Inter-Society Color Council *News*

Issue 458 Jul-Aug 2012

In Memoriam: *Dr. Louis D. Silverstein* (1950-2012)

Lou Silverstein, a leader and innovator of flat panel display technology, passed away unexpectedly working at his desk in his home office in Scottsdale, AZ on the evening of May 1. He was 61.

Lou was well known in the display industry for his pioneering work on pixel layouts, anti-aliasing and tone scale, viewing angle performance, color control and reconstruction, smooth motion, flicker, and sunlight legibility. A leading advocate for optimizing displays based upon human visual characteristics, Lou developed predictive models of display performance that directly linked engineering tradeoffs to human vision and perception. In 2004 he received the ISCC Macbeth Award for his contributions to color rendering through liquid-crystal technology in cameras and displays. *(continued on page 3)*

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Annual Meeting 2012 October 16-17, Manchester, NH

Plans continue for your 2012 Annual Meeting in Manchester, NH. The program committee is assembling a great series of presentations. As of this writing, here is a sample of what to expect:

- *Spectral Modeling of Surface Colors in Rural Outdoor Environments*
- *Color Versatility: Evolutionary Perspective*
- *A Meta-Analysis of Color Effectiveness in Designed Environments*
- *Illuminant-Dependent Von-Kries Primaries: A Way Out of the Sharpening Dilemma*
- Tutorial: *Why do individuals see colors differently? Metamerism, and what to do about it.*

There is still room for more submissions, so please consider participating. Our requirements for submission are flexible; generally abstracts are expected to be 2-5 pages. If you have specific questions regarding your paper, please contact one of the program committee:

- IG 1: Basic and Applied Color Research: Ms. Ann Laidlaw, `ALaidlaw@XRite.com`
- IG2: Industrial Applications: Mr. James Roberts, `jim.roberts@altanachemie.com`
- IG3: Art, Design & Psychology: Dr. Leslie Harrington, `leslie@colorassociation.com`
- Educational Session: Dr. David Wyble, `wyble@cis.rit.edu`
- Environmental color session: Dr Romesh Kumar, `Romesh.Kumar@clariant.com`

The General Co-chairs are Dr. Art Springsteen (`arts@aviantechnologies.com`) and Mr. John Conant (`jconant@aerodyne.com`). Please contact Art Springsteen if you have questions regarding this meeting. More travel information will be provided closer to the meeting date.

`iscc.org/meetings/AM2012/`

Member Body News: 2012 CORM Annual Meeting

The 2012 Annual Meeting of the Council for Optical Radiation Measurements was held in Ottawa Canada on May 30 – June 1. The meeting was well attended, and provided another good conduit between a national standards laboratory (in this case, NRC Canada) and the greater community of light measurement experts.

In attendance were four ISCC members, all interested in fostering the important interconnection between ISCC and its constituent Member Bodies.

Against panoramic Ottawa (L-R) Dave Wyble, Art Springsteen, Joanne Zwinkels, Mike Brill.

12th AIC Congress, July 8-12, 2013 The Sage: Gatehead, UK

The AIC Congress is held every four years and is the only international color conference that promotes all facets of color.

The main theme of the 2013 conference will be *Bringing Colour to Life*, in the practical sense of color production and reproduction, in the sense of color in nature, and the ways in which color can be used sustainably now and in the future.

For the latest details and information, visit `www.aic2013.org` or email `info@aic2013.org`.

CIE 2012 - Final Program Online

View the program for CIE 2012 "Lighting Quality & Energy Efficiency" online. A high number of abstracts was received, showing the true interest of the lighting community in the conference subject. The approach of CIE 2012 is to be a forum and a "show room" for best practices in a variety of fields and state-of-the-art research conducted worldwide. The program shall reflect this attitude.

We sincerely hope that we will meet your expectations and are looking very much forward to seeing you in Hangzhou at the CIE 2012.

hangzhou2012.cie.co.at/programme

Lou Silverstein Memoriam
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He developed liquid-crystal-based cameras and filters that correct for chromaticity wander in liquid-crystal displays. Earlier he designed the advanced cockpit color CRT display systems for the Boeing 757/767 aircraft and developed visual simulation methods for color liquid crystal displays.

Lou received a BS, MS, and PhD from the University of Florida. In his dissertation research he studied repetition and distribution effects on memory. After receiving his Ph.D. in 1977, Lou worked as an NIH Post Doctoral with Professor Francis Graham at the University of Wisconsin, where he investigated the relationships between eye movements and attention.

In 1979 Lou joined Rockwell International, where he was a human factors specialist working on avionic displays. Robin Merrifield of Boeing recruited Lou to join him in Seattle the following year. Their task was to enable CRTs to replace avionic steam-gauge displays in the Boeing 757 and 767 airplanes that were still under development. These were the first commercial aircraft to implement the glass cockpit and the first aircraft glass cockpit of any type to use color avionic displays.

Lou developed novel evaluation and color discrimination modeling techniques for generating acceptable performance requirements for displays used in the cockpit. Along with Robin Merrifield, who was primarily responsible for the CRT systems, hardware firmware and measurement instrumentation, Lou's work in determining the visual requirements and measurement criteria for the displays drove the development of the Electronic Flight Instrument System color CRT hardware and display specifications that led to the certification of CRTs on the 767 in 1982.

I knew Lou for about 18 years, starting with our involvement with early SID/IS&T Color Imaging Conferences, and through editorial board meetings of Color Research and Application. During those years, I saw his influence in any display-related activity in which I became involved. When I joined the Sarnoff-vision-model team, Lou had been a team collaborator on a video engineering and optimization system (VIDEOS for short) that simulated human visual response to a flat-panel display. Among other things, the project spawned a much-used coffee mug with the inscription, "Someday, the world will be flat." Later, I had the pleasure of working directly with Lou to create a "Common Flat Panel Display" standard for the U.S. Army. We had to devise specifications for a display that would operate in light environments from the darkest night to direct sunlight, allowing enough viewing angle for several people in a tank to see the display simultaneously, and hardened to the rigors of desert and jungle warfare. And the colors had to be right, over the whole screen. Lou grounded the effort in the sanity of real engineering and human limitations. The effort also led to a new color metric.

Lou always brought to a problem deep understanding of its many facets. He knew what makes a liquid crystal contort, how to make it send light of the intended color in the intended direction, and how to make sure the images produced by such light can be seen in conditions for which the signal can save lives. Rarely has a color technologist had so important an impact, or so enriched the perspective of his fellow workers. He was an insightful, funny, and engaging colleague. He will be missed.

Compiled by Michael H. Brill

Member Body News

- Leslie Harrington, Executive Director of The Color Association of the United States was quoted in this Huffington Post article: "How Color Affects Our Mood" (`tinyurl.com/77waa77`)
- Congratulations to The Color Marketing Group on their 50th Anniversary this fall in Miami!
- The Spring 2012 edition of Optical Radiation News, newsletter of the Council for Optical Radiation Measurements (CORM), is available online: (`tinyurl.com/ORN-Spring12`)
- The Gemological Institute of America (GIA) offers services to aid with the screening for Synthetic Diamonds. (`tinyurl.com/GIA-June2012`).
- The National Association of Printing Ink Manufacturers publishes an active blog. (`napim.org/blog/`)
- The Society for Information Display (SID) is celebrating their 50th Anniversary in 2012.
- The Society of Plastics Engineers Color and Appearance Division (SPECAD) has published their Spring 2012 newsletter online: (`tinyurl.com/SPECAD-Spring2012`)
- The Society for Imaging Science and Technology (IS&T) has an iPhone app. Who knew you could even do that? (`tinyurl.com/74myalx`)

Adobe RGB and sRGB Colors

Posted on June 24, 2012 by Parker Plaisted

Two of the most commonly used ICC profiles for RGB images are Adobe RGB (1998) and sRGB IEC61966-2.1. The Adobe RGB (1998) color space has a larger color gamut than the sRGB IEC61966-2.1 color space, but you may be surprised to see that they share many similarities.

Color-Image.com

In order to compare the two color spaces, I will use the CIE and ICC data that define the color spaces:

1) Gamma value
2) White point
3) Red primary CIE chromaticity coordinates
4) Green primary CIE chromaticity coordinates
5) Blue primary CIE chromaticity coordinates

	Adobe RGB	sRGB	Same?
Gamma value	2.2	2.2	yes
White point	D65	D65	yes
Red primary x	0.6400	0.6400	yes
Red primary y	0.3300	0.3300	yes
Green primary x	0.2100	0.3000	no
Green primary y	0.7100	0.6000	no
Blue primary x	0.1500	0.1500	yes
Blue primary y	0.0600	0.0600	yes

As you can see in the table, Adobe RGB (1998) and sRGB IEC61966-2.1 share the same values for four of the five attributes. The only difference is the set of CIE chromaticity coordinates for the green primary.

Now let me show you two versions of a sample image. For the first image, the sRGB IEC61966-2.1 ICC profile was assigned to the image in Adobe Photoshop. For the second image, the Adobe RGB (1998) ICC profile was assigned to the image in Adobe Photoshop. (Note: To make sure you see a difference between the two images, I converted the second image from Adobe RGB (1998) to sRGB IEC61966-2.1 so that both images are coded to the same color space. Yes, I could have coded both of them in the Adobe RGB (1998) color space to make sure no colors got clipped. Feel free to repeat this experiment in a color-managed display environment to see the color differences.)

As you can see, the colors in the image with the sRGB IEC61966-2.1 ICC profile are significantly different from the colors in the image with the Adobe RGB (1998) ICC profile.

Based on the data comparison above, I would have expected the reds and blues to be similar in both images, and I would have expected the greens to be very different. However, the greens and blues have small shifts in color, and the reds and oranges have large shifts in color.

sRGB IEC61966-2.1 ICC Profile

Adobe RGB (1998) ICC Profile

sRGB IEC61966-2.1 ICC Profile

Adobe RGB (1998) ICC Profile

Why do we see these large color differences in the reds and oranges when the only difference in the two color spaces is the set of CIE chromaticity coordinates for the green primary? The answer can be found in the CIE XYZ tristimulus values for the red, green, and blue primaries.

Read the rest of this entry at:
`www.color-image.com`

HUE ANGLES

(Send contributions to mbrill@datacolor.com)

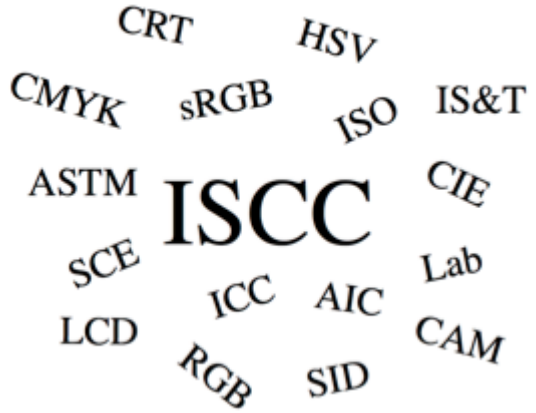
Perils of the TLA

There's many a slip twixt the intention and the abbreviation..

In the course of my duties as a subcommittee chair of the ASTM International, I recently shepherded a ballot to withdraw a standard on host computer communications because "the standard is not needed: manufacturers use their own SDKs and users can select an SDK from a menu." One voter complained that he couldn't find "SDK" in any dictionary but did find two definitions on the Internet: "Software Development Kit" and "Super Donkey Kong." He presumed correctly that the former was intended, but he made his point: We should spell out our abbreviations at first occurrence, even if we think everyone should know them.

It's easy to imagine amusing coincidences from such ambiguity, e.g., the ASA rating on a photographic medium used to record the luncheon meeting of the Acoustical Society of America. Or the National Science Foundation being caught at the bank with NSF (non-sufficient funds). Or the CIA spy who hangs out at the Culinary Institute of America. We could go on and it would look like fun.

Sometimes it isn't fun. Remember the famous legal trademark dispute between the World Wrestling Federation and the World Wildlife Fund? The giant panda won the WWF fight, as WWE know.



Once I was scheduled to fly from Baltimore-Washington Airport to Miami for a large religious meeting. In preparation for that meeting (and to avoid sunburn), I wore a baseball hat that bore the large letters "NSA." When I mistakenly ended up at the gate of Fort Meade, Maryland (right next to the airport), I got a strange look from the security guard. Fortunately, I still made my plane.

Undeclared abbreviations can cause confusion even in a narrow field. In connection with medical imagery, I have to inquire regularly whether the American College being called ACR is Radiology or Rheumatology. But my close encounter of the worst kind concerned two methods of solving differential equations, both called SDA: Strong Discontinuity Approach and Spectral Domain Approach. The name of the Russian mathematician Boris Galerkin is associated with both, which deepened the confusion.

"Super Donkey Kong" doesn't sound so funny anymore.

I think we ought to avoid double meanings of abbreviations at least in the same field. To this aim, I offer the public service of pointing out a new spell-out of LCD that emerged at a recent solid-state-lighting committee meeting: the Light Code Designation (LCD) system for LEDs. The term doesn't seem to have reached Google yet, so there may be hope for liquid-crystal displays if we can head this one off at the pass.

By the way, in the title of this essay, TLA means "Three-letter abbreviation." I haven't even mentioned two-letter abbreviations (numerous PCs, nm as nanometers versus nautical miles) or four-letter abbreviations with multiple meanings (most notoriously the ISCC).[‡]

What are some amusing/confusing TLA's in your field?

Michael H. Brill, *Datacolor*

[Note: When I began this essay, I incorrectly used "acronym" in place of "abbreviation." An acronym is a very special abbreviation that spells a pronounceable word. For example, when NBS changed to NIST (rhymes with "mist"), it graduated to an acronym. NRC and NPL are still just abbreviations. MHB.]

[The editor ponders why this Interesting, Significant, and Curious Communiqué does not mention a third related word form: "acrostic." - DRW]

[‡]Refer to the ISCC News Issue #450, Mar/Apr 2011 for a fun listing of other ISCC's.

Color Research and Application
IN THIS ISSUE, August 2012

In our first article, M. Ronnier Luo, Chengyang Fu, Changjun Li, Robert W. G. Hunt, Michael R. Pointer, and Guihua Cui present a new color-appearance model based on CIECAM02 specifically for unrelated colors under photopic and mesopic conditions, with parameters to allow for the effects of luminance level and stimulus size. In "An Investigation of Colour Appearance for Unrelated Colours under Photopic and Mesopic Vision," they report on experiments using magnitude scaling of brightness, colorfulness, and hue to investigate the effects of changes in luminance level and stimulus size for unrelated colors. They compared the results of the new model with those of the CAM97u model and CIECAM02 models.

The Colour Appearance Model for Colour Management Systems: CIECAM02 was published in 2004 by the Commission Internationale de l'Éclairage (CIE). It immediately received wide acceptance and use, although it was known to have some problems. At the CIE Quadrennial meeting in Beijing in 2007, CIE TC8-11 CIECAM02-Mathematics (chaired by Changjun Li) was established to improve CIECAM02. Tackling individual issues with CIECAM02 has been the topic of several articles in this journal and elsewhere since 2006. Colors that occur on or near the CIE spectrum locus seem to present the most difficulties, and it was proposed that this was because the color appearance transform embedded in CIECAM02 predicted corresponding colors with negative tristimulus values. To resolve this problem, Changjun Li, Esther Perales, M. Ronnier Luo, and Francisco Martínez-Verdú propose a mathematical approach to modify the color appearance transform in "Mathematical approach for predicting non-negative tristimulus values using the CAT02 chromatic adaptation transform." The also discuss the trade-offs that it requires.

In the field of color measurement, the techniques for determining the variability and uncertainty of colorimetric values caused by the measurement instrumentation have been developed and published. However, in the field of computer vision the vast majority of existing color analysis methods do not account for intrinsic variability of input Red, Green, Blue channels (RGB) provided by capturing devices. Rather than working in tristimulus or CIELAB spaces, these groups work in a Hue, Saturation, Value (HSV) space that is based on the RGB components of either the capture or display system. In "Variability Estimation of Hue and Saturation Components in the HSV Space," Santiago Romani, Eduard Montseny, and Pilar Sobrevilla introduce two new pairs of variability estimators of the Smith's H-S components: 1) The first pair of estimators is based on error-propagation analysis on RGB-to-HSV formulation (called Theoretic Estimators) and 2) the second pair of estimators is derived with heuristic relations on HSV components rendered by pixel distributions (called Heuristic Estimators). Both approaches provide predictions of real standard deviations of H-S distributions extracted from a set of NCS color samples. The authors report on experiments verifying the accuracy of both approaches with predictions of standard deviations of real data samples and derive some conclusions about the proposed variability estimators.

As industries become greener and greener, customers are more aware of efforts to conserve. Some look for recycled products, others avoid anything that is not top quality. In the paper industry, whiteness has long been the criteria for selection of paper and evaluation of its quality. But how will the consumers' knowledge that the materials are recycled products effect their acceptance of paper? That is the question that our next article examines. Hyojin Jung, Hyeon-Jeong Suk, Saori Kitaguchi, Tetsuya Sato, and Kanji Kajiwara report on their studies in "Color Tolerance Prediction for Recycled Paper Based on Consumers' Awareness." In their article they also propose a new equation to predict the consumers' tolerance of paper color, in which the equation contains two factors concerning the color distance from the white point and the hue impact.

From paper whiteness we move to skin whiteness. What a leap! There is no recycling here. Our next article is "Effect of Chromatic Components on Facial Skin Whiteness." It is this editor's opinion that generally if a person is asked to select from let us say a batch of Munsell color patches the colored specimen that is the color of their own face, it will be quite different from what a colorimeter would measure as the closest match. In dermatology and in the cosmetic industry instrumental color measurements of skin are common. However, there has been little work on the possible relationships among perceived whiteness and the metric lightness, chroma and hue angle of facial skin color. Hironobu

continued on next page

"In This Issue" continued from previous page

Yoshikawa, Kumiko Kikuchi, Hirohisa Yaguchi, Yoko Mizokami, and Sadaki Takata have rectified this situation. After several experiments, they concluded that a higher-level process of facial recognition affected whiteness perception, and the criterion of whiteness for facial skin was determined by the facial skin color distribution.

Our next article is on Ecommerce. It is known to that the atmosphere in the store affects customers' purchases and selections. Is this also true for ecommerce where the customer is not physically immersed in the shopping experience? Putting aside the immersion aspect, Steve Westerman, Ed Sutherland, Peter Gardner, Roxanne Metcalfe, Justine Nash, Sarah Palframan, and Nicola Woodburn examine two aspects: 1) the effects of color on the general cognitive processing capacities and strategies that support consumer decision making and 2) color-related effects on aesthetic judgments. In "Ecommerce Interface Colour and Consumer Decision Making: Two Routes of Influence," they report that specific products selection is mediated by the consumer's judgment of product aesthetics. However, interface color also affected the number of attributes considered as well as the aesthetic appearance of the particular product.

For the final article in this issue we go to the theater. Mi-Suk Lee, Jin Kang Sa, and Kyung Hee Chung provide an "Analysis of the Characteristics and Images of the Colors in the Stage Costumes of Korea, China and Japan." The northeast-Asian countries of China, Japan and Korea share much traditional heritage. In this article the authors analyze the degree of universality and the differences among the traditional plays in these three countries by closely examining the characteristics and images of costume colors. They found that the costume color images of the traditional plays of the three countries revealed that they all shared the use of dynamic images in the strong contrast of Five Element Colors. However, the study results suggested that their color images differed in terms of the tones used and the techniques for color combination. These results reflect that colors in the traditional costumes of the three countries are affected by their cultural codes, thereby representing the characteristics of certain peoples and cultural circles.

We close this issue with two book reviews and briefly mention another publication. Ian Ashdown reviews *The Art and Science of HDR Imaging* by McCann and Rizzi and Janos Schanda tells us about the book, *Light Sources: Technologies and Application* by Kitsinelis. Then the third issue of *New Geographies* is described. That issue is entitled "Urbanisms of Color."

Ellen Carter
Editor, Color Research and Application

Member Body News:
AATCC Webinar to Address Color & Lighting: Best Practices Today

At 11:00 am EDT on August 30 Ms. Ann C. Laidlaw, global supply chain program manager, with X-Rite Inc. will discuss Color & Lighting: Best Practices Today. The one hour webinar will review various current and emerging lighting technologies, methods for assessing them, and the practical implications of using the technologies to view colored objects. Register at www.aatcc.org

Calendar

Sep 22 – 25	**AIC Interim Meeting**, Taipei, Taiwan. www.aic2012.org
Sep 26 – 27	**CIE Division 1: Color and Appearance**, Taipei, Taiwan. www.cie.co.at
Sep 28 – 29	**SCAD Meeting 2012**, W Chicago City Center Hotel, Chicago IL www.scadent.org
Oct 16-17	**ISCC Annual Meeting**, Manchester NH (see page 1)
Nov 12-16	**IS&T** Color Imaging Conference, Los Angeles, CA www.imaging.org/ist/conferences/

2013

Jan 30-31	**ASTM E12** meeting at Hyatt Regency Riverfront in Jacksonville, FL.
Feb 3-6	**IS&T/SPIE** Electronic Imaging Symposium, San Francisco, CA www.imaging.org/ist/conferences/
Jun 26-27	**ASTM E12** meeting at NIST HQ in Gaithersburg, MD
Dec 12-13	**ASTM E12** meeting at Hyatt Regency Riverfront in Jacksonville FL

Metameric Blacks: A Color Curious Column

Ever wonder ... "if no light falls on an object does it still have a color?"

"If a tree falls in a forest and no one is around to hear it, does it make a sound?" This is an interesting philosophical riddle that probably dates to the mid 1800s in its modern English-language form. Certainly similar riddles date back many centuries in other cultures, probably as long as recorded history. To me, the answer is simple. Since sound is a perception and no one was around to hear it, the tree did not make a sound. (That answer also assumes there were no other animals capable of perceiving sound around, which is highly unlikely.) Color is also a perception, so I like to ask students if the tree has a color. The answer is still "no". This image is of a fallen giant sequoia tree in California's Sequoia National Park. Giant sequoias are the world's largest trees in terms of total volume and grow to typical heights of 165-280 ft. (50-85 m). They are thought to essentially live forever with the oldest measured specimen being over 3500 years old. Their wood is very resistant to decay and fire and it is thought that the only way a sequoia dies is that it is knocked over. Since their wood and bark is brittle, they tend to shatter when they fall, as shown in the picture. Imagine the sound!

Like the philosophical question about the sound of a tree falling in a forest, this is a question of perception. Since color is a visual perception and light is the stimulus that produces visual perception of objects, then with no light there is also no color. At least there is no color that belongs to that object. We might still perceive color due to the dark noise in our visual system. For example, when we are in a completely darkened room for a long period of time (so that we completely adapt), the perception is not one of black (which only exists as a related color), but one of a noisy (or grainy) dark gray.

These types of questions can never be answered definitively. That's what makes them philosophical in nature. It is fun to ponder them and discuss the possible answers with others. Such thoughts and discussions can lead us into greater insights about ourselves and the world around us. Another one to ponder from *The Gateless Gate* ... "The wind is flapping a temple flag, and two monks were having an argument about it. One said, 'The flag is moving.' The other said, 'The wind is moving.' They argued back and forth but could not reach the truth. The sixth patriarch said, 'It is not the wind that moves. It is not the flag that moves. It is your mind that moves.' The two monks were struck with awe."

Content of this column is derived from *The Color Curiosity Shop*, an interactive website, now also available as a Spanish-language book, allowing curious students from pre-school to grad-school to explore color and perhaps become interested in pursuing a science education along the way. Please send any comments or suggestions on either the column or the webpage to me at <*mdf@cis.rit.edu*> or use the feedback form at <*whyiscolor.org*>.

Mark D. Fairchild
Rochester Institute of Technology

The ISCC Online

We have many places online for additional information and interconnections for the color community. Why not take a moment to visit one and join in a conversation?

- www.iscc.org
- www.hueangles.blogspot.com
- www.whyiscolor.org
- www. tinyurl.com/ISCC-LinkedIn
- or any of our Member Bodies and Sustaining Members listed on the last page.

Member Body News: AATCC Color Management Workshop to be held September 19-20

Color plays an important role in a consumer's decision to purchase a particular product. In order to get the color envisioned by the designer and demanded by the consumer, the communication of color throughout the supply chain is imperative especially in textiles items which contain many components.

Attend AATCC's Color Management Workshop being held September 19-20 at the Association's Technical Center in Research Triangle Park, N.C. USA and hear world renowned color experts discuss color principles and the affect of lighting; factors to consider when developing your color palette and how these choices affect cost, fashion, durability, and dyeing reproducibility; how to implement a digital color program with your supplier; managing color on multiple textile substrates; how to control shade from concept to production and much more. Participants will have an opportunity to have their color questions answered during the presentations and breakout sessions. This workshop is designed for merchandisers, retailers, manufacturers, product developers, color approval managers, specifiers, and designers.

Breakout sessions will focus on illumination and observer issues; sample analysis and measurement technique; creativity with trends and virtual development; what is color matching; production evaluation and control; and how to do the right color right.

Individuals registering on or before September 4 pay US$1049 (US$705 for individual and corporate AATCC members) and will include luncheons, breaks and a copy of all available papers. After September 4 the registration fee increases to US$755 for AATCC members and US$1099 for nonmembers. Refunds will be honored if cancellations are received on or before September 4, 2012. A US$75 cancellation fee will be charged. Attendance is limited so early registration is encouraged.

For additional details or to register visit www.aatcc.org/events/workshops/color.htm.

Color News: We Don't all see the same colours say scientists as they claim one person's red is another's blue

Published online at *www.dailymail.co.uk*

June 30, 2012

New research has led scientists to believe that people do not see all the same colours when they look at similar objects.

Although there is a general consensus that red is the same shade as strawberries, blood and the planet Mars some people could perceive the colour red as another person's blue according to experts.

The revelations come after an experiment with monkeys which suggests that our colour perception is shaped by the outside world but follows no predetermined pattern.

In work published in the scientific journal *Nature*, colour vision scientist Jay Neitz from the University of Washington injected a virus into monkeys' eyes which enabled them to see red as well as green and yellow.

Scientists were able to infect squirrel monkeys with a virus which allowed them to see the colour red.

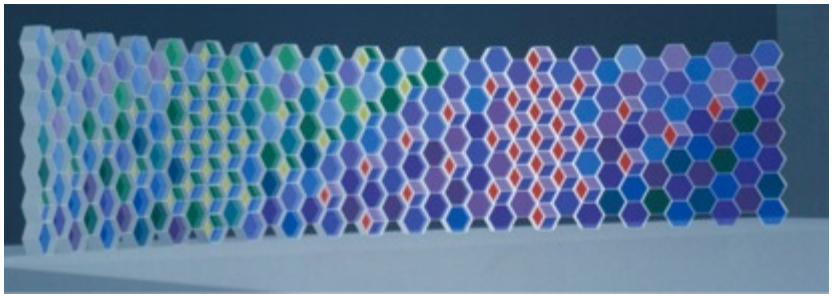
Remarkably the group of squirrel monkeys were able to make sense of the new information despite their brains not being genetically programmed to respond to red signals. The result was that just four months later the monkeys could see in full colour for the first time.

As well as allowing colour-blind humans to tell red from green, the innovative technique could restore sight to the blind.

Sufferers of age-related macular degeneration - the most common cause of blindness in the elderly - are among the millions who could eventually benefit.

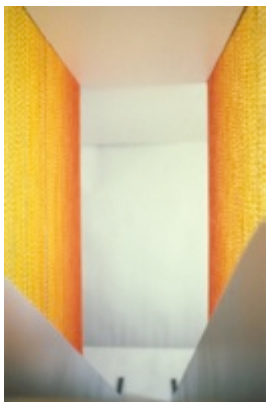
Read the rest of this article online at:
www.dailymail.co.uk/news/article-2166917/

Member News
Anna Campbell Bliss: Washington Visit



Meeting Ellen Carter and Cynthia Sturke at the National Museum of Women in the Arts was a delightful surprise. I had been thinking of ISCC only recently. Wonderful friends, stimulating sessions and a productive period were in mind.

Showing at the museum was a film of my life and work by the Washington filmmaker Cid Collins Walker. It dealt with early influences and directions but only minimally with color and later work. Working with ISCC was not reviewed and I considered it very important for the development of my art. My associations there helped me to gain a broader perspective and stimulation that was lacking in my home base of Utah.



At this stage in life memory leads you in many different directions. I think of mine as a multistoried structure of many floors. The film maker focused on the lower floors to develop a coherent view of early influences. My interests in color and the art/science/technology area developed more fully later during my association with the ISCC.

Medical demands interrupted the natural staging of interests. A year of virtual blindness that was a traumatic experience destroyed my focus and took years to fully recover. I was on my way to Italy after closing a major exhibition of my art of the last 40 years. I looked forward to seeing my favorite sites and doing more research in the library of the American Academy in Rome. My eyes had been a source of concern and I thought it best to have them checked, thinking I might have cataracts developing. Instead I was informed that I was going blind with macular degeneration. I was devastated. Not wishing to abandon my plans for Italy I made an appointment with a specialist for my return.

Dr. Michael Teske outlined an experimental treatment with a new drug that had not yet been approved by the FDA. He had some experience with it and felt it was the only option available. Not wishing to debate the alternative, I started the periodic injections every six weeks. Progress was recorded photographically as I still could not see my husband across the breakfast table. My trip to Italy had been a disaster. My favorite paintings in the Vatican and museums were sheets of grey without detail. In the Library I couldn't read the titles. Finally it was time to operate on the cataracts and I could see again. My spirits soared.

Good central vision was restored in my right eye but some difficulty remains with light to dark contrasts. Those fine gradations that permit illusions of movement and color change are difficult to develop but with patience can be achieved.

While in Washington for the film screening I visited the Hirshhorn Museum to see their Color and Light exhibition. I hope that ISCC members saw it. There is much overlap with my work of the 60's and 70's; it was stimulating to experience again. My concerns then moved from the two dimensional studies to the influence of color on hospital patients and the development of color in architecture.

Moving color into a spatial experience became an obsession. My lectures and workshops were extensive for architects and interior designers. Numerous exhibitions and publications during the 70's and 80's followed. More recent projects for the Nursing College and Cowles Mathematics building at the University of Utah create more extensive environments in which color and technology merge.

Images shown here:
Top: Great Color Arc (1995) Illuminated cast stained glass and aluminum frame, 9'-10" x 37' x 8", art concept proposal, SLC Airport Competition, model at 1"=1'.
Left: Passages (1978-80). Painted chain, art concept proposal, SLC Airport Competition, model at 1/4"=1'
Right: Light of Grace (1993) Stained glass window wall, 40' x 40', St. Thomas More Church, Sandy, UT

The International Association of Colour (AIC) has published the latest edition of their online journal. This issue is entitled "Special Issue of the VI conference of the Italian Colour Group." All articles are available for free PDF download from:

`tinyurl.com/JAIC-V8-2012.`

The articles in this issue include:

Colour stability and performance of vegetal dyes on natural fibres, by Stefania Acquaviva, Emilia D'Anna, Maria Luisa De Giorgi, Andrea Della Patria, Marco Fantuzzi.

Quality of the light sources and colour constancy, by Osvaldo Da Pos, Pietro Fiorentin, Alberto Maistrello, Elena Pedrotti, Alessandro Scroccaro.

Physics, colour and art: a fruitful marriage, by Mady Elias.

Use of optical fibre in spectrometry and colorimetry with remote probes by Marco Gargano, Nicola Ludwig, Davide Pandini.

Colorimetry evaluation supporting the design of LED projectors for paintings lighting: a case study by Fulvio Musante, Maurizio Rossi.

The evolution of colour in design from the 1950s to today by Francesca Valan.

Notes on colours and pigments in the ancient world by Sergio Omarini.

The "ID card" of ancient materials: spectral signature, colour and thermal analysis. A tool for the monitoring and conservation of the archaeological heritage by Franco Gugliermetti, Fabio Bisegna, Laura Monti.

Historical and scientific identification of an early XXth century artist pigments' collection, by Simona Rinald, Claudio Falcucci.

Partial image from *"Notes on colours and pigments in the ancient world."*

Sustaining Member News
Avian Technologies, LLC announces SpectroscopyFAQ blog

Avian Technologies has begun posting regular columns intended to inform the spectroscopy community. From the first page:

> *Our goal is to make these pages a general reference for the spectroscopy community. Please feel free to make comments on these posts and suggest ideas for additional posts. We'd like you to help guide us along, so we can make sure that we are meeting your needs.*

The postings to date are entitled:

- What We Measure. Part 1: Reflectance
- What We Measure. Part 2: Transmittance

The intellectual level of the columns is to be light, but solid enough to encourage further investigation for the interested reader. At the very least, readers should be informed enough to understand what they will get when requesting spectrophotometric or other related measurements. Future columns will discuss gloss, goniospectrophotometry, uncertainty, and more.

Join in at `SpectroscopyFAQ.blogspot.com`

Color Tidbits from Around the Web

- Birds Are Mostly Likely To Poop On One Particular Kind Of Car. (hint: red)

`tinyurl.com/HalfordsBirdPooping`
(*The editor apologies for the bathroom humor)*

- In another bird-related story, *Science News* (June 2nd, 2012; Vol.181 #11) tells us that birds are engaging in an evolutionary arms race surrounding egg color. `tinyurl.com/SN-EggColor`

- *Science News*, hits another color-related home run (June 2nd, 2012; Vol.181 #11), where they describe how a visual illusion emerges from tiny ocular movements. The "Rotating Snakes illusion" has been around for years. A research group at the Barrow Neurological Institute in Phoenix performed experiments attempting to explain the underlying physiological causes. `tinyurl.com/SN-OcularMovements`

ISCC Sustaining Members

Sustaining Members of the ISCC are organizations who support the mission and goals of the ISCC through financial or other support. With our Member Bodies, Sustaining Members also provide a critical connection to the color community. If you feel your company or organization should support the ISCC in this way, please contact the office for more information about member benefits.

Avian Technologies	www.aviantechnologies.com	603-526-2420
BYK-Gardner USA	www.byk.com/instruments	301-483-6500
CERAM Research Ltd.	www.ceram.com	+44(0)1782 764428
Datacolor	www.datacolor.com	609-895-7432
Gamma Scientific	www.gamma-sci.com	800-637-2758
Hallmark	www.hallmark.com	816-274-5111
Hunter Associates Laboratory, Inc.	www.hunterlab.com	703-471-6870
IsoColor Inc.	www.isocolor.com	201-935-4494
Chester F. Carlson Center for Imaging Science	www.cis.rit.edu	585-475-5944
X-Rite Incorporated	www.xrite.com	616-803-2113

Thank You!

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ISCC Member Bodies

At its foundation, the ISCC is composed of many related societies. These societies, our Member Bodies, help the ISCC through small annual dues as well as maintaining a relationship with each organization's individual members. We frequently hold joint meetings to further the technical cross-pollination between the organizations.

If you belong to one of our member body organizations, we encourage you to work with ISCC and your society to further the connection. Contacting the ISCC President is a good place to start. If your organization is not on this list and you think it should be, the ISCC office can provide you with details about membership.

Or use our new online application: www.iscc.org /applicationForm.php

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)
Gemological Institute of America (GIA)
Illumination Engineering Society of North America (IESNA)
International Color Consortium (ICC)
National Association of Printing Ink Manufacturers (NAPIM)
Optical Society of America (OSA)
The Society for Color and Appearance in Dentistry (SCAD)
Society for Information Display (SID)
Society for Imaging Science and Technology (IS&T)
Society of Plastics Engineers Color and Appearance Division (SPE/CAD)