

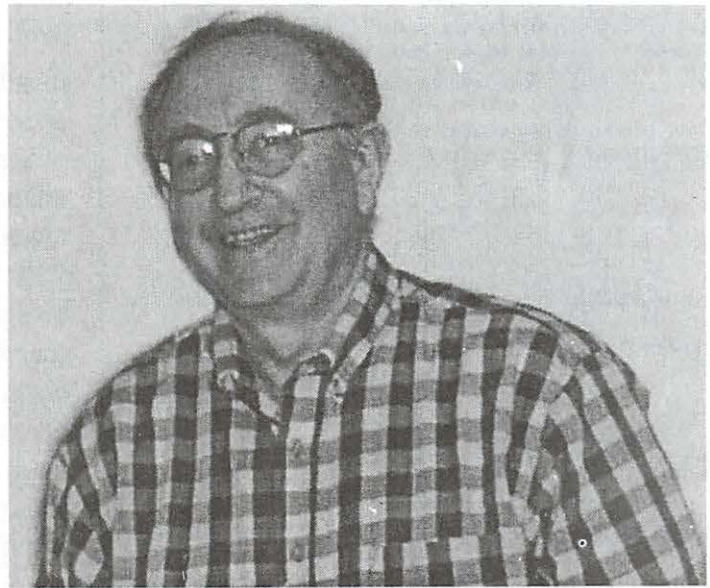


Inter-Society Color Council *News*

Issue 402 Contents

Paul Tannenbaum, Obituary	Cover
Letter from ISCC President	2
BOD, Officers Contact Information	2
Roland Connelly Elected President of AATCC	3
2003 Annual Meeting, Chicago Info. ...	4
Interest Groups/Programs	5
Symposium on Color and Appearance Instrumentation	6
AATCC Committee RA36 Highlights .	6
New ACM Journal	7
Color Cosmos/Color Harmony Web Site	7
Color Research & Application, April, 2003	8
Allen Ferrell Takes the Helm at CMG..	9
Videotape: Concepts & The Munsell System	9
Calendar	10
IS&T Annual PICS Conference	11
Advertisement.....	11
Sustaining and Memberbodies	Back Cover
Editor, Office Contact Information.....	Back Cover

March/April 2003



Paul M. Tannenbaum

Our colleague Paul Tannenbaum passed away on January 29, 2003. A respected color scientist, Paul has been an active member of the Inter-Society Color Council. He was Technical Program Chair of the 2002 Annual Meeting. Also active in ASTM International, he was a former chair of Subcommittee E12.01 on "Terminology", and more recently initiated and chaired Subcommittee E12.14 "Multi-dimensional Characterization of Appearance".

After receiving his doctorate in physics from Courant Institute of Mathematical Sciences of New York University, he developed an interest in Color Science working on the "picturephone" at Bell Labs. His publication of "The Spectral Reflectance of Hair, Skin, Wigs, and Beards in the Visible and Near-Infrared and Their Influence on PicturePhone Image Quality" was typical of his many technical contributions throughout his career. He thoroughly explored and understood the technical fundamentals in order to solve real-world problems. When Bell Labs discontinued this project, determined to continue his career in color, he moved to



ISCC EXECUTIVE OFFICERS

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2002-2005

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Tannenbaum*Continued from page*

DuPont's Engineering Physics Laboratory to, in his words, "work at the feet of the master, Chuck Reilly."

Paul was able to apply his skills to a variety of colored products, including plastics, films, fibers, clinical analyzers and mostly automotive finishes. His first project at DuPont was to improve metamerism indices. He collected visual assessments by fifty observers of color differences between twenty-five metameric pairs under daylight and incandescent light. His analysis of the data resulted in an improvement, the Tannenbaum Metamerism Index.

In addition to color, Paul contributed to the understanding of appearance. Individual components of appearance, such as gloss, haze, distinctness-of-image, etc, could be measured, but their interaction towards overall appearance perception could not be stated. Paul recognized that perceived color could be mathematically described because of the characterization of the "Standard Observer". No such observer had been established for appearance perception. His research found this missing but unimplemented link in the literature and led to incorporation of the Optical Transfer Function into a patented instrument that allowed assessment of perceived appearance. E12.14 will continue this work that he started.

Reference to Reilly as the "master" was typical of Paul's generosity in giving praise to his fellow workers, acknowledging their contribution to any success. He will be remembered by his colleagues in DuPont and professional society committees not only for his technical skills but also for his enthusiasm and teamwork. He is survived by his widow Felicia and his children Stephen, Joyce and her spouse.

In lieu of flowers, the family suggests contributions to the Brian L. Dombchik Memorial Fund, c/o Congregation Beth Shalom, 18th St. & Baynard Blvd., Wilmington DE, 19802. Brian, the teenage son of friends of the Tannenbaums also died of cancer. A fund was set up in his name at their synagogue. Alternatively, you may wish to contribute to some other charity of your choice.

*Allan Rodrigues**March 2003*

Letter from the President

We experienced a very successful Industrial Color Solutions symposium at the very beautiful and functional Philadelphia University. There were more than 80 attendees - too many some would say for a really good conference. There was lots of discussion and problem presentation and solution suggestions. Just the thing for those with reduced resources in their laboratories due the current economic situation. Those of you who had to miss it — well I can't even think of words to express your loss.

But never fear! There is still time to sign up for our annual meeting and the SCAI symposium with our member-body, FSCT. There will be plenty of time to meet with exhibitors and gets hands-on practice with the instruments as well as listen to a large assortment of technical presentations. By the way, some of you may not be familiar with the long standing tradition which the ISCC and FSCT have had in co-hosting these events. The name comes from, Symposium on Color & Appearance Instrumentation. This is the fourth such event that we have co-hosted with the FSCT and they have always been very popular and productive meetings.

I am very happy to report that we have had some responses to my request for help on the Newsletter and the Publications Committee. The Publications Committee is responsible for editing and composing this newsletter and reviewing, editing and approving the other technical and historical publications from the Council. The committee is still short handed so if last month's plea made you think about contacting Professor Celikiz or myself then let this plea prompt you to take that action. The actual amount of work is not that great and you do not have to travel. The only requirement is access to a standard PC and an email account.

At the upcoming annual meeting we will be closing out two of our current project committees. One has completed its task and an updated report will be reviewed and approved by the Board of Directors for publication. I'll give you more information in the May-June Newsletter after the Board has approved the report. If you are involved in color measurement and a certified quality management system (ISO 9001, ISO 14001, SixSigma, etc.) you will want to get a copy of this newly revised report. The other project committee is being closed due to lack of participation. Despite many attempts, the chairman was never able to attract a group of active members and the work has not progressed at all.

Have you visited our web page recently? Dave Wyble (wyble@cis.rit.edu) has been very active in trying to keep that page updated. One of the areas that I see as not as relevant as it should be is our calendar section. If you come across a color-related activity in your favorite trade journal or in a direct mail or from you primary professional association, please take a couple of minutes and send an email to Dave with that information. I am sure that he would not mind seeing the same announcement three or four times since that would be a big change to not getting any information at all - which is the norm today.

I hope to see you in Chicago!

Danny Rich

Roland Connelly Elected President of AATCC

Roland Connelly was elected president of AATCC for a two year term beginning in 2003. He has been very active in the organization since joining it in 1970, serving as secretary and chair of RA36 Color Measurement, as well as chair of both the Technical and Executive Committees on Research. Connelly is president and co-founder of SheLyn Inc., Greensboro, N.C.. With SheLyn, he is working with the application and development of new color technology for color-using industries. This includes all phases of color control, including systems, software, hardware, and training.

Connelly received his BS and MS degrees in textile science from Clemson University, with course work in color science, instrumentation, and computerization of color in the textile industry. His career in textiles began in 1970 when he joined Burlington Industries Corporate Research and Development as chemist and color technologist prior to becoming manager of Burlington's R&D Color Labs. In that position, he was responsible for the design, development, and implementation of laboratory, production, and quality control of color systems in all of Burlington's dyeing and finishing operations worldwide (over 50 systems).

Connelly holds five U.S. Patents, has published numerous papers and is a frequent lecturer. He has been active in professional organizations since the beginning of his career. He has served as president, director and interest group coordinator of the ISCC. He has been a delegate to the ISO TC 38.1 for textiles since 1977. He is also a member of the International Commission on Illumination (CIE), Detroit Colour Council, and American Society for Testing and Materials (ASTM).

2003

Inter Society Color Council Annual Meeting and

Symposium on Color & Appearance Instrumentation*

April 13 – 16, 2003

Sheraton Four Points Hotel – Chicago O'Hare Airport – Chicago, IL

The ISCC Annual meeting will be held on April 13–14, followed by the SCAI event on April 15–16 that will focus on new instruments, optical models, and other aspects of color and appearance. General sessions, featuring an international line up of speakers, will be combined with “hands-on” workshops, at which the latest color measurement equipment and software will be demonstrated. Manufacturing, production, and R & D personnel should all benefit from participating in this program by way of new and updated instrumentation and networking with others for better understanding of color and appearance issues in the coatings industry.

Contact for Registration: The registration form may be downloaded at www.coatingstech.org. Send the completed form with payment to FSCT, 492 Norristown Rd., Blue Bell, PA 19422-2350; 610.940.0777; fax: 610.940.0292; or email fsct@coatingstech.org.

Romesh Kumar Clariant Corporation 500 Washington St. Coventry, RI 02816
Tel: 401.823.2161 Fax: 401.823.2750 E-mail: romesh.kumar@clariant.com

Contact for Exhibiting:

Cynthia Sturke Inter-Society Color Council 11491 Sunset Hills Rd. Reston, VA 20190
Tel: 703.318.0263 Fax: 703.318.0514 E-mail: iscc@compuserve.com

**Co-sponsored by ISCC and Federation of Societies for Coatings Technology*

Registration Information

Before Feb 28th

After the 28th.

ISCC only	\$150	\$175
SCAI only	\$200	\$250
ISCC & SCAI	\$300	\$350
Students	\$100	\$100

Exhibitors Rate

ISCC & SCAI	(Sun, Mon, Tues evenings)	\$500
Reduced Registration Fee for exhibitors (per person) is \$150.		

Four Points Hotel Chicago O'Hare
For Reservations: 1-800-323-1239

Complimentary Hotel Shuttlebus
to and from airport every 20 minutes.

For special room rate please mention “ISCC”.

Registration forms are available from the ISCC office or on www.coatingstech.com.

ISCC Annual Meeting—April 13-14, 2003

Final Programs

INTEREST GROUP I

FUNDAMENTAL AND APPLIED RESEARCH

Dr. Joel Pokorny

"Rod-Cone Interactions Studied with 4-Primary Colorimetry"

Yingqing Huang

"Determination of Particle Absorption Spectrum of Pigments using Frequency Domain Photon Migration"

Dr. Steven Shevell

"Color Perception with Patterned Backgrounds"

Dr. Ethan Montag

"The Same Stimuli Lead to Different Results: A Comparison of Constant Stimuli and Gray Scale Methods of Color Difference Scaling"

Come and experience the presentations concerning what research approaches are being conducted by the outstanding list of speakers. What influences the perception of color, and what affects what and how we see will be discussed. Additionally, research concerning the use of photon migration in the determination of pigment concentrations will be presented.

INTEREST GROUP II

INDUSTRIAL RESEARCH GROUP

Richard Aspland and Pramod Shanbag

"Dependence of CMC Color Differences on the Choice of the Standard"

Jack A. Ladson

"3D Interactive Modeling of Products in a Real Time Environment, with True Color Appearance on Screen"

Alberto Argoitia

"Special Effects Pigments by Thin Film and Diffractive Interference"

Hugh Fairman and Michael H. Brill

"The Principle Components of Reflectances"

Dr. Danny C. Rich

"Choosing the Best Aperture of Illumination and View for Characterizing the Color of Inks and Print"

Experience a full session covering both visual and instrumental applications of color in industry.

INTEREST GROUP III

Art, Design And Psychology

"Color Science is Creating a Modern-Day Renaissance in Art & Design"

During the Renaissance scientific advancements contributed to a creative revolution in the world of art. Art and science were blended as the roles of artist and scientist became intertwined. Today's advancements in color science have had a similar impact on the work of artists and designers. A panel discussion will be held to explore how this renaissance is impacting design in the modern world.

Prof. Margaret Miele

Fashion Institute of Technology/SUNY

"How Technology is Altering Human Color Response"

Dr. Eileen Korenic

University of Wisconsin - River Falls

"The Relationship Between Technology and the Visual Arts"

Symposium on Color and Appearance Instrumentation -- Program --

Tuesday, April 15, 2003

“The Development of CIEDE2000”—Roy S. Berns, Munsell Color Science Lab/RIT, Rochester, NY

“Measuring Visual Appearance—A Framework for the Future”—Michael Pointer, National Physical Laboratory, Teddington, United Kingdom

“Progress in SAE J1545 Standard”—Jeff Alspach, DuPont Performance Coatings, Troy, MI

“Color Control of Colorants Before Color Measurement”—James Valukas, Accurate Dispersions, Chicago, IL

“Optical Imaging and Image Analysis System for Evaluation of Surface Defects/Appearance”—Fred Lee, Atlas Materials Testing Technology, LLC, Chicago, IL

“Computer Color Control: Yesterday, Today and Tomorrow”—Robert T. Marcus, Datacolor International, Princeton, NJ

“Artifact Standards in Color Measurement: Selection, Use, and Geometrical Considerations”—Art Springsteen, Avian Technologies LLC, Wilmington, OH

“Surface Color Measurement at NIST”—Maria E. Nadal and Edward A. Early, National Institute of Standard and Technology, Gaithersburg, MD

“Uncertainty Analysis for Reflectance Colorimetry”—Edward Early and Maria Nadal, National Institute of Standards and Technology, Gaithersburg, MD

“Precision and Accuracy of Commercial Spectrophotometers”—David R. Wyble and Justin L. Laird, Munsell Color Science Lab/RIT, Rochester, NY

“A New Approach to Spectrometer Instrumental Color Agreement”—Jack Ladson, Integrated Color Solutions, Inc., Yardley, PA

Wednesday, April 16, 2003

“Color Matching of Automotive Shades—A Systematic and Practical Approach”—Gerhard Wilker, Clariant Corporation, Frankfurt, Germany

“Flexible Fiber-Based Absolute Spectrophotometer”—Ken Richardson, Instrument Systems, Ottawa, Canada

“Measurement and Evaluation of Metal-Flake and Pearl-Mica Pigmented Paint Surfaces”—Gorow Baba, Murakami Color Research Laboratory, Tokyo, Japan

“Applied Retroreflectivity: Steps Toward Driver’s Safety”—J. Rennilson, Rennilson Consulting Service, La Mesa, CA

“In-line Measurement and Correction of Color and Physical Properties”—Girish Malhotra, EPCOT International, Pepper Pike, OH

“Goniospectrophotometer and Gonio-Colormatching: Not a Dream, a Reality”—Jacques Gombert, SPC Software, Nanterre Cedex, France

“NetProfiler—A New Technology in Color Communication”—Richard Knapp, GretagMacbeth, New Windsor, NY

“Coloration of Polypropylene with Interference Pigments and Effects of Dispersing Agents on the Optical Properties”—R.N. Jagtap and C.K. Nere, Institute of Chemical Technology, Mumbai, India

“Color Matching Software for Plastics from Colorant Producers Perspective”—Brian Coleman and Walter Grunenwald, Ciba Specialty Chemicals, Newport, DE

“Technology Update: An Industrial Investigation of CIE DE2000 and New Camera Based Appearance Analysis Techniques”—Richard Harold, BYK-Gardner USA, Columbia, MD

American Association of Textile Chemists and Colorists RA36 - Color Measurement Test Method Meeting Highlights

After reading the minutes of the last meeting, Hinks introduce the guest speaker, Rolf Kuehni. Rolf’s topic was: Color Differences: What We Know and What We Don’t. Rolf reviewed many of the frequently-overlooked sources of uncertainty in classical colorimetry and color difference metrics. Kuehni wrapped up his remarks with the observation that current industrial practice results in ~66% correct assessments. To achieve significant improvement will require much careful and deliberate work. If RA36 intends to pursue experimental work in color difference metrics, he recommended replication trial with 8-10 micro-color spaces, ~15 color difference pairs/micro-space, and at least 20 observers. Experiments should then be repeated at another site, with another pool of observers. Kuehni believes improvement to a level of 15-20% error is possible. After conducting the business, the Committee by voice vote elected Rolf Kuehni as the next chair and Dave Hinks as the next secretary of RA36. This is the second time that Rolf Kuehni is the chair of this committee.

New ACM Journal
Transactions on Applied Perception
--- Call for papers ---

The Association for Computing Machinery (ACM) is starting a new journal, *Transactions on Applied Perception*. The purpose of new journal is to further the development of inter-disciplinary research that crosses the boundaries between perception and computer science disciplines such as graphics, vision, acoustics and haptics. This journal aims to broaden the synergy between computer science and psychology/perception by publishing top quality papers that help to unify research in these fields. The scope of this journal includes applications and algorithms in any area of research that incorporates elements of perception and computer science. Topics include, but are not limited to:

Visual

- perceptually based techniques in computer graphics,
- scientific/data/information visualization, digital
- imaging and computer vision.

Auditory

- auditory display and interfaces, perceptual auditory
- coding, spatialized sound, speech synthesis/recognition

Haptics

- haptic rendering, haptic input and perception

Sensorimotor

- vestibular interfaces, eye/head tracking input,
- gesture input, body movement input
- multimodal rendering and multimodal interaction
- sensory integration

ACM will begin accepting papers in March 2003 and anticipates publishing the first issue in January 2004. Please visit the ACM Transactions on Applied Perception web site, <http://www.acm.org/tap>, for information on how to submit papers and a listing of the editorial board.

Color Cosmos/Color Harmony
color web site

Art Laboratory LE BEAU is offering the original text of the serial lectures of the "Color Cosmos/Color Harmony" on their web site: http://lebeau-jp.com/2002color_lec.html. It is linked to the chain of the ART SYSTEM.

The Art Laboratory LE BEAU was founded in 1966. It has pursued methodical and practical research for the ART SYSTEM which is a synthetic system of creation and realization of fine art. In the domain of art creation, a color and color harmony should correspond to inner motif or existence itself. The Color Cosmos/Color Harmony is generated in accordance with such a dimension. So it is essentially different from the existing color systems and theories of color harmony.

Technical opinions and comments to the series are welcome. Contact Mr. Eiji Sekine, artist and representative of the Art Laboratory LE BEAU, lebeau@lebeau-jp.com.

Color Research & Application

In This Issue; April 2003

The first three articles in this issue relate to the perception of color in one way or another. We begin with an article on a newly proposed modification of a color appearance model. Then we go from evaluation of the human color matching functions to perception of whiteness, to the anchoring effects in color scale magnitude estimations. Next, we will move to two studies that examine cultural differences in color language usage and the use of color in clothing and fashion. Finally, we end with a note that follows up on an article published last year comparing color anomalous observers and color normal observers.

Since the CIE color appearance model (CIECAM97s) was adopted, it has undergone intense study. One parameter studied models the cone response when the luminance level changes. It has been observed that the changes in saturation predicted by the model are much larger than the changes observed in practice. It would be preferable for color engineering purposes for a model in which the hue and saturation remain constant for a color of constant chromaticity when the luminance changes. In "Dynamic Cone Response Functions for Models of Colour Appearance," R. W. G. Hunt, C. J. Li, and M. R. Luo present a new model based on a power function. This model might be physiologically more plausible than the hyperbolic function with a noise constant, which is currently used in CIECAM97s and many of its modified versions.

In the 1920s and 1930s seminal work in measuring the color matching functions of observers led to the development of the CIE system of colorimetry. Since that time there have been numerous questions about differences from the 2° standard observer and real observers. In the mid 1990s the color matching functions of three additional observers were determined and reported in Spain. Since these color matching functions have been used by several researchers, it was felt that more data about these experiments would be useful. In the next article the "Mathematical Determination of the Numerical Data Corresponding to the Color-Matching Function of Three Real Observers Using the RGB CIE-1931 Primaries and a New System of Unreal Primaries X'Y'Z'" are presented. Besides presenting the color matching functions in terms of the CIE system, J. A. Martínez, F. Pérez-Ocón, A. García-Beltrán and E. Hita describe the method and calculation of the matrix that enables the transformation between primaries.

Fluorescent lamps differ from other "white

light" sources in that they may have spectral power distributions with sharp spikes at different wavelengths yet still produce a natural appearance. Therefore, the perception of white materials will vary under different fluorescent lamps. Miyoshi Ayama, Takao Akatsu, and Eiichiro Toriumi, Kenji Mukai, and Sueko Kanaya report on their research in "Whiteness Perception under Different Types of Fluorescent Lamps."

For years people have been trying to inter-relate various color scales and color order systems. Also, for 40 years researchers have known that it can be difficult to correlate results from magnitude estimation scales with those from partition scales. Color order systems have been developed that are based on both types of scales. In "Fixed Range Scales Applied to the Evaluation of Color: Comparative Analysis between the Munsell System and the Natural Color System" José Luis Caivano and María L. F. de Mattiello discuss the effect of anchoring on the estimation of chromatic variables. The Natural Color System claims that its scales answer to an internal intuitive measurement by the observer, and thus a color atlas is not necessary for color evaluation. If this is true, users could save by not having to purchase expensive color atlases. Drs. Caivano and Mattiello ask if this holds true for the Munsell system as well.

Our last two articles involve cross-cultural studies. First, Kimberly A. Jameson and Nancy Alvarez explore the linkage between color terms and color appearances. Certain colors fall into the categories sometimes referred to as focal colors, basic hues, or landmark colors. These colors are more easily located, learned, and remembered than other hues. In color cognition, salience is indicated by specific and selective non-verbal responses to colors that fall in such categories. In "Color Naming and Color Salience in Vietnamese and English" the results of two experiments are reported. By examining three groups with different language background, Drs. Jameson and Alvarez show that the relationship between visual and verbal domains is complex, and that the linkage between early visual neurophysiology and color cognition may not be as direct as in currently accepted theories. They propose an interpoint-distance model of color naming behavior as an alternative to the universal color naming and category structure.

In the last article in this issue Shigeko Shoyama, Yutaka Tochihara, and Jungsook Kim evaluate the color of clothing for elderly women and female students in Japan and Korea. There were discrepancies in what

was considered ideal and what was actually worn. In "Korean and Japanese Ideas About Clothing Colors for Elderly People: Inter-Country and Inter-Generation Differences" they report that the differences observed between Japan and Korea seem to be associated with differences in traditions, culture, public morals and racial consciousness. Differences in timing and the aging rate of the society may also be involved.

Last year J. Pérez-Carpinell, V. J. Camps, and J. A. Diaz compared the methods of simultaneous matching with color memory matching for normal and anomalous observers (Vol. 26: 158-170). In a note in this issue the same authors report on the effect of matching time for the same group of 61 observers. In "Color Memory in Protanomalies and Deuteranomalies: Matching Time Effect" they find differences in speed between protans, deuterans, and normal observers. The matching time varies not only by the observer's visual system characteristics but also by the color to be matched.

We close the issue with reviews and a meeting report. Three books: *Electrodynamics of Solids: Optical Properties of Electrons in Matter* by Dresser and Grüner, *Classical Optics and Its Applications* by Mansuripur, and the 2nd edition of *Coatings Technology Handbook* are reviewed by Nelson Rowell, William Stoner and Mary McKnight respectively. There is also a report of the Fourth Oxford Conference.

Ellen C. Carter, Editor CR&A

Allen Ferrell Takes the Helm at CMG

Allen Ferrell was named president of Color Marketing Group (CMG), an international association of more than 1,600 professional color designers and marketers. He will preside at the organization's Spring Conference in Hollywood, FL, April 11-15, 2003 where members from around the world will forecast the 2005 Consumer Color Directions palette for all industries, manufactured products and services.

Ferrell is color, styling and market trends manager of NorthPole USA, Denver, CO, a manufacturer of private label luggage, tents, sleeping bags, and other camping products. Ferrell earned a Bachelor of Fine Arts, Interior Design and a Masters of Business Administration from the University of Denver. He holds the prestigious "CMG" designation, recognizing his achievement and leadership in the profession of color and design. Ferrell has been an active member of CMG since 1988.

Videotape Review:

Concepts & The Munsell System

By: Graham Wilstead (Wilstead Services)
This 55 minute videotape is a very well done presentation of certain aspects of color science and the Munsell color order system. Both the narration and graphics are of professional quality. After instructing the viewer on how to adjust the controls of the television set, the rest of the tape is divided into three sections:

Section I includes: Introduction of Color Concepts; Hue; Psychological Color; Object Color; Perceived Color: Temporal Mixtures; Color Spaces; and the CIE System.

Section II includes: Introduction to the Munsell Color Order System; Historical System Concepts; and Description.

Section III includes: Some System Applications. It also describes the use of some of the material available from the Munsell Division of the GretagMacbeth Co.

My only negative comment is that the important topic of metamerism is not mentioned in this presentation. There is a fleeting comment, in the section on color matching, which states that two colors could match in one light source, but not match in a different light source. However, no explanation is given as to how or why this can happen.

This tape is a worthwhile addition to the library of anyone interested in the subject.

Reviewed by: Ralph Stanziola (January 20, 2003)

Publications Available from ISCC Office

"Color and Light" by Fred W. Billmeyer Jr. & Harry K. Hammond, III, Authorized reprint from:

ASTM Manual 17, Copyright 1996,

ASTM International, 100 Bar Harbor Dr., W. Conshohocken, PA 19428 \$5 ea or 20 copies/\$50.00

"Demystifying Color" by Bob Chung.

11 pages (color). Discusses and explains ten myths about color \$5 ea or 20 copies/\$50.00

Proceedings - 9th Congress of the International Colour Association, AIC Color 01 Rochester,

Allan Rodrigues, Editor, papers given at technical sessions \$75*

*Plus shipping and handling

**Society for Imaging Science and Technology
Annual PICS Conference, May 13 to 16, 2003
Hyatt Regency Hotel in Rochester, New York.**

This international technical conference, chaired by Mark Fairchild, RIT Munsell Color, focuses on Image Processing, Image Quality, Image Capture, and Systems Issues in the broad areas of Digital Photography. The informal conference format and timing of all presentations will provide ample opportunity for technical discussions of the various subjects of interest to attendees. On Thursday afternoon optional tours of the archives at the George Eastman House International Museum of Photography and Film are available on a space available basis. The technical program, Co-chaired by Peter Burns, Eastman Kodak (USA), Yoichi Miyake, Chiba University (Japan), and Bernard Hill, Aachen University of Technology/ Germany (Europe), includes over 110 oral and poster presentations and 14 tutorial classes.

Keynote speakers:

Don Waters, Mellon Foundation, "Imaging: Education Initiative"

Ken Parulski, Eastman Kodak on the opportunities and challenges for the next-generation Digital Still Cameras (DSC)

Ian Gatley, Rochester Institute of Technology, on newly developed methodology that supports collaborations between specialists who need to share large quantities of digital data and make the data bro!

Technical Sessions:

Vision and Psychophysics
Digital Image Capture
Imaging Quality Standards
Image Performance Measurement & Analysis
Engineering of Multispectral Systems
Evaluation of Multispectral Systems
Processing and Output of Multispectral Images
Multispectral Imaging Applications

Tutorials:

Characterization and Prediction of Image Quality,
Principles of Digital Color Management
Digital Imaging System Fundamentals
The Emerging Wavelet-Based JPEG-2000 Image Compression Standard
Preserving Images in a Digital World
Digital Halftoning Image Quality and Human Visual System,
Select the Right Image Sensor for Your Application,
System Interactions and Optimizations in Digital Color Imaging
Color Quality Factors in Desktop Printing,
Invisible Digital Image Watermarking,
Optics for Image Acquisition
Image Quality Prediction with the SQRI,
Analyzing Paired Comparisons and Ranked Data with Microsoft Excel
Introduction to Multispectral Color Imaging

VIDEO**Colour Concepts & The Munsell System**

The Video is divided into 3 separate Sections.

7 Colour Concepts: Hue; Psychological Colour; Object Colour Perceived Colour; Temporal Mixture; Colour Space; CIE System
System Exposition: Historical; Concepts & Description
System Applications: 5 Examples

Duration 55min. NTSC
Wilstead Services: 4530, Mayfair Ave. Montreal, Qc Canada H4B 2E5.
email: Graham.Wilstead@sympatico.ca Tel: (514) 486-0335

Please note: Above video has been revised to include metamerism.

Advertising Policy

The ISCC advertising policy for the ISCC News is as follows: Pre-paid color-related advertising will be accepted 30 days in advance of the publishing date. The rates are:

- \$ 100 business card-size ad
- \$ 250 1/4 page ad
- \$ 500 1/2 page ad
- \$ 1,000 full page ad

The editor reserves the right to determine the acceptability of the advertising. A 20% discount is available for a yearly contract.

Issue #402**March/April 2003**

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All submissions must be in English. Please note that the submission of materials is due the first of each even numbered month. Materials submitted later will be printed in the following issue.

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