

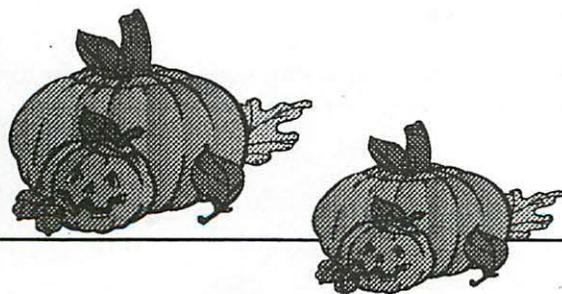


# Inter-Society Color Council News

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**Inserts: 2003 Godlove Nomination Form  
2003 March ISCC Conf. Registration Form  
Exhibitor Registration Form**



## September/October 2002

### Letter from ISCC President

This is my second communication since my installation as President of the Council. As I look around the various industries and technical societies that make up and support our Member bodies and general membership I can see the changes in the national and world economy that have taken place since I accepted the nomination to become President of the Inter-Society Color Council.

Many of my friends and colleagues are either retiring or are being retired as production and engineering of more and more colored goods and color services are moving to remote parts of the world. This is proving to be both bitter and sweet as Color Science and Technology are being transformed into Color Engineering, Color Management and global Color Communications.

In the 1930s when the Council was first formed it was a major challenge to measure the color of a piece of fabric or a paint film. After the war, the emphasis was on finding affordable ways to measure the color of objects. The creation of NASA and the challenge to place a man on the moon provided the technology of color-measurement with many new tools. In the 1970s color-measurement was not only affordable but reliable. In the 1980s and 90s the pendulum swung even further and as instruments became smaller and more portable they became less reliable. But color-measurement was also evolving as color imaging, long the realm of the graphic arts, was become the tool of choice for the textile and apparel designer and retailer, the plastics molder, even for the paint manufacturer.

*continued on page 2*

**ISCC Executive Officers**

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**ISCC Board of Directors**

2000-2003

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<b>Prof. Margaret Miele</b>	Fashion Institute of Technology/SUNY Dept. of Social Sciences 7th Ave @ 27th St., NY, NY 10001-5992 212-217-8449 fax 212-217-7095 mielemar@fitsuny.edu

2002-2005

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As a graphic artist, the color-imaging engineer knew that it was impossible to exactly reproduce all of the nuances of the original scene so he/she could accept some compromise in the reliability of the measurements of the input, transfer and output media. Today, with digital media carrying the images and colorimetric information about commercial products around the world in place of the physical swatches or test specimens a whole new set of problems and challenges have arisen. With the development and spread of the six-sigma philosophy the need for more reliable and accurate color and appearance measurements has never been greater.

Over the next six to seven months we have planned to offer opportunities for you to participate in this revolution in color and appearance technology. All quality programs - yours included - require a certain amount of continuous training and education to maintain its effectiveness or certification. We have a program on solutions to industrial color problems coming up during spring break at Philadelphia University followed later in the spring by our annual meeting and a Symposium on Color and Appearance Instrumentation (SCAI - pronounced as "sky") meeting, co-sponsored with the Federation of Societies of Coatings Technology. The SCAI meetings have always been popular as they provide a "hands-on" look at the most recent color and appearance measurement tools.

As indicated in my opening paragraph, we are aware of the current financial situation in the world. You may be thinking about your travel budget or restrictions. We have chosen venues for both of the meetings which have kept costs as low as possible. Our early spring meeting would normally be held in Williamsburg, Virginia, a wonderful location for a focussed conference. But such a venue comes with at a price that many of you cannot afford. The Schuylkill River may not be as charming as the Duke of Gloucester Street but the conference facilities and opportunities for networking are first rate. Similarly, Chicago's O'Hare airport is one of the busiest in the world serving as a main hub for several airlines or airline alliances. We have chosen a hotel located off the main flight path but close enough to provide courtesy shuttle service to and from the terminals. You won't need a rental car or taxi fare. The room rates are as good as they get in a major metropolitan area.

I want to encourage you to start making plans now to attend these meetings next year.

*Danny Rich*  
ISCC President



## THE 2003 ISCC GODLOVE AWARD

**Nominations for the 2003 Godlove Award are now being solicited through November 1, 2002**

The Godlove Award is the most prestigious award bestowed by the Inter-Society Color Council (ISCC) to honor long-term contributions in the field of color. The Godlove Award was established in 1955 in memory of Dr. I. H. Godlove, and is presented biannually, in odd numbered years, with the next award scheduled for presentation of the 2003 ISCC Annual Meeting.

Candidates will be judged by their contribution to any field of interest related to color, whether or not it is represented by an ISCC Member-Body. The candidate's contribution may be direct, it may be in the active practical stimulation of the application of color, or it may be an outstanding dissemination of knowledge of color by writing or lecturing, based on original contributions of the nominee. Candidates need not have been active in the affairs of the ISCC, but they must be either current or former members of the ISCC. All candidates must have at least five (5) years of experience in their particular field of color.

A Godlove Award Nomination Form is enclosed with this mailing of the ISCC Newsletter. The past and present membership of the ISCC boasts a number of individuals deserving of such recognition but such an award requires your participation in the process. Please take the time to consider and to nominate a worthy candidate for this honor.

Feel free to copy the enclosed nomination form, if necessary. Requests for additional nomination forms may be directed to:

Joel Pokorny  
Godlove Award Committee Chairman  
Visual Sciences Center  
940 East 57th Street Chicago, IL 60637  
TEL: 773 702-1983 FAX: 773 702-0939  
[j-pokorny@uchicago.edu](mailto:j-pokorny@uchicago.edu)

## A Color Puzzle: Answer

(Puzzle published in July/August ISCC News)

The Munsell Value must be 5, the Munsell Hue can be anything, and the starting Munsell Chroma must be  $2 + 1/(n\pi)$ , where  $n$  is any positive integer. The starting Chroma is greatest at  $n = 1$ , for which it is approximately 2.31831.

This solution comprises an infinite number of specifiable colors (**Extra credit answer is INFINITY**), in a set of rings concentric with the Munsell Value-5 gray. From any point on the ring with index  $n$ , the reduction of Chroma by 2 units brings you to a Chroma of  $1/(n\pi)$ . Then, traversal of 2 units of Hue angle brings you  $n$  times around the circle of radius (Chroma)  $1/(n\pi)$ . [Remember that the circumference of a circle is  $2\pi$  times the radius, so if the radius is  $1/(n\pi)$ , the circumference is  $2/n$ , and 2 units of excursion takes you around the circle exactly  $n$  times.] Then increasing the Chroma by 2 units brings you back where you started, as the problem specifies.

What do the Hints have to do with this answer? Admittedly, **Hint # 1** was somewhat a red herring, since the starting Hue angle doesn't matter. It was an educational red herring, however. **Hint # 2** is worth more: the Chroma 23.1831, beyond which you did not have to look, is just ten times the radius of the largest ring. (If you got the answer, you might have remembered the digits and thus known you had the correct answer.) **Hint # 3** is most valuable of all, because it points directly to the problem from which this was taken by analogy: "From some starting point, I travel 2 miles south, 2 miles east, and 2 miles North, and end up where I started from. I see a bear. What color is the bear?" Since the obvious starting point is the North Pole, the bear is alleged to be white. But an infinite set of rings around the South Pole also solve the problem. So the color of the bear might have pointed your thinking in a direction toward the solution.

Nobody replied to us (Hugh S. Fairman or Michael H. Brill) about this problem, but we decided to end the agony early by publishing this Solution so we can all go back to worrying about the color of the bear (market, that is).



# 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**

ISCC Annual meeting will be held on April 13–14, followed by 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.

For presentation in the “Symposium on Color & Appearance Instrumentation”, please submit an abstract to the program chairman, Romesh Kumar, at the following address. Each presentation will be 40 minutes long, followed by ten minutes for discussion.

**Abstract Deadline:            October 18, 2002**

**Final Paper Deadline:        January 31, 2003**

Romesh Kumar Clariant Corporation 500 Washington St. Coventry, RI 02816  
Phone: 401.823.2161 Fax: 401.823.2750 E-mail: [romesh.kumar@clariant.com](mailto:romesh.kumar@clariant.com)

**Contact for Exhibiting and Registration:**

Cynthia Sturke Inter-Society Color Council 11491 Sunset Hills Rd. Reston, VA 20190  
Phone: 703.318.0263 Fax: 703.318.0514 E-mail: [iscc@compuserve.com](mailto:iscc@compuserve.com)

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

## ISCC Annual Meeting—April 13-14, 2003

### Call For Papers

#### **INTEREST GROUP I**

##### **Basic And Applied Research**

Join Dr. Joel Pokorny in presenting your 30 minute paper at the 2003 ISCC Annual Meeting in Chicago April 13-14<sup>th</sup>. Reserve your time following Dr. Joel Pokorny's talk on: "Rod-Cone Interactions Studied With 4-Primary Colorimetry"

Send one-page abstracts of new research efforts dealing within the large framework of "Color & Appearance". Papers dealing with all aspects of research including new instruments, optical models, or other aspects of color and appearance are being solicited.

Please forward your abstract to Milt Hardt (Chair) by December 1, 2002.

Milton I. Hardt  
Color Communications, Inc.  
4000 W. Fillmore St., Chicago, IL 60624  
milhar@ccicolor.com  
For more information, please call 773-475-2576

#### **INTEREST GROUP II**

##### **Industrial Applications of Color**

Interest Group II presents technical challenges and solutions that the various industries encounter in commercial color applications. Abstracts are currently being solicited for papers to be presented at the April 2003 Annual Meeting to be held jointly with FSCT in Chicago, IL. Topics can include, but are not limited to; color reproduction, color management, quality control techniques and color tolerancing, measurement techniques, color matching, the relationship between color and other physical characteristics, or other color related industrial applications.

Please send a one page abstract by December 15, 2002 to:

Britt Nordby, Interest Group II Chair  
Degussa Corporation  
2 Turner Place, Piscataway, NJ 08855  
(732) 981-5433 Fax: (732) 981-5033  
[britt.nordby@degussa.com](mailto:britt.nordby@degussa.com)

#### **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. Abstracts with this theme are being solicited for papers to be presented at the April 2003 Annual Meeting to be held jointly with FSCT in Chicago, Ill. IGIII is particularly interested in presentations demonstrating how technology is being incorporated into the creative process and how technological innovation is being driven by the needs of the artist and designer. Submissions should be received no later than December 15, 2002.

Prof. Margaret Miele  
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[g.kalivas@worldnet.att.net](mailto:g.kalivas@worldnet.att.net)

## The Color Association of the United States (CAUS)

### Color Interactions Symposium

CAUS announces a symposium on "Color Interactions," an informal gathering of designers, curators, retailers, and color enthusiasts. The symposium will take place at the Association's office on Thursday, October 24th and Friday, October 25th. The symposium is limited to 30 attendees and centers around special people and places in New York City. Attendees will have the chance to interact directly with each other, with the panelists, with CAUS directors, and with New York City itself.

Fee for the symposium: \$500 CAUS members; \$800 non-members. The fee includes two breakfasts and the two lunches, all panels and tours, and an evening of theater. All tours will be led by a CAUS director and a CAUS director will accompany attendees to events outside the office. To register please telephone the CAUS Office 212-947-7774. Upon registration: the Association will provide a list of recommended hotels. At the conference, attendees will receive a list of suggested restaurants, retail walking tours and museums exhibitions for the Saturday and Sunday following the symposium. Please note: any refunds must be requested in writing and there will be no refunds after September 20th, 2002.

### International Safety Colors

The International Safety Colors have developed into a color language of the street, but seldom do they find their way into areas of design. The official names and meanings according to ICI - High Performance Coatings are as follows:

**Safety Red** = fire, danger, stop

**Safety Orange** = danger

**Safety Yellow** = caution

**Safety Green** = locator of first aid equipment

**Safety Blue** = information signs

**Safety Black on Safety Orange** = radiation hazard, contamination

**Hazard Yellow** = caution, marking hazards

**Black & White Stripping** = traffic area

These colors, highly visible and hard, are most widely used in industrial environments. However, we are surrounded by them in our cities too. The brightness of hues makes them extremely recognizable. The colors must be distinguishable so that no one will get confused. The colors need to contrast with either black and white or pop on a neutral gray. This is especially important in signage. International Safety Colors are so powerful that they are legible even in glare or extreme weather conditions.

The International Safety Colors have developed into a color language of the street, but seldom do they find their way into areas of design. Especially in clothing, people do not want to or do not have the confidence to wear these colors as they may draw too much attention. However, high-end lines of well known designers such as Marc Jacobs, Comme des Garçons, Apoc by Issey Miyake, Cacharel, and Eley Kishimoto, as well as furniture designers such as Marc Newson and architects like Rem Koolhaas do in fact employ these intensely bright colors.

Because of their high visibility, safety colors often are used by active wear designers so people are aware that an athlete is on the move. The more intense the sport (e.g. bike racing, rock climbing, skiing) the brighter the clothing. Also in professional, spectator sport, stark combinations can identify a team member. But as we have seen over the last twenty years the clothes of athletes have changed the look and feel of casual dress, for two main reasons, practicality and fashion-ability. Where have I found the safety colors in abundance? Where are people not scared to use them? On their feet.

In a study, I discovered that most contemporary urban footwear, whether in sneakers or in a comfortable walking shoe such as Birkenstocks or campers, uses safety colors from different urban zones: *orange* from construction sites, *black and white* from roads markings, *yellow with white* and *red with white* which is often found in New York City's subway signage and garages/basements. I welcome this display of strong color in contemporary footwear, and I am glad it is represented by such fantastically intense color.

There is considerable debate among people in the design industries about the place of color under the present economic and political circumstances. The reality is that footwear is the one place that injects color into a more or less gray society. The International Safety Colors have developed into a visual language of the street. New York, London or Glasgow are urban cultural cities where the majority of people wear black or neutrals. Footwear for urban trekking is especially amongst the sneaker-raised generation of teens and twenties, brightly colored.

*Jodie Fowler, CAUS Intern, Edinburgh, Scotland*

## TAGA Announces MicroTech Forum

Rochester, NY - The Technical Association of the Graphic Arts announced that it will host the first TAGA MicroTech Forum, October 7th and 8th, at the University of Chicago's Gleacher Center, 450 North Cityfront Plaza, Chicago, Illinois.

In April 2002, TAGA (set out on a long-term initiative to bring together innovators from the graphic arts with those from the fields of microelectronic technology and nanotechnology. TAGA's first effort was to create the TAGAMicroTech@printplanet.com electronic forum, and now TAGA is providing a forum for this same community of innovators in order to foster dialogue, collaborative research, and partnerships.

This first TAGA MicroTech program will focus on introductions, networking, and open dialogue in the hope that it will inspire wholly new technologies and markets for printing. Some of the topics will include discussion of printing circuitry and transistors, printable displays, radio frequency IDs, and other micro technology applications in the graphic arts under development. The event is being held in conjunction with GraphExpo and features a one-day, all-day forum on the 7th and an evening reception hosted by PrintPlanet at McCormick Place South on the 8th.

This event is intended to be a semi-private event. Although Non-member registrations will be accepted, capacity is limited to 100 registrants and only those with a serious interest in micro technology and nanotechnology applications in the graphic arts are encouraged to register.

For more information on the event, including a complete agenda and registration form, please visit:

[www.taga.org/microtech](http://www.taga.org/microtech) or

<http://www.taga.org/microtech/index>.

*Karen Lawrence*

*Managing Director, TAGA*

## AATCC International Conference & Exhibition (IC&E)

Color Management will be one of the topics addressed at this year's International Conference and Exhibition, to be held October 1-4 in Charlotte, NC. From analog to digital, the basics to the technical, AATCC will offer topics for all levels of expertise and interests. The conference will feature insight from industry leaders such as Milliken & Co., V.F. Jeanswear, eWarna, Galey & Lord, and more. Attendees will learn how color control can improve workflow, reduce lead times, increase profitability, and deliver a better quality garment to the consumer. More details: <http://www.aatcc.org/ice/index.cfm>.

*Sherri A. Satterwhite*  
*Editorial Director, AATCC*

## IMI Europe Announces Autumn 2002 Programs

Sheraton Lisbon Hotel & Towers, Lisbon Portugal.

**Ink Jet Academy (October 27-28, 2002)** This one and one half day introduction to ink jet covers all aspects of ink jet printing technology to get you up to speed or refresh your knowledge.

**10th Annual European Ink Jet Printing Conference (October 28-30, 2002)** This year the conference is packed with the latest information and developments in the industry. Stewart Partridge of Web Consulting and Ian MacGregor of Xaar will discuss ink jet developments in China that will effect us all - The Dragon Awakes! We have two new technologies - ToneJet and FlatJet - the future of wide fixed arrays from Spectra, details of Creo's latest proofing technology and Dr. Evan Smouse of HP will describe their latest ink jet platform for SOHO markets. Dr. Ken Stack of Flint Ink's Digital Division will forecast the increasing influence major ink companies will have on the industry, and Vecia and SunJet will discuss the choices between UV and solvent-based formulations. On the media side Dr. Gary Allen of Kodak and Peter Mason of Torrey Pines will present results of tests on the degradation of images from atmospheric and other contamination.

**5th Annual Digital, Industrial & Decorative Printing Conference October 30 - November 1, 2002** This year we are running four sessions focused on the latest developments in digital printing applications - Production printing, Packaging & display, decoration, Textiles, ink jet for manufacturing.

<http://www.imieurope.com/>

## Color Imaging Conference at Scottsdale, Arizona

November 12-15, 2002

IS&T/SID Color Imaging Conference Celebrates 10th Anniversary with Eminent Speakers and Increased Focus on Display and Imaging Devices

The 10th annual Color Imaging Conference (CIC10), to be held November 12 through 15 in Scottsdale, Arizona, will open with The Human Components of Color Systems, a two-hour tutorial by Brian Wandell, the eminent neuroscientist who founded the Image Systems Engineering Program at Stanford University (and gave the invited luncheon address at the SID Symposium in May). CIC, which has established itself as the premier international conference on Color Science, Color Engineering, and their applications, is jointly sponsored by the Society for Information Display (SID) and the Society for Image Science and Technology (IS&T).

Among the 16 tutorials to be held on November 12th are: Creating ICC Profiles (Christopher Hauf, Eastman Kodak), Digital Still Camera Systems (Michael Kriss, Sharp Laboratories of America), Color Image Scanners (Gauran Sharma, Xerox), Data Compression Technology and Standards for Digital Color Systems (Joan Mitchell, IBM), Visible Spectrum Imaging (Roy Berns, Rochester Institute of Technology), Solving for Color Constancy (Graham Finlayson, University of East Anglia).

The three-day technical conference that follows the day of tutorials will begin with *Eyeing the Camera*, a keynote address by Robert W.G. Hunt, the renowned color scientist who won SID's Johann Guttenberg Prize this year and an IS&T Honorary Member. Hunt, who regularly addresses the CIC, is known as an unusually engaging and innovative speaker. The other keynotes - CIC traditionally has keynotes scattered throughout the program - include a particularly interesting topic, Advanced Computer Vision Systems by Shree K. Nayar (Columbia University). There will be a special 10th-anniversary col-

laborative presentation on the evolution of color science and engineering designed to stimulate dialogue.

Among the technical papers scheduled for presentation are: Color Engineering - Ten Years Later (James C. King, Adobe Systems), The History of Device Independent Color - Ten Years Later (Robert R. Buckley, Xerox), Experiments on Adaptive Soft-copy Color Reproduction (Janne S. Laine, VTT Technical Research Center of Finland), ICC Color Management within the Motion Picture Industry (Andreas Kraushaar and Dietrich Gall, FOGRA and the Technical University Ilmenau), The Induction of Color Error by Pixel Structure (M. Kanazawa, K. Hamada, and F. Okano, NHK Science and Technical Research Laboratories), Gray Tracking Correction for TFT-LCDs (Gabriel Marcu and Kok Chen, Apple Computer), Characterisation of LCD and PDP Projection Displays (Lars Seime and Jon Y. Hardeberg, SINTEF Electronics and Cybernetics, Norway), Color Conversion from RGB to RGB+White While Preserving Hue and Saturation (Seong Deok Lee, *et al.*, Samsung), Color Calibration of LCD (Yasuhiro Yoshida and Yoichi Yamamoto, Sharp Corp.), Eyeing the Camera: the Next Century (Richard Lyon and Paul Hubel, Foveon).

The color imaging conference has become the leading event where color issues and applications are discussed by people from around the world - typically over 300 people from Europe, Asia, and North America - and the conference is organized with many opportunities for conversation and informal communication.

For registration and hotel information, contact:

Pamela Forness, IS&T Program Mgr  
The Society for Imaging Science & Technology  
7003 Kilworth Lane, Springfield, VA, USA 22151  
703/642-9090; fax 703/642-9094  
e-mail [info@imaging.org](mailto:info@imaging.org).

Conference program can be found on the IS&T website: [www.imaging.org](http://www.imaging.org).

## Color Research and Application In This Issue, October 2002

Some problems in color science are so difficult that they have rarely been stated, let alone solved. One of these problems is whether a particular set of colorants (say, subtractive or complex-subtractive) yields a color gamut that has holes or folds in it. Another problem is how to design a color atlas whose reflectance samples maintain their color relationships when the illuminant is changed. In "Color Science Applications of the Binet-Cauchy Theorem," Michael H. Brill shows how a mathematical theorem from two centuries ago offers promise in resolving these questions.

While the CIE system of colorimetry is central to most color measurement today, it has also been criticized as being less than optimal. In our next article, Mark Shaw and Mark Fairchild report on "Evaluating the 1931 CIE Color Matching Functions." They give an analysis of the CIE color matching functions, an optimization to derived a new set of color matching functions, and a computer-based simulation of the color differences between different sets of responsivity functions. One of the interesting points that they make is that the magnitude of observer variability was nearly eight times that of the variability found between the responsivity functions.

When Brown first extended MacAdam's research on visual sensitivities to color difference to various luminance levels, he proposed a metric called the fractional error of luminance. This metric was then widely used to fit experimental data directly in the  $x, y, Y$  space. However fitting the experimental data directly into the  $x, y, Y$  space has proved inadequate because it is not normally distributed. Carreño and Zoido have shown that the thresholds for luminance increments and decrements are different and asymmetric. In "The Weber Fraction and Asymmetries in Luminance Thresholds," they present a method for determining the Weber fraction based on a rigorous analysis of the probability density function derived from discrimination judgments.

When observers evaluate color and color differences they tend to discount the effect of the light source used to illuminate the specimens. This is because there is physiological and psychological adaptation to both the color and level of the light source. Chromatic adaptation, or the changes in the visual system that approximately account for spectral characteristics of the light source, has been

studied for most of the twentieth century beginning with von Kries. The studies include the mapping of colors from one source-space to a corresponding position in a space related to a different source. Corresponding colors are pairs of color stimuli that look alike with one color stimulus viewed under a given source and the other stimulus viewed under a different source. The most recent studies are reported in the next article, "Analysis for Predicting Corresponding Colors on LUTCHI Data" by Yoshinobu Nayatani, Tadashi Yano, and Masamori Ihara.

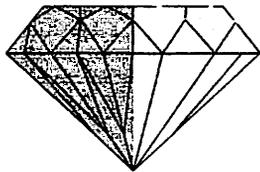
Just one year ago we published a topical issue on color difference metrics. At that time the newest industrial tolerancing metric, CIEDE2000, was introduced. The issue contained a report on its development as well as a number of articles reporting on research on other color-difference metrics. All of these studies as well as other studies reported since then aim toward the still far off goal of one universal color-difference metric, which is applicable both for industrial color difference evaluations and for color reproduction, industrial design and color communication. Haisong Xu, Hirohisa Yaguchi, and Satoshi Shioiri take a step toward this goal with the research reported in the next article. They examine the "Correlation between Visual and Colorimetric Scales Ranged from Threshold to Large Color Differences."

In 2000, the third edition of *Principles of Color Technology* was published. There were many changes from the earlier editions. One very significant change was the use of color management software to generate many of the images for the third edition. In this month's Industrial Applications section Roy S. Berns and D. Mark Reiman describe the rewards and pitfalls of "Color Managing the Third Edition of *Billmeyer and Saltzman's Principles of Color Technology*."

We close this issue with one item in our Communications and Comments section and three book reviews. Dr. Michael R. Pointer of the National Physical Laboratory in the United Kingdom requests uniform color samples of real surface colors so that he can revisit the gamut of real surface colors mapped in his 1980 paper published in this journal. The new books, *Flat Panel Display Measurements Standard Version 2.0*, *The Physics and Chemistry of Color, 2<sup>nd</sup> Ed*" by Nassau, and *Colour Chemistry* by Christie are reviewed in this issue. Also there is a brief farewell to John Yule.

Ellen C. Carter, Editor  
Color Research and Application

## Dazzling Collection of Sapphires on Display at GIA



Carlsbad, Calif. – August 19, 2002 – An extraordinary collection of dazzling rough and faceted sapphires from the Rock Creek deposit in what is known as Sapphire Mountain near Philipsburg, Mont. is currently featured at the Gemological Institute of America (GIA). On loan from Fine Gems International, this assortment of fine sapphires is on display through Feb. 2003 in the Salvador J. Assael Grand Atrium of the Institute's world headquarters in Carlsbad, Calif.

Sapphires are among the most colorful and revered gemstones in the world, and Rock Creek deposit is one of the few locations where they are found and mined in the western U.S. Commonly described as "Rainbow Over Montana," the Rock Creek deposit has been mined for more than 100 years and has produced an enormous 190 million carats of gem-quality rough sapphires during the period 1906—1923 alone. Sapphire Mountain, widely known as Gem Mountain, yields every known color of sapphire, varying from yellow, orange, and blue, to dozens of other colors.

Sapphires were first discovered in Montana by gold miners who noticed an assortment of small pebbles at the base of their sluices where the gold would typically collect. The stones were thought of as a nuisance because they cluttered the sluice box, and the gold miners would remove and discard the pebbles. It wasn't until the late 1890s that they were determined to be sapphires.

Montana sapphires are found in two different types of geologic settings, the first type lies in hard rock dikes. The second type of setting is alluvial deposits, where sapphire pebbles are sorted from the layers of gravel in rivers.

GIA Museum Director Elise Misirowski said, "What a rare privilege it is to be able to display to the public this stunning specimen of fine sapphires. If you have the opportunity to come to the Carlsbad area, this exhibit is not one to be missed."

## Fabricating the Future

Maggie Orth hunches over a sewing machine in her studio, carefully stitching a tiny piece of plaid cloth. But the new mother isn't making a baby outfit. Instead, she's creating an interactive wall hanging of fabric interlaced with electronics and special dyes. The finished product: textile art that changes colors in programmed sequence.

Dr. Orth's new technology is part of an emerging wave: weaving all sorts of intelligence into textiles, including the ability to detect dangerous chemicals, sanitize themselves, and serve as communication networks. Applications run the gamut, from health and sporting goods to sophisticated combat uniforms. It's a field - variously known as smart fabrics, e-textiles, wearable computers, or intelligent textiles - that many anticipate will become one of the next hot drivers of the American economy. Advocates also expect it to propel technology forward in general, because its applications are so diverse.

*(from The Christian Science Monitor - Cambridge, MA).*  
<http://www.csmonitor.com/2002/0829/p11s01-stgn.htm>

### 2002 ISCC Directory Updates

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## Color Your Diet With Fruits And Vegetables

It is time to get colorful. Color your daily diet with bright oranges, deep reds, dark greens, beautiful blues and purples and accent it with sunshine yellow. Nutrition research shows that colorful fruits and vegetables contain essential vitamins, minerals and phytochemicals that help prevent diseases such as cancer, promote health and help you feel great. Here are the specifics. . .

### Fruit/Vegetable

### Phytochemical

### Possible Benefits

#### **REDS**

tomatoes, red and pink grapefruit, watermelon and guava

Lycopene

Reduces the risk of select cancer, including prostate cancer

**GREENS** You probably hear it, "Eat your greens." But do you know why this color is so essential to your diet? Not only do these vegetables look great and taste wonderful, but they are rich in the phytochemicals that keep you healthy.

Broccoli, green peas, watercress, brussel sprouts, cauliflower, kale, rutabaga, turnips

Lutein and Indoles

Phytochemical such as Antioxidant properties of these chemicals protect your eyes by keeping your eyes strong. Also these cruciferous vegetables may reduce the risk of cancerous tumors

**ORANGES** Orange is a must-have in your daily diet. b-carotene, a carotenoid, is a natural antioxidant and enhances the immune system. This group is also rich in Vitamin C and Vitamin E. Folate, most often found in leafy greens, is also found in orange fruits and vegetables as is vitamin B, which may help prevent some birth defects. With a chemical make-up this good, the orange group should always be part of your diet.

Apricots, butternut squash, cantaloupe, carrots, mangos, peaches, pumpkin, sweet potatoes, orange fruit, clementines, nectarines

Beta-carotene

Reduced risk of cancer and heart disease, maintenance of good vision increase infection-fighting ability

**YELLOWS** Bright yellows have many of the same characteristics as the orange group: high in essential vitamins and carotenoids. Yellow fruits and vegetables belong to many different families, but they all share the common bond of health enhancing and great taste.

Springtime corn, squash, peppers raisins

Bioflavonoids

In addition, they maintain healthy, skin, yellow teeth and bones

**BLUES/PURPLES** Blues and purples not only add beautiful shades of tranquility and richness to your food, but also add health-enhancing flavonoids, phytochemicals and antioxidants. Anthocyanins, a phytochemical, are pigments responsible for the blue color in fruits and vegetables.

Black currants, blackberries, blueberries, purple grapes Eggplants, plums, prunes, raisins

Anthocyanins

Reduces risk of cancer, heart disease, age related memory loss

Phenolics

Slowing of some effects of aging

#### **WHITES**

Garlic, leeks, white onions

Allicin

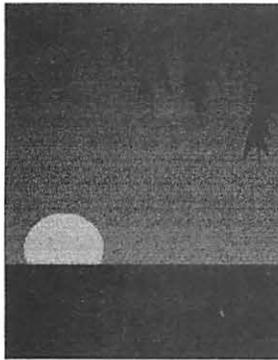
Reduced risk of cancer spread and heart attack; lowered cholesterol and blood pressure; enhanced infection defenses

## SAVOR THE SPECTRUM OF THE SEASON

There is not a single-color season. When it comes to your health, you'll fare best with a multicolored diet. By putting something of every color on your plate or in your lunch bag, you are more likely to eat at least 5 servings of fruits and vegetables every day. Think colorful: 1 cup of dark, leafy GREENS, 1/2 cup of RED tomatoes, 1/2 cup of YELLOW peppers, 6 oz. ORANGE juice and 1/2 cup of BLUEberries.

This season, get your "5 A Day" the colorful way! For recipes and ideas on how to color your daily diet with fruits and vegetables, check out the 5 A day web site at [www.5aday.gov](http://www.5aday.gov). (Based on National Cancer Institute's 5 A Day for Better Health Program Web.)

*Gultekin Celikiz*  
Editor, ISCC News.



### Why The Sun Turns Green

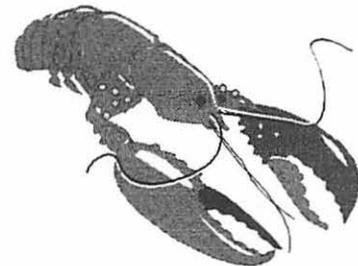
In the last issue of ISCC News, C. Sturke mentioned about the colorful days of Code Green; we even wrote a quotation from J. W. von Goethe about "green the golden tree of life." Here is another bit of information about green.

Why do green flashes of light appear at sunsets?

When light enters the atmosphere it is refracted or bent; the amount of refraction (or bending) depending on the wavelengths. The blue and green bend more; the red and orange bend less. The colors are separated as if by a prism. Thus on a day without haze when the sea or land is sharply warmer or cooler than the air, red and orange wavelengths vanish, leaving blue and green dominant. The result is seen as brief green flashes on the sun's disk.

*Gultekin Celikiz*  
Editor, ISCC News

(The above article is condensed from  
The National Geographic Magazine, Nov 2000.)



### Why Lobsters Turn Red

As the temperature rises in the lobster pot, the bluish-tinged lobsters enjoy their last few moments of freedom. As they are plunged into the boiling water their shell turns into a bright red. Now one could wonder if they might be making a show of anger in response to their demise, however the scientists at the University of Manchester in England have discovered the real reason for their colorful transformation and have reported so in the Proceedings of the National Academy of Sciences.

The proteins in a lobster's shell disintegrate when heated, leaving behind only the red-tinged pigment called astaxanthin. The scientists have uncovered the chemical details of how astaxanthin molecules bind with proteins (creating the bluish color of live lobsters) and then break apart (creating red). This scientific team led by Michele Cianci reports that this work might help researchers develop better food colorants or dyes.

So the next time you are lucky enough to enjoy a traditional boiled lobster dinner, thank those astaxanthin molecules for parting with the proteins to give you your attractive seafood fare.

*Cynthia Sturke, Assoc. Editor, ISCC News*



## CALENDAR



Please send any information on Member-Body and other organization meetings involving color and appearance functions to:

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### 2002

- Sept 9-12** ArgenColor 2002, The 6th Argentine Color Congress, School of Architecture, Planning and Design of Rosario National University, Rosario City, Province of Santa Fe, Argentina [argencol@fccia.unr.edu.ar](mailto:argencol@fccia.unr.edu.ar) Chair: Prof. Enzo Grivarello
- Oct 1-2** SPE CAD RETEC Annual Technical Conference, Toronto Ontario, Royal York Hotel.  
 Further Information: [www.specad.org](http://www.specad.org)
- Oct 1-4** AATCC International Conference and Exhibition, Charlotte Convention Ctr, C2C (Concept to Consumer), Charlotte, NC Contact: Shirley Clifton 919-549-8141  
 919-549-8933 fax or [www.aatcc.org/ice/index.cfm](http://www.aatcc.org/ice/index.cfm) or [c2c.aatcc.org](http://c2c.aatcc.org)
- Oct 1-3** TAGA, International Printing & Graphic Arts Conference, Bordeaux Exhibition Centre, Bordeaux, France Contact: TAGA at 585-475-7470 <http://www.taga.org>
- Oct 13-15** CMG's Fall International Conference, San Diego, CA, USA [www.colormarketing.org](http://www.colormarketing.org)  
 703-329-8500 Fax 703.329.0155 [jhood@colormarketing.org](mailto:jhood@colormarketing.org)
- Oct 23-24** AATCC Workshop: Color Measurement Principles and the Textile Industry, Research Triangle Park, NC. Info: [www.aatcc.org](http://www.aatcc.org)
- Oct 24-25** CAUS "Color Interactions" A two-day symposium in New York City. Featured sessions 'Curated Spaces' and 'Colored Materials', evening of theater and gallery tours.  
 CAUS members \$500, non-members \$800 212-947-7774 [www.colorassociation.com](http://www.colorassociation.com)
- Nov 8-15** Integrating Remote Sensing at the Global, Regional and Local Scale. The 15th William T. Pecora Memorial Remote Sensing Symposium/Land Satellite Information IV Conference and ISPRS Commission I (Platforms and Sensors) Symposium, Denver, CO  
[www.asprs.org/Pecora-ISPRS-2002](http://www.asprs.org/Pecora-ISPRS-2002). For ISPRS information: [www.isprs.org](http://www.isprs.org)

### 2003

- Jan 8-11** CMG's European Meeting, Frankfurt, Germany [www.colormarketing.org](http://www.colormarketing.org)
- Jan 22-24** ASTM E-12 Meeting: ASTM International Headquarters, W. Conshohocken, PA
- Feb 17-19** 26th Biennial Western Coatings Societies Symposium and Show, "Making a Difference". Reno, NV Technical Papers: Tim Specht 510-451-2326 Table-top exhibits: Leon Persson 702-492-1577.
- March 5-6** CMG's Western Regional Meeting Los Angeles, California, USA [www.colormarketing.org](http://www.colormarketing.org)
- March 9-11** ISCC Williamsburg Conference, Solutions for Industrial Color Problems,  
 Chairs: Ralph Stanzola, 908-369-8736 [rascolor@juno.com](mailto:rascolor@juno.com) Philadelphia University  
 John S. Locke, 302-695-1865 [john.s.locke@usa.dupont.com](mailto:john.s.locke@usa.dupont.com)
- April 6-9** TAGA 2003 Montreal, Hotel Omni Mont-Royal, Quebec, Canada  
 Contact: TAGA at 585-475-7470 <http://www.taga.org>
- April 12-15** CMG's Spring International Conference, Hollywood, FL Contact: Elizabeth Preston  
 703-329-8500 [epreston@colormarketing.org](mailto:epreston@colormarketing.org) or visit: [www.colormarketing.org](http://www.colormarketing.org)
- April 13-16** ISCC Annual Meeting and Symposium on Color & Appearance Instrumentation  
 Co-sponsored by ISCC and FSCT, Chicago, IL  
 Chair: Romesh Kumar, Clariant Corporation, 401-823-2161 [romesh.kumar@clariant.com](mailto:romesh.kumar@clariant.com)



## ISCC Sustaining Members

<b>Barr Associates, Inc.</b>	<a href="http://www.barrassociates.com">www.barrassociates.com</a>	978-692-7513
<b>BYK-Gardner USA</b>	<a href="http://www.bykgardner.com">www.bykgardner.com</a>	301-483-6500
<b>Chromatics Color Sciences Intl, Inc.</b>		212-717-6544
<b>Ciba Specialty Chemicals</b>	<a href="http://www.cibasc.com">www.cibasc.com</a>	302-633-2042
<b>Color Communications, Inc.</b>	<a href="http://www.ccicolor.com">www.ccicolor.com</a>	773-638-1400
<b>DuPont Performance Coatings</b>	<a href="http://www.dupont.com">www.dupont.com</a>	248-583-8345
<b>Flex Products, Inc.</b>	<a href="http://www.colorshift.com">www.colorshift.com</a>	707-525-7337
<b>GretagMacheth, LLC</b>	<a href="http://www.gretagmacheth.com">www.gretagmacheth.com</a>	800-622-2384
<b>Hewlett-Packard Company</b>	<a href="http://www.hp.com">www.hp.com</a>	650-857-6713
<b>Hunter Associates Laboratory, Inc.</b>	<a href="http://www.hunterlab.com">www.hunterlab.com</a>	703-471-6870
<b>Labsphere, Inc.</b>	<a href="http://www.labsphere.com">www.labsphere.com</a>	603-927-4266
<b>Minolta Corporation</b>	<a href="http://www.minoltainstruments.com">www.minoltainstruments.com</a>	201-529-6055
<b>Pantone, Inc.</b>	<a href="http://www.pantone.com">www.pantone.com</a>	201-935-5500
<b>PPG Industries, Inc.</b>	<a href="http://www.ppg.com">www.ppg.com</a>	724-274-3532
<b>Prime-Color, Inc.</b>	<a href="mailto:watprime@hotmail.com">watprime@hotmail.com</a>	908-272-5759
<b>SPC Software</b>	<a href="http://www.spc-software.com">www.spc-software.com</a>	+33-1-4784-0066

## ISCC Member-Bodies

**American Association of Textile Chemists and Colorists (AATCC)**  
**American Society for Testing and Materials International (ASTM)**  
**American Society for Photogrammetry & Remote Sensing (ASPRS)**  
**The Color Association of the United States, Inc. (CAUS)**  
**Color Marketing Group (CMG)**  
**Color Pigments Manufacturing Association (CPMA)**  
**Council on Optical Radiation Measurements (CORM)**  
**Detroit Colour Council (DCC)**  
**Federation of Societies for Coatings Technology (FSCT)**  
**Gemological Institute of America (GIA)**  
**Graphic Arts Technical Foundation (GATF)**  
**Illumination Engineering Society of N. America (IESNA)**  
**National Association of Printing Ink Manufacturers (NAPIM)**  
**Optical Society of America (OSA)**  
**Society for Information Display (SID)**  
**Society of Plastics Engineers, Color & Appearance Div.(SPE)**  
**Society for Imaging Science and Technology (IS&T)**  
**Technical Association of the Graphic Arts (TAGA)**  
**Technical Association of the Pulp and Paper Industry (TAPPI)**

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