** ISSC Williamsburg Conference, Fashion Institute of Technology, New York, New York, iscc@compuserve.com.
- Oct 13-15** NAPIM 2004 Technical Conference, Pheasant Run Resort and Spa, St. Charles, IL, <http://66.95.150.74/>
- Oct 27-29** FSCT, ICE 2004, "Challenge – Change – Opportunity," McCormick Place North, Chicago, IL, www.coatingstech.org.
- Oct 29-Nov 2** CMG's Fall International Conference, Rancho Mirage, California
- Nov 2-5** AIC 2004 Interim Meeting, Porto Alegre, Brazil, Contact: José Luis Caivano, jcaivano@fadu.uba.ar
- Nov 9-12** IS&T/SID, CIC12 12th Color Imaging Conference - Color Science, Systems & Applications, The SunBurst Resort, Scottsdale, AZ, <http://www.imaging.org/conferences/cic12/authors.cfm>.

2005

- April 7-11** NAPIM Convention - Hyatt Coconut Point, Bonita Springs, FL, <http://www.napim.org/>.
- Apr 29-May 3** CMG's Spring International Conference, Baltimore, Maryland, USA, http://www.colormarketing.org/visitors/cmg_events/cmg_events.htm
- May 8-13** AIC 05 Granada, 10th Congress of the International Colour Association AIC Colour 05, Conference and Exhibition Centre, www.ugr.es/local/aic05 email: eurocongres@eurocongres.es
- May 12-21** CIE Divisional and Technical Committees Meetings, Lighting in the XXI Century, Leon, Spain, email: leon05@ceisp.com.

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

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ISCC will be distributing the newsletter electronically to all members unless otherwise requested starting with the next issue. Please either return the post card to ISCC that was included with the dues notice, or notify the office as soon as possible regarding electronic distribution of the newsletter.

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\$ 250	1/4 page ad
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\$1,000	full page ad

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Issue #408

Mar/Apr 2004

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All submissions must be in English. Please submit materials by the first of each even numbered month. Materials submitted later may be printed in the following issue.

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 American Society for Testing and Materials International (ASTM)
 American Society for Photogrammetry & Remote Sensing (ASPRS)
 The Color Association of the United States, Inc. (CAUS)
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 Council on Optical Radiation Measurements (CORM)
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 Optical Society of America (OSA)
 Society for Information Display (SID)
 Society of Plastics Engineers, Color & Appearance Div.(SPE)
 Society for Imaging Science and Technology (IS&T)
 Technical Association of the Graphic Arts (TAGA)
 Technical Association of the Pulp and Paper Industry (TAPPI)

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