

# Inter-Society Color Council *News*



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Number 313

MAY-JUNE 1988

Allan's two years as President, the Board of Directors has made several large structural changes in how the Council functions. These changes were made not because the ISCC was functioning poorly but rather to better accommodate the diverse interests represented within the Council.

The Council exists to encourage the development of new knowledge about color. It is equally a center for the exchange of current information about color between different fields of interest and it is also the place where individuals can cooperate in solving practical color problems. The reorganization is intended to make better provisions for these diverse functions. The new Interest Groups provide a forum for communication within closely related fields. The Project Committees continue to provide a way to concentrate on specific color problems. The inclusion of invited and poster papers in the Annual Meeting program provides for the timely presentation of recent research.

Of course, just changing the structure of an organization does not automatically improve its functioning. It is the way these changes are implemented that will determine whether or not they achieve their goals. In the process of trying to make improvements, we must be careful not to lose the qualities that have made the Inter-Society Color Council a viable organization in the past and its meeting stimulating to attend. As always the main value of the Council will be in bringing the members together for an exchange of information and viewpoints on the intricate subject of color.

I ask for the help of every member in making the new structure successful. This means not only participating in the various activities, but also letting officers and Board members know about the things you believe are functioning well and those you think could be improved. I, personally, would especially appreciate hearing your criticisms. It will not be possible to satisfy everyone but we want to assure that the Council is a responsive organization, well informed about the interests of all its members.

You have made a very fine choice by electing Hugh Fairman President-Elect, which means he will follow me in this office. Hugh and I will begin to confer and work together just as Allan kept me closely informed while I was President-Elect. We will continue to have the benefit of Alan's advice and support as Past-President. This interlocking system ensures a smooth transition and unified position within the Council over the years.

## THE GAVEL IS PASSED

At the 1988 Annual Business Meeting of the ISCC, out-going president Allan Rodrigues passed the gavel to president-elect Joy T. Luke. Hugh Fairman now will assume the duties of president-elect for the next two years. Therese Commerford will continue as secretary. Our finances will be in the capable hands of our new treasurer, Philip Hunter. Ed Conner, after a number of years of faithful service can now relax and enjoy, without having to manage the budget. New members of the board of directors are W. Nick Hale, James Cave and Hilton Brown, all of whom now begin a term of three years.

Since this must be in the hands of the printer before the annual meeting actually takes place, the above paragraph reports events to come rather than those that have in fact occurred. A more complete report of the annual business meeting will be in the next issue of the NEWS.

## FROM THE PRESIDENT

I am deeply honored to have been elected President of the Inter-Society Color Council. Membership in the Council has enriched my life in many ways and it will be a great satisfaction to me if I can contribute something toward extending the Council's vitality and usefulness into the future.

I am following in office a particularly fine President. Allan Rodrigues has been a strong leader with a commitment to provide every Member-body and individual member with the assistance necessary to make their membership in the ISCC fruitful. He has been fair and considerate of all interests. During

Thank you for your continuing interest in and support of the Council.

Joy Turner Luke, President

## MEMBER BODY REPORTS

### Detroit Colour Council

Report for 1987-88 Program Year:

The Detroit Colour Council continued to build membership in the past year, acting as a forum for automotive color issues. Four successful program meetings were held, as follows:

Natural Leather Automotive Trim with Lowell Ramussen of Eagle Ottawa Leather and Robert White of Rohm & Haas.

Building Quality Into The Product with Mark Berenson of SCM Chemicals.

The Challenge of Automotive Color with Sol Panush of BASF Corp.

Automotive Color Coatings, a half-day symposium featuring Joseph Piazzon, General Motors; John Young, Ford Motor; Roy Sjoberg, Chrysler Motors; Jane Wolever, Honda of America; and Michael Franck, Daimler-Benz.

The DCC continues its support, through funds and instruction, of color education at Eastern Michigan University and Center for Creative Studies.

The DCC officers for 1988 are:

President: James Keiser, E. I. DuPont

Vice-President: Steve Daniel, 3M Automotive

Secretary: Joseph Koreck, Bee Chemical

Treasurer: Ella Brennan Cotter, BASF

Submitted by W.V. Longley, Delegation Chairman, April, 1988

## SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS

### Report from the Society of Motion Picture and Television Engineers Delegates Roland J. Zavada, Chairman

One of the highlights of the Society's 129th Technical Conference and Equipment Exhibit, held October 31 to November 4, 1987, in Los Angeles, was the screening of high-definition television material. The films, which were originally produced by HDTV and then transferred to 35-mm film, were impressive in their technical and artistic quality.

The conference theme, "Imaging and Sound — Today and Tomorrow," was enhanced by the presentation of many papers on the science of color:

Fox's Development of CinemaScope, 1953-1954

Stability of Processed Cellulose Ester Photographic Films

Restoring the First Television Show Produced on Color

Video Tape — An Evening with Fred Astaire

40 Years of Upgrade and/or Downgrade in Viewed Image Quality on the Screen Including Lens Changer

Eastman Color High-Speed Daylight Negative Film 5297/7297 — Trade Reaction

A Color Negative Film for Laser Recording

Electronics in Discharge Lighting

The Illumination of Travelling Matte Backing

Camera Lens and Light Source Filtering Recommendations for Application in Fluorescent and High-Intensity Discharge Lighting Situations

Eastman Color High-Speed SA Negative Film 5295: Production Experience

Colorization Challenges

Television-Compatible Prints: Fitting a Quart of Light Onto a Pint-Pot Screen

Film Facet 3000H Color Film Analyzer

The 300H Video Color Film Analyzer, A New Generation A Radically New Video Color Analyzer Designed Specifically for the Motion-Picture Industry

A New 1-Degree Spotmeter for Measuring Screen Brightness and Set Lighting

Optimizing the Encoding Process to Overcome the Major Defects of NTSC Color Pictures

Development of the New Generation's CCD Color Camera Component Analog Video Color Correction

Creative Color Correction in Component and Composite Environment

Several recipients were honored for outstanding technical achievements at the Honors and Awards Luncheon:

The Agfa-Gevaert Gold Medal was presented to Max Rotthaler, Institut fur Rundfunktechnik, for the development and improvements in the interface of film and television in the areas of colorimetry, steadiness, film equipment interface, and standardization.

Recipient of the John Grierson International Gold Medal Award was Ross Lowell, Lowell-Light Manufacturing, Inc., in recognition of his many achievements, inventions, and innovative developments in the field of lightweight lighting.

Petro Vlahos, Vlahos Motion-Pictures, Inc., was awarded the Herbert T. Kalmus Gold Medal Award for his outstanding contributions in the development of color films, processing, techniques and equipment useful in making color motion pictures for theater or television use.

The David Sarnoff Gold Medal Award was given to Yves C. Faroudja, Faroudja Laboratories, Inc., for his contributions in optimizing NTSC signal performance by developing techniques presently used in video processing equipment.

For his devoted energies and commitment during his professional career to both the motion-picture and television industries, particularly his early work which resulted in a color

laboratory which processed the first 35-mm color feature film, Irwin W. Young, Du Art Film Laboratories, Inc., was awarded the Progress Medal Award.

Color was the subject of several papers presented at the 22nd Annual SMPTE Television Conference, January 29-30, 1988, in Nashville, Tennessee:

Television Signal Transmissions: Technology in Transition  
A Single Channel Backward-Compatible EDTV System  
Noncompatible 6-MHz High-Definition TV Distribution Systems

International Transmission of HDTV

The Work of the Advanced Television Systems Committee  
Challenges to the Development of Studio Picture Monitor Specifications

Graphics Applications for Engineers

A list of papers on color published in the SMPTE Journal during 1987 is appended.

#### PAPERS PUBLISHED IN THE SMPTE JOURNAL, VOLUME 96, 1987

S. W. Spakowsky, J. C. Norris, and S. J. Powell, "Eastman Color High-Speed Daylight Negative Films 5297 and 7297," 679-683, July.

W. F. Schreiber, "Improved Television Systems: NTSC and Beyond," 734-744, August.

Y. Faroudja and J. Roizen, "Improving NTSC to Achieve Near-RGB Performance," 750-761, August.

R. Schafer and P. Kauff, "HDTV Colorimetry and Gamma Considering the Visibility of Noise and Quantization Errors," 822-833, September.

R. J. Iredale, "A Proposal for a New High-Definition NTSC Broadcast Protocol," 959-970, October.

F. J. Van Roessel and E. Tienkamp, "The Computer as a Camera-Operation and Image-Quality Manager," 1079-1086, November.

J. R. Forrest, "A Route to Higher-Definition Television with DBS," 1087-1089, November.

J. A. Mendrala, "Electronic Cinematography for Motion-Picture Film," 1090-1094, November.

H. Schou and D. Case, "An Experimental Quality Control Program for Printing Archival Films," 1180-1185, December.

*Editor's Note:* This may set a modern record for response from member-bodies. It is the first time since the late sixties that I remember an annual report having been prepared in time for the annual meeting. We are most grateful to Bill Longley and the DCC as well as Rollie Zavada and SMPTE for their energetic and timely activity. They have provided role models that we sincerely hope other member-bodies and delegation chairmen will emulate. The next issue will, we hope, have reports from *all* the other member bodies. The next dead-

line is June 15, 1988. This should be ample time to let us know what you have been doing in the past year.

#### CALL FOR PAPERS!

##### 1989 ISCC Williamsburg Conference: Color Discrimination Psychophysics

The 1989 ISCC Williamsburg Conference will be held *November 28-December 1* in Colonial Williamsburg. The objectives of this conference are to stimulate research and facilitate the exchange of information on the Psychophysics of color vision.

A two and one half day program of invited and contributed papers is planned by the conference co-chairmen, Dr. Alan Robertson from the Canadian National Research Council and Dr. Roy Berns of the Rochester Institute of Technology Munsell Color Science Laboratory. The program committee solicits papers on all aspects of color discrimination psychophysics. Sessions will focus on surface colors and aperture colors including stimuli generated on self-luminous displays. Consideration will be given to research likely to influence future methods of quality assurance rather than existing applications.

Abstracts should be submitted to Dr. Roy Berns, Munsell Color Science Laboratory, Rochester Institute of Technology, P.O. Box 9887, Rochester, NY 14623-0887 [Phone No. (716)475-2230]. Please include authors, affiliations, principal author's address and daytime telephone number, title and abstract typed on one page. The deadline for submissions is February 27, 1989. Authors will be notified of acceptance by March 31, 1989.

##### THE COLOUR GROUP (Great Britain) from the March 1988 Newsletter

The 213th meeting of The Colour Group (Great Britain) was held at The City University, London, on 1987 December 2.

*Spatial and chromatic properties of terrain scenes and their implications for post-receptoral coding mechanisms* was presented by Dr. I.R. Moorehead of RARDE. Dr. Moorehead addressed the question "What aspect of the luminance and colour information in a retinal image should be preserved (or removed) in the recoded version and what is the optimal coding? Experimental results indicate that photoreceptor information is recoded prior to transmission to the cortex.

Dr. Moorehead used colour transparency film to record 49 calibrate colour paths, and real scenes consisting of armoured vehicles in grassland: a total of 72 scenes were produced. These were scanned by an image processor through red, green and blue filters to give CIE X,Y,Z, tristimulus values that represented the luminance and colour information of the images.

128x128 pixel patches were produced of the real scenes,



centered on the vehicle. It was obvious from a comparison of the separate X,Y,Z content of each scene, that distance affects chromaticity, e.g., a shift in the blue direction as the distance increases.

Spatial and spectral statistics for a number of scenes were presented. Spatial characteristics showed adjacent images to be alike, thus making a lot of the information arriving at the receptor level redundant. The fact that there are *fewer optic nerves than receptors* in the eye suggests that there is such a compression of information.

The amplitude spectrum was approximately inversely proportional to the frequency, the spectrum for the bluer cones appearing less than that for the red and green ones. The correlation between the red, green, and blue signals was found to be better along the rows than down the columns probably because of the structure of the image, i.e., the rolling nature of the land with very few trees; this indicating that the results were scene dependent.

The results of the photographic/colorimetric experiment were summarized by four points:

1. A reliable method was developed for measuring the tristimulus values of images at high resolution.
2. Retinal cone signals are highly correlated both between different cone types and between cones in different positions.
3. The amplitude spectrum for natural scenes falls off as the inverse of the frequency.
4. The amplitude spectrum for images seen by each of the red, green and blue cones is not significantly different.

A second paper, *High speed instruments for colour measurements*, was presented by Dr. R. Angus of Nonolight Instruments Ltd. Dr. Angus compared the speed and reliability of three main types of instruments: three or four filter/photocell pairs whose spectral responses match those of the CIE 1931 Standard Colorimetric Observer; a monochromator and stepper motor; a polychromator and an array of photo-detectors.

Dr. Angus pointed out the limited accuracy attainable with the first type, the relatively slow data acquisition rate of the second type and the conflict between achieving a wide wavelength range and high resolution with the third type as well as the high noise associated with a high dark current requiring cooling of the sensor array. He then proceeded to describe an instrument that combines the high speed of the polychromator and detector array method with the accuracy of the monochromator. This is achieved by replacing the stepper motor with a D.C. motor directly attached to the grating via a spindle. The grating spins continuously at approximately 900 rpm. An encoding disc, which is read by an infra-red source/detector system is attached to the motor and enables the grating's position to be determined at any one time. A complete visible spectrum, measured at 0.5nm intervals, takes approximately 3 ms to measure, with a repeat rate of 15 spectra/sec.

After enumerating the advantages of this fourth system, Dr. Angus proposed that in many applications this alternative technique of high speed colour measurement provided a cost effective, highly reliable and superior instrument compared with the now familiar polychromator/photo-diode array based systems.

### Report of the 214th meeting held on 1988 January 6 at The Institute of Ophthalmology, London

R.W.G. Hunt made the opening presentation on "The effects of adaptation on receptor response and colour appearance." Physiological studies have shown that cone responses for different states of adaptation can be represented, on a log-log plot, by a family of S-shaped curves that are displaced along their log-stimulus axis. A model of colour vision was presented that incorporates curves of this type together with similar curves for the rod responses. The model was then used to predict the way in which colours alter in appearance as the level of adapting luminance is changed.

A second paper was titled "Colour constancy and the retinex theory" and was presented by K. McLaren. In classical colour vision theory the colour of an object is governed primarily by the stimulation of each type of cone by light from the object relative to that of the other two cone types. On the other hand, Land's retinex theory (1964) postulates that it is governed by the stimulation of each cone type by the light relative to the stimulation of cones of the same type caused by the light from the surrounding field. As these relative stimulations are unaffected by wide variations in the amount of stimulating light in the illuminant this explains colour constancy without the observer having to recognize subconsciously that an illuminant is present and to discount its colour as suggested by Helmholtz in 1867.

Among several other papers presented was an invited lecture by Dr. Oscar Estevez from the University of Amsterdam, Laboratory of Medical Physics. Talking to the subject "Making colour vision models; what are the questions?," Dr. Estevez suggested that models can be of two types: they can either reproduce a real situation or represent that situation. Many of today's so-called colour vision models are representative of part of the visual processing system and a key question is not so much what do they accurately model but what do they fail to model.

Dr. Estevez briefly outlined the structure of the visual system to make the point that it is a highly complex system. He reminded the audience that vision is about looking at objects and that vision gives us information about shape, form and movement as well as contrast and colour. He stressed the importance of the visual field, quoting the example that peripheral vision provides a stimulus that serves to signal a change in direction of our viewing. Models of the visual system tend to be

static whereas vision is very definitely dynamic and the overall need is for better models of the visual system and not just models of colour vision.

*The 217th meeting of The Colour Group (Great Britain) was held at the University of Bradford on 1988 April 6-7. This meeting was a conference on "Small Colour Difference Measurement."*

## ABOUT OUR MEMBERS

### 1987 Hermann von Helmholtz Prize Awarded

Leo M. Hurvich and Dorothea Jameson of the University of Pennsylvania have been awarded the 1987 Hermann von Helmholtz Prize by the Cognitive Neuroscience Institute. The award was given in recognition of their research on color perception in the human visual system and the development of a precise opponent-process model.

### About Our New President

Although you are probably aware of the many contributions to the Council of our new president during her term as a member of the Board of Directors (1980-1983) you may not be aware of the fact that she labors hard and long in the ASTM committee on Paint and Related Coatings and Materials, particularly the Subcommittee on Artists Paint and Related Materials which she was instrumental in establishing in 1977. She is also active in the ASTM Appearance Committee, particularly the Subcommittee on Color Order Systems, which serves as the U.S. Technical Advisory Group to the International Standards Organization Technical Committee on this subject.

Primarily for her work in the Paint Committee, Luke received the ASTM Award of Merit at the June 1987 meeting of this committee in Dearborn, Michigan. This award also carries with it the title of Fellow of ASTM. Luke was previously honored by the Paint Committee in 1981 by being voted the recipient of the prestigious Gardner Award for being the most efficient among leaders of the 26 paint subcommittees. She played a major role in the development of three ASTM standards relating to the safety and consistency of artists' materials.

Luke studied art at Rollings College, Southern Methodist Univ., and American Univ. She began her career in 1943 as head of the display dept. at a Florida department store. In 1965 she joined Studio II Art School as a drawing and color instructor, accepting a position in 1968, with the Art League as painting and color instructor. She has been proprietor of Studio 231 since 1972, and continues to teach courses and offer lectures on color. Her paintings have been shown in many galleries and museums including the Smithsonian Institution in Washington, DC.

Luke is on the editorial board of the journal, *Color Research and Application*, where she also contributes articles on color and book reviews on the subject. She is a member of the United States National Committee of the International Commission on Illumination, the National Artists Equity Assn., the Art and Craft Material Institute, the College Art Assn., and the Washington Conservation guild.

### Larry Tannas New President of SID

Larry Tannas, chairman of the SID Delegation to ISCC, will be installed as President of SID at their Symposium in Anaheim, CA during the week of May 22, 1988.

## APPLICATION FOR INDIVIDUAL MEMBERSHIP

### For Approval at Board of Director's Meeting May 7, 1988

- |  |  |
|--|--|
| Mr. Terry D. Applegate<br>502 Pasadena Avenue<br>Columbus, Ohio 43228  | Manufacturer's representative for a major supplier of color instrumentation. Is involved in color control, and the teaching of color, for paints, plastics and textiles. Color interests are the improvement both of agreement between visual and instrumental data, and sample preparation. |
| Mrs. Ronda Smart<br>Bradford<br>P.P.G. Industries<br>4325 Rosanna Drive,<br>P.O. Box 9<br>Allison Park, PA 15101 | Is involved in research, teaching and the control of color for paints. Interests include the psychological and physiological effects of color. Member of ACS.  |
| Ms. Yvonne M.<br>Clingerman<br>613 W. Sycamore Drive<br>San Gabriel, CA 91775                                    | Student at California State Polytechnic University-Pomona, with a major emphasis on Interior Design. Interests are the psychological effects of color on people in a non-residential environment, and how one can use color to aid the mind, productivity and health.                        |
| Mr. John M. Cone<br>IBM Corp., Dept.<br>H29/205<br>Box 12195<br>Research Triangle Park,<br>NC 27709              | Employed in the Visual Performance Laboratory of IBM, providing vision research services. Interests are display ergonomics, and ergonomic standards. Member of SID and SPSE.   |
| Mr. Charles G. Golemba<br>UNISYS Corp.<br>41100 Plymouth, MI<br>48170  | Work involves quality control for computer products. Interests are color use as a design semantic, and color and imaging on monitors. Member of CAUS.  |

- Mr. Chris Greatrex  
Davidson Instrument  
Panel (Textron)  
128 Peter St., P.O. Box  
300  
Port Hope, Ontario L1A  
3W4 Canada  
Colour Supervisor of quality control and tinting of paint and plastisol products. Interests in color include automotive interior, inherent problems in color matching. Member of DCC.
- Mr. Douglas M. Grossman  
Q-Panel Co.  
26200 First Street  
Westlake, OH 44145  
Has 14 years experience designing and correlating accelerated weathering chambers that evaluate materials' resistance to color change caused by UV. Interests are color changes due to weathering, color measurement and spectrophotometry. Member ASTM, FSCT, AATCC.
- Ms. Sandra Guttormson  
SG Design  
229 N. Smoketree Ave.  
Agoura, CA 91301  
Provides teaching and research services to the paint and ceramics fields. Her interests are how color relates to children in school setting (preschool to college level). Is working on Masters in color/children (psychology), historical colors.
- Mr. Timothy B. King  
VP, Periodicals Division  
John Wiley & Sons, Inc.  
605 Third Avenue -  
10th Floor  
New York, NY 10158  
Serves as Vice-President, Periodicals Division, of John Wiley & Sons, Inc. His color interests are 4-color printing and color illustrations.
- Mr. Charles L. Leary  
1227 Westbrook Street  
Portland, ME 04102  
Provides services in teaching and styling for glass and paint. Color interests are stained glass, paint and art.
- Miss Barbara Marston  
Professional Color  
Consultants  
72 Deening Street, Apt. 3  
Portland, ME 04101  
Has her own color consultant firm for wardrobe and interiors. Also is a painter, working mostly in oils. Interests include: researching what colors enhance individual colorations; maintaining a bank of graduated colors.
- Mr. Glen C. Miller  
SPAS-Rochester Institute  
of Technology  
One Lomb Memorial Drive  
Rochester, NY 14523  
Teaches at college level subject of photographic color systems. Color interests include color theory applications of color measurement techniques to photographic reproduction problems.
- Dr. Alan L. Moyer  
Eastman Kodak  
32 Wiggins Avenue  
Work involves research on electronic color processing and separation to color graphics arts business units.
- Bedford, MA 01730
- Ms. Karen L. Papy  
Design Spectrum, Inc.  
1156 Piedmont Ave.,  
NE A-5  
Atlanta, GA 30309  
Provides interior design services, working with textiles, paint and art objects. Interests include the human response to color; both the physical and psychological effects on human beings that color produces through environmental contact. Member of IES.
- Mr. Roy Perkinson  
Museum of Fine Arts  
479 Huntington Ave.  
Boston, MA 02115  
Is Conservator of Prints and Drawings for the Boston Museum of Fine Arts. Work involves recording color changes in art objects, and monitoring color changes in experiments.
- Mr. Lou T. Protonentis  
Guilford Mills, Inc.  
P.O. Box U-4  
Greensboro, NC 27402  
Provides quality control services to warp knits and textiles. Color interests include dyehouse measurement of fabric, various numeric systems such as CIELAB\* color differences, CMC and BFD, and measurement of luster. Member of AATCC.
- Ms. Melissa Roskiewicz  
North Brookfield School  
District  
32 Lagoon Road  
Ware, MA 01082  
Is both an artist and an art teacher, working with paint, textiles and ceramics. Her interests include color mixing, color optics, color and its psychological effects, color in painting, inks, color in graphic art, color tones and ranges.
- Mr. Kenneth S. Simone  
Sherwin-Williams  
Company  
10909 South Cottage  
Grove Ave.  
Chicago, IL 60628  
Provides control and research services in the paint field. Color interests include quality control, and formulation.
- Mr. Kenn L. Thomas  
Applied Color Systems  
5 Princess Road  
Lawrenceville, NJ 08648  
Involved in computer color control and matching for ink products. Experience with color problems include pigment production, color reproduction in printing industry, color matching, color specification and control. Color interests are: digital color specification and formulation; adult training in color theory and specification.
- Mr. Jerry L. Townsend  
Life Awareness  
Associates  
1545 Webster St., #C  
Fairfield, CA 94533  
Uses the Luscher Color Test (full test) with all clients, as well as color and color imagery in doing psychotherapy. Color interests are the psychological and emotional implication of color.

Ms. Barbara Harrington  
E.I. DuPont Co.  
63 Summer Street  
Cohasset, MA 02025

Work involves fibers and interiors. Problems with color have been a lack of understanding of colors/light and how they affect people in the working environment. Interests in color are psychology/human factors of color.

Mr. Douglas Ford Rea  
Rochester Institute of  
Technology  
One Lomb Memorial  
Drive  
Rochester, NY 14623

Teaches color photography, color theory and visual effects of color. Color interests include the solving of problems that have to do with photography and color, and the incorporation of computer imaging into his field.

Mr. Mark Gorzynski  
RIT – Munsell Color  
Science Lab  
One Lomb Memorial  
Drive  
Rochester, NY 14623

Serves as a Graduate Assistant for the Munsell Color Science Lab. Conducts general research related to instrumentation and imaging systems. Color interests include appearance, numerical and statistical analysis, applications in electronic imaging systems.

### Some Currently Active Project Committees

#### PROJECT #22: MATERIALS FOR INSTRUMENT CALIBRATION:

**Purpose:** There is a need for a neutral body to catalog and recommend suitable optical materials, the procedures for their use, and the pertinent techniques for the calibration of color measuring instruments.

**Scope:** To develop calibration techniques for specialized areas such as fluorescent, geometric, and retroreflective color measurement. To maintain a current list of calibration materials commercially available for use in the United States, and to update the tables in ISCC Technical Report 78-2 when necessary. To maintain working groups in the areas of education, terminology and calibration requirements for specialized color measurements.

**Objectives:** To revise the tables of ISCC Technical Report 78-2 within the coming calendar year.

#### PROJECT #27: INDICES OF METAMERISM:

**Purpose:** There is a need to classify and define the visually important phenomena of relative color change on change in illuminant or observer, to relate them to metamerism, and to develop numerical indices for describing them.

**Scope:** 1) To develop appropriate terminology and definitions

for describing the problems of metamerism, color constancy, and related phenomena.

2) To conduct experiments to generate data necessary to define metamerism, color constancy and other related phenomena and to test existing definitions.

3) To develop mathematical formulae to effectively quantify phenomena comprising the problem of metamerism.

**Objectives:** 1) To write and publish a paper recommending standard nomenclature and symbols for quantities and concepts dealt with in matrix derivations of Euclidean color space.

2) To complete the analysis of the Committee's visual scaling experiment, and to disseminate the results by publication, if warranted.

#### PROJECT #32: IMAGE TECHNOLOGY:

**Purpose:** There is a need for an inter-disciplinary study of the problems common to photography, printing, video display and television relating to the rendition, measurement, and specification of color.

**Scope:** 1) To compile a bibliography of recent color reproduction publications of interest.

2) To maintain a current list of user's needs and accomplishments with respect to calibration of video display phosphors, and display viewing conditions.

3) To design and execute some experiments to define the mapping function which would allow us to go from video display color space to hardcopy color space.

**Objective:** To compile a color reproduction (particularly video display) bibliography within the coming calendar year.

#### PROJECT #44: REGULAR RHOMBOHEDRAL SAMPLING OF VISUALLY UNIFORM COLOR SPACE

**Purpose:** To facilitate the application of regular rhombohedral sampling of visually uniform color space to practical problems in art and industry.

**Scope:** 1) Collect information on rhombohedral systems.

2) Identify where improvements in such systems would be desirable.

3) Define anticipated requirements, such as visual uniformity, step size, orientation, gamut, sample size, material, and method of display for greater utility in specific applications.

**Objectives:** Design and perform a limited experiment to verify the chromatic chrispening effect.

Analyze existing data to verify the chromatic enhancement of lightness effect.

Design and perform a limited experiment to verify the

uniform step sizes of an existing system.

#### PROJECT #45: PHYSIOLOGICAL RESPONSE TO COLOR

**Purpose:** There is a need to classify and define how color influences human physiology, psychology, and behavior in order to improve use of color in the human environment.

**Scope:** 1) To develop appropriate terminology and definitions for describing the effect of color on human physiology, psychology, and behavior.

2) To conduct experiments to generate data necessary to define human physiological response to color.

3) To conduct experiments to study the effects of color on human psychology and behavior.

**Objectives:** To design and conduct an empirical study which will yield repeatable data on the biological response of normal humans to color.

#### NEW DIRECTIONS FOR A MEMBER OF ISCC'S BOARD OF DIRECTORS

Roland L. Connelly and Robert F. Willis have left Burlington Industries corporate research and development division in Greensboro, N.C. to establish color consulting service to the textile, apparel, paint and plastics industries. The new company, *SheLyn, Inc.* is already providing contract consulting services on color technology applications and development, and it expects to be marketing specialized color systems in the very near future.

Connelly who is president of *SheLyn*, has been active in the ISCC for many years serving as chairman of a project committee and currently as a member of the Board of Directors.

The new company is located at 2806A Patterson Street in Greensboro, N.C. 27417-0973. The telephone number is (919)855-5162.

#### GROUP FLIGHTS TO AIC 89

The next International Colour Association (AIC) quadrennial meeting will be in Buenos Aires, Argentina on March 13-17, 1989. AIC President-elect Dr. Alan Robertson suggested that ISCC arrange a group flight to the meeting for U.S. and Canadian attendees. If there is sufficient interest, we could be eligible for group rates. We would all use the same airline, but not necessarily have to fly on the same plane. The rates could also apply regardless of which city each individual flew out of. If you have an interest in participating in a group plan, please contact Allan Rodrigues (E. I. DuPont, P.O. Box 2802, Troy, MI 48007). We will need an indication of your probable travel dates, originating airport, number in your party and a phone number to reach you. This is *not* a commitment, merely an indication of interest. We cannot proceed with arrangements unless there is sufficient interest. We must hear from you by June 15, 1988.

#### CALENDAR

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

Harry K. Hammond III  
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#### 1988

**AMERICAN CHEMICAL SOCIETY, June 5-10**  
195th Spring National Meeting and Third Chemical Congress of North America, Toronto, Canada. Information: (202) 872-4398.

**COLORIMETRY: AN INTENSIVE SHORT COURSE FOR SCIENTISTS AND ENGINEERS, June 6-9 & 13-16**  
Munsell Color Science Laboratory, Rochester Institute of Technology, Rochester, New York. Information: (716) 475-5842.

**ASTM COMMITTEE D-1 ON PAINT, June 26-29**  
Baltimore, Maryland. Information: (215) 299-5543.

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