

# Inter-Society Color Council *News*

Number 369 September/October 1997

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## 1998 Williamsburg Conference of The Inter-Society Color Council

**Color And Design: 21st Century  
Technology And Creativity  
February 22-24, 1998**

### THE CONFERENCE

The accelerating rate of technological change has presented designers, artists and other creative individuals involved with color new challenges, methodologies and design strategies within the studio and workplace. While increased efficiency may result from new technologies, ever present is the challenge to preserve quality, creativity and uniqueness within the overall pursuit of excellence.

The Inter-Society Color Council will sponsor a conference exploring the impact of technology on the pursuit of design and artistic excellence at Colonial Williamsburg from February 22-24, 1998. The objectives of this conference are to present current research and creative activities and exchange information among color, design, art and technology specialists. The two and one half day program of presentations will be given by leading authorities within their respective creative and professional fields and will encourage interaction between the speakers and participants. Conference presentations will be given by professionals involved with color and new technologies from the areas of computer graphics and animation, scientific visualization, virtual reality, architecture, painting, art conservation, graphic design, the cinema, color science and reproduction, the computer software and hardware industries, interior design, textiles and others.

### PROGRAM

#### Keynote Speaker:

**Professor Donna Cox**, Director, Center for Graphic Technologies, University of Illinois, the National Center for Supercomputing Applications, Urbana-Champaign, IL: **"VISUALIZATION AND VIRTUAL REALITY."**

Prof. Cox has exhibited computer images and animations in more than 100 invitational and juried

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exhibits around the world. Her work has been printed, cited or reviewed in more than 60 publications and has been reviewed in nationally recognized publications, including Time, National Geographic and The Wall Street Journal. International exhibitions include Digicom in Canada, Nicograph in Japan, "L'Agrifoglilo" in Milan, Italy and Eurographics '87 in Nice, France. She has authored many juried papers on computer graphics and scientific illustration. Her more than 70 invited presentations have taken place in Australia, New Zealand, Finland, MIT, Princeton, Kodak, Eli Lilly Corp. and T.J. Watson Center. Her animations have appeared on many television programs including NOVA, Good Morning AMERICA, The New Explorers and the PBS special, "The Infinite Voyage: Unseen World," featured her as a pioneering artist in scientific visualization. She was Art Director and Associate Producer for Scientific Visualization for the academy award nominated IMAX film "Cosmic Voyage" for the Smithsonian Air and Space Museum. She earned a BA in 1982 and an MFA in Computer Graphics in 1985 from the University of Wisconsin, Madison.

### **Program Speakers and Lecture Titles:**

**Mr. Ross Merrill**, Chief of Conservation, The National Gallery of Art, Washington, DC: **"ELECTRONIC IMAGES IN THE STUDY OF WORKS OF ART AT THE NATIONAL GALLERY OF ART."**

**Mr. Burton Silverman**, Painter, Author, Lecturer, New York City: **"COLOR AS THE HANDMAIDEN OF FORM AND CONTENT."**

**Mr. Moritz Zwimpfer**, Graphic Designer, Basel, Switzerland: **"EXPERIENCE IN COLOR: METHODS TO DEVELOP A PERSONAL UNDERSTANDING OF COLOR."**

**Mr. David Adamson**, Chair,

Computer Art Division, The Corcoran School of Art, Director, David Adamson Gallery, Washington, DC: **"COLOR CONCERNS FOR ARTISTS IN THE DIGITAL AGE."**

**Dr. Roy S. Berns**, Richard S. Hunter Professor in Color Science, Appearance and Technology, Munsell Color Science Laboratory, Rochester Institute of Technology: **"SPECTRAL BASED ART REPRODUCTION - POSSIBILITIES."**

**Mr. Harold Cohen**, Emeritus Professor and Director of the Center for Research in Computing and the Arts, University of California San Diego: **"TOWARDS AN AUTONOMOUS EXPERT COLORIST."**

**Dr. James C. King**, Principle Scientist, Adobe Systems Incorporated, San Jose, California: **"YES! YET ANOTHER REVOLUTION OF THE PUBLISHING INDUSTRY (THIS TIME ITS A REALLY BIG ONE)."**

**Mr. Todd D. Newman/ Mr. David Klippel**, Silicon Graphics Inc., Mountain View, CA: **"GETTING THE COLOR RIGHT: THE FUTURE OF COLOR TECHNOLOGY."** Mr. David Klippel, presenter.

**Mr. Harold Linton**, Professor of Color Design: **"THE MA DEGREE PROGRAM IN COLOR AND DESIGN, THE UNIVERSITY OF ART AND DESIGN-UIAH, HELSINKI, FINLAND."**

**Ms. Kristine K. Fallon**, FAIA, Kristine Fallon Associates, Inc., Chicago: **"THE VISUAL ENVIRONMENT OF THE WHOLE WIDEWEB AND ITS DESIGN INFLUENCE."**

**Mr. Joshua Pines**, Supervisor of Film Scanning/Recording, Industrial Light and Magic, San Rafael, CA: **"DIGITAL COLOR CORRECTION AND CALIBRATION ISSUES FOR MOTION PICTURE VISUAL EFFECTS (WHERE WE ARE NOW AND WHERE WE ARE GOING)."**

**Dr. Nancy Kwaliek**, Associate

Professor and Head, Division of Interior Design, The University of Texas at Austin: **"COLOR PSYCHOLOGY-ITS NOT JUST BLACK AND WHITE."**

**Dr. Julio Bermudez**, Assistant Professor, Graduate School of Architecture, The University of Utah: **"REVOLUTIONARY DIGITAL CONVERSATIONS. FOSTERING DESIGN CREATIVITY THROUGH HYBRID MEDIA AND TECHNOLOGIES."**

**Ms. Lori Eichel**, Digital Product Manager with d cube, a business unit of Cone Mills Corp.: **"CATAPULTING FROM CONCEPT TO CONSUMER-TECHNOLOGICAL INNOVATION AS COMPETITIVE ADVANTAGE IN DESIGN DRIVEN INDUSTRIES."**

**Ms. Penny Bonda**, FASID, Director of Interior Design, The Hillier Group, Washington, DC: **"THE POWER OF COLOR AS A DESIGN TOOL IN THE BUILT ENVIRONMENT."**

**Ms. Hilary Dalke**, Director, Colour Design Research Unit, South Bank University, London: **"COLOUR AND THE AUTOMOBILE."**

### **ORGANIZING COMMITTEE PRESENTATIONS**

**Wade S. Thompson, MA., MFA.**, Conference Organizing Chair, Professor of Art and Design, Southwest Missouri State University will be presenting a video concerning his paintings and personal use of color.

**Anna Campbell Bliss**, ASID, will present a poster paper concerning recent site specific projects developed with the computer and mixed media.

**Magenta Yglesias**, ASID, will present a video concerning the development of her recently published children's book "The Little Raindrop That Lost It's Rainbow" which she both wrote and illustrated.

Additional poster papers will be



presented during the conference.

A Conference Proceedings including abstracts of all presentations and the conference schedule will be distributed during registration. Additionally, a special topic issue of the international journal on color, *COLOR Research & Application*, published by John Wiley and Sons, New York, will be published based on the papers presented concerning the Conference theme. Continuing Education Credits will be awarded to ASID participants.

Request for additional information or a conference brochure including registration information should be directed to Ms. Cynthia Sturke, Administrative Assistant, 703-318-0263; fax: 703-318-0514 or Wade S. Thompson, Organizing Chair, 417-882-2553.

## COLOR RESEARCH AND APPLICATION

### IN THIS ISSUE, October 1997

In basic colorimetry, after we can specify colors numerically, the next step is to develop metrics to evaluate how closely colored material matches a designated color or standard. Major steps in the color specification were taken with the development of the CIE 1931 system. In the over 60-year time span since then, scientists have been working on developing color-difference metrics. At first most of the research focused on the determination of just perceptible differences. Later, metrics were expanded to include acceptability, rather than just perceptibility. That is, acceptability ellipses are based on what was a commercially acceptable difference, and may be slightly larger than just-perceptible differences. Earlier this year, an article was published on supra-threshold color-difference ellipsoids. Now in this issue, M.R. Pointer and G.G. Attridge are looking at the

scaling of even larger color differences. In "Some Aspects of the Visual Scaling of Large Colour Differences", they report on investigations of the application of four color-difference metrics to visual scaling of large color differences between photographically prepared reflection color samples.

One of the challenges facing color scientists today in advanced colorimetry is making reproduced colors in hardcopy medium the same as those seen on the color displays of designers or customers. This is particularly important in computer-aided design, multimedia systems, and desktop publishing, and even is becoming relevant in your neighborhood paint store. However, accurate cross-media reproduction requires color characterization that is independent of the display or printing device and, because displays and hardcopy are viewed differently, the characterization must be independent of the viewing conditions, too. While the device independence is accomplished through colorimetric characterization of the equipment, the viewing independence requires the use of a color-appearance model. In our second article, "Effective and Efficient Mapping of Color Appearance," E. Boldrin, P. Campadelli, and R. Schettini demonstrate that the Hunt94 model can be easily and faithfully approximated by feed-forward neural networks for several viewing conditions of practical interest. The authors believe it would be possible to define a library of neural network mapping functions to plug into color management systems to transform the color stimuli perceived on one device to the corresponding stimuli required to produce the same appearance on a second device both reliably and economically.

Often scientists in one specialized area, work on and solve problems that they perceive as unique to their industry. These results, while well disseminated within that industry, are not interwoven with those in other industries. It takes a broad educational perspective to expand beyond the regional horizon.

In the next article, Roy S. Berns begins with the relationships between colorants, their mixtures, and the resulting spectral and colorimetric properties that are familiar to textile, plastic, and paint industries and puts them in context as models that are appropriate for CRT displays, photographic materials and printers. In "A Generic Approach to Color Modeling", Dr. Berns presents the commonalities between characterizing the colorimetry of computer-controlled CRT displays and computer colorant formulation.

With the advent of more widespread technology, more and more museums and galleries create archival image data banks of their exhibits. These data banks may be reproduced in color slide form for assistance in conservation research and for computer-aided study of the art works. However, how faithfully are the colors in the digitized slide reproductions? M. Vallari, Y. Chrysosoulakis, and J.M. Chassery report on "A Colour Study Approach through Colour Measurements on Slides of Art Paintings" in the last article in this issue.

Moving on to the Color Forum, readers are probably familiar with figures showing the CIE color-matching functions. Some have probably wondered why the heights of the CIE color-matching functions are different. However, the answer to this question is not usually found in colorimetry textbooks. In this month's Color Forum, Dr. R.W.G. Hunt gives the answer when he discusses "The Heights of the CIE Colour-Matching Functions."

For the second time this year, we have a Classical Article in Color. In this issue, Andrew M. Geller and Pilar Herreros de Tejada Macua provide "Sensitivity of Rods and Cones in the Parafovea", a translation of "Sensibilidad de bastones y conos en la parafovea" first published in *Anales de la Real Sociedad Española de Física y Química*, serie A, 46, 251-282, 1950, by J. Cabello and W.S. Stiles. Stiles' work has been widely read and forms a basis for study for many researchers. However, this article is not as widely

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known as many of Stiles' publications, possibly because it is not the only one originally published in Spanish. Thus, we are pleased to be able to bring this English translation to the attention of our readers. As with all articles published in the Classical Articles in Color Section, this article comes with an introductory commentary, which places the article in history and indicates its significance to current readers. In this case the commentary is written by Oscar Estéves-Uscanga.

We close with one item in the Communications and Comment Section. This is also from Dr. R.W.G. Hunt. In some recent articles in *Color Research and Application*, the Bradford transform has been indicated as the transformation of choice. However, the practical implementation of this choice can be difficult, because the Bradford transform is not analytically reversible. Therefore, Dr. Hunt's communication, "Reversing the Bradford Chromatic Adaptation Transform", describes a method that is accurate enough for all practical purposes, and includes worked examples.

Ellen C. Carter

Editor

*Color Research and Application*

## A TRIBUTE TO A LIVING LEGEND DAVID LEWIS MACADAM

David L. MacAdam was born in Philadelphia, Pennsylvania on July 1, 1910. After finishing High School he entered Lehigh University, and graduated *Magna Cum Laude* and *Phi Beta Kappa*. He entered MIT in 1932 and studied for his doctorate under Prof. George R. Harrison. He was a charter member of *Sigma Xi* and a teaching fellow. Under Prof. Arthur C. Hardy, he originated the first course in color measurement. Dr. MacAdam also assisted in the preparation of Prof. Hardy's "Handbook of Colorimetry".



Kal Vizy, a fellow Kodak retiree, relates a story about Dave from their days at Kodak.

Upon graduating from MIT in 1936, Dr. MacAdam joined the Research Laboratories of the Eastman Kodak Company. He was instrumental in revising the 1922 Troland Report on Colorimetry with Dr. Loyd A. Jones. The revision was published as the Optical Society of America's *The Science of Color*. MacAdam was author of two chapters, namely, "Quantitative Data and Methods of Colorimetry" and "Colorimeters and Color Standards".

MacAdam is often remembered for the work he did that resulted in the now famous MacAdam ellipses, published in the Journal of the Optical Society of America under the title, "Visual Sensitivities to Color Differences in Daylight" (JOSA, Vol. 32, May 1942, p247).

Dr. MacAdam has made many contributions to the fields of colorimetry, color photography, color television, camouflage detection, and color standardization. He established the reliability of the automatic recording spectrophotometry. This instrument was invented by and known as the Hardy spectrophotometer and eventually became GE stove pipe and finally the GE recording spectrophotometer. He initiated the use of computers in 1946 for research in colorimetric studies of dye mixtures in color photography. He invented a tristimulus integrator for colorimetry and developed a geodesic chromaticity diagram to facilitate determinations of hue and saturation in evaluation of fidelity of color reproduction in color photography and color television. He has also developed equations for evaluation of color differences as a basis for standardization by the CIE, (e.g. FMC Color Difference Equation).

His interest in the classics inspired him to write a book in 1970: *Sources of Color Science*, (The MIT Press, 1970). MacAdam collected portions of articles from Plato's *Timaeus* 68, Thomas Young, Erwin Schrödinger, John Guild, Stephen Polyak to Sir Wilfred E. Le Gros Clark.

He has written numerous articles on color. Some of the articles have become classics in their field. Two of the papers have led to the data themselves being named for the author, a rare honor. They are the MacAdam limits for the maximum possible luminous transmittance or reflectance at a given chromaticity and the MacAdam ellipses for color discrimination as a function of CIE coordinates. Dr. MacAdam was the first recipient of the Adolf Lomb Award from the Optical Society of America. This award is given biennially to the most outstanding contributor in the field of optics, under thirty years of age.

During the second world war, he undertook a large-scale investigation of the influence of color contrast on the visual detection of targets.

Dr. MacAdam is an honorary member of Inter-Society Color Council and in 1963 received the Godlove Award of the Society. In 1966 he received the Mattiello Award of the Federation of Societies for Paint Technology, and in 1966 Hunter and Driffield Medal from the Royal Photographic Society. He was also given the highest award of the Optical Society of America in 1974, the Frederic Ives Medal, for his

contributions to color and optics.

In 1996, a symposium was arranged, called a Tribute to Dr. David L. MacAdam, "Horizons in Color Science", by Center of Electronic Imaging Systems, Rochester Institute of Technology and University of Rochester.

In closing we wish the good doctor a very Happy Belated Birthday! Best wishes.

*Gultekin Celikiz*  
Editor

## Conference on HUMAN VISION and ELECTRONIC IMAGING

**January 24-30, 1998**

Under the aegis of the SPIE/IS&T Symposium on Electronic Imaging Science and Technology San Jose Convention Center, San Jose, California

Chairs: Bernice Rogowitz, IBM T.J. Watson Research and Thrasyvoulos Pappas, Lucent Technologies

### Committee:

Jan Allebach, Purdue University  
Walter Bender, MIT Media Lab.  
John Dalton, Apple Computer, Inc.  
Gunilla Derefeldt, FOA (Sweden)  
Huib de Ridder (IPO, Netherlands)  
Jennifer Gille, Western Aerospace  
David Heeger, Stanford University  
Eugene Martinez-Uriegas, SRI Int.

Yoichi Miyake, Chiba University, (Japan)

Thomas Papathomas, Rutgers University

Adar Pelah, Cambridge University (Great Britain)

Zygmunt Pizlo, Purdue University  
Christine Podilchuk, Lucent Technologies

Robert Safranek, Lucent Technologies

Christopher Tyler, Smith-Kettlewell

The goal of this conference is to explore the role of human vision, perception and cognition in the design, analysis, and use of computer-based image and data systems.

This is the 10th anniversary of the conference. Over the years, it has brought together researchers from a wide variety of disciplines, from all over the world, for a rich and lively exchange of ideas. This dialogue is based on the growing understanding that the human observer is a fundamental key to the advancement of image systems, and that advances in these systems and applications stimulate new research into the vision, perception, and cognition of the human observer.

There will be papers on basic and applied research in:

### 1) Human Vision, Perception and Cognition

- spatial, temporal and color vision
- attentive and pre-attentive vision
- pattern recognition
- hypothesis generation and problem solving
- visual organization and object perceptions
- language and memory

### 2) Color Perception and its Applications

- models of color vision
- color constancy
- perceptual approaches to device-independent color
- color coding
- color selection
- color artifacts

### 3) Psychophysical Evaluation of Image Quality

- perceptual criteria for image compression
- perceptual measures of image compression
- perceptual effects of spatial, temporal and chromatic sampling
- visual comparison of compression, sampling, and halftoning algorithms

### 4) Vision-Based Algorithms for —

- still image and video compression
- image enhancement, restoration and reconstruction
- image rendering
- digital halftoning and quantization
- display

### 5) Image Retrieval Based on Visual Image Characteristics

- perceptual cues for navigating through large databases
- development of perceptually-important image metadata
- image semantics, segmentation and representation

### 6) Interactive Exploration and Visualization of Data

- perceptual issues in visualization and virtual reality
- visual cues for data mining
- metadata for characterizing higher-level features of data
- image semantics, segmentation and representation
- incorporating intelligence into interactive systems
- auditory and tactile cues

### 7) Art, Aesthetics, and Perception

The Conference on HUMAN VISION and ELECTRONIC IMAGING focuses on the perceptual and cognitive aspects of Electronic Imaging Systems.

We would also like to draw your attention to the following conferences which focus on related aspects of Electronic Imaging Systems and which will also be held as part of the EI Symposium:

- Color Imaging: Device-Independent Color, Color Hard Copy and Graphic Arts III
- Very High Resolution and Quality Imaging II

Further information can be found via the World Wide Web at URL: <http://www.spie.org/>

If World Wide Web access is not  
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available, then contact:

IS&T/SPIE EI '96  
SPIE, P.O. BOX 10  
BELLINGHAM, WA 98225

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## Book Review:

# COLOR: AN INTRODUCTION TO PRACTICE AND PRINCIPLES, BY ROLF G. KUEHNI

(Wiley, New York, 1997, 186  
pp., \$59.95 hardback).

Imagine you are asked to summarize in less than 200 pages all of color: science, technology, aesthetic theories, philosophy, and history. You must achieve technical correctness, accessibility to artists and interested lay people, graphical appeal—and above all, no equations! To comfort you, there are pre-existing models of the genre—such excellent near-classics as *Seeing the Light* by Falk et al. (Harper and Row, 1986) and *Color Theory and its Application in Art and Design* by Agoston (Springer-Verlag, 1981). But the former is geared toward freshman physics students, and lacks immediacy either for the artist or for the one who wants to understand the CIE standards, etc. The

latter, on the other hand, is geared explicitly for artists (although written by a technologist), and lacks the desired breadth. *Color: A Guide to Basic Facts and Concepts*, by Burnham, Hanes and Bartleson (Wiley, 1963) also comes close to the mark, but is very dated and adopts a “frequently asked questions” format rather than a more orderly presentation of concepts. Clearly the field is open for a study guide for the universalist interested in all aspects of color—perhaps a “required reading” for all the Interest Groups of the ISCC so they can communicate with each other.

Enter Rolf Kuehni, who earlier addressed this perceived need with his book *Color: Essence and Logic* (Van-Nostrand Reinhold, 1983), and now offers an updated edition by a different publisher. The would-be consumer might ask several questions. Is the new edition worth paying more than triple the price of the first edition (which sold for \$17.95)? Can I access easily the information that attracts my interest, no matter how arcane or pedestrian that interest might be? Does the book have enough clarity and consistency of terminology so it can be read as a monograph as well as used as a reference or study guide? Is it up-to-date?

Let me answer the last question first. The book is admirably up-to-date, referring to quite recent developments in basic vision science, color-difference formulas, and philosophy (e.g. by Hardin and by Dennett). The later material is incorporated seamlessly into the text, neither grudgingly nor with faddish enthusiasm. Often the later material enters through understated comment rather than by detailed references and description. For example, Kuehni acknowledges color constancy as having been called the most important problem in color science, but stands apart from the current modeling alternatives: “The factors involved in color constancy are complex, and its prediction from spectral power distributions of light sources and reflectance properties of objects requires a valid adaptation

model and a computer.” (p. 46) Kuehni seems more interested in the philosophical import of color constancy than in its details, apart from its incorporation in agreed-upon standards. The same is true of much of recent basic vision science, which finds coherent expression in the Appendix on “Evolution of the Color Vision System” based on work by John Mollon, rather than in quantitative details that would interact confusingly with the clear CIE presentation elsewhere in the book. Finally, in his chapter on color reproduction, Kuehni acknowledges the burgeoning of digital photography (replete with reproduction problems), without going into details of ICC color management. In every part of the book, Kuehni had to make agonizing decisions in selection and presentation. I almost always agree with the decisions.

Kuehni also makes illuminating analogies based on his extensive experience with the technology of textile dyeing. For example, on the photochemistry of vision: “Retinal is a dye with a purple appearance that is attached to a larger colorless protein molecule to form one of four visual pigments. Different protein molecules result in different visual pigments. This is somewhat similar to certain artificial pigments where bright dyes have been attached to colorless insoluble substrates to form (insoluble) pigments.” (p. 33)

Another success of the book is ease of access to particular information. The index was quite sufficient for certain tests to which I put it. The glossary is new to this edition, and every word in it is carefully measured. I especially appreciate the glossary because I have been working on glossary entries for a standards document. Whereas I used half a page to define “fovea”, Kuehni takes less than three lines, and gets nearly the same information across. Furthermore, it is possible to read almost any paragraph in the book out of context and still gain meaning from it. This makes the book effective as a reference work.

However, the book does not seem to work so well as a monograph. I found

that the very modularity that made it accessible to out-of-context reading made consecutive reading quite difficult. This fragmentation was almost absent from the chapters on CIE colorimetry and on colorant formulation. I actually welcomed it in the philosophical chapter "What is Color?", which could well enter the record books for its brevity and concreteness. However, the last three chapters (on history, color theory in art, and color harmony) went on with the relentless thoroughness of Monarch Notes, but without enough continuity for my taste.

I also had problems with some of the terminology, despite the fact that it is standard and has been faithfully transcribed in the book. For example, reflected-light tristimulus vectors are called "related colors" (see, e.g., Fig. 6.18 on the optical-color solid). Kuehni acknowledges, both in the Glossary and on p. 41, that object colors are "related" by dint of being seen in the context of other object colors. But then he implicitly equates "object color" to "related color", a term that confuses tristimulus vectors with color percepts, as well as setting the stage for referring to a single object as being intrinsically "color constant" independent of its context (p. 45). Also the association of luminance with brightness (p. 81) bothered me, because the adjective "presumed" was dropped from "brightness" after the first usage.

At first I missed the global reference list of the first edition, but the eight pages of chapter footnotes at the end turned out not to be onerous to search, especially in view of the vastly different subject matter of the various chapters.

Other than these rather small difficulties (and also the fact that Schroedinger and Judd were chronologically the last in a long list of color theorists) I found that I agree with Kuehni's terminology, selection of material, and emphasis.

And, finally, the second edition is worth the extra money: it is substantially revised, and the layout renders the book far more attractive and readable than the first edition. It is truly an inclusive

compendium. If I forget either the geological eras or the impressionist painters, I can find them here, tied quite explicitly to concepts of color.

*Michael H. Brill*

## 3RD NATIONAL DTP-CONFERENCE (first time with International Participation) ON THE APPLICATION OF COMPUTER SCIENCE ON PRINTING

**Budapest, Hungary  
February 6-8, 1998**

UNDER THE HIGH PATRONAGE  
OF: Hungarian Professional  
Association of Printers, and Hungarian  
Association of Paper- and Printing  
Industry.

PATRON PERIODICAL: Magyar  
Grafika, Printinfo, Print & Publishing  
PROFESSIONAL COORDINATORS:  
Mr. Istvan Rado, Rado Nyomda Ltd.,  
Mr. Peter Ratkovics, Partners Hungary  
Ltd.

TECHNICAL ORGANISER: Mr.  
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Fax: (36-1)118-3418, Email:  
instantc@mail.datanet.hu,  
Internet: [http://www.agria.hu/  
acreklam/instant/](http://www.agria.hu/acreklam/instant/)

CONFERENCE PROGRAMME:  
MAIN TOPICS:  
Prepress  
Digital photography (video)  
Digital printing, printing on demand,  
Internet, SGML Free topics

## THE RICHARD S. HUNTER COLOR INSTITUTE PROMOTES RICHARD W. HAROLD

**R**eston, Virginia, July 24 - Jane Hersey, Executive Director of the Richard S. Hunter Color Institute (RSHCI), the first organization solely dedicated to the commercial education and training of industrial color professionals around the world, announced today the promotion of Richard W. Harold to the position of Senior Director, Programs.

Richard Harold, an internationally recognized color expert, will coordinate the design, development and promotion of courses to be included in the RSHCI program schedule. He will also provide leadership and guidance to the team of course presenters. In addition to his new duties, Richard will continue presentations of his widely known color and appearance programs and on-site seminars worldwide.

Richard co-authored with Mr. R. Hunter the book *The Measurement of Appearance*, 2nd edition. He has also written numerous articles and publications on many of the aspects of color and appearance for textiles, food, paint and coatings.

Richard is actively involved in the work of several organizations such as American Association of Textile Chemists and Colorists, Inter-Society Color Council, the American Society for Testing and Materials, and the International Organization for Standardization (ISO) (Chairman ISO/TC 38/SC1), to name a few.

For more information on technical programs or to put your name on the mailing list, contact the Institute by mail at 11654 Plaza American Drive, Suite 211, Reston, VA 20190, by phone

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at 703-834-2212 or fax at 703-471-7408. Email address is rshci@hunterlab.com.

## UNITED STATES NATIONAL COMMITTEE (USNC) OF THE CIE

**T**his year for the first time - the Canadian National Committee and the USNC are meeting together to jointly participate in a full-day technical session in addition to their respective annual meetings. The dates are Friday October 31 through Sunday, November 2, 1997. The venue is Cleveland, Ohio and the newly remodeled Holiday Inn Northeast on Cleveland's suburban east side. There is excellent access via interstate 90 and 271 for those driving from Canada via Toronto. The Inn is also served by airport limousine from the Cleveland Hopkins International Airport. The Inn features new and remodeled rooms, an excellent restaurant, fitness center, a pool, outstanding service and free van transportation for sightseeing and shopping excursions. Parking is free.

Very special room rate of \$68.70, USD/night (including tax) - double or single - have been arranged. Reservations may be made now by calling the hotel directly at 1-800-752-2582. (The reservation agent may identify the group rate under "General Electric.")

Deadline for hotel reservations is Wednesday, October 15

### Preliminary Conference Program

#### FRIDAY, OCTOBER 31

Morning - Arrivals

Late Morning - Executive Committee Meetings

Afternoon - CNC and USNC Business Meeting

Evening - Welcome Reception (hotel)

#### SATURDAY, NOVEMBER 1

All Day - Technical Conference Session (hotel). Theme: New Developments in Lighting

Evening - Tour of GE Lighting Institute  
- Conference Dinner

#### SUNDAY, NOVEMBER 2

Morning - Leisure

Afternoon - Combined Session (CNC, USNC) - Conference Wrap Up  
TC and Other Committee Meetings  
As Arranged  
Departure

Reserve the dates and make your plans to come to Cleveland for the CNC/USNC joint conference and meeting - and quite a bit more - this fall. The new Rock & Roll Hall of Fame and Museum, the new Great Lakes Science Center, Tower City, the Cleveland Orchestra, the Playhouse, the Cleveland Museum of Art, and Gund Arena will be alive with sports and cultural events. For shoppers, a newly-opened shopping center featuring a Nordstroms, Dillards, and Saks Fifth Avenue, plus more than 90 specialty stores is just 20 minutes away from the Holiday Inn.

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*Harry Hammond III*

### CALL FOR PRESENTATIONS FOR THIS ALL IMPORTANT MEETING

Presentations are solicited for this joint meeting CIE - CNC and USNC technical Conference to be held in

Cleveland, OH on Saturday November 1, 1997. The objective of the conference is to provide a broad review of current lighting work and practice especially as it relates to the interests of the International Conference on Illumination. You do not have to be a member of the USNC or the CNC to be a presenter.

Topics of interest to the Conference attendees include reviews of work by CIE Divisions and Committees, results of independent lighting research, technology developments, and reviews of lighting practice. Significant work which has been previously published may be submitted for presentation as a summary.

Formal written presentations are not required and the proceedings of the Conference will not be published as such. Rather, those authors selected for the Conference will provide notes or outlines of their presentations which will be given to the attendees as part of the Conference hand-out material. Time for individual presentations will be about 30 minutes which includes 5 to 10 minutes for questions. If there are group presentations on significant work longer time, up to 1.5 hours, can be given for these.

Those interested in presenting at the conference should contact:

Rolf Bergman, 1997 USNC  
Technical Conference Chairman

Deadline for Proposals: October 3, 1997

(However, an immediate reply will enable us to better prepare the next meeting mailing to the USNC membership.)

Deadline for receipt of hand-outs:  
October 24, 1997!

*Ellen C. Carter*



## SID - THE SOCIETY FOR INFORMATION DISPLAY

### Display Research Conference Celebrates Canadian Growth in Toronto The International Display Research Conference's First Visit to Canada Coincides with Expansion in the Canadian Display Industry

The 17th International Display Research Conference (IDRC97) will be held at the Sheraton Hotel in Toronto, Canada from Sept. 15 to 19, 1997. The conference - which covers a broad range of research developments relating to electronic information displays - coincides with the emergence of several interesting display initiatives in Canada. The attractive host city of Toronto, located on Lake Ontario, is Canada's cultural and commercial center, and the home of the University of Toronto and York University.

New this year, the IDRC will open on Monday, Sept. 15, and close on Friday, Sept. 19, with invited symposia. Monday's symposia will be on active-matrix displays and liquid-crystal processes and devices. As part of the active-matrix symposium, H. Mori of Fuji Film Corp. will present "Applications of Negative Birefringence Films to Various LCD Models," and M. Kitamura of Asahi Glass Research Center will present "Applications of Multi-line Addressing." In the LCD symposium, Shinichi Hirano of IBM Japan will speak on "Perspectives on AMLCD and Future Directions."

Friday's symposia will be on field-emission displays and organic electroluminescence. In the FED symposium Robert Smith of Motorola Flat Panel Displays will present a paper entitled "Driving FEDs."

The keynote address will be "Transforming Display Technology into Profits and Jobs," by Jim Hurd, President and CEO of Planar Systems.

Among the individual technical sessions scheduled from Tuesday through Thursday are:

- Liquid Crystal Materials and Modeling
- Performance Enhancement of LCDs
- AMLCDs
- Projection Technology
- Reflective/Novel LCDs
- General Displays and AMLCD Manufacturing
- Color Plasma Displays
- Emissive Materials
- Field Emission Displays

Invited papers will be presented by Martin Schadt, the inventor of the TN cell, whose paper is "Liquid Crystal Displays with Cholesteric Filters/Polarizers," and Ryoichi Ohnishi, Executive Director of Mitsubishi Electric Corp., whose paper is entitled "Past, Present and Future of Large-area Displays."

For conference/hotel registration information, contact Ralph Nadell, IDRC 97 Conference Coordinator, Palisades Institute for Research Services, Suite 1006, 201 Varick Street, New York, NY 10014, USA. Tel: 212-620-3341; Fax: 212-620-3379.

The Society for Information Display is an international society devoted to the advancement of display technology, manufacturing, and applications, with headquarters at 1526 Brookhollow Drive, Suite 82, Santa Ana, CA 92705-5421.

*Dr. Karen Braun  
Xerox Corp.*

## CIE DIVISION 1 MAKES HISTORY IN KYOTO, JAPAN: An Interim Color Appearance Model, CIECAM97s, was Formulated in One Year's Time

CIE Division 1 met in Kyoto, Japan on Friday, May 23, 1997 and Saturday, May 24, 1997 prior to the AIC 8th Congress. A momentous event oc-

curred at the Technical Committee 1-34 Meeting on Testing Color Appearance Models. An interim color appearance model, CIECAM97s, was agreed to by majority vote. As background, the CIE Color Experts' Symposium on Color Standards for Imaging Technology held in Vienna, Austria in March of 1996, requested that the CIE deliver, in one year's time, an interim color appearance model that could be used universally by those needing to communicate color information under all types of viewing conditions. TC1-34 accepted the challenge and met the tight timeline.

The abbreviation, CIECAM97s, stands for CIE Color Appearance Model formulated in 1997 with the last s standing for simple. Including the 97 date implies that the model may change as new technology unfolds in the very complex area of color appearance. This model contains an amalgam of features from the Hunt, Nayatani, RLAB, and LLAB color appearance models. Shortly, a CIECAM97c, where the "c" stands for comprehensive, will be released. It will differ from CIECAM97s in that it will account for rod contribution and very large luminance ranges.

In addition to this exciting news from CIE TC1-34, many other significant events occurred at the Division 1 meeting in Kyoto, Japan. Here is a brief summary of them.

1. TC 1-16 (Lighting for the Partially Sighted) has finally published its very lengthy report in CIE Publication No. 123, Low Vision. It is also available in CD-ROM.

2. TC1-27 (Specification of Color Appearance for Reflective Media and Self-Luminous Display Comparisons) reported on paired comparison data from hardcopy/softcopy matching experiments featuring different viewing conditions across media. It was found, through multi-dimensional scaling analysis, that two dimensions explained, on average, 83% of the total

*(Continued→)*

variance. Follow-up experiments are planned to discover the identity of those two dimensions.

3. TC 1-31 (Color Notations - Color Order Systems) has published its report on color order systems in CIE Publication No. 124 *CIE Collection on Color and Vision 1997*.

4. R1-04 (Color Difference Reporter) Dr. Klaus Witt has completed a very nice summary of the color difference literature with annotated bibliographic entries from 1993 to present.

5. R1-15 (Lighting Terminology) Dr. Michael Pointer and over 40 contributors have completed Division 1's contribution to modifying and updating the International Lighting Vocabulary. It must now be sent for review to Division 2.

6. R1-17 (Improved Colorimetry Reporter) Dr. Schanda has written a report summarizing all work in the area of improved colorimetry. It will be posted on the CIE website hoping that many will read it and perhaps feel inspired to perform experiments. A new TC should not form in this area until more experimental evidence is provided by other researchers.

7. Three new Technical Committees were formed:

TC1-47: Hue and Lightness Dependent Correction to Industrial Color Difference Equation  
- Dr. David Alman (USA), Chairman

TC1-48: Revision of CIE Document 15.2 Colorimetry - Dr. Janos Schanda (HU), Chairman

TC1-49: Liaison with ISO/TC35 Paint and Varnishes Colorimetry - Chairman to be decided among TC members

8. Two new reporters were formed:

R1-19 - Specification on Individual Variation in Heterochromatic Brightness Matching - Dr. H. Yaguchi (JP)

R1-20 - Visual Performance in the Mesopic Range - Dr. Julie Taylor (GB)

Currently there are 20 Technical Committees (TC) and 13 Reporters, (R), within Division 1. For those wishing more detail, the remainder of this report will contain information on the status of the Technical Committees and Reporters within the Vision and Color sections of Division 1.

## TC Status

A. Vision Section - There are 9 TCs within the Vision Section.

### TC 1-21 Testing of Supplementary System of Photometry

Chairman: K. Sagawa (JP)

Terms of Reference: To test existing methods of photometry to evaluate lights for assessing comparative brightness relationships.

Status: A residual error analysis revealed that all 2° systems are equally good. Similarly all 10° systems are equally good. Therefore, the choice of which system to use should be driven more by requirements of each application, such as simplicity, ease of use, etc., rather than by which is best. A fifth draft report is being prepared in which the present testing is addressed only to test brightness relationships but not to test the brightness scale as requested at the last TC meeting in Göteborg. This draft will be circulated to TC members for voting approval for publication as a TC report.

### TC 1-26 Individual Variation of Heterochromatic Brightness Matching

Chairman: H. Yaguchi (JP)

Terms of Reference:

1. To analyze existing data on heterochromatic brightness matching in terms of individual variation.

2. To develop a simple set of individual characteristics for brightness matching.

Status: This TC has not been active since 1994. It has been difficult to bring the work to a close because the second item in the terms of reference is a separate research topic that needs much more work. The Chairman requested that the second item under

the terms of reference be deleted so that the TC can write a final report based on analysis of the existing data on individual variation in heterochromatic brightness matching before closing out the TC. This proposal was unanimously accepted. It was decided that the second item of the terms of reference should become a reportership so that it gets adequately addressed.

### TC 1-30 Luminous Efficiency Functions

Chairman: M. Ikeda (JP)

Terms of Reference: To prepare an ISO/CIE Standard on luminous efficiency functions which classifies and specifies the existing functions,  $V_p(\lambda)$ ,  $V_b(\lambda)$ ,  $V_m(\lambda)$ , and  $V_{b,10}(\lambda)$ , and the color-matching function,  $\bar{y}_{b,10}(\lambda)$ , if appropriate, in their photometric use.

Status: The technical report, entitled "Guide to Use of Spectral Luminous Efficiency Functions", is in effect completed. The Chairman is still working on final layout. The report should be completed within the next six months so that it can be delivered for Division ballot. The contents of the technical report are to include data of spectral efficiencies of heterochromatic brightness matching for 2 and 10 degrees as well as  $V(\lambda)$ ,  $V'(\lambda)$ ,  $\bar{y}_{b,10}(\lambda)$  in 10 nm steps. The work will not be delayed until TC 1-38 publishes its report on tabular data.

### TC 1-36 Fundamental Chromaticity Diagram with Physiologically Significant Axes

Chairman: F. Viénot (France)

Terms of Reference: Establish a chromaticity diagram of which the coordinates correspond to physiologically significant axes.

Status: The last meeting was held on September 12, 1996 in Strasbourg, France. The TC agreed on proposing a continuous fundamental observer with data from 10° to 1°. The TC also agreed on the procedure to follow for the derivation of fundamental curves as a function of field size. The CIE 1964 supplementary standard colorimetric observer would provide the initializing

data for this continuous fundamental observer. Corrections for lens optical density, macular pigmentation, photopigment optical density and miscellanea are being prepared.

At the 1996 meeting, the comparison between the photopigment spectral absorbance and the CIE 1964 supplementary standard colorimetric observer color-matching functions was discussed. The committee recommends working with tabulated data; not with analytical functions. The procedure is ready for numerical implementation. More work is needed to find representative figures for macular pigmentation and optical density of photopigments.

Draft 8 of the technical report is being prepared. The next meeting will be held in connection with the IRGCVD-meeting in Ghent, Belgium from July 6-9, 1997.

#### TC 1-37 Supplementary System of Photometry

Chairman: K. Sagawa (JP)

Terms of reference: To recommend a system of photometry to assess lights in terms of their comparative brightness relationships

Status: The Chairman is preparing a possible model to be recommended as a CIE model for brightness photometry at any level by taking into account the discussions held at the Göteborg meeting. The model should be as simple as possible. Consideration must be given on how to introduce the chromatic effect and the scotopic effect into the model. The model will be circulated to TC members by the end of July for comments and suggestions. Those comments and suggestions will be used to revise the model to a more acceptable version by the end of 1997.

#### TC 1-40, Critical Flicker Fusion Frequency

Chairman: K. H. Ruddock (GB)

Terms of Reference: To investigate fundamental parameters affecting critical flicker fusion frequency (CFF) for the evaluation of flicker in CRT

displays.

Status: The Chairman was tragically killed in a car accident on December 20, 1996. A new TC Chairman is currently being sought.

#### TC 1-41, Extension of Vm(l) Beyond 830nm

Chairman: P. L. Walraven (NL)

Terms of Reference: To write a report on the feasibility of extending the Vm(l) function beyond 830nm.

Status: No report was received.

#### TC 1-42, Color Appearance in Peripheral Vision

Chairman: M. Takase (JP)

Terms of Reference: To prepare a technical report on color appearance zones for colored lights in terms of unique hues in peripheral vision.

Status: This TC met in Kyoto. They are preparing a color zone map and hope to have it completed by the 1997 meeting.

#### TC 1-46, Equivalent Luminance

Chairman: S. Kokoschka (DE)

Terms of Reference: To write a technical report describing the fundamental concept of equivalent luminance and to provide guidelines on how to apply these concepts.

Status: Kokoschka must resign as Chairman. Dr. Nakano was unanimously approved as the new Chairman.

B. Color Section - There are 8 TCs within the Color Section.

#### TC 1-27 Specification of Color Appearance for Reflective Media and Self-Luminous Display Comparisons

Chairman: P. J. Alessi (USA)

Terms of Reference: To study and make recommendations for the specification of a color appearance match between a reflective image and a self-luminous display image

Status: This TC met in Kyoto. Input received from six experimenters was discussed. The Chairman collated all raw data, subjected them to the same statistical analysis (i.e. multi-

dimensional scaling and Duncan's test of significance), and reported that differences among experimenters' must be due to factors other than data analysis techniques. Image-processing paths and gamut mapping techniques were identified as the most likely factors contributing to differences among experimenters. One final set of experiments was outlined before completion of this TC's work. Emphasis would be on consistency among experimenters. One set of digital images and reflection prints will be sent to all experimenters. The same models, number of observers and data analysis techniques will be used. The multi-dimensional scaling analysis found that two dimensions explain, on average, 83% of the total variance in the data. This final set of experiments will focus on trying to identify what the two dimensions might be.

#### TC 1-31 Color Notations - Color Order Systems

Chairman: C. McCamy, (USA)

Terms of Reference: To study and report on color order systems in response to a request from ISO for preparatory and background work which must be accomplished before an ISO Standard in the field of color notation can be drafted.

Status: The technical report is completed and has been published in CIE Publication No. 124 CIE Collection on Color and Vision 1997. The work of this TC is now finished.

#### TC 1-33 Color Rendering

Chairman: J. Schanda (HUN)

Terms of Reference: 1) Study indices for the evaluation of color rendering properties of light sources based on a color appearance model, 2) Prepare a report on a proposed method that will replace CIE Publication No. 13.2 (this report has the potential to become a standard).

Status: A report was circulated among TC members for voting in 1996. Two open questions still remain:

1. Can the number of reference illuminants be reduced from any number along the spectrum locus to

(Continued→)

the 6 currently named (i.e. 2700K (close correlate to true tungsten), 2950K, 3450K (warm white fluorescent), 4200K (cool white fluorescent), D50, and D65)?

2. The lamp manufacturers say more than the 6 reference illuminants are necessary to make the technique relevant. Is this true?

Other issues raised were why does the report use an old chromatic adaptation model (the CIE transform resulting from TC 1-32) rather than the newest BFD transform which appears to be superior to all others? Also why does the report use CIELAB color difference rather than the CIE94 recommendation? Given all these important unresolved issues, three options for the TC moving forward were discussed:

1. The work of TC 1-33 should be reported as a technical paper in the literature or in the CIE Collection. The current color-rendering index method reported in Publication No. 13.2 should still stand.

2. The Chairman can produce a report emphasizing an interim method featuring the BFD chromatic adaptation transform, the CIE94 color difference metric, and only the 6 original reference illuminants.

3. The TC should be closed with no report produced and a new TC should be established where color appearance becomes more a part of the color-rendering index.

A straw vote favored option 1. This input will go back to the Chairman, who will decide how to proceed.

#### TC 1-34 Testing of Color Appearance Models was reported on at the beginning of this article.

Chairman: Dr. Mark Fairchild, USA

#### TC 1-38, Compatibility of Tabular Data for Computational Purposes

TC Chairman: C. McCamy (USA)

Terms of Reference: To prepare guidelines for tabulating CIE spectral data to provide compatibility of sets of data for computational purposes, considering such factors as spectral

range, spectral interval, bandpass function, truncations, interpolation, extrapolation and number of digits.

Status: A first draft report was sent to members and feedback was obtained. However, no agreement has been reached on interpolation techniques. A second draft of the report has been prepared based on the feedback and the Chairman awaits comments from TC members. Again, it was emphasized that this TC should hurry along to finish their work because their results are being awaited by other TCs.

#### TC 1-43, Rod Intrusion in Metameric Matches

Chairman: R. S. Berns (US)

Terms of Reference: 1. To write a report giving a step by step procedure for calculating the effect of rod intrusion on trichromatic color matches; 2. To use the procedure to calculate the effect of rod intrusion on typical industrial color matches

Status: The committee has been unable to reach consensus regarding the method of calculating the pupil diameter. The plan is to calculate effects of rod intrusion using limiting cases of pupil diameter and reference methods of estimating pupil diameter. A set of metamers to various Munsell chips that will represent typical object colors has been compiled. The plan is to perform the calculations during the next year.

#### TC 1-44, Practical Daylight Sources for Colorimetry

Chairman: R. Hirschler (Brazil)

Terms of Reference: 1. To intercompare existing daylight simulators for color measuring instruments and color matching booths; 2. On the basis of this intercomparison, to recommend practical methods for simulating daylight sources.

Status: A comprehensive report has been compiled. A large amount of data has been compiled to date with a great deal of support from industry on the provision of data. The Chairman is encouraged to conclude the report as soon as possible as there is an urgent need in industry for this work.

#### TC 1-45, Revision of CIE Publication 51 to include D50 Simulators

Chairman: C. S. McCamy (US)

Terms of Reference: To prepare a revision of CIE Publication 51-1981 "Method of Assessing Daylight Simulators for Colorimetry" to include the assessment of D50 simulators.

Status: A proposed supplement to CIE Publication No. 51, simply providing the D50 metamers (400-700nm) has been prepared for distribution to TC members for approval. The Chairman has derived metamers, defined over the spectral range 380 to 780nm, for assessing D50, D55, D65 and D75 daylight simulators. Tables are being distributed to TC members for evaluation.

### **Reporter Status**

A. Vision Section - There are 3 Reporters within the Vision Section.

R1-02 - Brightness-Luminance Relations: F. Blommaert (NL) Reporter

Status: It was unanimously approved to close this reportership since there has been no activity for quite some time.

R1-12 - Visual Acuity: P. Walraven (NL) Reporter

Status: The reporter is waiting on a report from Dr. W. Adrian, which addresses the standardization of visual acuity.

R1-16 - Visual Adaptation to Complex Luminance Distribution: I. Shinoda (JP) Reporter

Status: A brief report was given in Kyoto. Dr. Shinoda is active with experimental work relevant to this reportership at this stage. A report is expected shortly.

B. Color Section - There are 7 Reporters within the Color Section.

R1-04 - Color Difference Evaluation: K. Witt (DE), Reporter

Status: A very comprehensive 8 page



written report was given. It featured an annotated bibliography with entries from 1993 to present. This report will be updated further and published in the next CIE Collection issued from the Central Bureau.

**R1-11 - Cognitive Aspects of Color:** Dr. G. Derefeldt (SE), Reporter

Status: Dr. Derefeldt has completed a study which has been published in SPIE proceedings. It will also be published in the CIE Collection. It is still not time to form a TC. Dr. Derefeldt will continue as Reporter paying special attention to the literature with regard to spatial and motion issues of color. A final report will be ready in one to two years.

**R1-13 - Revision of Wyszecki and Stiles:** P. Walraven (NL), Reporter

Status: Enthusiasm for doing this by Wiley and potential authors is down. The reason given is that various other books have been published since making this revision less desirable. A final report is still awaited, however, it is likely that this reportership will close.

**R1-14 - Visual Observation of Blood Oxygen Levels:** W. Julian (AU), Reporter

Status: Experiments and research are ongoing. A written report was submitted.

**R1-15 - Lighting Terminology:** M. Pointer (GB), Reporter

Status: Fourteen active members, including ASTM E12.01 members, are assisting this Reporter in his work. Soon a final set of terms from Division 1 will be available. Division 1 is the only Division so far to have completed their task. The final set of Division 1 terms will be submitted to Division 2 for comment because there is a great amount of overlap.

**R1-17 - Improved Colorimetry:** J. Schanda (HU), Reporter

Status: A report has been produced summarizing experiments to date, most of which have been experiments from Dr. William Thornton. The reporter also performed some pilot experiments;

one of which yielded differences between colorimetric data for visual matches, but such differences did not correspond to those found by Thornton. This reporter will post his report on the CIE website hoping that others will read it and perhaps be inspired to perform similar experiments. A TC may form in the future if more experimental evidence is provided by other researchers.

**R1-18 - The Use of Color Identification Under Various Illuminance Levels:** T. Ishida (JP), Reporter

Status: A report was given. Four literature references were found on the subject. There is not enough data available yet. However, there are experiments being conducted now that should give more results within the coming year. Perhaps one year from now there will be enough information available to require formation of a TC.

## Meeting Schedule

Finally, it was decided that the next Division One meeting will be held in Baltimore, MD in the US in October 1998 either prior to or immediately following the joint ISCC/OSA meeting.

Respectfully Submitted,

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# AATCC INTERNATIONAL CONFERENCE AND EXHIBITION

American Association of Textile Chemists and Colorists will hold the 1997 International Conference and Exhibition in Atlanta, GA September 28 to October 1. There will be 18 technical sessions featuring over 70 formal presentations.

Three of the world's top textile scientists will be honored during the Conference.

Hans H. Kuhn of Milliken Research Corp. will be presented The Olney Medal for achievement in textile chemistry. He is the inventor of a new class of polymeric dyes on polyethoxylated aromatic amines. Later work involved the adsorption of hydrophilic polymers to the surface of fibers, particularly polyester, resulting in a change of the surface characteristics of polyester fabrics from hydrophobic to hydrophilic. Most recently Kuhn worked on the adsorption of conducting polymers to the surface of textiles resulting in electrically conductive textiles. A native of Switzerland, Kuhn holds an MS in chemical engineering and a PhD in organic chemistry from the Swiss Federal Institute of Technology. At the same institute, he conducted post-doctoral research in the field of synthesis and reactions with styrene oxide until 1957 when he immigrated to the U.S. He joined the research department of the Dewey and Almy Chemical Co. in Cambridge, MA, a division of W.R. Grace. In 1960, Kuhn joined the Millikan Research Corp. in Spartanburg, SC. He held several positions with the company and was promoted in 1995 to Millikan Research Fellow. From 1970-1995, Kuhn served as Honorary Consul of Switzerland for the cities of Spartanburg, Greenville, and Columbia, SC; and Charlotte and Asheville, NC. He has also been honored as Palmetto

Gentleman by Governor John C. West in 1973 and Knight of the Queen City of Charlotte by John M. Belk, Mayor, in 1977.

Herbert T. Pratt of DuPont Co. will be presented The Harold C. Chapin Award in recognition for his outstanding service to AATCC. Since joining AATCC in 1968, his proudest accomplishments include improving the quality of test methods and the *Technical Manual*, building interest in the history of textile dyeing and finishing, contributing to publications. Besides being actively involved in numerous committees, Pratt has been a speaker at over 30 workshops, symposia, and sectional and national meetings. Pratt holds a BS in chemical engineering from Tri-State University and an MA in history from Goddard College. His career began in 1945 with King Seeley Corp. as development engineer in electroplating. He then joined Fieldcrest Mills as head of analytical and applied chemistry in 1946. In 1952, he started working for DuPont Co. until his retirement in 1985 as a technical marketing associate.

John D. Turner of Cotton Inc. will be presented The Henry E. Millson Award for invention for outstanding contributions to textile wet processing technology. While working for Mooresville Mills (Burlington Industries), he invented a novel procedure for achieving durable press. He then joined Astro Industries and developed a new soil release finish for synthetic fabrics. Currently a senior chemist at Cotton Inc., Turner has developed a new method for treating garments for durable press that has been adopted worldwide. He has also invented a new non-contaminating marking ink for cotton modules as an aid to the cotton farmers. Turner holds a BS and MS in textile chemistry from Clemson University and a PhD in chemistry from Duke University.

Presentations will be made during the awards ceremonies at noon luncheon on Monday Sept. 29, at the Marriott Marquis Hotel in Atlanta.

Among the 18 technical sessions

one is always reserved to color science. This year the Color Science session will be on Tuesday, Sept. 30, 1:30 PM-5PM. The following papers will be presented.

- *Coloring by Numbers-An Overview of Color Measurement*, James Park, Park Dyeing Services Ltd.
- *How CMG Affects the Textile Industry through Color Selection*, Enid Allen, Gretag Macbeth
- *The Use of Spectrophotometers for CAD Design and Color Simulations*, Glenn Rinderman, Sophis USA
- *Integrated Color Management in Today's Textile Industry*, Sidney L. Jay, ITM Software
- *Novel Retroreflective Coatings on Textiles*, Graham N. Griffiths, BTG

The Welcoming Reception from 6 p.m. to 8 p.m. on Sunday, Sept. 28, will be held in the Exhibit Hall of the Inforum. The traditional Dinner Party beginning at 7:30 p.m. on Tuesday will feature music by Bo Thorpe and His Orch.

Exhibits will be located on the Exhibition Level (second floor) in the Inforum.

The Awards Luncheon at noon on Monday, Sept. 29, in the Marquis Ballroom at the Marriott Marquis Hotel will feature the presentation of the Olney Medal for outstanding achievement in textile chemistry, the Harold C. Chapin Award for service to AATCC, and the Henry E. Millson Award for Invention. Results of the Intersectional Technical Paper Competition and the Herman and Myrtle Goldstein Student Paper Competition will also be announced at this time and prizes awarded.

Tutorial Session is an added feature for 1997, this session will be held on Sunday afternoon from 1-5 p.m. Registration to this session is separate and will include a copy of Dr. Richard Aspland's new book *Textile Dyeing and Coloration* and one day admittance to the Exhibits on Monday ONLY. It is a basics course on dyeing and individuals interested should enroll in this session.

A copy of the official conference

book of papers is included in the registration fee.

Special tours have been arranged for spouses who attend the conference.

Special Events for Spouses: Monday, Sept. 29, see Ted Turner's dream blossomed into reality as you tour the Atlanta Headquarters of CNN and CNN **Headline News**, the two 24-hour all news networks that have revolutionized television journalism. Next, you will stop at the historic and fun-filled **Underground Atlanta**. What were once the original streets of Atlanta are now the home of one-of-a-kind shops. Encounter the past, present and future on your exciting tour of the **World of Coca-Cola**. Inside, priceless memorabilia trace the more than 100-year history of the world's best known consumer product. Through dazzling exhibits, you will travel to the more than 160 countries of Coca-Cola. Tuesday, Sept. 30, hop on board for your ride to breathtaking **Stone Mountain**. As you arrive, look up at the world's largest granite monolith with the images of Jefferson Davis, Robert E. Lee and "Stonewall" Jackson carved into a sculpture larger than an entire football field. Your day at the park will next be spent cruising around Stone Mountain Lake aboard the paddle-wheel riverboat, the Henry W. Grady. This engaging setting will be the arena for your southern style Barbecue Buffet lunch.

For more information, call AATCC at 919-549-8141.

Susan Keesee

## NEWS ABOUT MEMBERS

### VDC Peter-Abel Award 1997

On June 6, 1997, the work entitled "Performance of a color indicator in a disinfecting solution for the maintenance of soft contact lenses" by Dr. M. Melgosa of Univ. of Granada, E. Hita and M. J. Velasco, which was published in *Optometry and Vision Science* in April, was winner of the

VDC Peter-Abel Award 1997. This prize of around 6000 USD is convoked by the German Association of Contact Lens Specialists and Optometrists between all European universities and colleges of optometry. It is exciting that on this occasion a "new" application of colorimetry be recognized. Dr. Manuel Melgosa has been invited to present the work in Bonn on September 28, as the opening lecture of the 1997 VDC meeting.

## SECOND CALL FOR SUBMISSIONS

### Thresholds: :Limits to Perception

DEADLINE is September 18. Anyone interested in submitting work for exhibition should notify us as soon as possible, with a brief description.

"Thresholds: :Limits to Perception" will exhibit works by artists (including Robert Irwin and Ellsworth Kelly) and scientists (including John Robson and Jonathan Victor). The sun bathes our earth with a broad spectrum of electromagnetic waves, but we see only the tiny fraction that we call "light". Perception is limited in many ways. Each limit is a threshold,, separating seen from unseen. Only a few of our limits have been explored in art or science, but the explorations have revealed much about the nature of perception. We cannot see contrasts below about 1%. Images that hover at the edge of visibility have a magical purity that is seen in the faint gratings of Agnes Martin and dots and disks of Robert Irwin. We encounter another limit as forms get more complex. We can see the simple shape of a constellation of a few stars, but the complexity of the night sky is beyond us.

When a stimulus is too weak to convince our eye of its presence, we fail to see it. We can also see things that aren't really there. Paintings of Ellsworth Kelly and spare yarn sculptures of Fred Sandback mimic some aspects, but not

others, of real scenes and convince our eyes to see illusory contours and surfaces.

We invite submissions from artists and scientists that explore threshold and limits to perception, in any dimension.

The exhibition "Threshold: Limits of Perception" is part of the Arts Biennial 1997 organized by New York Arts Magazine. The October 17 opening of the exhibition will coincide with a day-long symposium on "Threshold of Vision" at New York University. Both events are open to the public.

Exhibition is at Eighth Floor Gallery, 473 Broadway, 8th Floor, New York City

Opening 6-8pm Friday October 17, 1997.

#### Curators:

Dennis Pelli

Professor of Psychology and Neural Science

New York University

212-998-8338

denis@psyc.nyu.edu

Ana Maria Torres

Architect, Partner

Balmori associates Inc

203-772-4074

atorres174@aol.com

## FIFTH KANIZSA LECTURE

Following a tradition established by Gaetano Kanizsa, Italian experimental psychologists have met every year at the Dept. of Psychology of the University of Trieste to discuss issues in "Perception and Cognition". In the recent years, the meeting has expanded to include foreign guests and to accommodate talks in English. This year the meeting is scheduled to begin on Thursday, October 16, at 9:00 am and it will end on Saturday, October 18, at 1:00 pm. Since 1993, to honor the memory of the late Gaetano Kanizsa the meeting also includes the "Kanizsa Lecture". This year, Alan Gilchrist, Rutgers University, will speak on "Visual Structure

and Surface Color". The lecture will be held at 4:00 pm on Friday, October 17, in the Musao Revoltella Auditorium, via Diaz 27a, Trieste, Italy.

For further information on attending the lecture or for participating in the symposium (or both)

call/write

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[nicola/indice.html](http://nicola/indice.html)

## New Sustaining Member: CHROMATICS COLOR SCIENCES INTERNATIONAL

Roughly 15 years old, Chromatics Color Sciences International, Inc. (hereafter, Chromatics), is a company engaged in the business of color science, including the measurement of and classification of human skin color and of the colors of certain color-sensitive consumer products; in determining the compatibility of such skin and product color classifications for use in a variety of industries including the cosmetic, beauty aid and fashion industries; and in technology development for potential medical applications involving the detection and monitoring of certain chromogenic diseases.

Most recently, Chromatics has applied its technology to the non-invasive monitoring of bilirubin infant jaundice, which can be a severe health problem in premature infants. It was only in July of this year that the FDA authorized Chromatics to distribute its color measuring device, the

"Colormate™", for this purpose, although clinical trials of the measurement of jaundice have been under way by Chromatics since 1989. In the intervening years, Chromatics has measured the skin color of thousands of infants of all pathologies, and developed excellent correlations between the measured jaundice and the referee laboratory test for bilirubin content of blood. The non-invasive nature of the Chromatics system offers notable advantages: most infants do not have veins suitable for drawing blood, and the alternative technique of incision and expressing blood is, to say the least, a trying experience that may have to be repeated many times.

This writer first became aware of Chromatics around 1984, and undertook to assist them in applying color measurement techniques to another field of interest, beauty consulting, then and still mostly carried out by purely visual estimation techniques. Of course, many people are aware of the importance of the accurate and pleasing reproduction of skin color and flesh tones in television and photography. Similar considerations are of great importance in the cosmetics industry, which is devoted to producing the most pleasing appearance possible of the consumer's complexion. A valid basis for achieving this goal is to create a harmonious coordination between skin tones and beauty product colors. Here harmony means agreement among the parts of a design or composition to give an aesthetically pleasing whole, in this case the composition being the consumer's face as modified by makeup, plus her hair, clothing, jewelry and accessories.

Chromatics, like most others in the field, soon found out that the results of visually based beauty consultations were far too dependent on the skills of the practitioners, a group subject to strong disagreements and almost impossible to train. The possibility of a solution to this problem, which Chromatics ultimately achieved. The Chromatics color measuring instrument and system allows the operator, without any visual estimates or judgements, to determine the color of a consumer's skin and assign it unambiguously and accurately to one of every 200 categories of skin tones. The system also includes databases of the colors of cosmetics of all sorts and of hair coloring, clothing, and accessories, allowing the selection of compatible choices for an overall harmonious result.

In addition to the subjective nature of the visual judgements, their practitioners are usually unaware of such well-known effects in color science as adaptation, the type of illumination, and variations in color vision. All of these problems are overcome in the Chromatics system.

Chromatics has also conducted many years of research in the technology of measuring the hair color of a consumer and identifying hair coloring agents for achieving a desired color result. Additional studies have been conducted on the measurement of teeth for color matching caps, bonding materials, and porcelain dentures. As a result of this research, the colors of teeth and hair can easily be measured, and provide scientifically sound bases for the prediction of

colors in denture formulation and hair dyeing.

Chief Executive Officer of Chromatics is Darby S. MacFarlane. Located in New York, Chromatics can be reached by telephone at 212-717-6644 or by fax at 212-717-6675.

The ISCC welcomes Chromatics as its newest Sustaining Member.

*Fred W. Billmeyer, Jr.*

## GENTLE REMINDER!

All appropriate information submitted to this *NEWS* publication is the full and complete responsibility of the sender.

This publication and the ISCC assumes no responsibility for information changes and inaccuracies.

Thanks,  
The Editor

## 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:

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tel: 703-318-0263  
fax: 703-318-0514  
email: [iscc@compuserve.com](mailto:iscc@compuserve.com)

## 1997

**SANCI - CIE International Conference on Lighting in Developing Countries**, Sept 1-3, International Conference Centre, Durban, South Africa, Info: CIE Central Bureau; email: [ciecb@ping.at](mailto:ciecb@ping.at), or mail Keselgasse 27, A-1030, Vienna, Austria

**ISCC & SPE ANNUAL MEETING**, Sept. 14-17; *Inter-Society Color Council and Appearance Division of Society of Plastic Engineers*, Marriot Inner Harbor Hotel, Baltimore, MD; Info: Gary Beebe, tel: 215-785-8497

**SID 17TH INT'L DISPLAY RESEARCH CONF. (IDRC97)**, Sept. 15-19, Sheraton Hotel, Toronto, Canada  
Info: Ralph Ardelle, Conf. Coordinator, Palisades Institute for Res. Services  
tel: 212-628-3341; fax: 212-626-3379



**HFES 41st ANNUAL MEETING**, Sept. 22-26; *Human Factors and Ergonomic Society*, Albuquerque, NM, Info: HFES, P.O. Box 1369, Santa Monica, CA 90406-1369; tel: 310-394-1811; fax: 310-394-2410; email: 72133.147@compuserve.com; internet: <http://hfes.org>

**DETROIT COLOUR COUNCIL**, Sept. 23; "Color shifting Pigments," will be presented by Jerry Droll, Flex Corp., Doubletree Hotel, Troy, MI.; Info: Jim King; tel: 248-583-8276

**COLOUR FOR LIFE CONFERENCE**, Sept. 26-29 *The Colour Society of Australia*, Info: Renée du Bruin, Performance Gap, P.O.Box 207, Maylands WA 6051; tel/fax: (08)-9272-5283, email [perfgap@ozemail.com.au](mailto:perfgap@ozemail.com.au)

**AATCC INTERNATIONAL CONFERENCE AND EXHIBITION**; SEPT. 28-OCT.1, *American Association of Textile Chemists and Colorists*, Marriot Marquis, Atlanta, GA; Info: AATCC, tel: 919-549-8141

**OSA ANNUAL MEETING**, Oct 11-19, *Optical Society of America*, Long Beach, CA, Info: OSA, tel: 202-223-0920; fax: 202-416-6100

**CIE LED WORKSHOP AND SYMPOSIUM**, Oct. 22-25; Standard Methods for Specifying and Measuring LED Characteristics, CIE Central Bureau, Vienna, Austria, Info: email: [ciecb@ping.at](mailto:ciecb@ping.at) or mail Kegelgasse 27, A-1030 Vienna, Austria.

**USNC & CANADIAN NC/CIE**  
First Joint Meeting, Oct. 31-Nov. 2, 1997, Holiday Inn NE, Cleveland OH, Conference Chair :Terry McGowan  
tel: 216-266-3234; fax: 216-266-2925  
Tech Conf. Chair: Rolf Bergman  
tel: 216-266-6970 ;fax: 216-266-2507

**IS&T 13th INTERNATIONAL CONGRESS**, Nov. 2-7 *Society for Imaging Science and Technology*, Advances in Nonimpact Printing Technologies; Sheraton Seattle Hotel, Seattle, WA ; Info: IS&T Conference Manager; 7003 Kilworth Lane, Springfield, VA 22151; tel: 703-642-9090; fax: 703-642-9094; email: [info@imaging.org](mailto:info@imaging.org).

**FSCT INTERNATIONAL COATINGS EXPO (ICE)**, Nov. 3-5; *Federation of Societies for Coatings Technology*, Georgia World Convention Center, Atlanta, GA; Info: tel: 610-940-6777; fax: 610-940-0292.

**CMG FALL INTERNATIONAL CONFERENCE**, NOV. 9-11, *Color Marketing Group*; St. Francis Westin Hotel, San Francisco, CA ; Info: CMG, 5904 Richmond Highway, Suite 408 Alexandria, VA 22303; tel: 703-329-8500; email: [colorcmg@erols.com](mailto:colorcmg@erols.com).

**THE COLORS OF INVENTION**, Nov. 13-16, *The Gerome and Dorothy Lemelson Center for the Study of Invention and Innovation*, Smithsonian Institute, Washington, DC 20560

**IS&T/SID FIFTH COLOR IMAGING CONFERENCE**, Nov 16-19; *Society for Imaging Science and Technology/ Society for Information Display*; Transforms and Transportability of Color, Radisson Resort, 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](mailto:info@imaging.org); internet: <http://www.imaging.org>.

**2nd CIE EXPERT SYMPOSIUM ON COLOUR STANDARDS FOR IMAGING TECHNOLOGY**; Nov. 20-21, Scottsdale, AZ, USA; Info: CIE Central Bureau, email: [ciecb@ping.at](mailto:ciecb@ping.at) or mail Kegelgasse 27, A-1030, Vienna, Austria

## 1998

**ASTM COMMITTEE D-1**, Jan 11-14, *Paint & Related Coatings, Materials and Applications*, Sheraton Harbor Island, San Diego, CA; Info: Scott Orthey; Tel: 610-832-9717; email: [sorthey@astm.org](mailto:sorthey@astm.org).

**ASTM MINI SYMPOSIUM**, Jan. 13, Color Instrumentation and Color Difference Scales (as related to the Coatings Industry), San Diego, CA; Info: Romesh Kumar, email: [kumarl@coventl.hcc.com](mailto:kumarl@coventl.hcc.com)

**ISCC WILLIMSBURG CONFERENCE**, Feb. 22-24; Color and Design: 21st Century Technology and Creativity; *Inter-Society Color Council* ; Info: Wade Thompson, Tel: 417-882-2553.

**FAIRPRINT 98**, 3rd Hungarian Conference on DTP on the Application of Computer Science on Printing, Budapest, Hungary, Feb. 6-8, 1998, Info: Instant.Congr-Ex Ltd., H-1364 Budapest 4., P.O. Box 210, Hungary; fax: (36-1) 118-3418 email: [instantc@mail.datanet.hu](mailto:instantc@mail.datanet.hu)

**CMG SPRING INTERNATIONAL CONFERENCE**  
April 19-21, *Color Marketing Group*, The Broadmoor, Colorado Springs, CO. Info: CMG, 5904 Richmond Hwy, Suite 408, Alexandria, VA 22303; Tel: 703-329-8500; Fax: 703-329-0155 email: [colorcmg@erols.com](mailto:colorcmg@erols.com).

(Continued→)

**TAGA 98-50TH ANNIVERSARY CELEBRATION**

Apr. 26-29, *Technical Association of the Graphic Arts* ; Marriot Lincolnshire Resort, Chicago, IL Info: Karen Lawrence, Tel: 716-475-7470.

**SID 98**, May 17-22, *Society for Information Display* , Anaheim, CA; Info: Lauren Kinsey, SID, 1526 Brookhollow Drive, Suite 82, Santa Ana, CA 92705; Tel: 714-545-1526; Fax: 714-545-1547; email: socforinfodisplay@mcimail.com.

**ASTM COMMITTEE D-1**, June 7-10; *Paint and Related Coatings, Materials and Applications*, Omni Inner Harbor, Baltimore, MD, Info: Scott Orthey, Tel: 610-832-9717; Fax: 610-832-9555; email: sorthey@astm.org.

**ASTM E-12 COMMITTEE ON APPEARANCE** June 16-18, St. Louise, MO; Info: Bode Buckley; Tel: 610-832-9740; Fax: 610-832-1547

**AATCC INTERNATIONAL CONFERENCE AND EXHIBITION**, Sept. 22-25, *American Association of Textile Chemists and Colorists* ; Marriot, Philadelphia, PA ; Info: AATCC, Tel: 919-549-8141

**ISCC & OSA ANNUAL MEETING**; Oct. 2-4, *Inter-Society Color Council* , Oct 3-8, *Optical Society of America*, Baltimore Convention Center, Baltimore, MD; Info: OSA Tel: 202-223-0920; Fax: 202-416-6100.

**COLOR BETWEEN ART & SCIENCE**, Oct. 8-11, Radisson SAS Scandinavian Hotel, Oslo, Norway, Info: Anne Lise Stenseth; Tel: +47-22112190; Fax: +41-22361144, International Conference Service, Holberg Plass 3A, N-0166 Oslo, Norway

**CMG FALL INTERNATIONAL CONFERENCE**, Oct. 4-6, *Color Marketing Group* ; Le Centre Sheraton Hotel Montreal, Montreal Quebec, Canada, Info: CMG, 5904 Richmond Hwy., Suite 408, Alexandria, VA 22303, Tel: 703-329-8500; Fax: 703-329-0155; email: colorcmg@erol.com.

## 1999

**ASTM COMMITTEE D-1**, Jan. 26-27 *Paint and Related Coatings, Materials and Applications* ; Peabody, Memphis, TN. Info: Scott Orthey; Tel: 610-832-9717; email: sorthey@astm.org.

**ISCC WILLIAMSBURG CONFERENCE**, Feb. 21-23, 2nd Panchromatic Conference; Color in its Surround; Info: Dr. Cynthia Brewer; Tel: 814-865-5072

**ISCC & TAGA ANNUAL MEETING**; May 5-7; *Inter-Society*

*Color Council* ; May 2-5 *Technical Association of the Graphics Arts* ; Vancouver, B.C., Canada, Westin Bay Shore Hotel, B.C., Canada, Info: Bob Chung, Tel: 716-475-2722; Fax: 716-475-7063

**ASTM COMMITTEE D-1**, June 26-30, *Paint and Related Coatings, Materials and Applications*, Omni Rosen Hotel, Orlando, FL; Info: Scott Orthey; Tel: 610-832-9717; Fax: 610-832-9555 email: sorthey@astm.org.

**SID 99** May , California, *Society for Information Display* ; Info: Lauren Kinsey. SID, 1526 Brookhollow Drive, Suite 82, Santa Ana, CA 92705 Tel: 714-545-1526, Fax: 714-545-1547; email: socforinfodisplay@mcimail.com.

**OSA ANNUAL MEETING**: Santa Clara, CA; *Optical Society of America*, 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: AATCC, Tel: 919-549-8141.

## 2000

**ASTM COMMITTEE D-1**; *Paint and Related Coatings, Materials and Applications*, Jan. 23-26, Hyatt Regency Hotel, New Orleans, LA; Info: Scott Orthey, Tel: 610-832-9717; Fax: 610-832-9555; email: sorthey@astm.org.

**SID 2000**, May, Toronto, Ontario, Canada, Inf: Lauren Kinsey, SID, 1526 Brookhollow Drive, Suite 82, Santa Ana, CA 92705, Tel: 714-545-1526; Fax: 714-545-1547; email: socforinfodisplay@mcimail.com

**ASTM COMMITTEE D-1**, June 11-14, *Paint and Related Coatings, Materials Applications*; John Ascaguns Nugent, Reno NV., Info: Scott Orthey, Tel: 610-832-9717; Fax: 610-832-9555; email: sorthey@astm.org.

**OSA 2000** , Oct. 1-6, Annual Meeting; *Optical Society of America*, Hyatt Regency, Chicago, IL; Info: OSA, Tel: 202-223-0920; Fax: 202-416-6100.

**AATCC INTERNATIONAL CONFERENCE AND EXHIBITION**, Oct. 1-4, *American Association of Textile Chemists and colorists*, Benton Convention Center, Winston-Salem, NC , Info: AATCC; Tel: 919-549-8141.

## 2001

**AATCC INTERNATIONAL CONFERENCE AND EXHIBITION**, Oct. 7-10, *American Association of Textile Chemists and Colorists*, Palmetto Expo Center, Greenville, SC, Info: AATCC Tel: 919-549-8141

# J O B S W A N T E D !



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 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 EMPLOYMENT IN R&D POSITION IN COLOR

PhD (expected, 1997) Color Vision, MS Biophysics, BS Biomedical Engineering. Highly motivated, adaptable and dependable individual seeking R&D position. Interdisciplinary background and research experience in color, color vision, biomedical instrumentation, colorimetry, photometry and reflectometry. Working knowledge of computer graphics, image analysis/processing, mathematical modelling. Computer and statistics skills include Pascal, C C++, Matlab, Assembly, S, SAS, Steplt.

Jun Xu

The University of Chicago, Visual Science Center  
939 E. 57th Street, Chicago IL 60637  
Tel: 773-702-1987, Fax: 773-702-4442  
email: junxu@midway.uchicago.edu

## SEEKING EMPLOYMENT RELATED TO COLORATION

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

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

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BYK-Gardner

Chromatics Color Sciences International, Inc.

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 Color Marketing Group (CMG)  
 Color Pigments Manufacturers Association (CPMA)  
 Council on Optical Radiation Measurements (CORM)  
 Detroit Colour Council (DCC)  
 Federation of Societies for Coatings Technology (FSCT)  
 Gemological Institute of America (GIA)

Graphic Arts Technical Foundation (GATF)  
 Human Factors & Ergonomics Society (HFES)  
 Illuminating Engineering Society of North America (IESNA)  
 National Association of Printing Ink Manufacturers (NAPIM)  
 Optical Society of America (OSA)  
 Society for Information Display (SID)  
 Society of Plastics Engineers, Color & Appearance Division  
 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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Please note: the deadline for submission of material is the 1st of each even numbered month. Material received after the 1st may not be printed until the following issue.

All submissions must be in English.