

Inter-Society Color Council *News*

Number 345

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NOMINATIONS FOR OFFICERS & DIRECTORS ANNOUNCED

The Nominating Committee, chaired by Past-President Hugh Fairman, and consisting of members Roland Connelly, Allan Rodrigues, Ralph Stanziola, and Evelyn Stephens, has made nominations for Officers and Directors of the Inter-Society Color Council for 1994 and following. The nominations were recently approved by mail ballot of the Board of Directors. By this newsletter item, the voting delegates are being notified of the nominations. Additional nominations may be made at the request of any five voting delegates. These voting delegates have twenty days from the time of notification through this newsletter to notify the Secretary of such additional nominations. The voting delegates should obtain the consent of the nominee to stand for election.

The nominees of the Nominating Committee for a January election for a two year term as Officers of the Council are:

President-Elect:	Dr. Ellen C. Carter OSA
Treasurer:	Mr. Daniel Walton IMG
Secretary:	Dr. Danny C. Rich ASTM

The nominees to stand for election in January for a three year term as Directors beginning immediately upon the conclusion of the 1994 Annual Meeting are:

Mr. Michael A. Hammel IMG
Mr. Jack A. Ladson IMG
Mr. Richard W. Riffel IMG
Mr. William S. Vogel AATCC

In the election for Directors, there will be three vacancies to be filled by the top three candidates.

The list of candidates brings to the ISCC a wealth of experience in color as well as other areas of endeavor.

The candidate for President-Elect DR. ELLEN C. CARTER is presently a member of the Board of Directors of the Inter-Society Color Council. Ellen attended Manhattanville College, and then in 1972 obtained her Ph.D. at Rensselaer Polytechnic Institute under Fred Billmeyer. Ellen spent the early years of her career at Sherwin-Williams in Sam Huey's color laboratory. She is currently Editor of

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New Board of Directors Nominees, from previous page

Color Research and Application.

DANIEL WALTON is Chief Financial Officer at Color and Appearance Technology in Princeton, NJ. Prior to joining CAT, Dan worked for 16 years at ACS which later became Datacolor International. Dan's education is in Accounting. He holds a BS with a major in Accounting and an MBA in Finance from Rider College. If Dan is elected, it will mark the first time that the ISCC has had an accounting professional as its Treasurer, having always opted in the past for a colorist turned Treasurer for this position. **DR. DANNY C. RICH** attended the University of Idaho majoring in physics. Then he obtained a Masters in physics at Virginia Polytechnic in Blacksburg, followed by a Ph.D. at Rensselaer under Fred Billmeyer in 1980. Dan spent 1980 through 1984 with Sherwin-Williams in Chicago before moving to Datacolor International where he is presently Manager of Advanced Colorimetry and Metrology. Dan is presently the Secretary of the Inter-Society Color Council.

MR. MICHAEL A. HAMMEL began his career in color and appearance in 1968 with Hunter Associates Laboratory. He later joined Gardner Laboratory as Sales Manager, has worked for Milton Roy, and founded Hammel & Company as a sales and consulting company with primary emphasis in the field of appearance measurement. He is currently Director of Sales for Colorgen Industrial Group. Mike has authored several papers on measurement of appearance and is an active member of ISCC, USNC, DCC, AATCC and is editor of the Inter-Society Color Council News.

JACK A. LADSON is Group Leader in the Product Development Group at BYK-Gardner, Inc. Jack has been with Gardner Lab for twenty years participating in a wide variety of association activities which has in the past included ASTM, CIE, CORM, CGATS, OSA and ISCC. He has authored several papers on geometrical

properties of appearance and measurement, as well as instrument performance parameters.

RICHARD W. RIFFEL is the head of the color lab at Monsanto's Indian Orchard Plant in Springfield, MA. There Rich deals with a wide variety of color problems relating to the coloring of the safety layer for automotive window glass. Rich is a graduate of RIT where he earned a MS degree in Imaging Science. Rich is presently the Co-Chairman of Interest Group II: Industrial Applications of Color with

Ralph Stanziola and was responsible for the activities of this IG at our recent meeting in Newport.

WILLIAM S. VOGEL attended Rutgers University where he obtained a BS in Chemistry. He began his career at Ciba-Geigy in Tom's River, NJ. Recently he has transferred to Ciba's plant at St Gabriele, LA, as Manager of the Color Laboratory. Bill is Chairman of AATCC's Committee RA-36 on Color and Appearance. Bill is a long time ISCC member, a former member of Project Committee #34 Color Difference, and has taught Color Measurement Workshops for AATCC.

THE ART & CRAFT MATERIALS INSTITUTE, INC. (ACMI)

ACMI SAFETY BOOKLET RECEIVES HONORS

ACMI has received honors at both the national and regional levels for its publication, "What You Need to Know about the Safety of Art & Craft Materials." The American Society of Association Executives has elected ACMI to the Honor Roll of its Associations Advance America Awards Program for ACMI's work in educating consumers about the safe use of art and craft materials through the booklet.

ACMI has also received an Outstanding Achievement Award in Public Relations for the booklet. The award was presented to Laurie Doyle, Associate Director of ACMI, at the Annual Meeting of the New England Society of Association Executives.

ACMI's booklet has assisted thousands of people in learning how to use art materials safely and has been referenced in a wide variety of trade and general publications.

New Officers and Directors Elected

At its recent Board and Annual Meetings, ACMI elected a new slate of officers and one new director for 1993-

94. The officers are Stephen Lynton, president; Phil Moll, vice president; Bond Sandoe, treasurer; and Deborah Fanning, secretary.

President **STEPHEN LYNTON**, of ColArt/Americas, Inc. in Piscataway, NJ, served for one year as ACMI's vice president before being elected President. He is a native of England and has resided in the United States for the past eight years. He received a diploma in business studies from Harrow College. He joined Winsor & Newton, now part of ColArt, in 1978 as Export Administration Manager after spending several years in the grocery industry. He also served as Marketing Manager of the company's Reeves-Dryad Division and headed a task force to study operational efficiency. Steve was appointed Planning Manager upon arrival in the U.S. and is currently Vice President of Sales and Marketing. He says he is still with the same company after 15 years because, "I still enjoy every day as much as the first." He became involved with ACMI because, "It's nice to try and give something back to an industry which has brought me so much enjoyment and where I've made so many good friends.

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VICE PRESIDENT PHIL MOLL earned his undergraduate degree in chemical engineering at Drexel University. He has worked at Binney & Smith, Inc. in Easton, PA for over fourteen years and is currently Director of Process Development/Product Safety. In this position, Phil is responsible for the transfer of new technologies and products from development to manufacturing.

TREASURER BOND SANDOE has been a member of ACMI's Board of Directors since 1977. He is President of American Clay Company, Inc. which was one of the founding members of ACMI. He received his business degree from Duke University and MBA from Butler University. His special industry interest is the Youth Art Month program, sponsored by ACMI.

Secretary **DEBORAH FANNING** is Executive Vice President of ACMI. She received her undergraduate degree in German from the University of Massachusetts at Amherst. She is a

Certified Association Executive and has nearly thirty years of association management experience. Deborah is Vice President of the Guild Associates, Inc., and association management company. She is a member of the New England and American Society of Association Executives and is Chief Executive Officer of four client associations.

DAVID BROWN, ACMI's new director, is Vice President of Palmer Paint Products. He has been with Palmer for nineteen years, starting at the company as a maintenance man and is now an officer of the company. His main areas of responsibility are manufacturing, the technical department, research and development, shipping and receiving, and purchasing.

For more information on ACMI and its programs, please contact the ACMI Office, 100 Boylston Street, Suite 1050, Boston, MA 02116, (617) 426-6400, (617) 426-6639 FAX.

The following story ran in the May/June 1989 issue of ISCC News. We thought you might enjoy reading it again. Ed.

THAT'S THE COLOR I WANT!!

The customer wanted EVERYCOLOR for the next season and he needed Quick Response. The designer selected SOMECOLOR to start with. The dyer was convinced that ANYCOLOR under the sun (or even cool white or tungsten) would be O.K. Management was ready to put SOMECOLOR or ANYCOLOR into production to stay on schedule but not EVERYCOLOR. In the ensuing battle it became obvious that with modern color science ANYCOLOR could be matched and that SOMECOLOR could certainly have the colorfastness necessary as well as a good price. However, all agreed that EVERYCOLOR could not be made in the time available. Some compromise was vital.

NOCOLOR was finally accepted by all those involved. And so NOCOLOR was put into production;

JUST-IN-TIME to miss the market!
Contributed by Louis Graham

INTERNATIONAL ART COMPETITION 1993

\$25,000 in Awards - New York Gallery Exhibition

The deadline is fast approaching for ARTFOLIO's annual multi-media competition.

All artists are invited to take advantage of this exciting opportunity to exhibit their artwork in the capital of the art world, New York City.

A top 60 "Winner's Exhibition" will be held in Art 54 Gallery, Soho, New York, from December 8- 26, 1993. The grand prize is \$5,000. The three distinguished judges are Susan Kismaric, Curator of the Museum of Modern Art, New York; Douglas Hyland, Director of the San Antonio Museum of Art, Texas; and Kathleen Derringer, Curator of The Discovery Museum, Connecticut.

Entries will be judged in the following categories:

Painting	Drawing
Pastels	Sculpture
Printmaking	Illustration
Icons	Watercolor

Mixed Media	Cartoon Art
Computer Art	Miniature Art
Photography	Holography
Clay	Glass
Fiber/Textiles	Paper
Furniture	Wood
Jewelry	Metalwork
Stone/Marble	

"The advantages of entering this competition are numerous," says Rachel Golan, one of the founders of ARTFOLIO. "This is by far the most economical way to gain exposure in New York, where critics explore artistic talent and share discoveries with art lovers everywhere."

For more details and information on entering this worldwide competition, contact: ARTFOLIO, Department of Art, 500 Summer Street, Suite 206, Stamford, CT 06901, USA, (203)359-4422 or 1(800)359-9531, Fax: (203)975-0266. All entries must be postmarked no later than October 11, 1993.

Aryana Nolan, ARTFOLIO

A I P R WORKSHOP, OCT. 13-15, 1993

The 22nd Annual AIPR (Applied Imagery Pattern Recognition) Workshop, "Inter-disciplinary Computer Vision: Applications and Changing Needs".

Cosmos Club in Washington D.C. This workshop is sponsored by the SPIE.

For further information please contact: J. Michael Selander (703)883-7294 or Joan Lurie (310)814-8690.

RESPONSE OF FRED BILLMEYER ON RECEIVING THE GODLOVE AWARD

Dear Friends in the ISCC:

I don't know how to acknowledge properly with my thanks to all of you who have contributed so much to my career in so many different ways. Let me first remind you of the old saying that I believe in firmly, that behind every successful man is a devoted wife, and acknowledge the support of my own wife, Annette.

I think that the precedent that has been started this year, of having one person receive at various times the Macbeth, Nickerson Service, and Godlove Awards, is in a way unwarranted. I think that the first recipient of all three of these awards should have been someone considerably more worthy of them than I. I have always felt myself to be the "new kid on the block" as far as color science is concerned, although as the years have gone by and I have gotten worn down a little bit, I'm not as new as I once was. But I feel that the first triple award recipient should have been a Dorothy Nickerson or a Dick Hunter or a Deane Judd or someone of that caliber.

Be that as it may, I want to thank both Joy Luke and Max Saltzman for nominating me for this award. I understand that Max said something that puzzles me, possibly in his nomination letter and, I know, by telephone to me when I learned of this honor. It was based on the old saying that goes back all the way to ancient times, having to do with "standing on the shoulders of giants." I am not quite sure what Max meant by that, but as I look around at the people I have had the privilege of working with and learning from, I feel that I owe my education in color science to these associations with the true giants in the field. Although I hate making and reading lists of names, because it is so easy to forget someone, I would like to note a number of these giants who are no longer with us. I particularly regret that I never had the opportunity to

know I. H. Godlove, but I am greatly indebted to Ralph Evans, S. Leonard Davidson, Franc Grum, Richard Hunter, Deane Judd, Dorothy Nickerson, Ed Stearns, and Gunter Wyszecski.

A precious few like giants are still with us, and we should make the most of their presence while it is still possible to learn from them. In this group I am particularly indebted to Eugene Allen, Walter Granville, Harry Hammond, Robert Hunt, Ruth Johnston-Feller, Joy Luke, David MacAdam, Cal McCamy, Max Saltzman, and David Wright.

But then I look also at the evidence of a group of potential new giants in the field, that I am privileged to think once stood on my shoulders for a little while and now have an influence on the ISCC. They are my former graduate students, and as they have already been mentioned so prominently today, I really don't need to name them again. They include your President, Paula Alessi, the ISCC Associate Editor of Color Research and Application, David Alman, past Board of Directors member and Macbeth Award recipient Roy Berns, Color Research and Application editor in chief, Board member, and Publicity chairperson Ellen Carter, past Board member and Arrangements chairman for this very successful meeting, Romesh Kumar, new Board member Robert Marcus, Secretary Danny Rich, and Board member and Member-Body Liaison chairperson Joann Taylor.

In thinking about what I have been telling you, over the last few weeks, it occurred to me that there is evidence for a lot of changes taking place these days in the Council. I want to mention a little about these changes, though when I attended the Board meeting a few days ago as By-Laws Committee chairman, I learned that the Board had been thinking along the same lines and discussing the same evidences for change. What are these changes? I will

remind you, first of all, that when the ISCC was founded in 1931, it was in order to bring together a group of people from different disciplines to work together to solve a color-related problem. This was the beginning of a strong emphasis in the ISCC on problem solving, and the Problems Committee and a long line of subcommittees, now called project committees and up to 49 in number, were called by Ruth Johnston-Feller the "heart of the ISCC." But the days of problem solving seem to be in decline. Most of the subcommittees have long since completed their work and been disbanded; today there are only three left, and at this time next year there may be only one. The interest in the Council has shifted, instead, to education. This has been a slow, deliberate process. For example, it was my privilege to introduce the category of student members many years ago, and you have just heard that this has now led to the formation of the first ISCC student chapter. We now have a standing committee on education, which will work closely with the Interest Groups, themselves organized with education strongly in mind. Of course these have come into being to supplement the Council's two main educational features, annual meeting (or, as this year, joint meeting) symposia and the highly successful series of Williamsburg Conferences, started in 1966. I am delighted to see the addition of an emphasis on education to the other activities of the ISCC.

A second change that is overtaking the Council is the problem of finding support for the officers. Let me tell you that well before "my day" in the ISCC, Ralph Evans of Eastman Kodak was secretary for 16 years, and during all that time the actual day-to-day work of secretary was carried out by George B. Gardner of Kodak. And Norman Macbeth was treasurer for no less than 28 years, with all the day-to-day work of that office carried out by Raymond Phipps of the Macbeth Corporation. There is no doubt that the Council flourished in no small part because

Evans and Macbeth were free of the daily chores of their offices and able to guide and direct the Council with their full attention. But when I took over as secretary on Evans' retirement and for the next 12 years, I had no such assistance, and that situation has continued. Especially in the last decade or so it has been very difficult to find officers with enough time and resources to carry out the duties of their offices. In today's business climate, it seems unlikely that we will see again the commitment of companies to long-term support, under which we once prospered.

Still another change in the structure of the ISCC has to do with the relative importance of the member bodies and the individual members. In 1931, the ISCC was founded, as its name suggests, as a council of representatives of societies, known then and now as member bodies. There were no individual members for the first three years, but this was soon changed. However, only member-body delegates could vote or hold office until very recent times. Now, any individual member has all the privileges once reserved for member body delegates only.

During the years of my close association with the operation of the Council, I have seen evidence that many member body societies have found themselves in less than favorable financial situations. Unless a society had at least one enthusiastic supporter of the ISCC as an influential member, the chances were that this member body would drop out of the Council. I can recall a high of 36 member bodies during my term as secretary; now we have somewhere in the low 20s, the number being uncertain as still more changes take place. These changes inevitably will result in financial problems for the Council, as the Treasurer has already hinted. At one time most of the ISCC income came from member body dues. I don't think that IMG dues ever took that position. In recent years we have relied on the success of annual meetings and Williamsburg Conferences to keep the

Council solvent, another example of the importance of education to our society. It is difficult to see how we can commit the Council to a continuing obligation for a paid staff member, the first in its history, on this uncertain income base. This is a situation that must be watched carefully as time goes on.

One of my most pleasant memories of receiving the Godlove Award will be this opportunity to speak to you for a few minutes. I hope you have found it interesting. Now it is time for me to let Paula get the meeting back on schedule. Thank you all very much.

Fred W. Billmeyer, Jr.



CIE SYMPOSIUM '93 ADVANCED COLORIMETRY

A symposium on this subject was held at the CIE Central Bureau in Vienna, Austria, June 8-10, 1993. The purpose of the symposium was to discuss considerations that led to the present CIE system of colorimetry and to review their limitations or shortcomings. A number of experts were invited to present their views and 26 persons from 9 countries accepted the invitation.

The need for a symposium to review the subject was precipitated by William Thornton in a 44-page paper titled: "Toward a More Accurate and Extensible Colorimetry. Part 1. Introduction. The Visual Colorimeter-Spectroradiometer. Experimental Results." published in *Color Research and Application (CR&A)*, v 17, n 2, April 1992, and subsequent discussions of the subject in the June and August issues. A Project Committee (PC 49) was established at the Annual Meeting of the Inter-Society Color Council

(ISCC) at Princeton, New Jersey, in June 1992. The PC met for four hours at the ISCC Annual Meeting at Newport, Rhode Island, April 18, 1993. Material was presented by PC Chairman William Thornton, Vice-Chairman Hugh Fairman, and Secretary Fred Billmeyer.

The CIE Symposium at Vienna was formally organized by CIE Executive Director, Janos Schanda. The program consisted of papers presented by thirteen authors. The first paper, presented by Alan Robertson, President of the International Colour Association (AIC), was an Overview of Sixty Years of CIE Colorimetry. Robertson presented a second paper on Review of Experiments Leading to and Properties of the 1931 and 1964 Standard observers.

This report will be too long for publication in one issue of ISCC News; so the author will stop here. Please look for additional information on this symposium in subsequent issues.

*From NIST Update,
August 9, 1993*

NEW PRESIDENT FOR ISCC SUSTAINING MEMBER BYK - GARDNER

The Silver-Spring-based manufacturer of color, appearance, and physical test instruments, recently announced the appointment of Dr. Daniel J. Pisano, Jr. as President and Director, effective July 1, 1993. Dr. Pisano has been involved with instrumentation for 15 years and has held positions in research and development, operations, and general management.

INTERNATIONAL ASSOCIATION OF COLOUR-CONSULTANTS (IACC)

International Association of Colour-Consultants in cooperation with the American Information Center for Color and Environment presents the San Diego Seminars of the IACC for Color and Environment. Seminar I will be held October 11-13 and Seminar II will be held October 14-16, 1993.

Color and light are major factors in our lives. Today, sophisticated techniques of research and analysis show us that color affects cortical activation (brain waves), functions of the autonomic nervous system, and hormonal activity, and that colour arouses definite emotional and aesthetic associations. Color influences both psychologically and physiologically.

For over 35 years the IACC has conducted a training program for anyone whose profession requires a deep understanding of color and its effects, with special emphasis on the use

of color in the man-made environment (architecture).

Seminar I discusses human reaction to color and to one's environment. Frank H. Mahrke, president of the IACC and internationally recognized authority on color, environment, and human reaction, will discuss four topics during the seminar. Analyzing the Environment will focus on the importance of correct man-made environments, the role of the professional color consultant, and the IACC.

Physiological Effects will discuss neurophysiological aspects, unity and complexity in balance, personality and

JACK HSIA ELECTED TO BE CIE PRESIDENT

At the Mid-Term Meeting of the CIE General Assembly, Edinburgh, Scotland, Dr. Jack J. Hsia was elected to be President of the International Commission on Illumination (CIE) 1995-1999. As President-elect, Dr. Hsia will serve as a voting member of the Commissions' Board of Administration until 1995 when he will become President at the 23rd Session of the CIE in New Delhi, India, November 1 through 3, followed by technical division meetings November 6 through 8.

Dr. Hsia has been serving as Secretary of the U.S. National Committee of the CIE (USNC/CIE) since 1987. He served as a director of ISCC from 1985-1988. Dr. Hsia joined the Radiometric Physics Division of the National Institute of Standards and Technology (NIST) twenty-two years ago and for a number of years has been head of the Colorimetry Unit of the Division.

reaction to stimulation, and environmental influence on emotions. Characteristics and Effects of Major Hues will focus on impressions, associations, symbolism, and psychological effect. Visual ergonomics and the perceptual world will be the focus of Role of Perception. Seminar II, Phenomenon Color, will focus on color theory, color harmony, and color as information/communication.

The seminars will be held in the Regency Plaza Hotel in San Diego California. For more information and registration materials, write to American Information Center for Color and Environment, 3621 Alexia Place, San Diego, CA 92116, or call (619) 283-0062.

1993 ANNUAL MEETING ITEM OF INTEREST

Another item of interest from the 1993 Annual Meeting held recently in Newport, RI was the Special Beverage that was produced specifically for the meeting.

Lovibond Golden Amber beer was specially brewed and bottled by Oldenberg Brewing Company for the Inter-Society Color Council. The circular seat-type insignia read "ISCC Annual Meeting, ISCC Symposium, Newport, Rhode Island, 1993" and in the center was a drawing of a Lovibond Tintometer set up in a triangular form with the words "Science, Industry, Art" forming the sides of the triangle. The label contained information about Joseph W. Lovibond (1833-1918). "His scientific interest in color stemmed from his early work as a brewer. He is noted for the development of the standardized Lovibond Colored glasses. These glasses were used in his Tintometer to examine transparent materials. This device could then be used to determine if a beer was truly a 'golden amber' color and would, consequently be of the finest flavor.

Harry Hammond III

INTERNATIONAL MEETINGS OF CORM AND CIE

CORM The CORM meeting at NIST, May 18-21, 1993, was billed as an International Conference, and in truth it was. A number of prominent scientists from other National Standardizing Laboratories attended. The registration list distributed May 21 contained names, addresses, phone and fax numbers for 120 attendees, 30 from eighteen other countries. The registration fee was high for a CORM meeting (\$130) but it provided funds to reproduce 150 copies of each view graph used by each speaker.

CIE Division 2, Measurement of Light and Radiation, met for two days prior to the CORM meeting and detailed reports were given on nine Technical Committees.

INTERNATIONAL CONFERENCE ON COLOUR EDUCATION 1994

The Faculty of General Studies and the Centre for Advanced Studies at the University of Industrial Arts Helsinki (UIAH) will organize a conference in Helsinki, Finland on the subject of color education in art and design schools during August 17-19, 1994. The conference is open to teachers, researchers, and students involved with color in either fine or applied art. The aim of the conference will be to review the current state of color teaching and its role in art and design education, and to provide an international forum for exchanging information and ideas on teaching color.

The conference will focus on the following themes:

Color - Light - Space - Object: color in design education; color on film and stage; color in architecture.

The Artist, Color, and Teaching: Itten, Kandinsky, Klee, and Albers; color education in fine art, contemporary art, and color.

Color Theories and Color Science: Bauhaus and post-Bauhaus, Goethe, Ostwald, Munsell, CIE, NCS, etc.; concepts of color harmony; new theoretical approaches in color for artists and designers; computers as an aid to color teaching.

While visiting Helsinki, participants to the International Conference on Colour Education will have the opportunity to combine in their travel program the Fifth International Symposium on Electronic Art (ISEA) '94 taking place at UIAH on August 23-26, 1994.

If you are interested in our conference, please send us your comments and suggestions on themes and possible speakers as soon as possible. Your comments will be most valuable in making this conference a rewarding, informative, and lively forum of colorful ideas.

The first announcement and call for papers will be available in September 1993. For further information please contact:

Harald Arnkil, Lecturer in Colour Studies, Tel: (+358 0) 799 827,75631, Fax: (+358 0) 7563 223; or Kristina Andersson, Secretary General, Tel: (+358 0) 7563 344, Fax: (+358 0) 7563 537.

NEW DIRECTOR FOR NIST

The U.S. Senate has confirmed Arati Prabhakar as director of the National Institute of Standards and Technology.

Prabhakar now takes on responsibility for managing NIST, an agency of the U.S. Commerce Department's Technology Administration. NIST is the only federal technology agency with the specific mission of helping U.S. industry. NIST also advances science and engineering, and works to improve public health, safety, and the environment.

President Clinton has proposed major expansion of NIST's laboratory research and development programs as well as the Institute's newer external activities of grants and extension centers to help industry to develop and better use technology.

Prabhakar comes to NIST from the Defense Department's Advanced Research Projects Agency, where she was director of the Microelectronics Technology Office. In this position, she managed a \$300 million program for the research, development, and demonstration of advanced microelectronics technologies critical for national security, with emphasis on dual-use technologies.

She previously served at ARPA as deputy director of the Defense Sciences Office and as a program manager in the Electronic Sciences Division. Prabhakar was a fellow in the congressional Office of Technology Assessment.

Prabhakar holds a B.S. in electrical engineering from Texas Tech University. She also holds an M.S. in electrical engineering and a Ph.D. in applied physics from the California Institute of Technology.

*Michael Newman
United States Department
of Commerce News
National Institute of Standards
and Technology*

IES INTERNATIONAL COMMITTEE ON ILLUMINATION (CIE)

The 1993 United States National Committee (USNC) Annual Meeting will be held from October 3 to 5, 1993 at the Hawthorne Hotel, On the Common, Salem, MA. The meeting will begin with a technical council/executive committee meeting on Sunday, October 3. Two technical sessions will be held on Monday, October 4.

The first is titled "CIE and IES International and National Lighting Standards." The second, held in association with the International Dark-Sky Association, is "Light Pollution, Obtrusive Lighting and Light Trespass." The final day of the meeting will include reports from all divisions and the standard committee and the annual USNC business meeting.

For more information of the USNC/CIE Annual Meeting, contact: Jack J. Hsia, Secretary, USNC/CIE, NIST, Room B306/220, Gaithersburg, MD 20899 (301) 975-2342 FAX (301) 840-8551

Or: Herbert A. Odle, Treasurer, USNC/CIE, Holophane Company, Inc., 214 Oakwood Avenue, Newark, OH 43055-7195 (614) 349-4229 FAX (614) 349-4185.

Jack Hsia, Secretary, USNC/CIE

EDITOR'S NOTE

We continue to receive information from all avenues for this newsletter and our thanks go out to those that do contribute. We strive to make your ISCC Newsletter as interesting and as fruitful as we can.

With that in mind, again we ask you - the readership to give. Reach way down in your pockets and give. What you know is of interest to others. Without your input the other readers will fall asleep. Please keep those disks and e-mail files coming folks! (And by the way, try to keep inside the deadline.)

Harry Hammond would like to spend more time with his wife Pauline. Is there someone that would be willing to put in no more than an hour every several months and help Harry to stay acquainted with his loving wife AND compile the Calendar(s)? You might even enjoy it! Try it, you'll like it. It is a way to find out ahead of everyone else, what colorful things are happening in the world (literally).

Drop us a note, we promise to appreciate it.

FROM THE EDITOR

I would like to take this opportunity to formally thank Karen (Rybarczyk) Braun for her assistance in the editing and production of the ISCC Newsletter.

As I'm sure most of you are aware, editing this Newsletter is a voluntary function, and finding time to generate the Newsletter is not easy!

Karen has graciously offered her services to help with the newsletter, and as a student at RIT simply studying takes most of her time (not to mention recently marrying!). To find time to do all three must be next to impossible. It is not impossible however, as she is doing a fine job of it.

Thank you Karen, for all you are doing for the ISCC.

Ed

NEW MEMBERS

We are pleased to list the latest members to the ISCC. Welcome!

Mr. James A. Cieslak
Johnsonite
16910 Munn Road
Chagrin Falls OH 44022
USA

Dr. Thilo H. Kaffenberger
WGH Press AG
Dorfstr. 7
Termen CH-3912
Switzerland

Mr. David L. Lee
Weyerhaeuser Paper
32901 Weyerhaeuser Way S
Federal Way WA 98003
USA

Ms. Ilona Nemes-Nemeth
Red Spot Paint & Varnish
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NEWS FROM MEMBER BODIES

COLOR ASSOCIATION OF THE U.S.

CAUS Color Conference, October 15-17, 1993.



Leaders in diverse fields seem to agree that interdependence and collaboration will likely distinguish the next century. Color does not exist in a vacuum. In the year 2000, textile stylists, fashion directors, designers, architects, and manufacturers will increasingly share ideas, and museums and sociological or ecological field studies could well be our future color emporiums. There will be new approaches - surprising ones.

The CAUS Color Conference "Color/2000" will make the initial forays into the next century by looking into what will be of color significance in the year 2000 and beyond. We hope you will attend this important gathering on October 15-17, 1993 at Montauk Yacht Club Resort Marina.

Topics and scheduled speakers:

Tomorrow's Textiles Roseann Forde, fashion director, Du Pont, Bonnie Cashin, designer, writer, painter

Street Fashion Colors from Today and Tomorrow June Roche, corporate fashion director, Milliken, tracks color from Paris and Tokyo to Harlery Davidson Bikers meets and college student spring breaks

Color in Architecture

Michael Graves, architect

Museums and Color Karl Katz, director, MUSE Film and TV

Enhancement through Color

Dominique Isbeque, Jennifer Morris, principals, Look Consulting, a New York City-based firm working to align outer appearance with goals and communication strategies

Climate/Environment & Color

Jean-Phillipe Lenclos, principal, Atelier 3D Couleur, a color/

design firm that focuses on environmental and product design approaches worldwide

Futures in Contract & Residential Color Linda Thompson, Pallas Textiles, Ken Charbonneau, Benjamin Moore & Co.

Women & Color

Mary McFadden

A Cultural Shift from Material to Spiritual William Segal, Margaret Walch, CAUS directors

Computer & Virtual Reality Color Anne Mitchell, corporate fashion director, AMC; Lillian Schwartz, author of *The Computer Artist's Handbook*, researcher, Bell Labs

Color and Health Care Design Debbie Kasmir, Ellerbe Becket
Sunday Morning Breakfast Wrap-Up Reports

A highlight of the Color/2000 A.D. Conference will be a tour of Jack Lenor Larsen's Longhouse Foundation in East Hampton. Longhouse is an unusual mix of gardens, collections, and a house that explores the relation of art to contemporary living. On view will be a new installation of ethnographic fabrics, primarily resists from Mr. Larsen's own collections.

A special invitation has been extended to ISCC members to attend the conference at the same special rate that CAUS members enjoy.

For more information and registration forms write to the

Color Association of the United States, 409 West 44th Street, New York, NY 10036, or call (212) 582-6884, (212) 757-4557 FAX.

Marcielle Bancou, Executive Director, CAUS

CD-ROM NOW AVAILABLE FROM

FSCT

FSCT

The FSCT and the Technical Committee

of the Chicago Society, in cooperation with the National Paint & Coatings Association, are developing the Coatings MSDS System for paint and coatings manufacturers. The Coatings MSDS System uses the latest in compact disc technology (CD-ROM) to compile an ever-expanding data base of the MSDS's used by the Coatings Industry.

The Coatings MSDS System fills the need for a simple, durable, and accessible storage system using the latest in CD-ROM technology. The FSCT is in the initial stages of production of the Coatings MSDS System on CD-ROM and is now accumulating MSDS's from raw material suppliers. The System is anticipated to be available at the FSCT Annual Meeting and Paint Industries' Show in Atlanta, Georgia, on October 27-29.

Available by annual subscription, updated CD-ROMs will be forwarded quarterly. The updated versions will contain all of the original MSDS's plus all new and revised MSDS's. All of the information on the MSDS's comes fully indexed, making it possible to find specific items in a matter of seconds. It is this accessibility, combined with the volume of information, that makes the Coatings MSDS System so attractive.

The Coatings MSDS System requires an inexpensive CD-ROM drive and may be used on both IBM compatible or Apple Macintosh SE/30 or Macintosh II family with 2MB of RAM. If you have any questions concerning the Coatings MSDS System, please contact Michele Wollheim at Accu-Mem (708) 670-7030, or FSCT Headquarters at (215) 940-0777.

IS&T / SPIE SYMPOSIUM ON ELECTRONIC IMAGING: SCIENCE & TECHNOLOGY



The Society for Imaging Science and Technology (IS&T) and

SPIE-The International Society for Optical Engineering invite you to participate in, and contribute to, the IS&T/SPIE International Symposium on Electronic Imaging: Science and Technology, the most important worldwide symposium covering all aspects of electronic imaging. The symposium will be composed of over 22 conferences, with papers providing timely expositions of the most recent developments. The conference will be held February 6-10, 1994 in San Jose, California.

The general chairs, Edward J. Delp, Purdue University, and Edward R. Dougherty, Rochester Institute of Technology, in conjunction with all of the conference chairs, conference committees, and the officers and staff of the supporting societies, hope to continue the growth of the symposium in both scope and quality.

The symposium remains dynamic, its topics reflecting the changing nature of electronic imaging. In this way, the societies can present conferences covering the latest advances, from image capture through storage, processing, analysis, and display. Some conferences have remained from last year, some have been changed, and others have been added.

Complimenting the conferences, there will be educational short courses, and small interest group meetings for discussion of various technological issues. The symposium provides a forum for transmittal of new developments, and discussions among those working in similar areas. In the end, the success of the symposium depends upon your participation. It is up to all concerned to provide the quality, scope, and interest to make the 1994 symposium the electronic imaging event of the year.

For more information on submission of papers for this symposium, contact:
IS&T/SPIE EI94
SPIE
P.O. Box 10
Bellingham, WA
98227-0010
Tel: (206)676-3290
Fax: (206) 647-1445



IS&T TECHNICAL SYMPOSIUM TO HIGHLIGHT THE DIGITAL FUTURE OF PREPRESS, PROOFING, AND THE PRESS



The Society for Imaging Science and Technology, a ISCC Member-

Body will hold its Third Technical Symposium on Prepress, Proofing and Printing on October 31 through November 3, 1993 at the Hyatt Regency Hotel in Chicago. The symposium will be held concurrently with Graph Expo 93, which will take place in McCormick Place East in Chicago, as well. The central theme of the symposium is "Focus on a Digital Future", according to Dr. Michael Rodriguez of R. R. Donnelley and Sons Company, who is Program Chair. Representatives of industry and academia will present technical papers in 18 sessions.

For symposium registration information, please call the IS&T Office at (703) 642-9090.

FSCT ANNUAL MEETING PROGRAM HIGHLIGHTS

FSCT

The basis for this year's Annual Meeting

technical program theme, "Today's Competitive Coatings: Lean, Mean, And Green", is the understanding that success in the coatings industry, both now and in the future, belongs to those who take the lead in blending long-term profitability, coatings performance, and environmental protection.

The theme recognizes these goals in the terms:

LEAN: as in cost effective; process efficient; and waste free;

MEAN: by being consistent; tough; durable ; and resistant;

GREEN: through being environmentally friendly; renewable; recyclable; and safe.

Other sessions to be held include Advanced topics in coatings research, latex technology, environmental affairs, environmentally compatible coatings, radiation curing and characterization of physical properties.

For further information contact FSCT (215) 940-0777.

THE ISCC WELCOMES CONTRIBUTIONS FROM OUR MEMBERS

O T H E R N E W S

UCLA EXTENSION
ANNOUNCES
SHORT COURSE

The Department of Engineering, Information Systems and Technical Management at UCLA Extension announces the short course "Photometry and Colorimetry in Electronic Imagery and Industry." The course will be held in Los Angeles, California from November 1-5, 1993.

This course offers the application of scientific color for engineers and scientists working in industry, and imparts the scientific color skills needed to solve industrial problems in color. It provides comprehensive coverage of photometry and colorimetry as it applies to self-luminous displays, electronic printing, and illuminated images, quality control, paint and dyes, etc. Basic concepts of radiometry and photometry are developed and techniques for measuring are described and demonstrated. A thorough review of color theory and characterization, including the basic color balance experiment, the derivation of the 1931 coordinate system, 1976 CIE color space, CIELAB and CIELUV color space, and delta E* are all developed and studied. The visual and psychophysical aspects of color are reviewed, with classroom demonstrations and personal hands-on experiments.

The lecturers for the course are Lawrence E. Tannas, Jr., president, Tannas Electronics, Orange, California; Kenneth A. Miller, president, Photo Research Division, Kollmorgen, Inc., Chatsworth, California; J.J. Rennilson, president, Advanced Retro Technology, Inc., La Mesa, California; Gary K. Starkweather, project manager, Peripheral Systems and Products, Apple Computer, Inc., Cupertino, California.

For more information, call the Short Course Program Office at (310) 825-3344; FAX (310) 206-2815.

UNIVERSITY CORNER
RIT AWARDS THE NATION'S
FIRST PH.D. IN
IMAGING SCIENCE

History was made May 22nd at Rochester Institute of Technology when the nation's first Ph.D. was awarded in

imaging science.

Robert Loce, 35, an imaging scientist in Xerox Corporation's Advanced Products and Technology/Imaging Science Laboratory, received the Ph.D., the first in RIT's 164-year history.

The national leader in imaging science education, RIT is the only university in North America to offer both bachelor's and master's degrees in imaging science. The doctorate enhances RIT's renowned imaging science program, already considered the most comprehensive in the world. The university estimates that 80 percent of American companies, including those in manufacturing, will need imaging scientists by the year 2000.

RIT created the doctoral degree program in imaging science in 1990 in recognition of the growing demand for research and education in areas such as diagnostic imaging, electronic printing, remote sensing, and HDTV.

"Our history and expertise in areas such as photography and photographic science, printing technology, the graphic arts, microelectronic engineering, and computer science, combined with our strong programs in materials science, physics, and chemistry, allowed RIT to develop the most unique program in imaging science in the nation," says RIT president Dr. Albert Simone.

Loce received his bachelor's degree in photographic science from RIT in 1985. In the areas of image processing and optical imaging systems, he is the author of 18 journal and conference publications and holds 18 patents. At Xerox, his work primarily involves simulation of digital reprographic systems and development of image processing algorithms for electronic printing.

"The research that I have been working on at RIT is already being applied at Xerox, and they're quite pleased with the results," explains Loce.

Imaging science at RIT formally began in 1985, when the Center for Imaging Science was established in response to a growing need for highly qualified imaging scientists, but has its roots in the university's long-established photographic science program.

The industrial Associates program began in 1987 and allows continuous interaction between industry and imaging science faculty, staff, and students. Among the distinguished group are Eastman Kodak Company, Fuji Photo Film, IBM, Konica Corporation, 3M Corporation, Polaroid Corporation, Mitsubishi Paper Mills, Ltd., and Xerox Corporation.

In RIT's Chester F. Carlson Center for Imaging Science, dedicated in 1989, the university has assembled some of the best and brightest minds in the world of imaging science. The center is the first, and largest, academic facility in the Western Hemisphere for education and research in imaging science, and reflects RIT's commitment to quality education in imaging science.

Neil Fagenbaum, RIT

KODAK PHOTO CD

The Kodak Photo CD system for making color separations has the potential to revolutionize the color prepress methods for publishers, trade shops, and image service bureaus. A CD of 24 color separations can be purchased for as little as \$25 from some sources. This capability gives publishers, customers, image service bureaus and printers the ability to produce complete pages on the desktop. They can easily drop the color separations into their QuarkXPress or PageMaker.

This eliminates the additional charges for high-end separations. Prepress production is speeded up and the customer has complete control.

The Kodak Photo CD process and its implications are fully explained in the February issue of "The Quality Control Scanner," a monthly newsletter dedicated to color quality and productivity. It is written by Professor Miles Southworth, the Roger K. Fawcett Distinguished Professor of Publication Color Management in the School of Printing Management and Sciences at Rochester Institute of Technology. Professor Southworth is known for his

many books, research articles, and newsletters about color prepress and color control. He is currently comparing the capabilities of the Photo CD process to other color scanning methods for quality, speed, and productivity in preparation for a future article.

The Photo CD report is only \$8.00 including postage. To obtain a copy of this special report, or information about other issues contact the Graphic Arts Publishing Company, 3100 Bronson Hill Road, Livonia, N.Y. 14487, (716) 346-2776.

Kay Burley

Graphic Arts Publishing Company

C A L L F O R P A P E R S

The Slovene Centre for Colour and the Slovenian Colorists Association present an International Color Symposium, Color and Colorimetry from Sept. 29 – Oct. 1, 1994.

The world we are seeing and living in is a world of light and colors. Color is not a property like volume, mass, or temperature, but a subjective sense of experience. Color can be perceived only by cells of a living organism; without this biological condition, color as conception does not exist. Therefore it is of great importance to be familiar with the achievements of the young interdisciplinary knowledge, to become qualified for unambiguous identification of colors and numerically to evaluate them by means of colorimetry.

The aim of the Symposium is to present the most up-to-date theoretic and applicative achievements together with effective and optimum use of colors in science and practice. It will consist of a series of papers on the following topics:

Theory of Color (Physics, Chemistry, Mathematics, Physiology, Psychology)	Color and Lacquers
Numerical Color Evaluation	Color and Paper, Graphics
Color Systems	Color and Plastics
Color Education	Color and Cosmetics
Color and Textiles	Color and Architecture
	Color and ...

The Symposium will also present a demonstration of systems for the determination of color values and generation computer aided recipes, laboratory dyeing devices, and an exhibition of literature, as well as many interesting social events.

Preliminary registration is due by October 1, 1993
and submission of titles and abstracts is due December 15, 1993.

For more information and registration materials, contact:

University of Maribor
Faculty of Technical Sciences
Slovene Centre for Colour
Smetanova 17, 62000 Maribor, Slovenia
Tel: (3862) 25-461, Fax: (3862) 225-013, (3862) 225-451

NIST AND FHA CONSORTIUM

THE SERVICE LIFE OF PAINT

A government-industry consortium for seeking a better way to predict the service life of paint will be proposed by the National Institute for Standards and Technology (NIST) and the Federal Highway Administration at an October 1993 workshop at NIST's headquarters in Gaithersburg, Maryland. The group's goal will be to help the U.S. paint industry get new, highly predictable products more quickly to market. Because of health and environmental concerns, the chemical makeup and manufacturing processing of paints have changed tremendously over the past decade. However, reliable methods of predicting performance have not kept pace. Current methods rely heavily on outdoor exposure tests that are time consuming and difficult to duplicate. The proposed consortium will develop an assessment protocol based on the fundamental mechanisms that cause paint degradation and will rely more on short-term laboratory tests. The consortium is expected to start in January 1994; individual member fees are estimated at \$30,000 per year. For more information contact Jonathan Martin, NIST, Gaithersburg. Tel 301-975-6717.

THE COLOUR GROUP (GREAT BRITAIN) FEBRUARY MEETING RESULTS

The February meeting of the Colour Group (Great Britain) took place at The Royal Society, Carlton House Terrace, in London. At this meeting, the Chairman, Dr. John Mollon presented the Newton Medal to Professor Semir M. Zeki in recognition of his exceptional and outstanding work on the processing of chromatic information in the visual cortex. For many years Professor Zeki's research interests have focused on the study of anatomical and functional organization of the visual cortex in the macaque monkey and the implications that these findings have for human vision in relation to results obtained from clinical and psychophysical studies.

After the presentation of the Newton Medal, Professor Zeki delivered his lecture entitled "Colour vision as a guide to brain organisation." He said that this lecture was to be 'his song in praise of colour vision' for being the simplest, most eloquent guide to the organisation of the cerebral cortex that has ever been found. In the first part of his presentation, Professor Zeki discussed the historical steps that preceded present day work. It was as long ago as 1861 when Broca first presented results which suggested functional specialization in the brain, for example, that the left lobe of the brain was responsible for the production of articulate speech. These results provoked further studies designed to reveal the organization of the mass of tissue in the cortex that was already known to be made up of many cells organized into essentially six layers. Later in 1905, Brodman provided the first architectonic picture of the brain's organization and Salomon Henschen of Uppsala University designated the primary visual cortex which has a distinct architecture (known today as

area V1) as the cortical retina, that is, the place where seeing occurred, and the visual psychic cortex which has a different architecture as the place where one understands what one sees. A similar view was put forward by Paul Flechsig of Leipzig University in the late 19th century.

Clinical observations that supported a theory of functional specialization in the visual cortex were ignored conveniently for decades, although no good evidence was ever produced to support alternative views. Detailed electrophysiological examination of the properties of single neurons revealed a great deal of cell specificity in the primary visual cortex of the monkey, largely as a result of the work carried out by Hubel and Wiesel in the seventies.

Of paramount importance in understanding the function of the prestriate cortex has been Professor Zeki's own electrophysiological studies in the macaque monkey. These studies provide a clear demonstration of the functional specialization and associate distinct visual functions with discrete areas of the brain. The experiments involved single cell recordings in prestriate areas of the brain in response to a range of stimuli such as color, size, spatial structure, orientation, and direction of movement. These studies resulted in the isolation of discrete regions of the brain where neurones specialize in the detection of movement (i.e. area V5) with little or no preference for orientation, size, or color. Another area, labeled as the V4 complex has been associated largely with the processing of chromatic information; the cells in this area show little preference for movement and respond best to the color of the stimulus even in the presence of large changes in illuminant. Cells in adjacent areas, namely V3 and V3A respond best to stimulus orientation but, like V5, show little preference for the color of the stimulus.

These results led to Professor Zeki's theory of functional specialization that is based directly on the experimental findings. The primate prestriate cortex

contains multiple functional areas each exhibiting a mapping of the visual field with a particular emphasis on a specific stimulus attribute such as structure, orientation, motion, or color. The majority of the input to the specialized areas comes from V1, so it too must have a specific function, likewise V2, which received input from V1 and connects with the same specialized areas. They are, in effect, behaving as the receiving points for the information on its way to the functionally specific areas.

Recent advances in staining techniques and the arrival of PET (positron emission tomography) have allowed the connections from V1 to other areas, and the location of such areas in the human brain to be identified and localized more precisely. Zeki's PET experiments were carried out at the Hammersmith Hospital in London. The technique requires the use of small doses of short lived radioactive isotopes that reveal small increases in regional cerebral blood flow as a result of intensive activation of certain areas of the brain. The function of the PET scanner is to reconstruct a map of brain activity from the detected changes in regional blood flow. In this way it is possible to identify, for example, the areas of the visual cortex that are involved specifically in the processing of color or movement information.

The results obtained confirmed earlier clinical observations in that the processing of stimulus color takes place in and around the lingual and fusiform gyri and that movement information is processed largely in a more lateral area which has been called human V5. The PET experiments confirm that functional specialization is also a feature of human visual cortex. Along with such studies, Professor Zeki also reviewed some of the psychophysical and clinical investigations in patients with specific prestriate lesions who exhibit specific defects of color vision or motion perception.

One prediction from the above studies is that areas V1 and V2, which feed the functionally specialized prestriate visual areas, must themselves

show some degree of functional specialization. More recent work with the cytochrome oxidase staining technique reveals the metabolic architecture of V1 that is characterized by columns of cells perpendicular to the surface of the cortex. Work carried out by Margaret Livingstone and David Hubel show that even the V1 region divides functionally into column regions where cells have wavelength discrimination properties and the intercolumn regions that are populated mostly by orientation selective cells. A similar organization has now been discovered in the V2 region of the cortex and the pattern of neural projections from these areas to more central prestriate areas is much better understood.

The discovery of several different visual areas specialized to process different attributes of the visual scene naturally raises the question of how these specific areas interact to provide us with our unitary view of the visual world. All the results show that there is no single area to which all the visual areas report exclusively. Rather there are intricate visual connections between the specialized areas and between the latter and areas V1 and V2, which feed them. These anatomical discrepancies have led Professor Zeki to propose a theory of multistage integration. Divergent integration is a process whereby perception and comprehension of the visual world occur simultaneously. The results of his most recent studies support this hypothesis. Such a system requires a network of re-entrant connections between all the specialized areas as well as within areas V1 and V2 that behave as the initial collecting stations for the parallel pathways from the retina. This pattern provides the means for uniting and synchronizing the signals for form and motion found in two different visual pathways. Output from V2 to the specialized areas is highly segregated. A complex re-entrant system in this region in particular from V4 allows signals dealing with form, motion, and color to be united.

Professor Zeki's concluding remarks

re-emphasized the important role that our perception of color has played in enabling many marvelous discoveries concerning the specificity and functionality of the cerebral cortex to happen. He went on to say that it is no longer possible to separate the process of seeing from that of understanding as neurologists once imagined, nor is it possible to separate the acquisition of visual knowledge from consciousness; in fact, consciousness may well be a property of the complex neural apparatus that the brain has developed to acquire knowledge.

Dr. Mollen thanked Professor Zeki for what was a truly inspiring and enlightening lecture, much appreciated by the audience that included many color and vision scientists. The lecture was then followed by the Newton dinner held at The Royal Society in honor of Professor Zeki.

Vicki A. Barbur

CR&A OCTOBER 1993

In This Issue

The first four articles in this issue deal with color CRT monitors. They range from theoretical considerations of monitor calibration and correction methods for color variation across a monitor screen to comparisons of color-appearance modes using CRT's in color science research.

Current trends towards increased use of CRT color monitors in color and vision research, desktop publishing, and prepress proofing make the colorimetric characterization of CRT performance an absolute necessity. It is important not only to characterize the CRT, but to relate accurately to CIE colorimetry the colors produced. Roy S. Berns, Ricardo J. Motta, and Mark E. Gorzynski team up to produce a pair of articles on CRT colorimetry. This set of articles provides an overview of current knowledge and practice concerning CRT color monitors. "CRT

SPECIAL SALE PRICE FOR PROCEEDINGS OF "COLOR '91"

Color'91 was held June 3-5, 1991 in Plovdiv, Bulgaria. The published proceedings of the conference are available for \$20.00 plus \$2.00 postage transferred to the account of The Color Group of Bulgaria, ZKK-FNTD: Bulgarian Foreign Trade Bank Sofia; Acc. N-421-087-300-5. For more information contact Dr. Todor Kehlibarov, Chairman, The Color Group, ZKK-FNTD, P.O. Box 431, 1000 Sofia, Bulgaria.
Color Research and Application

Colorimetry. Part I: Theory and Practice" concentrates on the signal processing and colorimetry appropriate to computer-controlled CRT displays and practical methods to characterize a display colorimetrically.

Just as it is vital to characterize the pigments to be used when formulating and shading paints, the precise and accurate colorimetric characterization of the computer-controlled CRT display is critical when the display will be used for psychophysical color research or when issues of soft-to-hardcopy conversions are to be considered. In "CRT Colorimetry. Part II: Metrology", the precision and accuracy requirements for photometers, colorimeters, and spectroradiometers are examined. A variety of tests and the results of evaluating four imaging systems are described. It is concluded that displays, measurement equipment, and procedures are available today to characterize colorimetrically computer-controlled CRT displays to very acceptable levels of precision and accuracy.

Researchers who have used CRT displays in vision experiments have

long been aware that a color displayed on the monitor may vary depending on the location on the screen. This spatial inhomogeneity complicates the accurate display of stimuli. Researchers have sometimes avoided this problem by confining the display to a small portion of the screen. Others have decided to "live with" a larger amount of variability in order to use the whole screen. James N. Cook, Pamela A. Sample, and Robert N. Weinred have developed a platform-independent spatial compensation algorithm to correct for variance in output luminance over the surface of the screen. In "A Solution to Spatial Inhomogeneity of Video Monitors", they describe the algorithm and its testing.

The fourth article in this issue on CRT displays deals with how the observer interprets color when viewed on a monitor. When we see light reflecting from a surface, the observer normally interprets the color as an attribute of the surface. However, color can be attributed to the light itself under certain viewing conditions. Normally we talk about perception in the surface color mode or in the aperture color mode to distinguish between these ways of attributing color. This issue becomes increasingly important because most colorimetric research is carried out with aperture colors, and most colors we perceive in everyday life are surface colors. Earlier research indicated that perceived brightness differs depending on color mode. Recently there have been articles examining brightness, chromaticness, and colorfulness in both modes, as well as an article discussing the factors that influence the observer's decision to consider a color as in a surface mode or aperture mode. In this issue, Hiroyuki Shinoda, Keiji Uchikawa, and Mitsuo Ikeda examine "Categorized Color Space on CRT's in the Aperture and the Surface Color Mode". The aim of their research was to study the structure of colors categorized in the aperture and the surface color modes. They compared zones of color categories on a chromaticity diagram when colors are perceived as aperture or as surface colors on a CRT display.

For the remaining articles in this issue, we will leave CRT's and delve into two other commercial areas. Any time that one is trying to reproduce or match in a different medium than the original, there are special considerations and problems. One of the most fundamental issues is whether the reproduction medium has as large a color gamut. It would be impossible to have accurate color reproduction of colors on the outer edge of the gamut if the reproduction gamut is not as great. In "A Fast Algorithm for Computing Color Gamuts", Masao Inui describes an algorithm for calculating the color gamut of a subtractive color dye system (such as that used in color transparencies). However, with minor modifications the same algorithm can be used for color-reproduction systems, whether subtractive or additive, covering other photographic, scanner, and hardcopy systems.

The last article deals with a completely different color measurement application: human teeth. When doing replacement or reconstruction on teeth, it is important for the new work to match that which is already in the mouth. The whitening of teeth is another aspect which has caused many

patients to seek professional help. It is useful to have objective methods of evaluation of the success of these procedures, but objective methods require specific measurement techniques and the use of accepted standards. Several whitening indices have been developed for various purposes, for example, in the paper industry. In "Measuring the Whiteness of Human Teeth", J.A. Garcia, M. Rubio, J. Romero, and E. Hita describe their attempts to determine the best index for measuring the whiteness of human teeth.

Last year the International Color Association (AIC) celebrated its twenty-fifth anniversary by holding a symposium in Princeton, New Jersey (see *Color Res. Appl.* 18, 54-66 1993 for a report on that meeting by David H. Alman). In the Brief Look Back section of this issue we are pleased to publish the AIC Silver Jubilee Banquet Speech by Gunnar Tonnquist. In his speech, entitled "25 Years of Colour With the AIC - and 25,000 Without", Mr. Tonnquist traces color's use and its description throughout the world from the beginning of history. We are also pleased to be able to include some of his color slides with this article.

C A L E N D A R

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

Harry K. Hammond, III
 BYK-Gardner, Inc.
 2435 Linden Lane
 Silver Spring, MD 20910
 301-495-7150 FAX 301-585-4067

1993

CMG - CONFERENCE, Sep. 12-14
 Color Marketing Group International Color Directions Conference, Hotel del Coronado, San Diego, California. Information: Katie Register (703) 528-7666.

DCC MEETING, Sep. 23
 Detroit Colour Council New Pigments for Automotive Applications, Michigan State Management Education Center, Troy, Michigan. Information: James Hall (313) 947-5428

USNC/CIE, Oct. 3-5
 The United States National Committee of the CIE, Annual Meeting, Hawthorne Hotel, Salem, Massachusetts. Information: Dr. Jack Hsia (301) 975-2342.

AATCC - CONFERENCE AND EXHIBITION, Oct. 3-6
 American Association of Textile Chemists and Colorists, Montreal, Quebec, Canada. Information: AATCC, (919) 549-8141.

OSA - ANNUAL MEETING, Oct. 3-8

Optical Society of America Annual Meeting, Toronto, Canada. Information: OSA (202) 223-0920.

IS&T 9th INTERNATIONAL CONGRESS, Oct. 4-8

The Society for Imaging Science & Technology, 9th International Congress on Advances in Non-Impact Printing Technologies with Exhibit, Pacific Convention Plaza, Yokohama, Japan. Information: IS&T (703) 642-9090.

FSCT - 71st ANNUAL MEETING, Oct. 27-29

Federation of Societies for Coatings Technology 71st Annual Meeting and 58th Paint Industries' Show, Georgia World Congress Center, Atlanta, Georgia. Information: FSCT Office, (215) 940-0777.

COLOR IMAGING SYSTEMS, Nov. 7-10

Color Imaging Systems co-sponsored by the Society for Imaging Science and Technology and Society for Information Display, The Pointe Hilton Resort at Squaw Peak, Phoenix, Arizona. Information: IS&T (703) 642-9090.

ASTM COMMITTEE D-20 ON PLASTICS, Nov. 15-18

Fort Worth, Texas. Information: Katharine Schaff, (215) 299-5529.

1994**ASTM COMMITTEE D-1 ON PAINT, Jan. 23-26**

Crown Sterling Suites, Fort Lauderdale South, Florida. Information: Scott Orthey, (215) 299-5507.

ASTM COMMITTEE E-12 ON APPEARANCE, Jan. 23-26

Crown Sterling Suites, Fort Lauderdale South, Florida. Information: Bode Buckley, (215) 299-5599.

WILLIAMSBURG CONFERENCE, Feb. 21-23

Inter-Society Color Council Williamsburg Conference on Fluorescence, Williamsburg, Virginia. Information: Richard Harold (703) 471-6870.

IMAGES IN COLOUR, Apr. 10-12

The Royal Photographic Society Imaging Science and Technology Group and The Colour Group (Great Britain) Symposium on Images in Colour. University of Cambridge, Cambridge England. Information: Michael Pointer 44 81 424 4524 FAX 44 81 424 3750

BARTLESON SYMPOSIUM, Apr. 11

Cambridge, England.

ISCC - ANNUAL MEETING, Apr. 24-26, 1994

Inter-Society Color Council Annual Meeting & Joint Symposium with Detroit Colour Council, Troy Marriott, Detroit, Michigan. Information: Jim Kaiser (313) 583-8345

TAGA ANNUAL CONFERENCE, May 1-4

Technical Association of the Graphic Arts Annual Technical Conference, Baltimore, Maryland. Information: Karen Lawrence, (716) 475-7470.

CMG - CONFERENCE, May 8-10

Color Marketing Group International Color Directions Conference, Sheraton New York Hotel & Towers, New York, New York. Information: Katie Register (703) 528-7666.

ASTM COMMITTEE D-1 ON PAINT, Jun. 26-29

Marriott Crab Tree Valley, Raleigh, North Carolina. Information: Scott Orthey, (215) 299-5507.

ASTM COMMITTEE E-12 ON APPEARANCE, Jun. 19-23

Montreal, Canada. Information: Bode Buckley, (215) 299-5599.

IESNA ANNUAL CONFERENCE, Aug. 7-11

Illuminating Engineering Society of North America, 88th Annual Conference, Miami, Florida. Information: Valerie Landers, (212) 705-7269.

CMG - CONFERENCE, Sep. 25-27

Color Marketing Group International Color Directions Conference, Sheraton Bal Harbour, Miami, Florida. Information: Katie Register (703) 528-7666.

AATCC - CONFERENCE AND EXHIBITION, Oct. 11-14

American Association of Textile Chemists and Colorists, Convention Center, Charlotte, North Carolina. Information: AATCC (919) 549-8141.

LONG RANGE CALENDAR**1995****ASTM COMMITTEE E-12 ON APPEARANCE, Jan. 22-26**

San Antonio, Texas. Information: Bode Buckley, (215) 299-5599.

ISCC PANCHROMATIC CONFERENCE, Feb. 5-8

Inter-Society Color Council Pan-Chromatic Conference, Reston, Virginia. Information: Michael Brill (703) 734-4027.

TAGA ANNUAL CONFERENCE, Apr. 2-5

Technical Association of the Graphic Arts Annual Technical Conference, Orlando, Florida. Information: Karen Lawrence, (716) 475-7470.

ISCC ANNUAL MEETING, Apr. 23-25

Inter-Society Color Council Annual Meeting, Greensboro, North Carolina. Information: Ms Ann Laidlaw (919) 274-1963

CMG - CONFERENCE, May 14-16

Color Marketing Group International Color Directions Conference, Dallas Texas. Information: Katie Register (703) 528-7666.

CIE, Sept.

New Delhi, India

MEMBERSHIP APPLICATION

INTER-SOCIETY COLOR COUNCIL APPLICATION FOR INDIVIDUAL MEMBERSHIP

Name _____ Date _____
 Dr. Mr. Ms.

Company/Affiliation _____

Street _____

City, State, Zip _____

Telephone (____) _____ Home

Fax (____) _____ Business

Signature

My chief interests in color are:

Fundamental and Applied Research

Industrial Application of Color

Art, Design and Psychology

My work relates to the following products and services:

Name other interests

My present and past business, professional or educational connections with color are: _____

My particular interests in color are: _____

I belong to the following national organizations or associations: _____

I learned about ISCC from: ISCC Newsletter Other source: _____

Please tell us the individual or organization that interested you in ISCC

ISCC dues are shown on the reverse side. Applications for membership dated prior to July 1 should be accompanied by full annual dues; those dated July 1 and later should be accompanied by 50% of annual dues. You have the option of subscribing to Color Research & Application at special membership rates. If you wish to do so, please add \$70 (U.S.) or \$100.00 (Overseas) to the amount of your check.

This application and remittance should be sent to

Ms. Ann C. Laidlaw, Membership Committee,

c/o SheLyn, Inc., 1108 Greccade Street, Greensboro, NC 27408 Telephone: (919) 274-1963

ISCC BY-LAWS

EXCERPT FROM THE BY-LAWS OF THE INTER-SOCIETY COLOR COUNCIL, INC.

Constitution, Article II — Aims and Purposes

The Council shall operate solely and exclusively as a non-profit organization with the aims and purposes:

- A. To stimulate and coordinate the work being done by the various members leading to the description and specification of color by these members.
- B. To promote the practical application of this work to the color problems arising in science, art, and industry, for the benefit of the public at large.
- C. To promote communications between technically oriented specialists in color and creative workers in art, design, and education, so as to facilitate more effective use of color by the public through dissemination of information about color in both scientific and artistic applications.
- D. To promote educational activities and the interchange of ideas on the subject of color and appearance among its members and the public generally.
- E. To cooperate with other organizations, both public and private, to accomplish these objectives for the direct and indirect enjoyment and benefit of the public at large.

Council Activities

The ISCC is the principal professional society on the field of color in the United States, encompassing the arts, sciences and industry, pursuant to the Aims and Purposes described above. Other national organizations with an interest in color are Member-Bodies of the Council and appoint delegations to participate in the Council's work. Individual members are the largest single group. The Annual Meeting, usually held in April, includes meetings of the Project Committees and sessions of four Interest Group: Measurement & Colorimetry; Vision & Color Appearance: Art, Design & Psychology; and Color Education. There is also a main program devoted to a specific aspect of color plus a Poster Paper session. Joint programs with one of the Council's Member-Bodies are interesting and educational.

In most years there is a separate topical Williamsburg Conference, often in February, where a single color subject is explored in depth with participants from all over the world providing state-of-the art information. Attendance at these conferences is usually smaller than at Annual Meetings, reflecting their topical nature and permitting interaction between speakers and participants.

The ISCC is the U.S. Member of the Association Internationale de la Couleur (AIC), which holds general meetings quadrennially and topical meetings annually. Color Research & Application, published bimonthly in English, is the principal international journal in this field; it is endorsed by ISCC. It reports recent research and opinions of colorists, review books and reports on national and international color meetings. Membership in ISCC permits subscription at more than a 50% discount. The ISCC News, a bimonthly newsletter, reports the color activities of the Council, its members, Member-Bodies and international color organizations. Members receive the ISCC News at no cost. Member-Bodies and Sustaining Members receive 10 copies of the ISCC News.

Categories of Membership

	Annual Dues
<i>Individual Member.</i> Any person interested in color and desirous of participating in the activities of the Council.	\$45.00
<i>Student Member.</i> Full time students.	\$10.00
<i>Member-Body.</i> Any non-profit national organization interested in color and desirous of participating in the activities of the Council.	\$100.00
<i>Sustaining Member.</i> Any organization not eligible as a Member-Body, or any individual, interested in color and wishing to support the work of the Council. Receives 10 copies of ISCC News.	\$500.00
<i>Retired.</i> Treasurer must be notified, in writing, of retirement before dues have been billed.	\$10.00
<i>Library Subscriptions.</i> Receives all ISCC mailings, including ISCC News.	\$60.00
<i>Overseas Member.</i> A surcharge of \$20 is added to \$30 dues to cover additional mailing costs.	\$65.00

AATCC - CONFERENCE AND EXHIBITION, Oct. 8-11
American Association of Textile Chemists and Colorists,
Hyatt Regency, Atlanta, Georgia. Information: AATCC,
(919) 549-8141.

1996

ISCC ANNUAL MEETING, Apr. 21-23

TAGA ANNUAL CONFERENCE, Apr 28-May 1
Technical Association of the Graphic Arts Annual Technical
Conference, Dallas, Texas. Information: Karen Lawrence,
(716) 475-7470.

AATCC - CONFERENCE AND EXHIBITION, Oct. 8-11
American Association of Textile Chemists and Colorists,
Oprtkabd Hotel, Nashville, Tennessee. Information: AATCC,
(919) 549- 8141.
1997

TAGA ANNUAL CONFERENCE, May 4-7
Technical Association of the Graphic Arts Annual Technical
Conference, Montreal or Quebec City, Canada. Information:
Karen Lawrence, (716) 4757470.

AATCC - CONFERENCE AND EXHIBITION,
Sep. 28- Oct. 1
American Association of Textile Chemists and Colorists,
Marriott Marquis, Atlanta, Georgia. Information: AATCC,
(919) 549- 8141.
1998

TAGA ANNUAL CONFERENCE, May 3-6
Technical Association of the Graphic Arts Annual Technical
Conference, Chicago, Illinois. Information: Karen Lawrence,
(716) 475-7470.

AATCC - CONFERENCE AND EXHIBITION, Oct. 4-7
American Association of Textile Chemists and Colorists,
Philadelphia, Pennsylvania. Information: AATCC, (919) 549-
8141.

1999

TAGA ANNUAL CONFERENCE, May 2-5
Technical Association of the Graphic Arts Annual Technical
Conference, Philadelphia, Pennsylvania. Information: Karen
Lawrence, (716) 475-7470

AATCC - CONFERENCE AND EXHIBITION, Oct. 12-15
American Association of Textile Chemists and Colorists,
Convention Center, Charlotte, North Carolina. Information:
AATCC, (919) 549-8141.

Attention All ISCC Members and Interested Parties:

A CALL FOR POSTER PAPERS

for the Williamsburg conference has been issued. While it is unusual for the ISCC to offer a Poster/demonstration session at Williamsburg, we have chosen to do so because of the exciting graphic nature of the subject. Entries should pertain to the colorimetry of fluorescent materials.

Submit titles and abstracts no later than October 1, 1993 to:

Ron Oldchurch
1680 N. Hwy. 101 #11
Leucadia, CA 92024
Phone/fax: (619) 943-7029
E-mail: Internet bsa @ mcl. Saic.com

NEWSLETTER EDITOR Michael A. Hammel
ASSOCIATE EDITOR Karen M. Braun

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

Editor, ISCC News • 98 Grand View Drive • Fairport, NY 14450 • Tel. (716) 223-1823

If at all possible, please send all other materials ON DISKETTE as follows:

MSDOS-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)

For E-Mail transmission send information to "MCSL@RITVAX.ISC.RIEDU"

For hard copy transmission, FAX to (716) 425-2411.

Or send to: Dr. Ellen C. Carter • 2509 N. Utah St. • Arlington, VA 22207-4031

Please note: the deadline for submission of material
 is the 1st of even numbered months.



meeting reports



photos



contributions from members

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Ms. Magenta Yglesias	JJ, Inc., 1827 23rd St. NW, Washington, DC 20008-4030	(202) 328-2120	(202) 232-5602

1992-1995

Dr. Michael H. Brill	Science Applications, Int'l Corp., 1710 Goodridge Dr., MS-1-11-1, McLean, VA 22102	(703) 734-4027	(703) 821-3576
Prof. Robert Chung	Rochester Inst. of Tech., School of Printing, One Lomb Memorial Dr., PO Box 9887, Rochester, NY 14623-0887	(716) 475-2722	(716) 465-7063
Dr. Joel Pokorny	939 East 57th Street, Chicago, IL 60637	(312) 702-1983	

ISCC MEMBER-BODIES

American Association of Textile Chemists and Colorists (AATCC)	Graphic Arts Technical Foundation (GATF)
American Chemical Society (ACS)	The Human Factors & Ergonomics Society
American College of Prosthodontists (ACP)	Illuminating Engineering Society of North America (IESNA)
American Psychological Association (APA)	National Artists Equity Association (NAEA)
American Society for Testing and Materials (ASTM)	National Association of Printing Ink Manufacturers (NAPIM)
American Society of Interior Designers (ASID)	National Paint and Coatings Association, Inc. (NPCA)
American Society for Photogrammetry and Remote Sensing (ASPRS)	Optical Society of America (OSA)
The Color Association of the United States, Inc. (CAUS)	Society for Information Display (SID)
Color Marketing Group (CMG)	Society of Motion Picture and Television Engineers (SMPTE)
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)

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