



Inter-Society Color Council *News*

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CALL FOR PAPERS TAGA/ISCC SYMPOSIUM VANCOUVER, BC, CANADA MAY 5, 1999

Technical papers are now being solicited for the 1999 TAGA/ISCC Symposium to be held on Wednesday, May 5, 1999 at Westin Bayshore Hotel, Vancouver, BC. This is a bridge program which is designed to link the 1999 TAGA technical conference (May 2-5, 1999) and the 1999 ISCC annual meeting (May 5-7, 1999) together.

Both ISCC members and TAGA members and other interested parties are encouraged to submit scientific papers, especially in the color measurement, colorimetry for process control, color management systems, CRT and flat-panel display, graphic arts technology standards, etc., for presentation at the symposium.

Papers should emphasize original and unpublished research and development in color and graphic arts technology. Papers of commercial nature are discouraged. Papers accepted will be published in the 1999 TAGA Proceedings, Vol. 1 hardcover book. All authors are responsible for their own registration, travel arrangements, and expenses at the conference.

Proposed abstracts (~100 words) should be sent to the TAGA Office, 68 Lomb Memorial Drive, Rochester, NY 14623-5604, fax: 716-475-2250 or email to TAGAOfc@aol.com. **The deadline for submitting your proposal is October 30, 1998.**

About TAGA

Technical Association of the Graphic Arts (TAGA); its mission is to provide a worldwide forum that fosters an integrative dialogue between evolving theoretical

understandings of related technologies and the pragmatic application of such technologies to graphic arts print production.

About ISCC

Inter-Society Color Council (ISCC); its mission is to stimulate and coordinate the work being carried out by the various members leading to the uniformity of description and specification of color by these members, and to promote the practical application of this work to color problems arising in science, art, and industry, for the benefit of the public.



LOU GRAHAM SELECTED TO RECEIVE ISCC'S NICKERSON SERVICE AWARD

Mr. Louis A. Graham will receive the ISCC Nickerson Service Award during this year's Annual Meeting. The presentation will take place during the business meeting on Saturday, October 3, 1998.

The ISCC Nickerson Service Award was established in

1980 to recognize the outstanding long-term contributions towards the advancement of the ISCC and its aims and purposes. The contributions may be in the form of organizational, clerical, technical, or other services that benefit the ISCC and its members. The Award is named to honor the late Dorothy M. Nickerson, a founding member of the ISCC, its Secretary from 1938 to 1950, and its President from 1954 to 1956.



Mr. Graham is the twelfth recipient of the Nickerson Service Award. He joined the ISCC in 1957 while employed by the American Viscose Division of FMC and has been an active member since that time. Mr. Graham has served as a delegate and delegation chairman for the American Association of Textile Chemists and Colorists (AATCC). He has served on and chaired numerous ISCC committees. As a member of ISCC Project Committee 23, Expression of Historical Color Usage, he was instrumental in the formation of the Color Marketing Group (CMG) in 1962 and served as CMG's first president (1962 - 1965).

Mr. Graham was president of the ISCC from 1982 to 1984, and was chairman of the Council's Long Range Planning Committee from 1988 to 1993. He received his BS in Chemical Engineering from the University of Virginia and his MS in Chemical Engineering from the University of Louisville.

Mr. Graham was a Senior Manager of Corporate Research and Development at Burlington Industries from 1967 until 1987, with responsibility for dyeing, computer and color laboratories.

Following retirement from Burlington Industries, he served on International Executive Service Corps projects in Zimbabwe and Mauritius. He formed Lou Graham and Associates, Inc. and developed the HVC Color Vision Skill Test. Mr. Graham was a thirty year resident of Greensboro, North Carolina and now resides in Temple, Texas with his wife Jean and family.

*Robert M. Marcus
Datacolor International*



BILLMEYER RECEIVES REINHART AWARD

ASTM has just announced that Fred W. Billmeyer, Jr. received the Frank W. Reinhart Award for 1998. This award has been presented annually by ASTM Committee E-2 on Terminology to an ASTM member who has made an outstanding or unusual contribution to ASTM in the area of terminology standardization.

For many years, Billmeyer headed Subcommittee E12.01, Editorial and Terminology, of Committee E-12 on Appearance; however, a few years ago the decision was made to separate the two aspects. Formation of Subcommittee E12.94, Editorial, permitted Billmeyer to concentrate on this aspect, while at the same time continuing to be an active member of the Terminology Subcommittee, E12.01.

ASTM Standard E284 on Terminology of Appearance was originally published as a tentative standard in 1966. According to ASTM membership records, Billmeyer became a member of E-12 on January 1, 1964. In the early days of E-12, there were relatively few subcommittees, so there was little need to have subcommittees meeting concurrently, thereby permitting Billmeyer to attend many subcommittee meetings and make constructive suggestions on terminology as well as an editorial format.

Billmeyer took it upon himself to look carefully at the terminology used in nearly every E-12 standard. He also reviewed the standards of materials committees involving appearance properties, such as those of Committee D-01 on Paint and D-20 on Plastics. His education as a chemist was particularly helpful. On one occasion he loaned Hammond his copy of a useful little book, "The Chemist's English," by Robert Schoenfeld. Very recently he sent Hammond a small paper-covered book of 85 pages, "The Elements of Style," by William Struck, Jr. and E. B. White, Third Edition, 1979, in new condition, that he found at his library's used book sale.

Billmeyer was the Founding Editor (1976) of the Wiley Journal, Color Research and Application. He served as Editor-in-Chief through 1986 and is now Editor Emeritus. One requirement of a good editor is to ensure that authors use correct terminology.

At a 1991 symposium, held by the ASTM Committee on Terminology, Billmeyer presented the paper, "Development of Standard Terminology of Appearance." The papers presented at this symposium were ultimately published in 1993 as STP 1166, "Standardizing Terminology for Better Communications." Billmeyer also served three 2-year terms as an appointed member of the ASTM Standing Committee on Terminology.

Although Committee E12.01 activity in terminology has recently been headed by another member of Committee E-12, it is interesting to recall that ASTM Standard E284 when first published in 1946 was a 6 x 9-inch document of but a few pages. The current edition of Standard Terminology of Appearance, ASTM Designation: E284-98, is an 8-1/2 x 11-inch document comprising 18 well-written pages, largely due to the effort of Fred W. Billmeyer, Jr.

While professor at Rensselaer Polytechnic Institute (1964-1984), Billmeyer had the privilege of serving as advisor to numerous students, 15 Ph.D., 11 MSc. and a few BSc. Needless to say, they were instructed in the use of correct terminology in their writing, particularly in their use of these.

*Harry K. Hammond III
BYK-Gardner USA*



Inter-Society Color Council

67th Annual Meeting
co-located with Optical Society of America

October 2-5, 1998
Baltimore, MD, USA

Preliminary Program

Friday, October 2 (Marriott Inner Harbor)

Program Begins at 9:00AM

•**Education Committee: "Colour: Art & Science"**

The Evolution of Human Color Vision, J. Jenness

The Importance of Color in Language & Culture, J. Schirillo

The Color of Art, and More..., G.C. Miller

•**Interest Group II, Industrial Applications of Color:
"Industrial Uses of Color Appearance Models"**

Color Image Parameters for Color Appearance Description,
A. Treneau et al.

*Testing Color Appearance Models Including CIECAM97s Using
SCID Images*, H. Yaguchi et al.

Rod and Cone As Self-Filtering Opponent Color Receptors,
V.V. Gavrik

*Color Image Distances to Quantify Images Synthesized by Ray
Tracing Algorithms*, S. Albin et al.

*Abstract Mathematics Provides Fundamental Color Order
Systems and Applications for Industry*, A.S. Zoch

*An Evaluation of the Instrumental and Visual Color Difference
of Metameric Tiles*, J. Taylor et al.

•**Wine & Cheese Reception / Newcomers Welcome /
Contributed Posters Session**

Saturday, October 3 (Marriott Inner Harbor)

•**Interest Group I, Fundamental & Applied Color
Research: "Color Difference and Color Appearance"**

The CIECAM97s Color Appearance Model, M.D. Fairchild

*Quantitative Testing of Color Appearance Models Using the
Munsell Renotation Data*, D.R. Wyble et al.

Towards an Improved Uniform Color Space, R.G. Kuehni et al.
New Color Effects Related to Retinal Organization,
C.S. McCamy

*Lightness, Whiteness, Blackness, and Chromaticness in
Chromatic and Achromatic Colors*, O. da Pos et al.

Basic Color Terms and Basic Color Categories, C.L. Hardin

•**Awards Luncheon / Business Meeting**

•**Interest Group III; Art, Design, & Psychology:**

"Global Culture and Color"

Speakers TBA

•**Crab Feast on the Baltimore Waterfront**

Sunday, Oct. 4 (Convention Center)

•**Joint ISCC/OSA Symposium: "Color Discrimination
and Color Differences: Perception and Prediction"**

Role of Higher Order Mechanisms in Color Discrimination,
J. Krauskopf

Data and Prediction of Color Discrimination, V.C. Smith et al.

Testing CIELAB-Based Color-Difference Formulas, M. Melgosa

*Testing Colour Difference Formulae Using New Colour
Difference Data Sets*, M. R. Luo et al.

Measurements of the Surfaces Dividing Opponent-Colors,
B. Wandell et al.

Is There a Perceptual Color Space?, Q. Zaidi

*Some Recent Developments in the Evaluation of Small Colour-
Differences*, K. Witt

*Industrial Color Difference Equations - Current Initiatives and
Future Directions*, R.S. Berns

Monday, Oct. 5 (Convention Center)

•**Joint ISCC/OSA Color Vision and Measurement
Poster Session**

(Open to ISCC Participants, 21 Posters)

For more information or a registration form please visit <<http://www.iscc.org>> or contact:

Cynthia Sturke, ISCC Office

11491 Sunset Hills Rd.

Reston, VA 20190

Voice: 703-318-0263 Fax: 703-318-0514

iscc@compuserve.com

COLOR RESEARCH AND APPLICATION

IN THIS ISSUE, OCTOBER 1998

This issue includes seven articles, a color forum, several items in the communications and comments section, two book reviews, three meeting reports (Color Imaging Conference, Williamsburg Conference and Derby Week), and an announcement of the ISCC 1998 Macbeth Award Recipient. The books reviewed are *Digital Color Management - Encoding Solutions* by Giorgianni and Madden, and *Electronic Display Systems* by Keller.

We start off the issue with several articles about research in how we see color in the theoretic sense and how standard specifications can be established for our use in expressing what people generally see. Then we have two articles, as well as a color forum piece, on color difference and its metrics. We also have an article in the applied field of gemology and an article on education.

The International Commission on Illumination (CIE) has defined both photopic and scotopic standard observers. However, there is none for the mesopic range. In addition the limiting levels of the scotopic and photopic ranges have not been absolutely defined. Some research had been done in this area, but more is needed. In order to make the best use of the available research and focus future research Pat W. Trezona examines the "Theoretical Aspects of Mesopic Photometry and Their Implication in Data Assessment and Investigation Planning." In this first article of the October Issue, Dr. Trezona discusses what form the data should take, and do existing databases meet the requirements in order to develop a photometric standard observer for the mesopic region.

The CIE has been endeavoring to establish a new photometric system that is able to evaluate the brightness of light sources correctly by introducing a photometric quantity called equivalent luminance. When a reference stimulus is defined, brightness of any complex light can be of ten expressed by its equivalent luminance which is the luminance of the reference stimulus with the same brightness as the complex light. In order to do this, it is important to sample the whole area of the chromaticity diagram. In "Brightness-to-Luminance Ratio of Colored Light in the Entire Chromaticity Diagram," Miyoshi Ayama and Mitsuo

Ikeda report on the development of a large data base of brightness to luminance rations, covering the whole chromaticity diagram for four observers.

The next article also relates to the perception of lightness and brightness. In the recent years, Dr. Yoshinobu Nayatani has written several articles on the evaluation and representation of the Helmholtz-Kohlrausch effect. However three questions have been repeatedly asked. In the article "Relations between the Two Kinds of Representation Methods in the Helmholtz-Kohlrausch Effect," Dr. Nayatani answers the following questions: 1) How does one use the prediction equations and adapt them to practical applications; 2) What are the theoretical derivations of the prediction equations in both methods and the clarification of the relation between the numerical coefficients used in the prediction equations by the two methods; and 3) Is there a logical consistency between the long series of studies on the Helmholtz-Kohlrausch effect by Nayatani and his colleagues.

For our next two articles we move on to the field of color difference and its tolerances. During 1995, a Color Difference Evaluation Consortium was established at Rochester Institute of Technology. The Consortium decided that the first research effort should be aimed at generating a new set of data optimized to reveal any significant CIELAB hue-angle dependencies. In "Visual Determination of Hue Suprathreshold Color Difference Tolerances" Qiao, Berns, Reniff, and Montag describe this research. Their experiments sampled hue in three complete circles at two lightness levels and two chroma levels.

In the second article, Rolf Kuehni discusses "Hue Uniformity and the CIELAB Space and Color Difference Formula." Kuehni's approach is to examine the uniformity of the CIELAB system using the hue circle of Munsell colors at value 6 and chroma 14. The authors of both articles conclude the development of new systems or metrics are necessary. It is interesting to compare their approaches.

In a more applied article, Yan Liu, James Shigley, Tom Moses and Ilene Reinitz study the Tavernier Diamond. The famous Tavernier Diamond is a pear-shaped gem diamond of over 56 carats that is very interesting colorimetrically. Not only does the diamond show a color change between incandescent light and daylight, but it also exhibits a strong

blue fluorescence when exposed to long-wavelength ultraviolet radiation. The article "The Alexandrite Effect of the Tavernier Diamond Caused By Fluorescence Under Daylight" not only discusses these effects, but has color photos that show the effects.

The final article in this issue is "Color Research in Architectural Education - A Cross-Cultural Explorative Study" by Jan Janssens and Byron Mikellides. They report on a study investigating the knowledge of architectural students about perceptual and psycho-physiological aspects of color, color nomenclature, existing myths and belief, and how color is used in their everyday work in the studios. It compares students in three schools of architecture in Sweden and two schools in of architecture in the United Kingdom.

This month's Color Forum includes an article by Rolf Kuehni entitled "The Conundrum of Supra-Threshold Hue Differences." Again in this column, Rolf Kuehni compares Munsell Colors graphed on CIELAB space, with a very interesting discussion of the implications of each system upon the other.

Finally, in the Communications and Comments section we have four items. The first is a letter written by C. S. McCamy "On the Number of Discernible Colors." Dr. Michael Pointer author of the Color Forum article "On the Number of Discernible Colours" replies to Mr. McCamy's letter. The second pair of items relates to the book, *Color Appearance Models* by Mark Fairchild. First Dr. S. Lee Guth writes "Correcting errors about ATD," the model developed by Dr. Guth. Then Dr. Mark Fairchild responds to the letter by Guth.

*Ellen C. Carter, Editor
Color Research and Application*

MEETING REPORT THE THIRD OXFORD CONFERENCE ON OPTICAL SPECTROMETRY

I would like to preface this report by recounting a brief history of the preceding Oxford Conferences. The Oxford Conference is co-sponsored by two groups -- the UV Spectrometry Group (UVSG) of the United Kingdom; and CORM, the Council on Optical Radiation Measure-

ments of the United States. The UVSG group was founded in 1948. Its original name was the Photoelectric Spectrometry Group. Its purpose was to provide a forum to discuss problems of methodology of using the "new" spectrometers. The scope of the group increased as the years passed. It now concerns itself with UV, visible, and near IR measurements. The UVSG maintains a very close relationship with the National Physical Laboratory, NPL. The CORM group was founded in 1992 as a permanent organization of practicing radiometrists and photometrists, with the general purpose of establishing and defining consensus standards in the field of optical radiation. The council maintains a close relationship with National Institute of Standards and Technology. The first Oxford Conference on Spectrometry took place in September 1986 in Keble College and Clarendon Laboratory of Oxford. Seventy-five attendees from seven countries participated in the conference. Internationally acclaimed experts presented twenty-four papers, and there were ten poster papers. Elsevier published these proceedings in 1987 as Volume 2 of the Analytical Spectroscopy Library. The Second Oxford Conference on Spectrometry took place in June 1994 at the Franklin Pierce College in Rindge, New Hampshire. Twenty-nine papers were presented and ten poster papers were presented. Elsevier published these proceedings in 1995. The Third Oxford Conference convened on Sunday, June 28, 1998, at the University of London's Royal Holloway College in Egham, England. The conference was entitled *Optical Spectrometry - Applications and Instrumentation into the 21st Century*. There were approximately 100 people registered for the conference representing governmental agencies, academia and industry. Thirty quality papers were presented and 15 poster papers exhibited.

The conference was organized into three sessions;
Measurement Standards and Validation,
co-chaired by T. Frost and P. Wychorski;
Reflectance, Fluorescence and Color
chaired by A. Springsteen; and
Instrumentation and Applications
co-chaired by J. Taylor, J. Zwinkels and P. Knee.

The conference began Sunday evening with a casual dinner. This enabled participants to renew acquaintances and make new ones.

Philip Wychorski, President of CORM, welcomed the

conference attendees on Monday morning with a few opening remarks. Wychorski mentioned he opened the 1992 conference in Rindge and was privileged to open this conference. Tom Frost, one of the conference organizers and Chair of the UVSG, helped us become oriented to the conference program and the Royal Holloway College.

The first session of the conference, Measurement Standards and Validation, contained the following papers: "Quality Measurement Process" by Philip Wychorski; "Challenges in Providing Standard Reference Materials for Chemical and Pharmaceutical Process Analysis" by John Travis; "Accreditation of Absorbance Standards for UV/Visible Spectrometry" by Doug Irish; "The Absolute Calibration of Mid-Infrared Transmittance Standards" by Dr. F.J.J. Clarke; "New NIST Transmission Density Instrument" by Edward Early; "Diffuse Reflectance and Transmittance Measurements and Their Relation to Solar Protection Factor" by Dr. Art Springsteen; "The Establishment of Absolute Diffuse Reflectance Scales using the NPL Reference Reflectometer" by Dr. David Williams; "Gonio-Spectrophotometric Reflected Light Distributions of Reference Materials" by Dr. Gorow Baba; and "Quality Systems and Their Impact on the Laboratory of the Next Millennium" by John Hammond.

The second session of the conference, Reflections, Fluorescence and Colour, contained the following papers: "Bispectral Fluorescence Colorimetry" by Jim Leland; "The NPL Reference Spectrofluorimeter" by David Williams; "The Instrumentation, Standards and Procedures used at The NRC of Canada for High-Accuracy Fluorescence Measurements" by Dr. Joanne Zwinkels; "Metrology of Fluorescent Retroreflective Material and its Relationship to Material Visibility" by Norbert Johnson; "Problems of Colour Measurement of Fluorescent Paper Grades" by Tarja Shakespeare; and "A Novel Spectrophotometer for the Measurement of Colour and Appearance" by Will Weber and Perry Palumbo. The third session of the conference, Instrumentation and Applications, contained the following papers: "Fluorescence Spectroscopy of Biological Systems" by Otto Wolfbeis; "An Improved Model for Improving the Inter-Instrument Agreement of Spectrocolorimeters" by Dr. Danny Rich; "The Determination of Colorimetric Uncertainties

in the Spectrophotometric Measurement of Colour" by Peter Clarke; "Comparison of CIE Chromaticity Values" by Natasha van Tonder; "Scattering Properties of Diffuse Reflectance Materials" by Yvonne Barnes; "Infrared Diffuse Reflectance Instrumentation and Standards at NIST" by Leonard Hanssen; "Tests of an Omnipresent Standard for Absolute Spectral Radiance Measurements" by Alan Migdall; "New Compact Echelle Spectrographs with Multichannel Time-Resolved Recording Capabilities" by Peter Lindblom; "High Accuracy Measurement of Specular Spectral Reflectance and Transmittance" by Atte Haapalinna; "Characterization of Optical Detectors Using High Accuracy Instruments" by Farshid Manoochehrit; "The Design and Use of Reference Data Sets for Testing Scientific Software" by Maurice Cox; "50 Years of UV Spectrometry Group" by Dr. Arthur Tarrant; "Laser Based Techniques in Spectrometry" by Eric Usadi; and "Use of Fourier Transform Spectrometry for Radiometric Applications" by Christopher Chunnillal.

Two enjoyable social events were part of the conference -- a French Brothers' barge tour down the Thames and a lecture by Mr. Richard Williams in the picture gallery of the Royal Holloway College. It was immediately apparent to many during this conference, the scientific advances in metrology and advancement of the state of the art in optical spectrometry since the Second Oxford Conference in 1992. The author reviewed the proceedings from the second conference and found that new technologies are emerging and the uncertainty between national laboratories continues to decline. While there is still a great deal to be learned on this topic, let's hope that we will not have to wait another four years to gather and have such an informative and interactive conference.

I found this conference to be one of the most exciting and informative conferences I have attended in many years. The organizers, A. Springsteen in the U.S., Dr. Mary Barnard in the U.K., T. Frost and J. Taylor and all those involved are to be applauded for their accomplishment. The relevance of the material presented, the quality of the presentations and the quantity of the poster papers silently attest to this quality and success of this conference. The full proceedings of the conference are

scheduled to be published by the organizing committee in early 1999. Contact the secretary of CORM for purchasing information. Informally, the conference continued on Thursday with a field trip to the Optical Radiation Measurement facility of the NPL in Teddington.

Respectfully submitted,

*Jack A. Ladson
Director Color Technology
Estee Lauder Companies*

STUDENTSHIPS IN COLOUR IMAGING UNIVERSITY OF DERBY

The Colour & Imaging Institute at the University of Derby is pleased to announce that a limited number of studentships are available to support students undertaking the new MSc Colour Imaging programme on a full-time basis, commencing in September.

The MSc Colour Imaging programme provides high quality training in colour image science both for students wishing to enter the rapidly growing field of colour engineering for multimedia products and for students wishing to undertake further research in image science. It will include significant modules on human vision and colour science, led by Prof. Robert Hunt and Prof. Ronnier Luo.

Background

Although digital image processing has been studied for some 25 years as an academic discipline, its application in the past has largely been in the fields of photographic science, medicine, remote sensing, non-destructive testing and machine vision. Such academic programmes having tended to specialise in these knowledge domains, have generally not produced students with a broad range of skills required by industry for the development of high-technology imaging products.

Colour image science spans a wide range of disciplines, including colour science, vision, computer science and multimedia systems. The need for knowledgeable and competent practitioners in this field has been driven by the accelerating proliferation of inexpensive colour technology in desktop computers and consumer devices, ranging from colour monitors and printers to scanners and digital cameras. What now endows the field with critical importance in mainstream information technology is the establishment of the Internet and World Wide Web, augmented by CD-ROM storage, as a means of quickly and cheaply transferring colour image data. The problems of analysing images, accurately characterising colour imaging devices and managing image reproduction are major issues confronting system developers in the field of imaging science. The successful color-imaging scientist must combine a broad understanding of psychophysical methods with a significant technical ability in mathematics and computer science.

Programme Outline

The MSc Colour Imaging can be taken in one year by the Full-Time route or in two years by the Part-Time route. The Programme draws on the great expertise and experience within the Colour & Imaging Institute, in the fields of colour science and colour imaging. The team recognises that the design of effective colour imaging systems relies upon a blend of psychophysical methods with the techniques of mathematics, computer science and engineering quality evaluation. The Programme therefore spans the theory of both human colour perception and digital image processing and their implementation in multimedia technology. Applications encompass the full digital image reproduction chain; from initial image capture and digitalisation to image storage; manipulation, compression and transmission to image reconstruction on various types of output devices. The coherent and integrated Programme aims to produce competent colour image scientists and engineers, who can work effectively on the design and development of colour imaging products for multimedia systems, in both hardware and software design roles. It also aims to provide a foundation for higher research degree (Ph.D.) study in the field.

The Modules

The Programme consists of the following nine prescribed modules (subject to validation):

- Colour Vision ? Optics, physiology and function of the human eye; perceptual to visual stimuli.
- Colour Science ? Concepts and methods of colorimetry, colour specification and colour measurement.
- Digital Image Processing ? Theories and techniques covering the capture, manipulation and processing of digital images.
- Colour Image Analysis ? Physics of colour image formation and novel strategies for recovery of image information.
- Image Technology & Devices ? Principles of colour generation in various imaging devices and their performances.
- Cross-Media Reproduction - Establish requirements for and implement cross-media colour management systems.
- Image Quality Assessment ? Objective (instrumental) and subjective (observer-based) measurement of quality.
- Research Methods-Information gathering, experimental design, critical analysis and presentation skills.
- Independent Research Project -Significant piece of research into an aspect of colour imaging with industrial applications.

The Teaching Team

The staff of the Colour & Imaging Institute includes the following distinguished members, all of whom have international reputations in the field of colour imaging. All will be closely involved in reaching the MSc Colour Imaging: Prof. Lindsay MacDonald (Programme Leader), Prof. Ronnier Luo, Prof. Robert Hunt, Dr. Graham Finlayson, Prof. Tony Johnson.

More details about the MSc programme may be found at our Web site on:

http://colour.derby.ac.uk/colour/courses/msc/colour_imaging.html

Entry Requirements

We are seeking highly motivated students with reasonable mathematical and computational skills, having a good Honours degree in a numerate discipline.

For further details, please contact:

Professor Lindsay MacDonald

Tel: +44-1332-622217,

Fax: +44-1332-622218

email: l.w.macdonald@colour.derby.ac.uk

The above information is compiled from the Web site.

Gultekin Celikiz, Editor

ISCC News

Special Sale Continues.....

Reprints of "Color and Light"
by Fred W. Billmeyer Jr., and
Harry K. Hammond, III.

Chapter 40 of ASTM Paint Manual,
23 pages

\$5 each 20 copies \$50...

Available only while current supply lasts.

This is an authorized reprint from ASTM Manual 17, Copyright 1996. American Society for Testing and Materials. 100 Bar Harbor Drive, West Conshahocken, PA 19428-2959

Demystifying Color by Bob Chung
11 pages color

\$5 each 20 copies \$50...

(\$15 ea. when current supply runs out)

This technical report produced by Bob Chung of Rochester Institute of Technology when he was ISCC Education Committee Chair, discusses and explains ten myths about color.

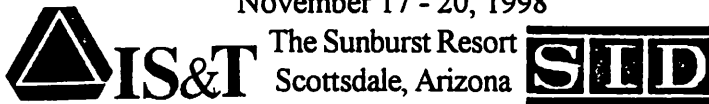
Either of these publications can be obtained by sending a check or money order to the Inter-Society Color Council to (s&h incl): Cynthia J. Sturke, Admin. Asst.

Inter-Society Color Council
11491 Sunset Hills Road,
Reston, VA 20190



THE SIXTH COLOR IMAGING CONFERENCE: COLOR SCIENCE, SYSTEMS AND APPLICATIONS

November 17 - 20, 1998



The Sunburst Resort
Scottsdale, Arizona

The Color Imaging Conference has become the premier technical conference for scientists, technologists and engineers working in the areas of color science and systems and their application to color imaging. 1998 marks the sixth year of this topical, annual conference with a significant growth in overall participation. The conference is international in nature. In 1997, one third of the participants came from outside the United States and Canada. This year, the Technical Program Committee refereed and selected just over 35% of the submitted abstracts for oral presentations and a similar fraction for posters. This careful selection provides attendees with the highest quality technical program in this field. As the Conference has grown and matured, the focal areas have expanded dramatically. Professional disciplines represented range from psychophysics, optics, image processing, color science, photography, graphic technology, system engineering and applications as well as hardware and software development. Beyond representing all areas of color imaging, this year's conference will expand into the areas of color communications.

The first day of the conference is dedicated to presentations in color science, especially human visual systems, appearance models, reproduction models, and measurement. The second day will introduce color issues in input and output devices, as well as feature the poster session in the afternoon. Presenting color imaging research in poster format provides speakers with the unique opportunity to display the often very visual results of their research in a highly interactive way. Color communication is the focus of the third day, with encoding, processing, applications, and color management papers. The conference program is designed to promote interaction between the participants. The format includes keynote addresses by leading specialists in various color-related fields, as well as submitted papers presented in oral and poster format. Despite rapid growth, the single-session

format will be continued to allow participants to attend all presentations.

The Tutorials will again be in the able hands of Dr. Joann M. Taylor.

- T1: Color Fundamentals
— Instructor: Joann M. Taylor
- T2: Color Management Systems
— Instructor: Michael Bourgoïn
- T3: Status of Electronic Color Display
— Instructor: Walter F. Goede
- T4: Color Issues in the Graphic Arts
— Instructor: Gary Field
- T5: Understanding and Using Color Management Workflows — Instructor: Eckhard Huebner
- T6: Color in Desktop Computing: From Theory to Practice
— Instructor: Charles Poynton
- T7: Color Appearance Modeling and CIECAM97
— Instructor: Mark D. Fairchild
- T8: Color Quality in the Desktop Printing
— Instructor: Gabriel Marcu
- T9: Color in Digital Video: DTV, ATV, and High Definition Television
— Instructor: Charles Poynton
- T10: Color Hardcopy Technology
— Instructor: Gary Starkweather
- T11: Color Fidelity Testing
— Instructor: Michael Stokes

Wednesday is devoted to "Color Science" with talks on "The Human Visual System", "Appearance Models", and "Measurement." Thursday is devoted to "Color Devices", with talks on "Input", "Output", and "The Poster Session" with twenty posters. Friday is devoted to "Color Communication" with talks on "Encoding", "Processing" and "Color Management."

Thursday Evening there is a panel discussion on "Color Standards". Several international standards organizations and industry consortia are currently working to establish standards related to color imaging technologies. What is the purpose of these standards? Do they inhibit or advance progress in the color imaging industry? What focus and expertise can be found in the different standard bodies? Do they establish conflicting standards? Can the needs of different industries be addressed adequately

by a more unified standards development structure? Does the consumer ultimately benefit from standards? Four color experts involved in standards work will discuss the focus of their respective organizations, and address the issues of color standards as they relate to the color image industry. Moderator for this interesting panel discussion is Robert Hunt, Colour Consultant with Panelists: Tim Kohler, ICC; Alan Robertson, CIE; Tony Johnson, ISO; Hiroaki Ikeda, IEC; and Recorder: David Q. McDowell, Eastman Kodak Co.

For further information contact:

Society for Imaging Science and Technology (IS&T)
7003 Kilworth Lane
Springfield, VA 22151
Tel: 703-642-9090
Fax: 703-642-9094
info@imaging.org

Society for Information Display (SID)
31 East Julian Street
San Jose, CA 95112
Tel: 408-977-1013
Fax: 408-977-1531
office@sid.org

**DETROIT COLOUR COUNCIL
PRESENTS ISSUES AFFECTING
MATCHING OF AUTOMOTIVE
COLOR AND APPEARANCE**



September 17th, 1998

In the continuing expansion of globalization and component outsourcing, a number of issues affecting appearance and color need to be resolved. This forum is a timely update from the Sept. 11, 1995 Panel Discussion "Globalization of Automotive Color."

Our speakers will define some of the issues followed by an open forum consisting of representatives from the Tier I Integrators, Paint, Textile and Plastic industries. This is the 20th in a series of annual panel conferences presented by the DETROIT COLOUR COUNCIL.

Registration is \$65.00 for DCC members and \$85.00 for non-members. Mail registration to :
DETROIT COLOUR COUNCIL
c/o Boehle Chemical, Inc.
P.O. Box 2001
Southfield, MI 48037

**AIC 1999
MIDTERM MEETING
IN WARSAW**

**Applications of Colorimetry in
Industry and Design
22 - 23 June 1999**

Two-day conference-meeting focusing on industrial and design applications of colorimetry will be held in the Main Technical Organization (NOT) building, which is situated nearly in the centre of town. Conference-meetings are jointly organised by the central Office of Measures and Polish Committee on Illumination and will take place immediately before the 24th Session of the CIE in Warsaw. Tristimulus and spectral colorimetry in industrial and design applications including measurement and calibration techniques, reference standards and methods of evaluation of uncertainty are the main topics of the conference-meeting. The registration fee will amount to US \$200 for the participants and US \$50 for the accompanying persons and is to be paid to:

Powszechny Bank Kredytowy SA,
III Branch in Warsaw,
Account No: 11101024-979869-2700-1-42
with notice "AIC'99"

SECRETARIAT OF CONFERENCE

Central Office of Measures,
Optical Radiation Laboratory, Elektroralna 2
00-139 Warsaw POLAND

Tel: (+48 22) 620 59 71 Fax: (+48 22) 620 83 78

Cancellations and Refund

Written notification of cancellation is required, by fax, or mail to: CONGRESS BUREAU ORBIS. Refunding for services booked is possible when cancellation reaches Congress Bureau at least 21 days prior to booking date. After that deadline - no refund is possible. Administrative & bank charges will be deducted.

BOOK REVIEW

Color For Science, Art and Technology

Kurt Nassau, Editor

Elsevier Science, Inc.
P. O. Box 945
Madison Square Station
New York, NY 10160-0757

This book is a collection of articles by some of the most prominent names in color science and applications in the world today. In the dedication, the editor asserts, "This volume is dedicated to the proposition that there is much common ground between science, technology, and the arts and that color is a major connecting bridge." This is a sentiment that is shared and has been actively promoted by the Inter-Society Color Council since its inception in 1931. With this as a backdrop, I excitedly began to tour the book, which held so much potential for me.

The book is divided into three sections and fifteen chapters. There are 17 pages of color illustrations; not enough for a book on applications of color but most likely a compromise with the publisher. The preface indicates that the editor struggled with the publisher over the length of each chapter. It also emphasizes, "There exist many erroneous ideas on color. As one example, we are usually taught in school that there is just one set of three specific primary colors." Chapter 1 is then assigned to dispel any myths or misconceptions about color to avoid misinterpretations of the information that follows in the more detailed chapters. The book does not quite succeed but it is of little importance. The majority of the chapters, written by notables in their field, stand alone with no need for the introductory chapter.

The list of contributors include: J. R. Aspland (University of Clemson), G. C. Brainard (Jefferson Medical College), G. G. Field (California Polytechnic State University), E. J. Giorgianni (Eastman Kodak), C. L. Hardin (Syracuse University), J. B. Hutchings (Unilever PLC), J. Krauskopf (New York University), H. Lang (Broadcast Television Systems, GmbH), P. A. Lewis (Sun Chemical Corp.), T. E. Madden (Eastman Kodak), R. T. Marcus (Datacolor International), K. Nassau (Bell Telephone Laboratories), and S. Wurmfeld

(Hunter College of the City University of New York).

The three sections cover The Science of Color, Color in Art, Culture and Life, and Colorants, The Preservation and Reproduction of Color. These sections correspond nicely with the three of the goals of the Inter-Society Color Council (Color in Art, Industry and Science) and the majority of the authors come from educational institutions (the fourth goal of the ISCC) where they are actively passing their learning on to the next generation.

The one major flaw with the book is the failing of chapter one to dispel all of the myths of color. The chapter consistently confounds lightness with brightness. This is sad because any of the points that are made are very commonly misunderstood phenomena and now they are correctly described but assigned to an incomplete or inconsistent cause. On page 9, a generalization is made that reducing the brightness of an orange light produces a brown light and reducing the brightness of a yellow-green light produces an olive light. Such transformations only occur in relation to the brightness of the surround. Relative brightness is termed lightness. Thus the true statement is that when the lightness of an orange color is reduced a brown color results. I can assure the editor that in aperture mode or in a black surround, the orange light will never become brown. Similarly, in Figure 1.5, diffuse reflection is shown as a surface reflection phenomenon. While surface degradation can produce a diffuse-like appearance (ground glass), most diffuse reflectance comes from multiple occurrences of single particle light scattering. In a discussion of the additional dimensions required for a full specification of perceived color, the work of Ralph Evans is not even mentioned in passing. In general, the chapter does a good job of reviewing the known facts about color vision, perception and relationships. Section 1.9, in particular, does a fine job of comparing and contrasting "Science versus Art" in the history of color.

Chapter 2 on The Measurement of Color by Robert Marcus covers mostly object mode colorimetry and computer color matching. Only two pages are reserved for the colorimetry of self-luminous objects, such as lamps and computer displays. His emphasis is on the industrial standards used in the application of color measurement.

John Krauskopf gives a rather detailed discussion of the physiology of color vision and perception and then refers the readers to Boynton and Kaiser for more details. His verbal comparison between the visual system and the process of a color matching experiment are excellent. Kurt Nassau gives a short synopsis of his book on The Fifteen Causes of Color. Wurmfeld's chapter on Color in Abstract Painting is excellent but really needs more color plates. This chapter alone could have used up all seventeen pages of the color plate section. Alas, he was allocated only five plates.

Hutchings has two chapters, one on Color in Archeology and Folklore and one on Color in Plants, Animals and Man. The two chapters are complementary and full of speculation and assumptions as they should be. The Folklore on color is especially interesting. The discussions will leave the reader longing for more or at least for someone to debate the issues. This brings us to the chapter by Hardin on the Philosophy of Color. Now here is a bridge between the arts and sciences. It is a short chapter but my review copy is already filled with marginal annotations and notes to review. His opening paragraphs say it all.

"A problem that has long preoccupied philosophers is whether color qualities are to be located in the physical world, independent of the consciousness of perceivers, or whether they are mind-dependent phenomena. This is not merely a matter of the terminology that we chose to employ, as in the moldy riddle, 'If a tree falls in the forest and nobody is around does it make a sound?' That question is readily answered once the questioner is obliged to specify whether 'sound' is taken to mean 'vibration of the air' or 'auditory sensation'. What intrigues philosophers is quite different. It may be expressed by a pair of related questions: First, how can we reconcile the picture of the world presented to us by science with the view of the world that naturally suggests itself to common sense? Second, are color sensations (and other sensations and feelings) identical with brain states, or different from them?..." You will have to read the chapter to see how Hardin answers these questions.

George Brainard presents a chapter on the Biological and Therapeutic Effects of Light. He has worked with many ISCC members over the years within our Interest

Group on the Human Response to Color and cites some of their joint publications. While he does not give definitive answers to many of the popular questions of the day, he does give insights into how these conclusions arise and how they have been examined. Nassau follows with an Editor's license and describes his definition of Double Blind Testing Methodology for Biological and Therapeutic Effects of Color.

The remaining six chapters cover industrial applications of color technology including pigments, dyes, restoration of antiquities, color in printing, photography, electronic imaging and visual displays and television.

In conclusion, I cannot see how an ISCC member, who is serious about the study of color can live without this new book on or near his/her desk.

Danny Rich
Datacolor International

WESTERN COATINGS SHOW

The Golden Gate Coatings Society will host the 24th Biennial Western Coatings Societies Symposium and Show February 15-17, 1999 at John Ascauga's Nugget Casino-Hotel in Sparks (Reno) Nevada. This show is traditionally the second largest coatings show in the US and is supported by the Los Angeles, Golden Gate, Pacific Northwest, Arizona, and Rocky Mountain Societies. Harold (Hal) Harlan III is General Chairman and Dennis Owen is Co-Chairman.

Some changes are being made to the general format used in prior years. The full size exhibit booths will be replaced by Table Top displays and Technical Papers may now have been previously published. Anyone interested in an exhibit table should contact Leon Persson at 510-337-9303 or FAX 510-337-0733.

Tim Specht of Flecto Company is the Technical Chairman and is calling for approximately 32 technical papers. Anyone interested in submitting a paper should contact Tim at 510-655-2470 or FAX 510-652-0969.

Cash prizes will be awarded to the 3 best presentations. The theme of this 1999 show is "Doorway to the Millennium".

The emphasis of the Symposium Committee is to provide the best possible Technical Program at the lowest possible cost. Cost is a major factor for moving the show from San Francisco to Sparks and for changing from exhibit booths to Table Top displays.

*Leon Perrson
402 Tideway Dr.,
Alameda, CA 94501*

IMPROVED COLORIMETRY WEIGHTING FUNCTIONS

William Thornton has been writing for several years on the subject "Toward a More Accurate and Extensible Colorimetry." His data and analyses have been set forth in six manuscripts, each of which has been published in the Wiley Journal, Color Research and Application (CR&A), the first in 1992, the sixth in 1998 (Vol. 23, No. 4, pages 226-233).

These thought-provoking articles are one of the reasons why everyone in the field of colorimetry should subscribe to CR&A so as to receive this kind of important material automatically as each issue of CR&A comes to press. If you are not a subscriber, you should seriously consider becoming one.

For economic reasons, obtain an application form from ISCC Office Manager, Cynthia Sturke, thereby ensuring that you get the very substantial subscription discount extended by publisher Wiley to each current ISCC member.

The series of articles by author Thornton documents the fact that something is basically wrong with the CIE Standard Observer functions and thus with CIE Colorimetry. Strongly metameric, visually matched, pairs of white or colored lights, are often found to have different CIE tristimulus values. The discrepancies range from small to large depending on the spectral power distributions of the matching lights. In many instances the discrepancies pose a real problem: how good is the color match?

Customers and quality control people have been increasingly critical of color matches, and they have begun to experience the fact that CIE colorimetry is not as incontestable as was once thought.

If you are involved with CIE colorimetry, you should consider obtaining a personal subscription to CR&A or having your company library subscribe to the journal. You should carefully read Part VI of author Thornton's "Towards a More Accurate and Extensible Colorimetry." References at end of article document volume, pages and year of CR&A publication of the five preceding articles.

*Harry H. Hammond III
Consultant to BYK-Gardner USA*



LETTER FROM BILL THORNTON

SUBJECT: SUMMARY OF LATEST IN "IMPROVING COLORIMETRY... SERIES

In the case of pairs of visually matching lights whose spectral compositions are very different (strong metamerism), both CIE Standard Observers often make large errors in tristimulus values and in chromaticity (both of which should be nearly identical, of course, for visual matches). Parts I to IV define the nature and magnitude of the problem; in large or small and in dim or bright visual fields, CIE errors in ΔE_{ab}^* are as large as 20-30 units, and occasionally 60 or greater. Part V dismisses "rod intrusion" as a significant factor in these errors.

Part VI demonstrates a new method of extracting improved weighting functions (eventually to replace the CIE "color matching functions"). The new functions are extracted from many pairs of visually matching white lights, each pair of which is strongly metameric. The new functions reduce errors to 1-3% of those caused by the use of color matching functions of one or the other CIE Standard Observer.

Dr. William A. Thornton



American Association of Textile Chemists and Colorists

Three of the world's top textile scientists will be honored during the 1998 International Conference & Exhibition of the AATCC in Philadelphia, PA, on September 22-25.

Joseph C. Shivers of DuPont Co. will be presented The Olney Medal for achievement in textile chemistry. He began working at DuPont as a research chemist developing polymers. He first worked on perfecting Orlon and then Dacron polyester. He also started working on a project to develop a synthetic elastomer to replace rubber, then the mainstay of foundation garments. Unable to find a fiber that would snap back like rubber, the project was shelved in 1950, but Shivers had learned much about elastomers and his persistence paid off in the early 1950s when he used an intermediate substance to modify Dacron polyester. The polymer thickened, bounced, and withstood high temperatures. As a result, additional activity sparked in the laboratory and in 1962 DuPont marketed Lycra, the company's tradename for spandex, the elastic fiber now found in everything from bathing suits to sportswear to underwear. Shiver is credited with developing the basic structural concepts that led to Lycra's discovery.

Warren S. Perkins of the University of Georgia will be presented The Harold C. Chapin Award in recognition for his outstanding service to the Association. He joined AATCC in 1963 as a freshman student at Clemson University. In 1967, he was president of the University's AATCC student chapter and in 1986 he became a life member of the Association. He has served as vice-president of the Southern Region (1984-86) and president of the Association (1991-1992). He has also served in a number of local, regional, and national AATCC posts. He has been chair, national councilor, chair of the Standing Research Committee, and sectional committeeman for the Southeastern Section. He has been a judge for the International Technical Paper Competition and the Paper of the Year award. He has also been a chair or member of several research and administrative committees including Textile Education, Applied Dyeing Theory, and the Committee on Conferences.

William Hogue Stewart Jr. of Milliken Research Corp. will be presented The Henry E. Millson Award for invention. The award, established in 1979, recognizes outstanding contributions to textile wet processing technology. He brought computerized ink jet printing to the textile industry with the successful introduction of advanced machinery and process innovations. The Millitron ink jet printing system can produce a vast array of patterned broadloom carpets, carpet tiles, and area rugs for commercial, hospitality, and residential markets. Stewart and the Millitron team showed cross-functional expertise at high skill levels in chemistry, electronics, computing, machine design, and broad scope textile technology. He also applied his expertise to several machines that produce carpet products that have attracted many gold medal design awards including those presented by the Institute of Business Designers, the NEOCON Contract Interiors Exhibition, the UK International Contract Floors Exhibition, and the International Facility Managers Associates as well as awards from fiber producers DuPont and Monsanto.

Presentations will be made during the awards ceremonies at a noon luncheon on Wednesday, Sept. 23, at the Philadelphia Marriott, 1201 Market St. Some 2000 attendees will also have the opportunity to listen to 76 technical presentations and visit 42 poster sessions and the exhibits to over 60 suppliers of dyes, chemicals, machinery, and equipment.

Founded in 1921, AATCC is the world's largest technical and scientific society devoted to the advancement of textile chemistry. The Association, which is headquartered in Research Triangle Park, NC, has some 7000 individual members and 260 corporate members in the United States and internationally.

Invitation to Press Officials:

Press badges for admittance to the technical sessions and exhibit area are available at the on-site registration area during the conference upon presentation of your business card.

Susan H. Kessee,
Editorial Director, AATCC
Tel: 919-549-8141, Fax: 919-549-8933,
email: kessees@aatcc.org

SID '99


CALL FOR PAPERS
May 16-21, 1999

The Society for Information Display (SID) encourages the submission of original papers on all aspects of research, engineering, application, evaluation, and utilization of displays. SID 99 will feature topical sessions which focus specifically on selected issues or key developments. Paper submissions are welcome for any of the general symposium topics or any of the specific topical sessions listed below.

- (1) *Active-Matrix LCDs*: Advances in the development and implementation of active-matrix electronics into displays.
- (2) *Applications*: Practical Aspects of display technology, such as design, materials and testing of displays and display-related products, encompassing innovative and unusual display applications.
- (3) *Applied Vision / Human Factors*: Work regarding the human perception of display images.
- (4) *CRTs*: Design and design methods utilized in cathode-ray tubes and yokes, including flat-thin CRTs, their components, and materials.
- (5) *Display Electronics* (New for SID 99): Circuits (integrated or otherwise) for displays, circuits-related image-processing algorithms, and electronic components for displays.
- (6) *Display Manufacturing*: Topics concerning the productions of displays and their components.
- (7) *Display Measurement*: Novel methods of characterizing displays, display standards.
- (8) *Display Systems*: Novel integration of displays into specialized devices, as well as systems-level aspects of electronic displays.
- (9) *Emissive Displays*: New developments in emissive displays other than CRTs, including advances in materials, structures, fabrication processes, characterization, and addressing and driving techniques.
- (10) *Projection Displays*: Displays, components, and systems involving projection displays.
- (11) *Liquid Crystal and Other Nonemissive Displays*: Advances in the development of liquid-crystal materials, electro-optical effects, and devices, includes materials development in other non-emissive display technologies.

For further information contact:

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 767-C Concord Ave.
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 Tel: 617-868-8088 ; Fax: 617-868-8089
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Heiju Uchiike (Asia)
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 Hiroshima, 724 Japan
 Tel: +81-824-24-7638; Fax: +81-824-22-7031
 email: uchiike@ipc-hiroshima_u.ac.jp

Study of Color-Blind Consumers

I am currently recruiting people who have some level of color-deficiency in their vision, as part of a study which attempts to identify problems that color blind consumer face. My survey takes about 10 minutes, and asks about problems that color-blind persons have had with products, labels, advertisements, and shopping in stores. My preliminary work identifies several issues related to their quality of life.

If you are interested, or know someone who is color-deficient and may be interested, please email me. I can send you a copy of the survey either by email or by surface mail. I would appreciate any ideas for finding participants in my study. My preliminary study results were presented at the Public Policy and Marketing Conference in Arlington, VA in June 1998.

As a university researcher, I appreciate people's needs for confidentiality and sensitivity. There is no need to identify respondents, since the research will present a summary of problems which are reported, in terms of frequency of responses. Upon completion of the survey, I remove all

identifying information, and simply assign a numerical code which tracks method of contact.

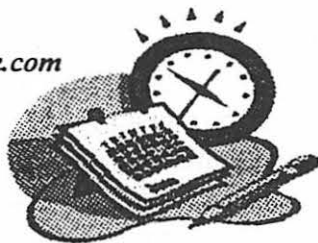
Thank you.

Carol Kaufman-Scarborough, Ph.D.
Associate Professor of Marketing
Rutgers University School of Business
227 Penn St. Camden, NJ 08102
Email: ckaufman@crab.rutgers.edu
Office: 609-225-6592 Fax: 609-225-6231

C A L E N D A R

Please send information on Member-Body and other organization meetings involving color and appearance functions with dates, places, and information source to:

Cynthia Sturke tel: 703-318-0263
ISCC Office fax: 703-318-0514
11491 Sunset Hills Rd.
Reston, VA 20190
email: iscc@compuserve.com



1998

AATCC INTERNATIONAL CONFERENCE AND EXHIBITION, Sept. 22-25, American Association of Textile Chemists and Colorists, Marriott, Philadelphia, PA
info: Shirley Clifton,
tel: 919-549-8141; fax: 919-549-8933.

DETROIT COLOUR COUNCIL, Sept. 17, Annual Panel Discussion and Open Forum on "Issues Affecting Matching of Automotive Color and Appearance."

CAD ANNUAL CONFERENCE (RETEC), Color and Appearance Division, Society of Plastics Engineers, "Riding the Wavelengths of Color", Cleveland Downtown Marriott, Sept. 27-29, 1998.

ISCC ANNUAL MEETING (Oct. 2-4); Inter-Society Color Council, Marriott Inner Harbor Hotel, Baltimore, MD; info: ISCC office, tel: 703-318-0263 and OSA ANNUAL MEETING, Oct. 4-8; Optical Society of America, Baltimore Convention Center, Baltimore, MD info: OSA, tel: 202-223-0920; fax: 202-416-6100.

COLOR MARKETING GROUP, Fall International Conference, Oct. 4-6, Le Centre Sheraton Hotel, Montreal, Canada, Info: CMG, 5904 Richmond Hwy, Ste 408, Alexandria, VA 22303 tel: 703-329-0155

COLOUR BETWEEN ART AND SCIENCE; OSLO INT'L COLOUR CONFERENCE 1998, Oslo, Norway, Oct. 10-11, National College of Art and Design, NCAD, Institute of Colour, Ullevalsveien 5m N-0165 Oslo, Norway. info: Ms. Ane Forsmo or Mr. Erik Wessel; tel: (+47)22995680, fax (+47)22995681 email: colour@chaos.shks.no <http://samson.shks.no/colour/>

TAPPI CONFERENCE, Oct 18-23, Technical Association of the Pulp and Paper Industry, Milwaukee Hilton, Milwaukee, WI

IS&T/SID, SIXTH COLOR IMAGING CONFERENCE, Nov 16-19, Society for Imaging Science and Technology/Society for Information Display, Sunburst Hotel, Scottsdale, AZ, info: IS&T Conference Manager, 7003 Kilworth Lane, Springfield, VA 22151, tel: 703-642-9090; fax: 703-642-9094; email: info@imaging.org; internet: <http://www.imaging.org>.

1999

ASTM COMMITTEE D-1, Paint and Related Coatings, Materials and Applications, Jan. 24-27, Ft. Lauderdale, FL, info: Scott Orthey, tel: 610-832-9717; fax: 610-832-9666

ASTM COMMITTEE E-12 ON APPEARANCE, Jan 24-26, Ft. Lauderdale, FL, info: Bode Buckley; tel: 610-832-9740; fax: 610-832-1547

ISCC & TAGA ANNUAL MEETINGS, May 5-7, Inter-Society Color Council and May 2-5, Technical Association of the Graphic Arts Tech. Conf. Westin Bayshore Hotel, Vancouver, British Columbia, Canada; info: Prof. Bob Chung; tel: 716-475-2722

SID 99, May 16-21, Society for Information Display, info: SID tel: 714-545-1526, email: socinfodisplay@mcimail.com.

ASTM COMMITTEE D-1, Paint and Related Coatings, Materials and Applications June 13-16, Omni Rosen Hotel, Orlando, FL; info: Scott Orthey, tel: 610-832-9717; fax: 610-832-9666.

TAPPI, Oct. 17-22, Technical Association of the Pulp and Paper Industry; Conference, Omni Durham Hotel, Durham, NC, info: Lisa Archer, tel: 800-332-8686, ext: 225

OSA ANNUAL MEETING, Optical Society of America, Santa Clara, CA, info: OSA, tel: 202-223-0920, fax: 202-416-6100

AATCC, INTERNATIONAL CONFERENCE AND EXHIBITION, Oct. 12-15, American Association of Textile Chemists and Colorists, Convention Center, Charlotte, NC, info: Shirley Clifton, tel: 919-549-8141; fax: 919-549-8933

2000

ASTM COMMITTEE D-1, Paint, and Related Coatings, Materials and Applications, Jan. 23-26, Hyatt Regency, New Orleans, LA info: Scott Orthey; tel: 610-832-9717; fax: 610-832-9666.

ASTM COMMITTEE E12 ON APPEARANCE, Jan 25-28, Hyatt Regency, New Orleans, LA, info: Bode Buckley; tel: 610-832-9740; fax: 610-832-1547.

ISCC WILLIAMSBURG CONFERENCE, Feb 20. 2nd Panchromatic Conference, Color in it's Surround; info: Dr. Cynthia Brewer, tel: 814-865-5072

ISCC & CPMA ANNUAL MEETINGS; April, Inter-Society Color Council and Color Pigments Manufacturers Association, Charlotte, NC., info: Romesh Kumar tel: 410-823-2161

SID 2000, May 14-19, Society for Information Display Long Beach CA, Info: SID, tel: 714-545-1526; fax: 714-545-1547; email: socforinfodisplay@mcimail.com www home page: <http://www.sid.org>.

AATCC INTERNATIONAL CONFERENCE AND EXHIBITION, Oct. 15-18, American Association of Textile Chemists and Colorists, Benton Convention Center, Winston-Salem, SC, info: Shirley Clifton, tel: 919-549-8141; fax: 919-549-8141

2001

ISCC/AIC MEETING, June 24-29, Inter-Society Color Council and Association Internationale de la Colour, Rochester Riverside Convention Center, Rochester, NY, info: Paula J. Alessi, tel: 716-477-7673; fax: 716-722-1116

COLOR ME CRAZY

Want to lose weight? Set the table with black place mats. Got a boss with a bad temper? Wear green, a placid color. Need to calm a hyperactive child? Decorate his or her room with brown accents, for stability. So urges Lin Yun in his book *Living Color*, a guide to using hues to change your life. Countless others have made cases for the power of color, but Yun takes his to the limit. He suggests painting your home to match your neighbor's for friendlier coexistence, driving a two-toned car that has both your and your spouse's favorite colors for a more harmonious marriage, even planting white flowers [they're lucky] on your lawn to attract reliable babysitters. Whatever happened to trying for a personality match?

For Your Information.....

We are compiling the Newsletter at the ISCC Office. We have made some minor physical changes hoping that the members that read the Newsletter will do so with ease. Let us hear from you!

Jobs Wanted!

This Section is intended to help ISCC members that are in need of, and are looking for employment. Here is an opportunity to use the resources at hand. There is no charge for this service, however, the restrictions are as follows:

1. This service is for ISCC members' use only.
2. No more than 50 words may be used to describe yourself.
(Not including name, address and/or telephone number.)
3. If you are using a P.O. Box, you must supply a complete address.
4. No Agency representing member(s) is allowed.
5. Neither the ISCC News nor the the editors are responsible for any errors.
6. You must advise us in writing when you have obtained employment.

We hope this new section will be of value to you, the ISCC member. If you have any suggestions/criticisms, please send them to the editor. Let's make this work!

SEEKING FULL-TIME EMPLOYMENT

regarding the application of Color Trends as well as the psychological use of color.
Educational background: Studied color and design at Philadelphia College of Textiles & Science, Kutztown University; PA School of Art and Design; Eisemann Institute in Seattle, WA; North American Association of Color Consultants in San Diego, CA; Gale Laurence Studios in San Francisco; active member of Color Marketing Group and Inter-Society Color Council.

Resume and References upon Request:

Therese Rabel
38 Brandywine Court
Wyomissing, PA 19610
Tel: 1-888-397-4850

SEEKING EMPLOYMENT RELATED TO COLORATION

Noted Bulgarian color and light expert. returning from visiting scholoarship in Japan, seeks short or long term employment in the West. Thirty years of extensive and varied experience in visual and instrumental color measurement in many systems. Capable in research, teaching, program development, and quality control. Multilingual.

Assoc. Prof. Dr. Todor Kehlibarov
P.O. Box 1089
Sofia BG-1000
Bulgaria
Phone/Fax 011 359 2 88 05 97
US Contact: Dr. F. W. Billmeyer, Jr.
Phone/Fax 01 518 377 9511

SUSTAINING MEMBERS

BYK-Gardner USA
Tel: 301-483-6500
Labsphere, Inc.
Tel: 603-927-4266

Chromatics Color Sciences International, Inc.
Tel: 202-717-6544
David L. Spooner, rhoMetric Assoc., Ltd.
Tel: 302-764-9045

Hunter Associates Laboratory, Inc.
Tel: 703-471-6870
Minolta Corp.
Tel: 201-934-5291

ISCC MEMBER-BODIES

American Association of Textile Chemists and Colorists (AATCC)	Graphic Arts Technical Foundation (GATF)
American Society of Interior Designers (ASID)	Human Factors & Ergonomics Society (HFES)
American Society for Testing and Materials (ASTM)	Illuminating Engineering Society of North America (IESNA)
American Society for Photogrammetry and Remote Sensing (ASPRS)	National Association of Printing Ink Manufacturers (NAPIM)
The Color Association of the United States, Inc. (CAUS)	Optical Society of America (OSA)
Color Marketing Group (CMG)	Society for Information Display (SID)
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