

# Inter-Society Color Council *News*

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## INTEREST GROUP I ANNUAL MEETING REPORT - 1995

**ISCC IG I, Basic and Applied Color Research, held a session at the last ISCC Annual Meeting in Greensboro and it consisted of two tutorial lectures.**

The first tutorial, entitled "CRT Colorimetry" was presented by Dr. Roy Berns, Richard S. Hunter Professor of Color Science, at the Rochester Institute of Technology (R.I.T.). Dr. Berns extracted his tutorial from a short-course on "Device-Independent Color" that he gives at R.I.T. The tutorial logically progressed from describing basic to more advanced concepts. To make these concepts more tangible for the audience, Dr. Berns frequently made analogies to color matching and formulation problems.

Dr. Berns began his tutorial by introducing the basic concepts of CRT colorimetry, such as display tristimulus values and the mechanism of color production in a CRT. He then described a simple linear model for characterizing the display which was based on the assumptions of additivity, channel independence and spatial complexities of gain, offset and "gamma" (GOG) correction, interreflection and ambient flare. A detailed step-by-step calibration procedure was given for the display characterization and involved understanding the inherent colorimetric properties of the CRT, whereas calibration involved adjustment of the monitor to a known value, e.g. a white point. These steps were illustrated with a worked example. In summary, Dr. Berns presented a very clear description of the theoretical concepts of CRT colorimetry, frequently punctuated with practical advice for the user.

The second tutorial, entitled "The Design and Use of a Cone Excitation Space" was presented by Dr. Vivianne Smith, Professor of Ophthalmology and Visual Sciences and Psychology in the Visual Sciences Center at the University of Chicago. This tutorial described the procedure and rationale for converting between CIE spaces, which are used by colorimetrists, and cone excitation spaces, which are used by vision scientists. Dr. Smith began her tutorial by explaining that the Judd (1951) revised colorimetric observer is used by vision scientists in preference to the CIE 1931 colorimetric

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Photo by Harry K. Hammond

Dr. Vivianne C. Smith during her presentation on cone excitation space at the Interest Group I session of the 1995 ISCC Annual Meeting

observer, because it more accurately represents luminosity below 460 nm. She then discussed the procedure for deriving König excitation fundamentals using the Judd (1951) revised observer diagram and the Smith and Pokorny (1975) transformation equations. These König fundamentals represent primaries which correspond closely to visual photopigment spectral sensitivities. It was shown that calculations in a relative cone troland diagram are fairly straightforward and obey centre-of-gravity laws. Dr. Smith then succinctly described the procedure for deriving the relative cone troland chromaticity diagram based on the proposals of MacLeod and Boynton (1979) and Boynton and Kambe (1980). The significant feature of the cone excitation model is that the axes of this space have been shown to match those of the major retinal processing streams.

Dr. Smith then discussed briefly how this cone troland excitation space can directly link chromaticity data with experiments in detection and discrimination. An example was given where chromaticity discrimination measured using a CRT was expressed as ellipses in a relative cone troland chromaticity diagram or as cone quantal

excitation in a threshold diagram. In summary, Dr. Smith presented an excellent primer for the non-vision scientist on the procedure and rationale for expressing chromaticity data using a cone excitation space.

Joanne Zwinkels  
Chair IG I

## INTEREST GROUP II ANNUAL MEETING REPORT - 1995

This year's session focused on unique problems within the industrial world with special emphasis in the textile industry where applicable.

"What's New in Material Color Standards". Professor Frederick T. Simon, FTS, Inc.

This session gave an overview of standards (color, haze, translucent and fluorescent), that are available. Existing and proposed new methods were discussed along with suggestions on how to verify and improve instrumental

performance and accuracy. User confidence of this integrity could be substantiated over time.

"Computer Color Formulation for Carpets: A Comparison of Instrument Types", Ms. Diane Niedringhaus, Hunterlab

Multiple measurements of dense pile carpets were made on both diffuse 8 degree spheres and 45/0 geometry instruments (handhelds and benchtops). The advantages/disadvantages of each instrument were presented, with emphasis on computer color formulation, repeatability, quality assurance and sample presentation considerations for best results.

"Experience with the new Color Facsimile Standard", Dr. Giordano Beretta, Hewlett Packard Laboratories.

An overview of the latest information of color-facsimile standards was presented. They included: color space selection, color representation, data compression methods and color processing. Considerations for adding color to facsimile protocols supported by transmission experiments suggested other areas of investigation and improvement. Examples of current technology breakthroughs were presented.

Dyers' Brightness", Mr. James Wiberly

Vivid samples were presented to demonstrate the relationship of hue to the wavelength of maximum absorption whereby the sharper the peak, the brighter the dye. This would support that "the visual system sees the absorbance, rather than the reflectance of an object's color".

Bill Tuting  
Co-Chair IG II

## INTEREST GROUP III ANNUAL MEETING REPORT - 1995

Art, Design and Psychology Interest Group III presented a program at the 1995 Annual Meeting which encompassed a wide range of color applications within the arts, design and color psychology. The program included three speakers who have made important contributions within their research and creative disciplines and who offered Interest Group III participants an exceptional opportunity to witness current developments within color as related to fiber arts, design and psychology.

Marian-Ortolf Bagley, Professor of Design and Coordinator of Design Foundations at the University of Minnesota, presented "Color After Image Studies in Design and the Goldstein Gallery Quilt Exhibition." Her presentation presented an overview of foundational color experiments and their practical application in the work of design professionals and after-image research at the University of Minnesota. The basic color integration strategies of gradation, contrast, transparency illusion and design integration principles of similarity, repetition, proportion and interpenetration were presented. The influence of these color experiments were documented through a presentation of former students' quilt designs in the national invitational exhibit "Quilt Design" at the University of Minnesota. These quilt designs demonstrated that the after-image strategies offered the designers a meaningful alternative towards exploring color design relationships while maintaining overall aesthetic integrity and visual richness.

Dr. Bill R. Wooten, Professor and Chair of the Department of Psychology at Brown University presented

"Chromatic Experience" which investigated how the psychological dimensions of hue, saturation and lightness contribute to distinctions of common notions of warmth and coolness. Dr. Wooten indicated that subjects within the study rated colored chips from the Natural Color System atlas for their warmth/coolness or lightness/darkness. Dr. Wooten's research suggested that increases in the percentage of saturation in a color produced warmer ratings with the specific amount of increase depending on the hue, while changes in lightness did not significantly affect warmth/coolness ratings. His research suggested that warmth ratings may be associated with low-level physiological processes involved in color perception, rather than the psychological and that warm/cool attributes may be more than just a "cognitive process."

Mr. Joseph Roberts, Chairperson of the Communications Design Department at Pratt Institute in New York, presented "Interaction of Color: Interactive CD-ROM Edition." He is Art Director for the interactive multimedia computer edition of Joseph Alber's *Interaction of Color*, published by Yale University Press. An overview and background of the interactive CD-ROM edition was presented, including a summary of the preliminary efforts as well as a detailed analysis of the solution which has been published by Yale Press. Design issues, including the methods of presentation, the design of the controller and interface issues were covered. Mr. Roberts discussed issues involving the presentation of Alber's studies on a computer screen, since the original color studies were done with colored paper and presented in silk screen and litho plates for the first printed edition. Mr. Robert's demonstration of the CD-ROM program itself to the audience provided a highly rewarding conclusion to an excellent presentation.

Ms. Shashi Caan was introduced as the new Vice-Chair of Interest Group

III. Ms. Caan received her Masters in Architecture in 1992 and her Masters in Industrial Design in 1986 from the Pratt Institute and a Bachelor of Environmental Design degree in 1982 from the Edinburgh College of Art, Scotland. She is presently a designer at Gensler and Associates in New York and teaches Color and Design at the New York School of Interior Design and the Pratt Institute. Ms. Caan brings a wealth of experience to Interest Group III both as a designer and lecturer. Praise and gratitude were given to Magenta Yglesias who has served as Chair and Co-chair of Interest Group III since its inception in 1987. Ms. Yglesias' strength of purpose and professionalism have provided Interest Group III the kind of leadership necessary to successfully implement and maintain this strong component of the Council's activities.

Ms. Ann Laidlaw and Mr. Ron Oldchurch provided organizational and technical assistance for the 1995 April meeting of Interest Group III which proved invaluable.

*Prof. Wade S. Thompson  
Chair  
Interest Group III  
Art, Design and Psychology*

## EDUCATION COMMITTEE REPORT Annual Meeting 1995

### Topic 1

### ISCC Education Committee Workshop Explored Color Diversity & Unity

The 1995 ISCC Annual Meeting was kicked off with the Education Committee workshop entitled, "Color — Diversity vs. Unity," on Sunday, April 23, 1995, 8:30 - 10:30 am in Greensboro, NC. The workshop pro-

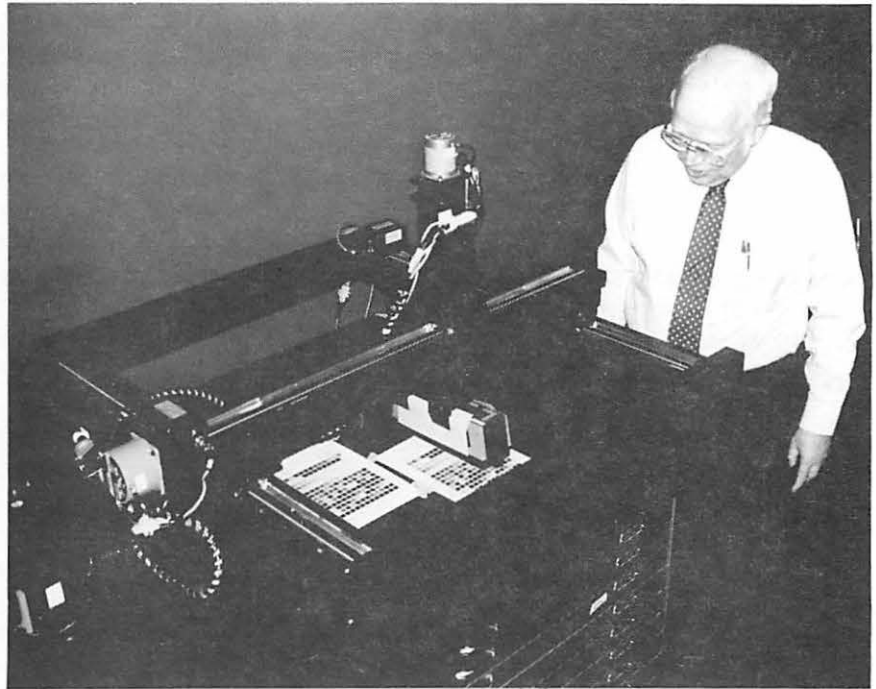
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vided a forum whereby ISCC members exchanged their wide interests in color and, at the same time, searched for what's common among them.

A total of eight panel members were present. Representing Interest Group I (Fundamental and Applied Color Research) were Joanne Zwinkels and Mike Brill; representing Interest Group II (Industrial Applications) were Richard Riffel and Ralph Stanzola; representing Interest Group III (Art, Design, and Psychology) was Shashi Caan. In addition, the Education Committee was represented by Jim Wiberly, Viviann Smith, and Richard Harold. Bob Chung, Chair of the Education Committee, was the panel moderator. Richard Harold provided a summary at the end of the workshop.

Each Interest Group described some aspects of color that challenged their understanding of it, and the need to broaden its knowledge base. It became clear that the science and art of color cross paths rather frequently. In order to communicate color more effectively among vision people, industrial people, and creative people, education from a solid and diverse base of knowledge is essential. For example, artists and designers need to understand the effect of lighting on color and the necessity for precision and accuracy in the description of color. Scientists need to combine qualitative as well as quantitative knowledge of color together, and use them to help solve color problems. Industrial technologists become bridge builders — they help enable science as a solution, in the form of products, and offer it to artists as color communication tools.

To provide educational opportunities for ISCC members, the ISCC annual meeting provides members with forums, tutorials, and presentations on current topics. The publication, *Color Research and Applications*, offers additional readings. To educate the general public, the formation of Speakers Bureau came alive. Steve Bergen commented that



*Long Time ISCC Member, Dave Spooner observes the operation of a programmable spectrophotometer system that he designed for the automatic measurement of color hard copy calibration targets. He supposedly retired last year. (Sure doesn't look that way - Ed.)*

the Speakers Bureau was tried many years ago and was not successful. Jim Wiberly shared his public outreach efforts with everyone. The fact that public school teachers have so little knowledge of basic color science and understanding worries him. He reminded us of the unrelenting effort of the missionary work. He encourages ISCC members to adopt the "Just Do It" attitude, and began reaching out from his/her community.

Because of schedule conflicts, some members of the Education Committee were not able to attend the conference. But their written comments were shared. Evelyn Stephens wrote, "The general public has to be made aware of the different ways one can change their visual perception of an object. After all is said and done, the visual appearance is what people rely on."

To conclude the relevance of color education in fulfilling the ISCC mission, Anna Campbell Bliss wrote, "Art is a way of exploring the visual world, of mining personal resources, of creating

one's own reality. Boundaries are artificial. Often the most exciting ideas emerge at the intersection where more than one discipline meet."

## Topic 2 U of Chicago Established ISCC Student Chapter

At the 1995 ISCC Annual Meeting, the University of Chicago was recognized as the second ISCC Student Chapter in the U.S. Vincent Sun, President of the chapter, and Phil Jin attended the annual meeting. They contributed a poster paper explaining the purpose of the student chapter, its current members (there are ten of them), and their color research interests. A colorful chapter banner was also on display at the poster session. The faculty advisor at University of Chicago is Dr. Joel Pokorny, Professor of Visual Sciences Center.

The first ISCC Student Chapter was established in 1994 at RIT, and Professor Glenn Miller of Photographic Arts and Sciences is the faculty advisor.

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### Topic 3 Vivianne Smith Assumes Education Committee Chair

At the beginning of the ISCC Education Committee workshop, Roland Connelly, ISCC President, announced that Dr. Vivianne Smith, Professor of Ophthalmology and Visual Science, and Psychology in the Visual Sciences Center at University of Chicago, will assume the Education

Committee chair. Connelly thanked Bob Chung, Professor of Printing Management and Sciences at RIT, for his leadership in the education and ISCC student chapters activities. During Chung's tenure as Education Committee Chair, there is a stronger presence of the education and student's involvement at ISCC.

*Bob Chung  
Past Education Committee Chair*

## ISCC STUDENT CHAPTER FOUNDED AT THE UNIVERSITY OF CHICAGO

The University of Chicago became the second school to have an ISCC Student Chapter. The RIT Chapter was founded in 1993. Four ISCC student members in the University of Chicago founded this organization on March 13, 1995. The organization was

soon recognized by the ISCC Education Committee.

Things did not go smoothly when these students applied to the University to begin the Inter-Society Color Council Student Chapter. The Director of University's Student Activities Office first disapproved their application, and requested to meet the applicants. The students were asked only one question when they saw the director: What does "color" mean? At the end they got the approval after they cleared up the misunderstanding and revised the by-laws by defining the word 'color' unrelated to race.

## POSTER SESSION AT GREENSBORO- A BIG SUCCESS

The poster papers session at the ISCC '95 Greensboro Annual Meeting was a high point of the Conference. The session consisted of ten papers, covering a wide range of color topics in science art, and industry. The posters involved a variety of media, from cloth samples to computer animations to excellent graphic presentations. They were available to participants for the duration of the conference during break times, and provided the backdrop for many interesting discussions.

Computer-aided design has come far in recent years, as evidenced in one poster. Fabric samples were simulated with printed output. The matches were so close that this reporter did not at first realize which samples were paper, and which were cloth! The system has many uses, in the design of fabrics, checking for errors in design, and sales of fabric designs before fabrics are made (Pam Richard, Cone Mills, Look What CAD Can Do!).

Non-uniformities in the color of a fabric such as denim contribute to the overall appearance of an item. Traditional color measuring instruments do not account for non-uniformities. One poster described an integrated system consisting of a computer-

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*Photo by Harry K. Hammond*

The University of Chicago has a newly established ISCC Student Chapter. Pictured (from left to right) are Vincent Sun, Phil Jin, Roland Connelly, Vivianne Smith, Joel Pokorny, and Bob Chung.

controlled 3-CCD camera and image-processing software. This system provides a means to measure difficult appearance attributes such as abrasion in prewashed denim (Mark Jarvis, Color Appearance Technology, Colorimetric Imaging for Denim Appearance Measurement).

Color often varies unintentionally from one piece of fabric to the next. Shade tapering minimizes the color difference between textile pieces. Observers use different strategies when moving gradually from one shade to the next. This 7-panel poster visually demonstrated a variety of strategies of

shade tapering, from light to dark, increasing and decreasing chroma, and combinations thereof (Ann Laidlaw, Shelyn Corp., Shade Sequencing of Textiles).

Yarn colors appear different depending on how a fabric is constructed. This poster demonstrated the apparent color difference when yarn is prepared as a card winding and as a knitted sock. Instrumental data was also included for the samples (Ann Laidlaw, Shelyn Corp., The Effect of Construction on Yarn Color).

Students from the University of Chicago announced the inauguration of the Inter-Society Color Council's Student Chapter at their campus. Their President is Vincent Sun, and the advisor is Dr. Joel Pokorny. The chapter contains 10 members from diverse areas of study, among them psychology, ophthalmology, and the medical school (Vincent Sun, ISCC Student Chapter at University of Chicago).

Rochester Institute of Technology's Munsell Color Science Laboratory described their Master of Science degree program in Color Science. This program is a leader worldwide, draws from many disciplines, and contributes to nearly every aspect of color science. The program is flexible and offers various kinds of support to students, including well equipped laboratories, strong support from industry, and scholarships to qualified applicants (Roy Berns, RIT, M.S. in Color Science at RIT).

To augment her IG III talk, Marion Bagley presented work from the University of Minnesota's Color Design and Fiber Arts program. She displayed quilts, fabrics, and books designed by past and present students, some of them now internationally known. Each of the works demonstrated different design and color harmony strategies. These included a nightshade quilt by Linda Wilcox, and an afterimage quilt by Barbara Otto, and the Lunn Fabrics Catalog (Marion Bagley, University of Minnesota, Color Design for Fiber Arts).

Giordano Beretta presented a poster augmenting his IG II talk on Hewlett-Packard's experience with color fax technology. This poster graphically

## JOINT ISCC/AATCC SYMPOSIUM TEXTILES AND COLOR

The following four sessions of talks took place at the 1995 ISCC Annual Meeting during the joint ISCC/AATCC symposium on Textiles and Color:

Session I: How We See Color. Moderator: Dr. Roy Berns

- In Textiles, Color IS Quality, and the Eyes Have It!, LOUIS A. GRAHAM, Lou Graham & Associates.
- Perceived Grey-Levels in Complex Configurations, QASIM ZAIDI, JEREMY S. DE BONET, BRANKA SPEHAR, The Lighthouse Research Institute.

Session II: How We Describe Color.

Moderator: Dr. Roy Berns

- Color Names for CIELAB Color Space, FREDERICK T. SIMON, FTS, Inc.
- A Study of the Color Memory of Dyers, MARTIN BIDE, KENNETH LANGLEY, AND EHTESHAM KHOYRATTY, University of Rhode Island
- Memory for Color: What Do We Recall?, STEVEN K. SHEVELL, University of Chicago

Session III: How We Match Color. Moderator: Mr. Roland Connelly

- Direct Dyeing: Repeatability and Match Prediction, CHRISTINA MILLER AND J. RICHARD ASPLAND, Clemson University
- Recipe Formulation for Textile Dyeing and Print - How to Succeed in Industry, LUIZ CLAUDIO RAMALHO DE ALMEIDA, KELSON DOS SANTOS ARAUJO, ROBERT HIRSCHLER, SENAI/CETIQT

Session IV: Color, Design, and Textiles. Moderator: Mr. Roland Connelly

- Applications of Colorimetric Vision Systems in the Textile Industry, CHRISTOPHER D. BUNTING, Hunter Lab
- Successes and Challenges of Fabricless Product Development, MICHAEL P. KEATING, Cone Mills

Abstracts of this joint ISCC/AATCC Symposium held after the 1995 ISCC Annual Meeting are available. If you are interested, please send \$5 for postage with your name and address to:

Ann Laidlaw  
c/o Shelyn, Inc..  
1108 Greccade Street  
Greensboro, NC 27408

illustrated both material and data processing stages of the color fax scanning, transmission, and printing process. Beretta also showed the actual results of fax transmission experiments (Dr. Giordano Beretta, Hewlett-Packard Corp., Experience with the New Color Facsimile Standard).

The ISCC is considering availing itself of the Internet to serve its members and to attract new ones. A computer demonstration simulated the ISCC as a site on the World Wide Web, complete with the powerful graphics, text and instantaneous worldwide links the Web provides. The ISCC has appointed an ad hoc committee to investigate further possibilities. Readers are invited to look in on the ISCC's progress at <http://www.infi.net/~wmdawes/>

(William Dawes, ColorNet Ventures, The ISCC and the Internet: Is It Time?).

This presentation proposed the oscillator as mathematics essential to color appearance. The oscillator clearly and effectively models hue appearance, but this has gone unnoticed until now. Oscillator-based models appear to be useful for various forms of color and vision-related processing, both in the brain and in various forms of applied technology. Readers are invited to find out more by visiting <ftp://ftp.cts.com/pub/ronald/home.html> (Ron Oldchurch, The Oscillator: Mathematics for Visual Processing?).

In honor of Josef Albers' paintings entitled "Homage to the Square," a computerized slide show explored contrast and spreading effects which depart dramatically from conventional notions. This appears to occur when the eye interprets the visual plane as having three dimensions. The slide show is now available on the Internet in both Macintosh and Windows versions, and can be downloaded with a Web tool such as Mosaic. Readers are invited to visit this site at <ftp://ftp.cts.com/pub/ronald/home.html> (Ron Oldchurch, Homage to the Flag).

We would like to thank the authors for sharing their interests with ISCC members. They enlivened an already exciting and energetic conference. We

invite and encourage all members to share their varied interests in color in the open forum of the poster sessions.

Reported by Ron Oldchurch, Chair, Contributed Papers

Postscript: Homage to the Flag was also presented as a talk at the recent

Panchromatic Conference in February, and reviewed in the previous ISCC Newsletter. However, the URL directing readers to the Internet Web site did not function. Thanks to flexibility built into the Internet, readers will now find a fully functional Web site at the address given above. - R.O.



Photo by Harry K. Hammond

Max Saltzman, Joyce S. Davenport and Ralph Stanziola, three long-time members of ISCC, chat sessions.

## STEVE SHEVELL INTRODUCES 1995 ISCC GODLOVE AWARD RECIPIENTS: SMITH & POKORNY

It is an honor and a pleasure to introduce Joel Pokorny and Vivianne Smith as recipients of the 1995 ISCC Godlove Award. Joel and Vivianne were truly elated upon hearing they would receive this award. They are not ones to publicize an honor, even one as important as this, but I think they felt an obligation to mention it before the news appeared in print. They walked into my

office one afternoon, closed the door — which is very unusual in our place — and said they had some news. Their expressions signaled the news was extraordinarily pleasant. I sat expectantly, virtually certain that one of their children was getting married.

Several days later, Joel began to wonder about the award. He noticed that many of the previous recipients have died since receiving it. Of course, the Godlove Award is merely correlational. It does not cause 60-hour work weeks, or the intensity of a laboratory that consistently breaks ground in the most important areas of color science. This award probably will fail even as a warning sign to slow down. We can expect another 100 joint publications in the years ahead.

Joel and Vivianne both did their graduate study at Columbia University in New York City, where they worked

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in Clarence Graham's laboratory. They received the Ph.D. in 1967, and the next year produced not one but two important collaborative products: their first joint paper and their son Charlie. From Columbia they came to the University of Chicago, where they have stayed throughout their careers, now as Professors of Ophthalmology and Visual Science and of Psychology.

Vivianne and Joel's major contributions to color vision are many and remarkably broad. Their work on photoreceptors and visual pigments would be an extraordinary career for any scientist. For them, it is only the beginning. Their research and their breadth of knowledge have established them as world experts on physiological mechanisms of inherited and acquired color vision defects. They also have applied the principles of basic visual science to develop noninvasive clinical procedures, ranging from large-field color matching to S-cone electroretinography. Over the years their major research programs have greatly advanced our understanding of the temporal aspects of vision, of the post-receptor neural pathways that encode color and luminance, of chromatic discrimination, and of color appearance. The range of studies now,

this month, in progress in their lab includes work on the eye's lens, the neural pathways mediating chromatic discrimination, the color appearance of chromatic stimuli, the influence of rods on color matching, and modeling of electrophysiological responses measured in the retinal ganglion cells of macaque monkeys. By now this list probably is incomplete because it is two weeks old.

Their names are perhaps best known for the fundamental cone spectral sensitivities published about twenty years ago: the Smith-Pokorny fundamentals. Their quantitative specification of the spectral sensitivities of the three types of cone are now a cornerstone that is used worldwide for modeling the human neural response at the first stage of vision. Despite their general acceptance, some of the quantitative details have been challenged recently. It should be no surprise that new laboratory measurements questioning the Smith-Pokorny fundamentals were presented at a meeting of the Optical Society of America by Pokorny and Smith.

Joel and Vivianne look normal but they have a supernatural ability to keep an unlimited number of balls in the air. They enthusiastically take on major

service posts in the field of color science again and again. We ISCC members benefit greatly from their work. Joel is on the ISCC Board of Directors, and serves on the editorial board of Color Research & Application. Vivianne is the topical editor for color vision for CR&A. Other major posts, past and present, include the editorial boards of Investigative Ophthalmology and Visual Science, Clinical Vision Sciences, and the Journal of the Optical Society of America, as well as terms (note the plural) on study sections of the National Institutes of Health. Their scientific expertise, indefatigable spirit, and old fashioned common sense are assets from which all of us benefit.

Their students, post-docs, and collaborators, past and present, are an international family of contributors to our field from laboratories on four continents. This year marks a first for this family: an 'academic grandchild' — a student of one of their former doctoral students will take up an assistant professorship in September. Their own children, Charlie and Julie, have been an important part of this family from the beginning, when Charlie went to his first color meeting at age 1, and Julie attended before being born.

It is always a pleasure to spend time with Joel and Vivianne, whether doing science, enjoying a meal together, or watching a Chicago Cubs baseball game. It is a special pleasure to be with them today as they receive the Godlove Award.

*Written by Steve Shevell  
Submitted by Karen Braun*

## REMARKS ON RECEIVING THE 1995 GODLOVE AWARD

*By Joel Pokorny & Vivianne C. Smith*

**T**hough we have long been aware of the Godlove Award we have had little knowledge of the contribu-

*(Continued→)*



*Photo by Harry K. Hammond*

*Godlove Award is presented jointly to Dr. Joel Pokorny and his wife and Coworker, Dr Vivianne C. Smith by ISCC President, Roland L. Connelly*



tions of I. H. Godlove in whose memory the award is given. We would like to describe briefly something about the man and his contributions. I.H. Godlove's professional life was concerned with the physics and chemistry of color, particularly its measurement and specification. His interests also encompassed aesthetic problems of color, color harmony and the history of color in art and archeology.

Isaac Hahn Godlove was born in Saint Louis, Missouri on June 13, 1892. He received the B.S. (1914) and A.M (1915) degrees from Washington University, St. Louis, and the Ph.D. (1926) in Chemistry from the University of Illinois. He taught chemistry at the University of Illinois (1916-21) and was an Associate Professor at the University of Oklahoma (1921-25). Dr. Godlove was Director of the Munsell Research Laboratory (1926-30). He held several positions between 1931 and 1935. He directed the exhibit on color for the New York Museum of Science and Industry (1930-31). He was with the E.I. du Pont de Nemours Co. Research Laboratory, Wilmington, DE (1936-43) and General Aniline and Film Co. Easton PA (1943-54). He was Chairman of the Inter-Society Color Council (1948-49) and served on the Board of Trustees of the Munsell Color Foundation from 1942 until the time of his death. I. H. Godlove died on August 14, 1954 from complications following an emergency appendectomy.

I.H. Godlove was an extraordinary color scientist who participated in all three of the disciplines represented by the Inter-Society Color Council triangle, science, art and industry. In reading ISCC newsletters and other material from 40-50 years ago, we are impressed with the diversity of his interests and skills. It is evident that his colleagues had high regard for him. When we talk with ISCC members who were contemporaries of Godlove, they refer to him affectionately as "IH".

#### SCIENCE:

I.H. Godlove made significant

contributions to color science. He was active in the Optical Society of America and published frequently in the Journal of the Optical Society. A few representative publications are:

The wavelengths of complimentary hues. *J. Opt. Soc. Am.* 20:411-418, 1930

Neutral Value Scales; I, Munsell Neutral Value Scale. *J. Opt. Soc. Am.* 23:394-411, 1933. (with A.E.O. Munsell and L.L. Sloan).

Improved color-difference formula with applications to the perceptibility of color changers in fastness tests and "on-tone" fading. *J. Opt. Soc. Am.* 41:760, 1951.

#### INDUSTRY:

Dr. Godlove worked for most of his professional life in industry. He was active in the American Association of Textile Chemists and Colorists and he was Chairman for many years. A few representative publications are:

Color measurement in the dyestuff industry with special reference to fastness tests. *Am. Dyestuff Rptr.* 27:148-156, 1938.

Perceptibility and acceptability of color changes in fastness tests and "on-tone" fading. *Am. Dyestuff Rptr.* 40:549-558, 1951.

#### ART:

Dr. Godlove was also deeply involved in the history of color and its use. He was a member of the Archeological Society of America. He was a joint author of *The Science of Color*, authored by the OSA Committee on Colorimetry and published by the Optical Society of America in 1953. Dr. Godlove wrote the history of the use of color from the first cave paintings up until the time of the Greeks. Here is an excerpt from the history:

"Apparently sculpturing, engraving, and painting on the walls and ceilings of caves more or less simultaneously

marked the awakening of the artist in man... The earliest paintings were simply outlines in red, black, and yellow which have no more relation to the actual colors of the object than do our own drawings in black pencil... The next artists were the Cro-Magnons,... Their mural paintings showed some modeling of the colors but this variegation was not yet developed... European cave man's art reached its zenith, after the last glacial were beautifully done. The outlines were usually black, as were the eyes, horns, mane, and hoofs. The modelling was skillfully executed with various colors produced by mixing yellow, red and black pigments..."

(Committee on Colorimetry, The Science of Color. 1953, Washington, D.C.: Optical Society of America. pp 16-17)

The ISCC Newsletter was first published in 1933. Dr. Godlove served as editor of the ISCC Newsletter from 1936-54. This was a period in which some remarkable changes in science and technology changed the lives of people worldwide. Dr. Godlove witnessed television develop for the initial commercial broadcasts to the development of the NTSC Standard for color vision. Fluorescent lamps were first publicly demonstrated at the World's Fair in New York in 1939.

At the time of his death Dr. Godlove was preparing a "Jubilee Issue" of the ISCC Newsletter to celebrate the 100th issue under his editorship. The issue was completed by his wife, Margaret Noss Godlove. The cover for the Jubilee Issue was designed and painted in the spring of 1954 by I. H. Godlove to illustrate the coordination of color represented by the membership of the Inter-Society Color Council in the fields of science, art and industry. Dr. Godlove invited about 30 persons to review the progress made during the 18 years of his tenure as Newsletter Editor. The list of contributors was outstanding, these were the individuals who inaugurated the modern science and technology of color. Included in the list were Norman Macbeth, Deane B. Judd, Richard S. Hunter, Sidney M.

Newhall, Walter Granville, Kenneth L. Kelly, Faber Birren, Forrest L. Dimmick, Ralph M. Evans, and Commander Dean Farnsworth.

I. H. Godlove was an extraordinary man who played a critical role in the growth of the Inter-Society Color Council. It is a great honor for us to accept the 1995 Godlove Award.

*Joel Pokorny  
Vivianne C. Smith*

## CITATION FOR THE 1995 NICKERSON SERVICE AWARD: PRESENTED TO ALLAN B.J. RODRIGUES

The Nickerson Service Award is presented to individuals whose long term contributions have advanced the aims and goals of the Society. It is often described in terms of leadership, organizational service, clerical, and technical contribution. The difference between those worthy of this award and others may be the dedication to which they serve.

Upon receiving his Ph.D. in Chemical Engineering from the University of Notre Dame, Allan joined the Dupont Company in 1969. He has had a broad range of technical assignments in automotive coatings, yet seemed to find his place in color. He joined the ISCC around 1973, and by 1975 he was active as a co-chair on PC27 — Indices of Metamerism. By 1980, he was on the board of directors. In 1981, he was program co-chair for the 50th anniversary meeting with Joyce Davenport. He later chaired two other annual meetings; the 1984 meeting in Troy, Michigan and the 1992 meeting in Princeton, New Jersey. I almost forgot

to mention that Allan served as President of the ISCC from 1986 through 1988. Allan's service and dedication are not limited to the ISCC. He is also active in the Detroit Color Council, the Federation of Societies of Coatings Technology, and the American Society for Testing and Materials.

My association with Allan began in 1989, when I joined Dupont fresh out of the University of Michigan. At that time, the names Allan Rodrigues and Dave Alman were just names on the group list that I was to join. It was only later that I would realize how fortunate I was having them as potential mentors. Now those of you that know anything about Midwest college football would never believe that it was possible for there to be a positive association between Allan and me. Yet, I did seem to like Allan right away, despite his faults and his 1977 National Championship coffee mug, which he seemed to parade around with.

In a very short time, his dedication to the ISCC became obvious. In 1991 he encouraged me to join the ISCC and learn from the experts in Color Science.

By 1992 he convinced me that organizing a Color Instrument Exhibit at the Annual Meeting would help me make contacts within the Industry; so I did. What he failed to mention at that time is that in the ISCC when you volunteer for something, you become "chairperson" until you find someone else to take your place. Another one of his involvement's, this time as a member of the Nomination Committee, landed me on the Board of Directors after the 1992 meeting. I don't want to give the impression that I regret any of this. My point is that Allan's dedication and "lead by example" approach made every decision seem like an obvious one.

In many respects the greatest service you can do for an organization, such as ISCC, is to inspire others through your own dedication. Perhaps this is the one quality that exemplifies Nickerson Award recipients. It is with great pleasure I give you Dr. Allan B.J. Rodrigues, the 1995 recipient of the Nickerson Service Award.

*Joseph F. Campbell*



*Photo by Harry K. Hammond*

*ISCC-Nickerson Service Award is presented to Dr. Allen B.J. Rodrigues by ISCC President Roland Connelly.*

## THE '95 PANTONE CONSUMER COLOR PREFERENCE STUDY

The Pantone Color Institute, in conjunction with Roper Starch Worldwide Marketing, recently completed a consumer color preference study. The study asked 2,000 consumers to select their color preferences from a broad spectrum included in the PANTONE Textile Color System.

Data was collected on the age, sex, income, geographic location and education of the respondents. Participants were asked their favorite colors in general, and in specific apparel and home furnishings categories.

34% call a shade of blue as one of their favorites, the most favored were: Spectrum Blue PANTONE 18-3963 TP and Sky Blue PANTONE 14-4318. Men were more enthusiastic about blue than women.

The "up and coming" favorites were in the green family.

Bright and deep colors were the most popular among young adults, while pastels and candy colors were favored by the 45+ age group.

The least appealing color was orange, especially in fluorescent finishes.

Subjects were also queried about color images through word association. Interestingly, blue, which is usually responded to as cool, was described as warm for those ages 60+. The perception of blue as warm for this age group could be the results of the yellowing of the lens of the eye with aging.

There were also some changes in the usual responses to other colors. Purple, for example, has been described as "regal" in numerous studies. The newest reactions to purple include "cheerful" and "exciting." Yellow has improved in popularity; it is preferable to blue in kitchens, and is described as "cheerful" and "warm," especially among more affluent respondents.

The updated color responses in all color families are an essential marketing tool for professionals.

*Color News  
Pantone Institute*

## INTERIOR COLOR PALETTES

The design and color direction for Fall/Winter '95 and extending through 1996 focuses on contrasts and balance in texture, mood, and color. This direction has been fostered by the great attention to the need for balance in every aspect of our lives — emotionally, spiritually, physically and aesthetically. While it may seem a stretch to equate color and design directions with our state of mind and body, color and design trends have always reflected society's concerns and interests.

Lifestyles and attitudes require a perpetual balancing act between work and play, practicality and fantasy, technology and humanism; seeking what is new while treasuring the old. Indeed, the ancient Chinese symbol depicting the balance of yin and yang has become the icon for the latter '90's. Above all, our homes are critical to our sense of equilibrium. For increasing numbers of people, it is both workspace and living space. Now, more than ever, there is a need for home to be (literally) a safe haven, a place where we can feel secure, nurtured, connected and comfortable.

In fact, various studies have shown that "comfortable" is today's key word for the consumer — it is the #1 priority in their homes, both physically and psychically. Hard-edged textures and synthetic-looking colors do not work in the context of "comfortable design" — what does work are handcrafted, casual, whimsical, nostalgic retro or ethnically-inspired looks.

Individualism is one of the most important driving forces in color and design trends. Not since the mauve, teal, and gray of the early '80's has there been "one color palette fits all" school of thought. Color palettes are as diverse today as they were rigidly prescribed in the past. As a result of this diversity, four palettes are introduced, each representing a compilation of interior themes for the future.

The first of the palettes is titled Tinted Vistas. Directly translated from the fashion world, this palette includes an intimate, inviting gentle group of misty colors that seem to be bathed in a transparent light; soft, comforting tints like Pale Banana, Rose, Nude, Celestial Blue, Wisteria, as well as subtle greens and moonlit taupes.

In direct contrast to the "Yin" of the previous palette is the "Yang" of Classic Concepts. These are the basic hues like Charcoal Gray and Moonbeam, Blue Indigo, Toffee brown, and Balsam Green stunningly accented by Garnet red, creating a sophisticated atmosphere in either traditional or minimalist modes.

The third palette, Country Landscapes, evokes a familiar atmosphere where one can truly feel at home. The colors combine the natural nut browns, the warmth of creamy white, the honest simplicity of blue and the calming greens often sparked by the energy of red and yellow.

The final palette, Exotica, represents a marriage of ethnic groups — the merging of cultures redolent in diversity. These colors are strong enough to stand

*(Continued→)*

on their own or combine in sumptuous and often riotous combinations adding intriguing accent to darkened or neutral backgrounds. The possibility for the play of color is truly exotic: orange and blue, magenta and copper, red and amethyst. This palette adds a beguiling final touch for the newest looks in the colors of the future.

## JOZEF COHEN HONORED BY UNIVERSITY OF ILLINOIS

The University of Illinois' UI Foundation recently held a dinner meeting at the Four Seasons Hotel in Chicago to honor thirteen major donors to the University during the past year. The thirteen donations totaled \$22 million. Among those honored were ISCC member Jozef Cohen and his wife, Huguette.

Jozef Cohen has been a University of Illinois faculty member for forty-five years. He now holds the rank of Professor Emeritus. During his active teaching, he taught in the Psychology Department, but is best noted for his color research leading to the founding of the branch of color science known as matrix R theory. Matrix R prescribes the formulation of a fundamental color space that is invariant to transformation and is Euclidean in its geometry. Both are features lacking in many other formulations of color space. In 1992, the ISCC awarded Jozef Cohen its Macbeth Award in honor of this contribution to the field of color.

Huguette Cohen is a researcher in the French Department at Illinois specializing in the eighteenth Century.

The Cohens specified that their donation to the University be utilized to fund researchers working in areas considered outside the mainstream of their fields or whose ideas conflict with prevailing views.

*Submitted by Hugh Fairman*

## CALL FOR MACBETH AWARD NOMINATIONS

Every two years the Inter-Society Color Council is honored to be able to present the Macbeth Award to an individual for outstanding recent contributions to the field of color. This award was established in 1970 by Mr. Norman Macbeth, Jr. in honor of the memory of his father, Norman Macbeth, a founding member of the ISCC and founder of Macbeth Daylighting Corporation, now a part of Kollmorgen.

Nominations for the Macbeth Award are now being considered by the Macbeth Award Committee. Individuals or groups of individuals interested in having a specific nominee considered by the committee should submit nominations by October 1, 1995.

Candidates will be judged for their recent significant contribution to any field of interest related to color whether or not it is represented by an Inter-Society Color Council Member Body. The candidate's contribution may be direct, it may be in the active practical stimulation of the application of color, or it may be an outstanding dissemination of knowledge of color by writing or lecturing, based on original contributions by the nominee. Candidates need not have been active in the affairs of the Inter-Society Color Council but they must be either a current or former member of the ISCC. Requests for nomination forms should be directed to:

Joel Pokorny  
Chairman, Macbeth Award Committee  
Visual Sciences Center  
University of Chicago  
939 East 57th Street  
Chicago, IL 60637

Phone: 312 702-1983  
Fax: 312 702-4442  
e-mail: s+p@chroma.uchicago.edu

## NEWS FROM MEMBER BODIES

### ASTM PAINT AND COATING TESTING MANUAL (Gardner-Sward Handbook, 14th Edition)

**ASTM** ASTM announces the 14th edition of the Paint and Coating Testing Manual. This new guide provides in-depth treatises, test methods, procedures, and standards of ASTM and other national and international organizations for paint and coating testing. This collective effort has resulted in a manual that has de-emphasized

natural products. The manual's 78 chapters cover:

Current industry regulations  
Main polymeric species, colorants, special pigments, extenders, and additives used today

Analyses used to dissect and analyze a coating

Instruments used in the industry  
Products of the industry; how they are used and tested

Of particular interest in the area of color are:

Part 6: Pigments  
Chapter 19: White Pigments  
Chapter 20: Black Pigments  
Chapter 21: Colored Organic Pigments  
Chapter 22: Inorganic Colored Pigments

Chapter 23: Ceramic Pigments  
 Chapter 24: Extender Pigments  
 Chapter 25: Metallic Pigments  
 Chapter 26: Pearlescent Pigments  
 Chapter 27: Inorganic Anti-Corrosive Pigments  
 Chapter 28: Oil Absorption of Pigments

Part 10: Optical Properties  
 Chapter 40: Color and Light  
 Chapter 41: Gloss  
 Chapter 42: Hiding Power  
 Chapter 43: Mass Color and Tinting Strength of Pigments

The manual is available from:

ASTM  
 1916 Race Street  
 Philadelphia, PA 19103-1187  
 Phone: (215) 299-5585  
 Fax: (215) 977-9679

Europe  
 ASTM European Office  
 27-29 Knowl Piece  
 Wilbury Way  
 Hitchin, Herts SG4 0SX  
 ENGLAND  
 Phone: 462-437933  
 Fax: 462-433678

995 Pages (1995); Hard Cover  
 \$220 List; \$198 ASTM Members

## SYMPOSIUM ON ELECTRONIC IMAGING



A conference on  
 Color Imaging:  
 Device-Independent  
 Color, Color

Hard Copy and Graphic Arts will be held as part of the Symposium on Electronic Imaging: Science & Technology, San Jose, California, January 28, 1996 to February 2, 1996. The conference is sponsored by IS&T, The Society for Imaging Science and Technology and

SPiE, The International Society for Optical Engineering. In recent years, this meeting has emerged as an important functional forum for the discussion of color imaging. For more information contact:

Giordano Beretta  
 Hewlett-Packard Company  
 1501 Page Mill Road, 3U-3  
 Palo Alto, CA 94304-1126  
 Voice: (415) 857-6713  
 Fax: (415) 857-4691  
 E-mail: beretta@hpl.hp.com

## ASIA DISPLAY '95 — FORMERLY JAPAN DISPLAY — SPREADS BROADER WINGS



Asia Display '95, sponsored by the Society for Information

Display and the Institute of Television of Japan, will be held in ACT CITY Hamamatsu, Hamamatsu, Japan, from October 16 to 18, 1995. The conference covers a broad range of research developments relating to electronic information displays with a special focus on displays for new multimedia systems. This year's conference will have a pan-Asian emphasis as well.

The keynote address, presented by H. Mizuno, Distinguished Advisor at Matsushita Electric Industrial Co., Ltd, is entitled "Information Displays for the Era of Multimedia." The general invited addresses are "Recent Progress of AMLCDs" by E. Lueder (University of Stuttgart), "Calculating Color Appearance and Image Quality" by J. McCann (Polaroid), and "Synthesis of Realistic Sensation" by M. Hirose (University of Tokyo). The Takayanagi Memorial Session will include a historical review of television research

by T. Hiruma (President and CEO of Hamamatsu Photonics) and a discussion of multimedia systems and application directed toward imaging on the information superhighway.

To celebrate the conference's name change from Japan Display, a special session will focus on display industries and display research and development in each of the Asian countries/regions pursuing significant display activity: China, Hong Kong, India, Japan, Korea, Malaysia/Singapore, and Taiwan. Hamamatsu is the home of Yamaha Corp., and Yamaha will present a special evening session: "Past, Present, and Future of Electronic Musical Instruments (with Demonstrations)."

Invited talks within the individual technical sessions will include presentations on LCD projection technologies and applications, liquid-crystal devices for optical computing, electroluminescence of devices using new fluorescent organic materials, progress in TFT-LCD technology and production, and the analog display services interface (for display-based telephone services.) Technical sessions will include fundamentals, display devices, input systems, hard copy and storage, integrated devices and device applications, multimedia systems, image and signal processing, color perception, and human factors.

For conference and hotel registration information, contact the Asia Display '95 Secretariat, c/o The Convention, Annecy Aoyama 2F, 2-6-12, Minami-Aoyama, Minato-ku, Tokyo 107, Japan. Phone +81-3-3423-4180; fax +81-3-3423-4108.

*SID News Release*



## JUDD-AIC AWARD

On Tuesday, September 5, 1995, at the Interim Meeting of the International Colour Association (AIC) in Berlin, Germany, the President of AIC, Prof. Dr. Lucia R. Ronchi, will present the Deane B. Judd-AIC Award for 1995 to Prof. Dr.-Ing. Heinz Terstiege.

The award consists of a gold medal with a portrait of Deane Judd on one side. On the other side will be the inscription "To honor Heinz Terstiege 1995 for important work in color science."

Funds to establish and administer the award were provided by Elizabeth (Betty) Judd in memory of her husband.

The award was administered by the Munsell Color Foundation until it was disbanded. Administration is now carried out by the Munsell Color Science Laboratory, Roy Berns, director.

The award has been presented biannually since 1975 at a quadrennial or interim meeting of AIC. Previous recipients have been:

1975 Dorothy Nickerson  
1977 William David Wright

1979 Gunter Wyszecki  
1981 Manfred Richter  
1983 David Lewis MacAdam  
1985 Leo M. Hurvich and  
Dorothea Jameson  
1987 Robert W. G. Hunt  
1989 Tarow Indow  
1991 Hans Vos and  
Pieter Walraven  
1993 Yoshinobu Nayatani

*Harry K. Hammond III*

## OTHER NEWS

# AIC INTERIM MEETING ON COLORIMETRY BERLIN, SEPTEMBER 3-6, 1995

Sunday September 3, 1995

10:00 Executive Committee (BAM)  
15:00 - 18:00 Setup Colorimeters Exhibition  
19:00 - 22:00 Registration and Welcome Reception in: Brauhaus im Nicolaiviertel, Spreuer 4

Monday September 4, 1995

8:00 - 9:00 Registration at Mauerstr. 32, 10117 Berlin (Center)  
9:00 - 9:15 Opening of the AIC Interim Meeting President, Prof. Dr. Lucia Ronchi, Istituto Nazionale di Ottica, Italy

Invited Paper

9:15 - 10:00 "What's new in material standards" F. Simon, FTS, Inc., USA  
10:00 - 10:30 Coffee Break

Contributed Papers

10:30 - 10:50 "Excitation and weighting of fluorescence in colorimetry" D. Gundlach, BAM, Germany  
10:50 - 11:10 "CIE Whiteness and tint: possible improvements" R. Griesser, CIBA-Geigy, Switzerland  
11:10 - 11:30 "The correlation of measured spectral radiance of fluorescent and non-fluorescent materials to perceived conspicuity under natural low light levels" D. Burns, N. L. Johnson, 3M Center, USA  
11:30 - 11:50 "Spectral and colorimetric properties of the light emitted by the dorsal bioluminescent organs by *Phyroporus pellucens*" R. Saunders, R. DeFour, The University of the West Indies, Trinidad  
11:50 - 12:10 "Fluorescent colors on stage" T. Krzeszowiak, Theater an der Wien, Austria

*(Continued→)*

- 12:10 - 12:30 Visit to the exhibition
- 12:30 - 13:30 Lunch
- 13:30 - 13:50 "Colorimetric data comparison of bench-top and portable instruments" J. A. Ladson, BYK-Gardner, USA  
 13:50 - 14:10 "A practical test of the equilibrate color matching" B. Sluban, D. Golob, St. Jeler, University of Maribor, Slovenia
- 14:10 - 14:30 "Color recipe prediction by artificial neural networks" W. H. Kettler, J. Spehl, M. Kolk, M. W'lker, Herberts GmbH, Germany
- 14:30 - 14:50 "A training concept in color science for the graphic arts and industry" P. Glatz, S. Kurz, GRETAG, Switzerland
- 14:50 - 15:20 Coffee Break
- 15:20 - 15:40 "Colorimetry in collision field between modern quality management according to ISO 9000 and daylight laboratory praxis" H. Pelshenke, Glasurit, Germany
- 15:40 - 16:00 "Measuring nighttime color of retroreflective materials" N. L. Johnson, 3M, USA
- 16:00 - 16:20 "Color measurement and quality control on coloured liquids in the chemical industry" F. Brucker, Dr. Lange, Germany
- 16:20 - 16:40 "Camera colorimetry, new instrumentation for appearance and spatial color" D. Alston, R. Feld, Color & Appearance Technology, Germany
- 16:40 - 17:00 "Developments in color instrument design utilizing LED technology" J. T. DeGroff, ColorTec Associates, Inc., USA

Tuesday September 5, 1995

- 9:00 - 10:00 Deane B. Judd - AIC Award 1995 L. Ronchi, AIC President  
 Lecture of the recipient of the Deane B. Judd - AIC Award 1995
- 10:00 - 9:15 Coffee Break

Contributed Papers

- 10:30 - 10:50 "DIN - Standardization of metallic and pearlescent colors" Baurle, Herberts, Germany
- 10:50 - 11:10 "Measurement of metallic & pearlescent colors" A. Rodrigues, Steenhoek, E. I. DuPont, USA
- 11:10 - 11:30 "Goniochromatic quality control of pearl pigments" P. W. Gabel, A. Eberle, H. Pieper Merck, Germany
- 11:30 - 11:50 "Do the apertures of illumination and measurement influence measurements of metallics?" G. Doring, BAM, Germany
- 11:50 - 12:10 "Multigeometry color measurement of structural surfaces" G. Rosler, Kollmorgen Instruments, Germany
- 12:10 - 12:30 Exhibition
- 12:30 - 13:30 Lunch
- 15:00 - 18:30 Boat trip under the Bridges of Berlin

Wednesday September 6, 1995

Invited Paper

- 9:00 - 10:00 "Improvement in the weighting functions of colorimetry" B. Thornton, USA
- 10:00 - 10:30 Coffee Break

(Continued→)

## Contributed Papers

- 10:30 - 10:50 "To optimize or not to optimize (l:c) ratios " R. Berns, Rochester Institute for Technology, USA
- 10:50 - 11:10 "Linearity of grey scale with small stepwidth" K. Witt, BAM, Germany
- 11:10 - 11:30 "An approximately uniform object colour metric for industrial colour tolerances" E. Rohner, D. C. Rich, Datacolor, Switzerland/USA
- 11:30 - 11:50 "Some considerations on MacAdam's ellipses" E. Bernabeu, J. M. Zoido, F. Carreno, Departamento de Optica, University Madrid, Spain
- 11:50 - 12:10 "Uniform-scale chromaticity diagram by von Kries-invariant-logarithmic transformations for foveal vision" C. Oleari, Dipartimento di Fisica, University Parma
- 12:10 - 12:30 "WYZ - colour storehouse" W. Y. Zhang, Fine Art Department of South China Teachers University, China
- 12:30 - 13:30 Lunch
- 13:30 - 13:50 "A method of color renderings optimization of CRT-TV monitors by means of electronically generated test colours and test patterns" Antkowiak, L. Grambow Deutsche Telecom, Germany
- 13:50 - 14:10 "Analytical color space transformations" P. G. Herzog, Institute for Technology Electronik, Germany
- 14:10 - 14:30 "Cross media color reproduction by neural networks" R. Schettini, B. Barolo, E. Boldrin Istituto Tecnologie Informatiche Mulimediali, Italy
- 14:30 - 14:50 "Nominal color coding by Hopfield networks" P. Campadelli, F. Castiglioni, R. Schettini Istituto Tecnologie Informatiche Mulimediali, Italy
- 14:50 - 15:20 Coffee Break
- 15:20 - 15:40 "A solution to color problems in open-system architectures" Th. Keusen, B. Hill, F. W. Vorhagen Institute for Technology Electronik, Germany
- 15:40 - 16:00 "On a deuteranope's foveal opponent-colour vision" H. Scheibner, A. Orazem Physics Institute der University Aachen, Germany
- 16:00 - 16:20 "Upgraded quality for color notation" A. Nilsson, T. Hard Skandinaviska Farginst., Sweden
- 16:20 - 16:40 "Error of HLS color model" W. Y. Zhang Fine Art Department of South China Teachers University China
- 16:50 - 17:00 "Brightness and characteristics of hibrid AC EL structures" T. Kechlibarov Bulgarian Academy of Sciences, Bulgaria
- 19:00 - 24:00 Banquet

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## ISGG HOLDS CONFERENCE IN CRACOW

In the name of the International Society for Geometry and Graphics (ISGG), I want to invite you to participate in the 1996 Cracow Conference on Engineering Computer Graphics and Descriptive Geometry, July 18-22, 1996. The conference is co-sponsored by the Engineering Design Graphics Division of the American Society for Engineering Education (ASEE), Cracow University of Technology, the Polish Society for Geometry and Engineering Graphics, and the International Society for Geometry and Graphics.

For additional information please contact: Drs. J. Tadeusz Gawlowski, Chair, or Lidia Zakowska, Vicechair, ICECGDG Organizing Committee at: [icecgdg@oeto.pk.edu.pl](mailto:icecgdg@oeto.pk.edu.pl) (Please include your complete mailing address, telephone, fax and e-mail, with your request.

(Continued→)



We hope to see you in Cracow,

Walter Rodriguez, President, International Society for  
Geometry and Graphics

"The art of civilization is the act of drawing lines."  
Oliver Wendell Holmes.

Dr. Walter Rodriguez, PE  
Professor and Berger Chair  
Anderson Hall, CEE  
Tufts University  
Medford, MA 02155 USA  
(617) 627-3035  
wrodrigu@pearl.tufts.edu

**SPIE/IS&T SYMPOSIUM ON  
ELECTRONIC IMAGING:  
SCIENCE AND TECHNOLOGY  
JANUARY 28- FEBRUARY 2,  
1996; SAN JOSE CONVENTION  
CENTER, SAN JOSE, CA.**

**Color Imaging:  
Device-Independent Color, Color Hard Copy  
and Graphic Arts**

Conference Chair: Jan Bares, Xerox Corp.

Conference Committee: Brigit Ananya, Apple Computer, Inc.; Joachim L. Heinzl, Technische Univ. Muenchen (FRG); James M. Kasson, IBM Almaden Research Ctr.; John Michaelis, R.R. Donnelley & Sons Co.; Shin Ohno, Sony Corp. (Japan); Ivan Rezanka, Xerox Webster Research Ctr.; David L. Spooner, rhoMetric Associates, Ltd.; H. Joel Trussell, North Carolina State Univ.

Color imaging has been evolving rapidly. Production of electronic originals calling for a color hard copy output has been growing due to steadily decreasing cost of color capable personal computers and software. This, in turn, has promoted development of technologies necessary for affordable color printers. In commercial printing applications, advances in both digital image processing and printing now enable short run color printing ready to challenge high-quality offset.

Image transfers between a variety of platforms from initial capture or creation to storage, display, and printing require technology that will preserve image appearance. This conference provides an opportunity for presenting as well as getting acquainted with the most recent developments in the related technologies and applications. Focus of the conference is on both the device-independent color imaging as well as the printing of images requiring gray scale and/or full color. It covers hardware, software, media, and systems. Special attention is given to applications and requirements created by other disciplines. Areas of interest include:

- Color Appearance and Constancy
  - color appearance models
  - chromatic adaptation
  - perception of self-luminous and object colors
- Device Modeling and Characterization
  - scanners
  - displays
  - systems
  - color models
  - lookup table methods
  - color conversion algorithms
  - gamut mapping
  - color correction
  - hardware implementations
  - device limitations
  - device characterization methodology
  - color measurement instrumentation
- Color Image Encoding and Standards
  - interchange languages
  - file formats
  - image quantization and artifacts
  - visual tolerance
  - color encoding
- Systems and Architecture
  - device-independent color implementation in commercial systems
  - color management
  - color matching device drivers
  - systems performance
- Technology Applications
  - short-run printing
  - prepress
  - color proofing
  - office and home devices
- Novel Hard Copy and Imaging Concepts
  - laser hard copy technology
  - xerotyping
  - dry silver
  - microencapsulation approaches
- Raster Imaging and Digital Image Setting
- Electrophotography and Related Technologies
  - gray scale

(Continued→)

- color
- high resolution
- hardware
- new applications
- Ink Jet
  - color and gray scale
  - hot melt solid ink
- Thermal Printing
  - wax transfer
  - dye diffusion
- Print Quality
  - image registration
  - process control
  - color calibration and measurements on hard copy systems
  - hard copy media and supplies
- Applications of Color Hard Copy
  - medical imaging
  - fine arts
  - use of color in hard copy documents
- R&D Status and Outlook: Academia and Industry

This conference is just one of nearly 30 conferences to be held at the EI'96 symposium. And EI'96 is just part of the larger Photonics West Symposium being held 27 January - 2 February 1996, San Jose Convention Ctr., San Jose, California USA.

**TO OBTAIN ALL CALLS FOR PAPERS ELECTRONICALLY**  
The calls for papers for all conferences in the Photonics West symposium will be available early June on SPIE Web ([http://www.spie.org/web/meetings/calls/pw96\\_home.html](http://www.spie.org/web/meetings/calls/pw96_home.html)), by anonymous FTP ([ftp://spie.org/meetings/calls/pw96\\*](ftp://spie.org/meetings/calls/pw96*)), or by e-mail file retrieval send a message to [info-optolink-request@spie.org](mailto:info-optolink-request@spie.org) with the following in the message body: send [meetings.calls]pw96\*

For a printed call for papers or other information:  
E-mail: [pw96@spie.org](mailto:pw96@spie.org)  
Fax: 360/647-1445 (\*)  
Phone: 360/676-3290 (\*)

Electronic Imaging '96 DEADLINES  
Paper Abstracts Due from Authors:  
3 July 1995

Advance Programs due from Chairs:  
31 July 1995

Manuscripts Due from Authors:  
2 January 1996

## GUIDELINES FOR SUBMITTING AN ABSTRACT

Send a 500 word abstract of your paper, by the appropriate deadline, in ONE of the following ways:

- >>mail (please mail 4 hard copies) to:  
IS&T/SPIE Electronic Imaging '96  
SPIE, P.O. Box 10, Bellingham, WA 98227-0010  
Shipping Address: 1000 20th Street, Bellingham, WA 98225  
Telephone: 360/676-3290 (\*)
- >>electronic mail in ASCII format to Internet  
[abstracts@spie.org](mailto:abstracts@spie.org) (Please send one submission per email message.)
- >>fax to SPIE at 360/647-1445 (\*)  
(Please send one submission per fax.)

Be sure each abstract includes the following:

1. CONFERENCE CHAIR and CONFERENCE TITLE (submit to ONLY ONE conference) to which the abstract is submitted
2. AUTHOR LISTING (List principal author first) for each author: full name [first(given) last(family) and affiliation, mailing address, phone/fax numbers, email
3. ABSTRACT/PAPER TITLE
4. ABSTRACT TEXT: 500 words typed on white paper
5. KEYWORDS: maximum of 5 keywords
6. BRIEF BIOGRAPHY of the principal author: 50-100 words

Please contact SPIE if you have any questions or require further information.

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# COLOR RESEARCH AND APPLICATION

**IN THIS ISSUE, June 1995**

We begin this issue with two articles about the Nayatani Color Appearance Model. Yoshinobu Nayatani first presented the formulation of a nonlinear model of chromatic adaptation in 1980. From this beginning, over the succeeding fifteen years the Nayatani model to predict color appearance has been developed and refined with applications in many areas. Now in "Revision of Chroma and Hue Scales of a Nonlinear Color-Appearance Model," Dr. Nayatani reports on a new coefficient,  $ES_{\theta}$ , that corresponds to the chromatic strength of spectral colors (and those colors on the red-purple locus). Using this new coefficient in place of the eccentricity function,  $ES_{\theta}$ , the nonlinear color appearance model can predict the hue and chroma scales of the Munsell and Natural Color System (NCS) very well.

In a follow-up article, Hiroaki Sobagaki, Kenjiro Hashimoto, and Tadashi Yano join with Yoshinobu Nayatani to report on the "Lightness Dependency of Chroma Scales of a Nonlinear Color-Appearance Model and its Latest Formulation." A new chroma CN (which is the old chroma, C, multiplied by a lightness correction, LA) is proposed. CN improves the agreement between the model predictions, Munsell Chroma and NCS chromaticness. For those researchers wishing to use the nonlinear color appearance model, the step-by-step procedure for making calculations is given and explained in an Appendix including the resulting numbers for four examples.

When the Commission Internationale de l'Eclairage (CIE) defined the spectral power distributions of various phases of daylight illumination, no artificial sources were available with the defined distributions. Since then there has been a continuing search for sources that can serve as suitable daylight simulators. For some additional discussion on this problem readers may want to refer to Dr. Hunt's Letter to the Editor of August, 1992 [Vol. 17, 293-4, 1992]. The CIE has recommended two methods that can be used for computation of the color differences introduced by a change from a reference to a test illuminant. One method measures the color rendering properties of a light source in terms of a General Color rendering Index Ra. The second method is intended specifically for testing the quality of daylight simulators by assessing the performance over the visible region in terms of a Metamerism Index Mlvis. Bjarne Hisdal examines these two methods in "Colorimetric Evaluation of Daylight Simulator Sources" and concludes that both methods evaluate daylight simulators in the same way and that disagreement between the two methods in detailed rank may often be due to visually insignificant color differences.

Another search that has gone on for years is the one for the ideal color difference formula. In "A General Form of Color Difference Formula Based on Color Discrimination Ellipsoid Parameters," Chengwu Cui and Jeffery K. Hovis derive a general color difference formula based on the color discrimination ellipsoids in the CIELAB color space. They show the link among the current popular color difference formulae and suggest a framework for modifying the CIELAB color difference formula in the future.

We take for granted the way in which the two-dimensional visual information we receive through our eyes is interpreted into our understanding of the surroundings made up of three-dimensional objects. That is, we take it for granted until we try to teach a machine to see and interpret things the way that we do. What laws have we internalized? Are there visual cues that we use? The understanding takes on degrees of complexity as we add depth, shadows, and transparent objects. In computer vision the researcher tries to transform the two-dimensional image to three-dimensional object perception by using natural constraints. In "Depth and Orientation Through Surface Transparency" only E. M. Gerritsen, Charles M. M.de Weert and Johan Wagemans report on investigations to determine if people use the physical constraints of additive color mixture in their interpretations of depth or orientation.

It is well known that color attracts attention and sells products. Therefore the proper selection of color is an important consideration in the product design process. In "A Systematic Method for Color Planning in Product Design" Shih-Wen Hsiao describes how to incorporate the results of market surveys into a systematic methodology for color selection in the design process. Thus the color image that the customer has of a product is translated into the product design. The tools that the designer uses in this process are 1) the Hue and Tone system and the Color Image Scale to translate words to color or color to words, 2) the composite operation for fuzzy set theory to get semantic equivalence of words and colors, and 3) a computer program to calculate the membership functions and present to results to the designer. In this way, the psychology of the customer can be presented to the designer increasing the efficiency of the design process or to help train new designers.

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

## ANTEC '96 CALL FOR PAPERS

The Society of Plastics Engineers 54th Annual Technical Conference will be held in Indianapolis, Indiana May 5-9, 1996. ANTEC hosts the largest annual worldwide gathering of plastics professionals from academia and industry. Topics to be presented will include technical innovations and technology trends. The Technical



Program Committee invites the presentation of original and significant work. Simply follow the steps below to expedite the paper review process:

1) Submit a title and author(s) to SPE by September 15, 1995.

2) Indicate the SPE Division, such as Color and Appearance, or Special Interest Group (SIG) for which the paper is intended. The SPE Technical Program Chairperson reserves the right of reassignment.

3) Prepare a manuscript by adhering to SPE instructions. The paper must be submitted for review by November 10, 1995.

4) Reviews will be completed by December 31, 1995.

Any questions regarding the submission of a manuscript should be directed to:

Jae Choi  
 ANTEC '96 Technical Program Chairperson  
 Phone: (317) 845-6529  
 Fax: (317) 845-6461/3744  
 E-mail: sky@inuxs.att.com

## NEW MEMBERS

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 Gonzalez FL 32560-0097  
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Bensalem PA 19020  
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New Windsor NY 12553  
USA

Mrs. Carolyn S. Womer  
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PO Box 386  
74 Main Street  
Lebanon NJ 08833  
USA

## 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:

Harry K. Hammond, III  
or  
John Peterson  
BYK-Gardner, USA  
2435 Linden Lane  
Silver Spring, MD 20910  
Phone: 301-495-7150  
Fax: 301-585-4067

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

Harry K. Hammond, III  
or  
John Peterson  
BYK-Gardner, USA  
2435 Linden Lane  
Silver Spring, MD 20910  
Phone: (301) 495-7150  
Fax: (301) 585-4067

## 1995

### 5th INTERNATIONAL CONFERENCE ON IMAGE PROCESSING

July 3 - 6  
Information: IAP95 Secretariat  
IEE Conference Services  
Savoy Place  
London  
WC2 0BL

### ASTM COMMITTEE D-1 ON PAINT

July 9 - 13  
Atlanta, Georgia  
Information: Scott Orthey  
Phone: (215) 299-5507

**ASTM COMMITTEE D-20 ON PLASTICS**

July 9 - 13

Lake Como, Wisconsin

Information: Mrs. Katherine Morgan

Phone: (215) 299-5529

**1995 IESNA ANNUAL CONFERENCE**

July 29 - Aug. 3

Marriott Marquis

New York City, NY

Information: Valerie Landers

IESNA

Phone: (212) 248-5000 ext. 117

**AIC INTERIM MEETING '95**

Colorimetry

Sep. 4 - 6

Berlin, Germany

Information: Prof. Dr. Heinz Terstiege

c/o BAM

Unter den Eichen 87

12205 Berlin, Germany

Fax: (011) 49-30-812-10-83

Sept. 4 - 8

Silver Halide and Electronic Imaging

Information: Dr. M. R. Pointer

Kodak Ltd.

Research Division W93

Headstone Drive

Harrow

Middlesex

HA1 4TY

Phone: (011) 44 0181 424 3750

Fax: (011) 44 0181 424 3750

**OSA ANNUAL MEETING**

Sep. 10 - 15

Optical Society of America Annual Meeting

Portland, OR

Information: OSA Meeting Department

Phone: (202) 416-1980

**"COLOR AND CULTURAL HERITAGE" CONFERENCE '95**

Sept. 12 - 15

Color Group - Bulgaria

"St. Constantine" Resort

"F. J. Curie" Scientists' House

Varna, Bulgaria

Information: M.F.A Krasimir Krustev

Color Group - Bulgaria

P.O.B. 431

BG-1000

Sofia Bulgaria

Phone: (011) 359-2-88-4075

Fax: (011) 359-2-87-9360

**SPE RETEC 95**

Sep. 25 - 26

Color & Appearance Division & Carolinas Section of the  
Society of Plastics Engineers (SPE)"Coloring Properties and Effects of Colorants on Processing  
and Polymer Properties"

Isle of Palms, Wild Dunes Resort

Information: Johnny F. Suthers

Phone: (615) 229-3263

**AATCC CONFERENCE AND EXHIBITION**

Oct. 8 - 11

American Association of Textile Chemists and Colorists

Hyatt Regency

Atlanta, GA

Information: AATCC

Phone: (919) 549-8141

**IS&T 4th TECHNICAL SYMPOSIUM**

WITH GRAPH EXPO '95

Oct. 8 - 12

Prepress, Proofing, &amp; Printing

Chicago, IL

Information: IS&amp;T

7003 Kilworth Lane

Springfield, VA 22151

Phone: (703) 642-9090

Fax: (703) 642-9094

email: Imagesoc@us.net

Oct. 9 - 11

Biological Effects of Light

Hotel Nikko

Atlanta, GA

Information: Scott Bowen

(404) 252-7913



**FSCT Annual Meeting & Paint Industries Show**  
 Oct. 9 - 11  
 Saint Louis, MO  
 Information: Robert Ziegler  
 Federation of Societies for Coating Technology  
 492 Norristown Rd.  
 Blue Bell, PA  
 19422-2350  
 Phone: (610) 940-0777  
 Fax: (610) 940-0292

**IS&T 11th ANNUAL INTERNATIONAL CONGRESS**  
 Oct. 28 - Nov. 3  
 Advances In Non-Impact Printing Technology  
 Hyatt Regency Hilton Head  
 Hilton Head Island, SC  
 Information: IS&T  
 7003 Kilworth Lane  
 Springfield, VA 22151  
 Phone: (703) 642-9090  
 Fax: (703) 642-9094  
 email: imagesoc@us.net

**CIE 23rd QUADRENNIAL MEETING**  
 Nov. 1 - 3 Division Meetings: Nov. 6 - 8  
 International Commission on Illumination  
 Vigyan Bhavan Conference Complex  
 New Delhi, India  
 Information: Jonathan Hardis  
 Secretary USNC/CIE  
 Phone: (301) 975-2373  
 Fax: (301) 840-8551  
 E-mail: hardis@onyx.nist.gov

**CMG FALL CONFERENCE**  
 Nov. 5 - 7  
 Color Marketing Group International Color Directions  
 Conference  
 The Pointe Hilton Resort at Squaw Peak  
 Phoenix, AZ  
 Information: Katie Register  
 Phone: (703) 329-8500  
 Fax: (703) 329-0155

**S&T & SID 3rd COLOR IMAGING CONFERENCE**  
 Nov. 7 - 10  
 Color Science, Systems, and Applications  
 Radisson Resort  
 Scottsdale, AZ  
 Information: IS&T  
 7003 Kilworth Lane  
 Springfield, VA 22151  
 Phone: (703) 642-9090  
 Fax: (703) 642-9094  
 email: imagesoc@us.net

**ASTM COMMITTEE D-20 ON PLASTICS**  
 Nov. 13 - 16  
 Norfolk, VA  
 Information: Mrs. Katherine Morgan  
 Phone: (215) 299-5529

## 1996

**ASTM COMMITTEE D-1 ON PAINT**  
 Jan. 21 - 24  
 Fort Lauderdale, FL  
 Information: Scott Orthey  
 Phone: (215) 299-5507

**ASTM COMMITTEE E-12 ON APPEARANCE**  
 Jan. 22 - 24  
 Fort Lauderdale, FL  
 Information: Bode Buckley  
 Phone: (215) 299-5599

**USNC/CIE "1995" ANNUAL MEETING**  
 Jan. 27-29  
 United States National Committee of CIE  
 Orlando, FL  
 Information: Jonathan Hardis  
 Secretary USNC/CIE  
 Phone: (301) 975-2373  
 Fax: (301) 840-8551  
 E-mail: hardis@onyx.nist.gov

**IS&T/SPIE**  
 Feb. 4 - 9  
 Electronic Imaging: Science and Technology  
 San Jose Convention Center  
 San Jose, CA  
 Information: IS&T Conference Manager  
 7003 Kilworth Lane  
 Springfield, VA 22151  
 Phone: (703) 642-9090  
 Fax: (703) 642-9094  
 email: imagesoc@us.net



**IS&T 9th INTERNATIONAL SYMPOSIUM**

Feb. 18 - 21

Photofinishing Technology

Co-located with PMA Show (Feb. 22 - 25)

Las Vegas, NV

Information: IS&amp;T Conference Manager

7003 Kilworth Lane

Springfield, VA

22151

Phone: (703) 642-9090

Fax: (703) 642-9094

**ASTM COMMITTEE D-20 ON PLASTICS**

Mar. 18 - 21

Orlando, FL

Information: Mrs. Katherine Morgan

Phone: (215) 299-5529

**TAGA ANNUAL CONFERENCE**

Apr. 28 - May 1

Technical Association of the Graphic Arts Annual Technical Conference

Dallas, TX

Information: Karen Lawrence

Phone: (716) 475-7470

**ISCC ANNUAL MEETING WITH ASTM**

May 5 - 7

Orlando, FL

Information: Danny Rich

Phone: (609) 895-7427

Fax: (609) 895-7461

**CMG SPRING CONFERENCE**

May 5 - 7

Color Marketing Group Conference

Sheraton New Orleans Hotel &amp; Towers

New Orleans, LA

Information: Katie Register

Phone: (703) 329-8500

Fax: (703) 329-0155

**ASTM COMMITTEE E-12 ON APPEARANCE**

May 8 - 10

Orlando, FL

Information: Bode Buckley

Phone: (215) 299-5599

**EXPO 96**

May 11 - Oct. 4

Color and Light in Communication

Information: Gabor David

3 Tukory u.

Budapest H-1054

Hungary

**SID '96**

May 13 - 17

San Diego, CA

Information: Lauren Kinsey

SID

1526 Brookhollow Drive

Suite 82

Santa Ana, CA 92705

Phone: (714) 545-1526

Fax: (714) 545-1547

email: socforinfodisplay

@mcimail.com

**IS&T 49th ANNUAL CONFERENCE**

May 18 - 24

Minneapolis Marriott City Center

Minneapolis, MN

Information: IS&amp;T Conference Manager

7003 Kilworth Lane

Springfield, VA 22151

Phone: (703) 642-9090

Fax: (703) 642-9094

**AIC - '96 INTERIM MEETING**

June 16 - 18

Color Psychology Beyond Psychophysics

Gothenburg, Sweden

Information: Lars Sivik

Kullaviks Skogsvag 4

S-429 35 Kullavik, Sweden

Phone: (011) 46-31-933347

Fax: (011) 46-31-431012

email: sivik@psy.gu.se

**ASTM COMMITTEE D-1 ON PAINT**

June 23 - 26

San Francisco, CA

Information: Scott Orthey

Phone: (215) 299-5507

**ASTM COMMITTEE E-12 ON APPEARANCE**

June 24 - 26

San Francisco, CA

Information: Bode Buckley

Phone: (215) 299-5599

**AATCC CONFERENCE AND EXHIBITION**

Oct. 8 - 11

American Association of Textile Chemists and Colorists

Opryland Hotel

Nashville, TN

Information: AATCC

Phone: (919) 549-8141



**IS&T 12th INTERNATIONAL CONGRESS**

Oct. 27 - Nov. 1

Advances In Non-Impact Printing Technologies

Hyatt Regency San Antonio

San Antonio, TX

Information: IS&amp;T Conference Manager

7003 Kilworth Lane

Springfield, VA

22151

Phone: (703) 642-9090

Fax: (703) 642-9094

email: imagesoc@us.net

**CMG FALL CONFERENCE**

Nov. 3 - 5

Color Marketing Group Conference

Sheraton Seattle Hotel &amp; Towers

Seattle, WA

Information: Katie Register

Phone: (703) 329-8500

Fax: (703) 329-0155

**IS&T FOURTH COLOR IMAGING CONFERENCE**

Nov. 16 - 23

Color Science, Systems &amp; Applications

Radisson Resort

Scottsdale, AZ

Information: IS&amp;T Conference Manager

7003 Kilworth Lane

Springfield, VA 22151

Phone: (703) 642-9090

Fax: (703) 642-9094

**ASTM COMMITTEE D-20 ON PLASTICS**

Nov. 18 - 21

New Orleans, LA

Information: Mrs. Katherine Morgan

Phone: (215) 299-5529

**1997****ASTM COMMITTEE D-1 ON PAINT**

Jan. 26 - 29

Fort Lauderdale, FL

Information: Scott Orthey

Phone: (215) 299-5507

**ASTM COMMITTEE E-12 ON APPEARANCE**

Jan. 26 - 29

Fort Lauderdale, Florida

Information: Bode Buckley

Phone: (215) 299-5599

Fax: (215) 299-2630

**TAGA ANNUAL CONFERENCE**

May 4 - 7

Technical Association of the Graphic Arts Annual Technical Conference

Montreal or Quebec City, Canada

Information: Karen Lawrence

Phone: (716) 475-7470

**SID '97**

May 12 - 16

Boston, MA

Information: Lauren Kinsey

SID

1526 Brookhollow Drive

Suite 82

Santa Ana, CA

92705

Phone: (714) 545-1526

Fax: (714) 545-1547

email: socforinfodisplay

@mcimail.com

**COLOUR '97**

May 26 - 30

8th AIC Quadrennial Meeting

Colour '97 Executive Committee Meeting

May 25

Kyoto International Conference Hall (KICH)

Kyoto, Japan

**ISCC ANNUAL MEETING**

Sep. 14 - 17

Inter-Society Color Council Annual Meeting with Color and Appearance Division of Society of Plastics Engineers

Newport, RI

Information: Gary Beebe

Phone: (215) 785-8497

**AATCC CONFERENCE AND EXHIBITION**

Sep. 28 - Oct. 1

American Association of Textile Chemists and Colorists

Marriot Marquis

Atlanta, GA

Information: AATCC

Phone: (919) 549-8141

**1998****TAGA ANNUAL CONFERENCE**

May 3 - 6  
 Technical Association of the Graphic Arts Annual Technical  
 Conference  
 Chicago, IL  
 Information: Karen Lawrence  
 Phone: (716) 475-7470

**SID '98**

May 17 - 22  
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**ASTM COMMITTEE E-12 ON APPEARANCE**

Jun. 16 - 18  
 Saint Louis, MO  
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**AATCC CONFERENCE AND EXHIBITION**

Oct. 4 - 7  
 American Association of Textile Chemists and Colorists  
 Convention Center  
 Philadelphia, PA  
 Information: AATCC  
 Phone: (919) 549-8141

**1999****TAGA ANNUAL CONFERENCE**

May 2 - 5  
 Technical Association of the Graphic Arts Annual Technical  
 Conference  
 Philadelphia, PA  
 Information: Karen Lawrence  
 Phone: (716) 475-7470

**SID '99**

May  
 California  
 Information: Lauren Kinsey  
 SID  
 1526 Brookhollow Drive  
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 Santa Ana, CA  
 92705  
 Phone: (714) 545-1526  
 Fax: (714) 545-1547  
 email: socforinfodisplay  
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**AATCC CONFERENCE AND EXHIBITION**

Oct. 12 - 15  
 American Association of Textile Chemists and Colorists  
 Convention Center  
 Charlotte, NC  
 Information: AATCC  
 Phone: (919) 549-8141

**2000****SID 2000**

May  
 Toronto, Ontario  
 Canada  
 Information: Lauren Kinsey  
 SID  
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 Fax: (714) 545-1547  
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 @mcimail.com



# 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!

#### JOB WANTED

Phil Q. Jin,  
The University of Chicago, 939 East 57th Street, Chicago, IL 60637  
ph.: (312)702-1987 (lab) or (312)363-7919 (home)  
fax: (312)702-4442  
e-mail: [jinq@midway.uchicago.edu](mailto:jinq@midway.uchicago.edu)

Ph.D. in Color Vision (03/95), MS in Color Science/Optics, interested in obtaining a professional position doing research, development, or marketing in color science and/or optics. Fluent in Chinese and English. Experienced in color vision, psychophysics, colorimetry, photometry, statistics, UNIX, C, image display programming. Permanent resident of USA.

## ISCC NEWS EDITOR Michael A. Hammel

Send photo material (black and white if possible) to:

Editor, ISCC News • Michael A. Hammel • 3782 Bonny Rigg Trail, Roswell, GA 30075

Please send all other materials on diskette as follows to the above address:

MS DOS-ASCII, Q&A, Word Star, Word Perfect (5.25"-1.2 Meg, or 360K) (3.5"-1.44 Meg or 730K). MACINTOSH-Word, Macwrite, MS Works (3.5"-1.44 Meg, 800K or 400K).

E-mail:

Internet: hammel@gvu.gatech.edu (or) MCSL@rit.edu

CompuServe: 75664,1567

If necessary, fax material to (404) 587-5128

Please note: the deadline for submission of material is the 1st of each even numbered month. Material received after the 1st will not be printed until the following issue.



meeting reports



photos



contributions from members

### OFFICERS 1994-1996

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Pres. Elect	Dr. Ellen C. Carter	2509 N. Utah Street, Arlington, VA 22207	(703) 527-6003	
Secretary	Dr. Danny C. Rich	Datacolor International, 5 Princess Rd., Lawrenceville, NJ 08648	(609) 895-7427	(609) 895-7461
Treasurer	Mr. Daniel S. Walton	Color and Appearance Technology P.O. Box 3709, Princeton, NJ 08543	(609) 734-0300	(609) 734-0245
Past-Pres.	Ms. Paula J. Alessi	Eastman Kodak Company, Rochester, NY 14650	(716) 477-7673	(716) 722-1116

### LIST OF DIRECTORS

#### 1993-1996

Mr. Gary E. Beebe	Ato Hass North America Inc., P.O. Box 219, Bristol, PA 19007	(215) 785-8497	(215) 785-4315
Mr. Joseph F. Campbell	DuPont Marshall Laboratory, 3401 Grays Ferry Ave., Philadelphia, PA 19146	(215) 339-6039	(215) 339-6008
Dr. Robert T. Marcus	Pantone Inc., 590 Commerce Blvd., Carlstadt, NJ 07072	(201) 935-5500	(201) 896-0242

#### 1994-1997

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Mr. Richard W. Riffel	ColorTec Associates, Inc., P.O. Box 386 Lebanon, NJ 08833	(908) 236-2311	(908) 236-7865
Mr. William S. Vogel	10013 Sagefield Dr., Baton Rouge, LA 70818	(504) 261-7107	

#### 1995-1998

Dr. Mark Fairchild	RIT Munsell Color Science Laboratory, P.O. Box 9887 Rochester, NY 14623	(716) 475 2784	(716) 475 5988
Mr. Ronald Oldchurch	1680 N. Hwy 101, #11 Leucadia, CA 92024	(619) 943 7029	(619) 943 7029
Prof. Wade Thompson	1910 East Cardinal St., Springfield, MO 65804	(417) 836 6694	(417) 883 5830

### ISCC MEMBER-BODIES

American Association of Textile Chemists and Colorists (AATCC)	Graphic Arts Technical Foundation (GATF)
American College of Prosthodontists (ACP)	The Human Factors & Ergonomics Society
American Society for Testing and Materials (ASTM)	Illuminating Engineering Society of North America (IESNA)
American Society of Interior Designers (ASID)	National Artists Equity Association (NAEA)
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)
Color Pigments Manufacturers Association (CPMA)	Society of Plastics Engineers, Color & Appearance Division
Detroit Colour Council (DCC)	Society for Imaging Science and Technology (IS&T)
Federation of Societies for Coatings Technology (FSCT)	Technical Association of the Graphic Arts (TAGA)
Gemological Institute of America (GIA)	Technical Association of the Pulp and Paper Industry (TAPPI)

### SUSTAINING MEMBERS

Pantone Color Institute  
Color and Appearance Technology

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