Inter - Society Color Council

Quarterly Newsletter

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email: isccoffice@iscc.org
address: 7820B Wormans Mill Rd. Suite #115, Frederick MD 21701

Photo by Maggie Maggio of David Batchelor's Chromolocomotion Art Installation taken in London

ISCC Board of Directors Corner

Dr. Kate Edwards

Hello! I am excited to join the ISCC Board of Directors and look forward to supporting an organization and community that has helped me from the moment I entered the world of color science.

Like many people in the color world, I came from another discipline. Much of my color training has been on the job, and ISCC has been a key resource. Presently I work at Datacolor, a spectrophotometer manufacturer, as a research scientist helping to improve our instruments' accuracy in color measurements. However, I got my start as an undergrad at Wesleyan University with an interest in the role of technology in society. After graduation I worked for a consulting company on energy regulation, but soon sought something more concrete and dynamic. I entered the PhD program in Physical Oceanography at Scripps, where I used satellite measurements of ocean color to track the annual widening of the California Current, affecting its transport of heat and nutrients. As a postdoc at the Applied Physics Lab at the University of Washington, I helped collect remote aircraft measurements of the color and temperature of an estuary to track how tides mix river and ocean water, affecting pollutant transport. ISCC members may be interested to know that the color of water is widely used in oceanography to trace different water types, or "false color" images can be constructed to highlight combinations of wavelengths that indicate biological processes such as harmful algal blooms. After a stint at Ocean Power Technologies where I defined optimal wave conditions for power-generating floating buoys, I came to Datacolor five years ago. At Datacolor, I have worked on many products, from inexpensive handheld devices, to research-grade desktop instruments, to spectral imagers that measure multi-colored objects. The common thread has been: What color information is useful to our customers, and how can we best measure it? I am fortunate to work with colleagues who are curious and resourceful in addressing these questions.

What I enjoy about color is that it is both broad and deep: it spans many disciplines yet requires constant learning to drill down on a particular problem. ISCC has delivered that learning at stellar conferences such as Munsell 2018, and webinars as varied as From Photon to Brain: The Perception of Color and Color in Digital Cinema. More importantly, ISCC has connected me with a community of people working in color, while enjoying Philip Ball's display of pigments in a discussion at Color Impact 2020 for instance, to longtime ISCC participants who have shared their knowledge to help me bridge a gap in my understanding. The organization connects new entrants with color history, for example, in summing up career contributions of recipients of the Godlove Award. In addition, ISCC has given me insight into color's application in the arts, design, and industry, providing context for my work. I hope you find your ISCC participation as rewarding and stimulating as I have. I look forward to talking with you about your favorite color topic soon!

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Hue Angles

Color-Coding the Pandemic

Michael H. Brill, Datacolor

Each of us has a different life story through the pandemic. My story does not include the uneasy "new normal" experienced by students in school. Part of the "new normal" requires students to attend school in staggered part-time schedules. How did kids react to this complication? In curiosity, I Googled my old high-school newspaper, the Brentwood *Pow Wow*. (Yes, the Native American name remains.) Immediately a web page appeared with an article for their April Fools' edition: "Satire: Crayola Box Plan to Replace Original Tri-color Hybrid Plan;" author, Lilian Velasquez; dateline, 24 March 2021. This was going to be about color coding, about the resilience of young people, and maybe more.

The school had seen fit to illuminate the monthly calendar with color-coded parts to clarify three alternative student schedules. That was the original Tri-color plan. Ms. Velasquez started with a calendar illustrating the Tri-color plan (using the first three entries on the list below), and then "sprinkled in" the rest:

Teal: Fully remote students.

Gold: Hybrid students attend school on Tuesday and Fridays, and alternating Wednesdays.

Green: Hybrid students attend school on Monday, Thursday, and alternating Wednesdays.

Chocolate: Attend school 9 times a year, on the first Monday of each month.

Cherry: Attend school every day for only 4 hours each day from 9 a.m. to 1 p.m.

Magenta: Attend school only on Fridays for 16 hours.

Indigo: Attend school on the weekends from 7 a.m. to 2 p.m. (Saturday and Sunday).

Silver: Attend school twice a month on the 7th and on the 21st.

Velasquez then showed a typical one-month calendar annotated with a delightfully confusing panoply of font colors: a scheme that might give new meaning to the term "drop-out colors." It's the kind of gentle extrapolation one expects from high-school students in an April Fools' satire. I remember reading such extrapolations and writing them. The genre was grounded in acceptance of the normal. Now it is the "new normal."

Before I went to Russia in 2008 to teach English as a Second Language (ESL), I heard that Russians would characteristically respond to a story of complaint and indignation by declaring, "It is normal." My trip confirmed that assertion. I think that every time we reset the condition that we consider normal, we rewrite the past to conform. It is a coping mechanism, and it is helped along by writers.

In the same vein, Jorge Luis Borges said: "Every writer 'creates' his own precursors. His work modifies our conception of the past, as it will modify the future." The better the writer, the more responsibility this incurs.

Still, the past is not easily erased. Brentwood High School retains Native American metaphors. Our media preserve other metaphors, as does our collective memory—sometimes unconsciously. Borges himself, with his quote, immortalizes his own present (and our recent past) by using "his" instead of "their" in describing a hypothetical writer.

It is a delicately balanced narrative into which Ms. Velasquez entered as she wrote extrapolating a color code for the "new normal." She writes well, and her underlying optimism can encourage us all. I wish her the best as she extrapolates further—we hope from a better "new normal."

And perhaps her new color code foretells a career as an artist or color scientist!

Michael H. Brill
BHS Class of 1965

Send contributions to mbrill@datacolor.com

AIC 14th Congress Milan 2021

August 30 – September 3, 2021

Paula J. Alessi, ISCC Liaison to AIC

It is finally here! The AIC 14th Congress will be held from Monday, August 30 to Friday, September 3, 2021. The host is the Associazione Italiana Colore. All sessions are 100% online with each day starting at 9:00 Congress time (CEST) and ending at approximately 20:00 CEST. So in the United States each Congress day will start at 3:00AM EDT and end at approximately 3:00PM EDT.

Registration

Online registration is now open at https://www.aic2021.org/registration and the registration fee is 260 Euros. The registration fee covers access to the full Congress, including the opening and closing ceremonies, virtual rooms for all sessions, and all AIC online events. The Book of Abstracts (in PDF format) will be emailed to all registered participants prior to the Congress. The Book of Proceedings (in PDF format) will be published within 3 months of the Congress conclusion and will be emailed to all registered participants.

Day-by-Day Program

This is a shortened version of the day-to-day schedule for the week. There will be breaks, but they are not shown here. For a more complete version of the detailed schedule, including speaker names and presentation titles, see: http://www.aic2021.org/detailed-program/

Monday, August 30
9:00 – 12:55 CEST which is 3:00AM – 6:55AM EDT
Special Session: Innovation and Research in Color for Beauty Care and Hairstyle – 4 sessions of oral and short presentations

13:30 – 15:30 CEST which is 7:30AM – 9:30AM EDT
Opening Ceremony

16:00 – 16:40 CEST which is 10:00AM – 10:40AM EDT
Invited Speaker

16:50 – 19:35 CEST which is 10:50AM – 1:35 PM EDT
Special Session: All the Colors of Cinema – 2 sessions of oral presentations

19:45 – 20:45 CEST which is 1:45PM – 2:45PM EDT
Session 1: Color and Culture – oral presentations

Tuesday, August 31 – begins and ends with two parallel sessions of oral and short presentations

9–12 CEST or 3:00AM–6:00AM EDT	9:00–12:10 CEST or 3:00AM–6:10AM EDT
Sessions 2 & 3: Color and Physiology	Sessions 4 & 5: Color and Design

12:20 – 13:00 CEST which is 6:20AM – 7:00AM EDT
Invited Speaker

13:30 – 15:30 CEST which is 7:30AM – 9:30AM EDT
AIC General Assembly

16:00 – 16:40 CEST which is 10:00AM – 10:40AM EDT
Invited Speaker

16:55–20:45 CEST or 10:55AM–2:45PM EDT	16:55–20:55 CEST or 10:55AM–2:55PM EDT
Special Sessions ILA 1, 2 & 3: Color, Light, and Sound: Holistic Approach for Well-Being	Sessions 6, 7 & 8: Color and Design

Wednesday, September 1 – begins and ends with two parallel sessions of oral and short presentations

9:00–10:35 CEST or 3:00AM–4:35AM EDT	9:00–10:35 CEST or 3:00AM–4:35AM EDT
Session 9: Color Education	Sessions 14: Color and Psychology

10:45–12:00 CEST or 4:45AM–6:00AM EDT	10:45–12:00 CEST or 4:45AM–6:00AM EDT
Session 10: Color and Restoration	Sessions 15: Color and Psychology

12:20 – 13:00 CEST which is 6:20AM – 7:00AM EDT
Invited Speaker

Two Parallel Sessions of AIC Study Groups

13:30–15:00 CEST or 7:30AM–9:00AM EDT	13:30–15:00 CEST or 7:30AM–9:00AM EDT
Environmental Color Design Study Group	Language of Color Study Group

15:00–16:30 CEST or 9:00AM–10:30AM EDT	15:00–16:30 CEST or 9:00AM–10:30AM EDT
Color Education Study Group	Art and Design Study Group

16:30 – 17:10 CEST which is 10:30AM – 11:10AM EDT
Invited Speaker

17:15–18:15 CEST or 11:15AM–12:15PM EDT	17:15–18:35 CEST or 11:15AM–12:35PM EDT
Session 11: Color and Lighting	Session 16: Color and Psychology

18:25–19:35 CEST or 12:25PM–1:35PM EDT	18:45–20:15 CEST or 12:45PM–2:15PM EDT
Session 12: Color and Restoration	Session 17: Color and Education

19:45 – 20:55 CEST which is 1:45PM – 2:55PM EDT
Session 13: Color and Built Environment

Thursday, September 2 – begins and ends with two parallel sessions of oral and short presentations

9:00–9:55 CEST or 3:00AM–3:55AM EDT	9:00–10:35 CEST or 3:00AM–4:35AM EDT
Session 18: Color and Measurement/ Instrumentation	Sessions 25: Color and Communication/Marketing

10:05–10:55 CEST or 4:05AM–4:55AM EDT	10:45–12:00 CEST or 4:45AM–6:00AM EDT
Session 19: Color and Measurement/ Instrumentation	Sessions 26: Color and Culture
11:05-12:10 CEST or 5:05AM–6:10AM EDT	
Session 20: Color and Digital	

12:20 – 13:00 CEST which is 6:20AM – 7:00AM EDT
Invited Speaker

13:30 – 15:30 CEST which is 7:30AM – 9:30AM EDT
Awards Ceremony

16:00–18:55 CEST or 10:00AM–12:55PM EDT	16:00–18:50 CEST or 10:00AM–12:50PM EDT
Session 21 and 22: Color and Digital	Sessions 27 and 28: Color and Culture

19:05–19:50 CEST or 1:05PM–1:50PM EDT	10:45–12:00 CEST or 4:45AM–6:00AM EDT
Session 23: Color and Measurement/ Instrumentation	Sessions 29: Color and Culture
20:00 – 20:25 CEST or 2:00PM – 2:25PM EDT	
Session 24: Color and Production	

Friday, September 3 – singular consecutive sessions with oral and short presentations

9:00 – 10:25 CEST which is 3:00AM – 4:25AM EDT
Session 30: Color and Lighting

10:35 – 12:05 CEST which is 4:35AM – 6:05AM EDT
Session 31: Color and Built Environment

12:20 – 13:00 CEST which is 6:20AM – 7:00AM EDT
Invited Speaker

13:30 – 14:30 CEST which is 7:30AM – 8:30AM EDT
Closing Ceremony

15:00 – 17:30 CEST which is 9:00AM – 11:30AM EDT
Session 32 and 33: Color and Built Environment

17:40 – 19:20 CEST which is 11:40AM – 1:20PM EDT
Special Session: All the Recent Books on Color – 2 sessions of oral presentations

More Information

The Inter-Society Color Council is a collaborating organization with the Associazione Italiana Colore, the association that is organizing the **AIC 14th Congress.** We encourage our members to consider registering for this first-time 5-day online AIC Congress before the **June 10 early deadline.** For more details, see: https://www.aic2021.org/ Mark your calendars for a color-filled Olympic-type event like no other from **August 30 – September 3, 2021!**

Color Research and Application

From the Editor
Vol. 46-4, August 2021
By Ellen Carter

Illumination Estimation Challenge: The Experience of the First Two Years

The issue begins with a feature article, Illumination Estimation Challenge: The experience of the first two years, by E. Ershov et al. Illumination estimation is essential to computational color constancy and is used in image processing pipelines of modern digital cameras. To motivate new ideas in this field, two challenges on illumination estimation were conducted. The first had only a single task, global illumination estimation. The second also had indoor and two-illuminant tasks. A rigorous test using a big database of images was designed to evaluate candidate algorithms. This article describes the test design, names algorithms that won in each track, and discusses conclusions from the test. Some details on the test: The ground truth is decided by the RGB values of a calibrated target in each image, which are not revealed until the test results are submitted; the statistics used for scoring are chosen to be robust to outliers but not too forgiving. Citations are made to the candidate algorithms, but the test (not a tested algorithm) is the main focus of the article. Such nexus papers that cover multi-player challenges are rare. This one is exemplary, and we are honored to have it in the pages of our journal.

Von-Kries-Enhanced Chromaticity Gamut

Having visited an over-arching description of a large-scale test, we now proceed to a quiet corner of color theory, M. H. Brill's article, Von-Kries-Enhanced Chromaticity Gamut. Every once in a while, someone will describe the phenomenon of supersaturated colors—chromatic-adaptation-induced appearances that are higher in chroma than any that could be seen by a visual system adapted to white light. How far can you go with this construction? Brill defines the limits, under the assumption that the adaptation follows the rule of Von Kries. The construction may be useful in delimiting the chromaticities that are computed as intermediate states in a color-management system.

Color Appearance of Small Stimuli Presented in Central and Near Peripheral Visual Fields

The next four articles deal with color appearance perception and modeling. Shuichi Mogi, Masato Sakurai, Tomoharu Ishikawa and Miyoshi Ayama collected color appearance data for a small stimulus presented in various locations in the visual field. In the article, Color appearance of small stimuli presented in central and near peripheral visual fields, they provide color appearance data for a small stimulus (0.5°) that was using the two methods (the hue and saturation judgment method and the categorical color naming method) and examine whether the connection between the responses of the two methods changes with the location of the stimuli. While there were changes in the color appearance for each stimulus, the relationship between the responses obtained by the two methods for all stimuli was approximately the same across the visual field examined, but the unique red component required to elicit the color name "red" is significantly higher than that for the other primary colors, especially at 0°.

An Extension to the CAM16 Colour Appearance Model to Predict the Size Effect

A new colour appearance model, CAM16 has been proposed which overcomes some of the earlier mathematical problems, and simplifies some of the calculations, in the CIECAM02 model. Building on CIECAM02, CAM16 can predict the perceptual attributes for related colors viewed in the photopic region over a wide range of viewing conditions. Color appearance, however, changes according to the size of the color stimulus (known as the size effect.) with the effect increasing as the distance of the viewing field from the center of the retina increases. In the article, An extension to the CAM16 colour appearance model to predict the size effect, Cheng Gao,

Changjun Li, Kaida Xiao, M. Ronnier Luo and Michael Pointer describe an extension of the CAM16 color appearance model to predict the effect on the appearance of stimuli with different values of angular subtense. It was found that the size-effect correction can be modelled as a von Kries type of chromatic adaptation transform with different scaling factors or the tristimulus values of a stimulus with angular subtense can be transformed to the CAT16 cone-like space via the CAT16 matrix to derive cone response signals or these cone response signals can be obtained by adjusting the cone response signals for a 2° stimulus, R2, G2, B2, independently. Since the matrix transforming the XYZ tristimulus space to cone-like space is the CAT16 matrix, the size-effect correction can easily be added to the CAM16 model and is recommended for the size-effect correction.

CAM20u: An Extension of CAM16 for Predicting the Color Appearance of Unrelated Colors

Since a comprehensive color appearance model should be capable of predicting color appearance under a wide range of viewing conditions, including related and unrelated colors and CIECAM02 focuses on related color, Cheng Gao, Changjun Li, Keyu Shi, Ming Ronnier Luo and Michael R. Pointer conducted a study investigating a model that is an extension of CAM16 for predicting the brightness, hue quadrature, amount-of-white and colorfulness attributes of unrelated colors. In the article, CAM20u: An extension of CAM16 for predicting the color appearance of unrelated colors, they report on the study and compare its performance with that of three earlier unrelated models, by tests based on three available datasets from University of Derby, UK; KU Leuven, Belgium; and Zhejiang University, China. They conclude that, in principle, color appearance models for related colors can be extended to predict the appearance of unrelated colors; however, further experiments are required to verify the model's performance in more comprehensive lighting conditions.

Color Appearance Model Incorporating Contrast Adaptation - Implications for Individual Differences in Color Vision

Although CIE standard observer data is widely used in color science, there are significant differences in the cone fundamentals of individuals, even when the individuals fall within the category of color-normal observers. Lorne Whitehead, Kevin A. G. Smet and Michael A. Webster explored how the visual system compensates for changes in color information arising from variations in cone fundamentals. Their article Color appearance model incorporating contrast adaptation - implications for individual differences in color vision, discusses their study and introduces a color appearance model to predict long-term contrast adaptation in the vision system, which maintains the average long-term levels of color contrast. They report that the model offers additional ways to assess appearance and evaluate improvement of light sources and displays for diverse observers. Finally, they suggest that this approach also be considered in the more sophisticated color appearance models that address a wider range of illumination conditions and visual stimuli.

Quantitative Assessment of Color Tracking and Gray Tracking in Color Displays

In the field of color imaging, there are many specialized applications. One broad area of applications is medical imaging. The medical display provides a two-dimensional array of patient data in the original geometrical order for the human reader to see the structured information. Commonly, gray or monochrome images are used for mammography, computed tomography and other tests, where the energy sources are invisible to the human eye. Color medical displays are used in pathology and dermatology. Pseudo-color modalities and synthetic images that fuse data from multiple modalities also require color medical displays. Wei-Chung Cheng, Chih-Lei Wu and Aldo Badano introduce two metrics, primary purity and gray purity, to describe the color shift of the primary and gray shades of a display in their article, Quantitative assessment of color tracking and gray tracking in color displays. They explain that a plot of both the purity curves of the imaging system's primary colors and the gray purity curve provide a concise visual presentation of the color tracking and gray tracking properties of a display. The areas under these curves in the plots are single-value measures representing the color tracking and gray tracking properties of a display.

Superiority of Optimal Broadband Filter Sets under Lower Noise Levels in Multispectral Color Imaging

Optimizing multispectral cameras with broadband or narrowband optical filters is necessary for accurate color reproduction and spectral reconstruction, but which is better?

Both have specific advantages, so Suixian Li conducted a series of experimental simulations under several noise levels to discover the optimal filter type and conditions for a multispectral camera to provide the best results in terms of color reproduction and spectral reconstruction. The study found that the broadband filter set performed better at lower noise levels, and the narrowband filter set demonstrated better anti-noise features in the research. The article, Superiority of optimal broadband filter sets under lower noise levels in multispectral color imaging, presents the effects of optimal broadband and narrowband filters on multispectral imaging performance under different noise conditions. The article gives suggestions in choosing between broadband or narrowband filters for multispectral imaging, and it provides systematic experimental testimonies to support the feasibility and advantage of broadband multispectral cameras in the spectral color community.

Photometric and Colorimetric Analysis of LED Luminaires for Interior Lighting Design

Light Emitting Diode (LED) lighting has been rapidly replacing incandescent lamps for both indoor lighting, traffic signs and outside lighting because of its qualities, such as energy efficiency, robustness, longevity and good stability over time. With so many sold, David Baeza Moyanoi, Silvia Baeze Moyano, Miguel Gomez Lopez, Alejandro Salcedo Aznal and Roberto Bonzalez-Lezcano asked the question whether the LED lamps were meeting the standards that had been set for them. For their study they used randomly acquired samples available in commercial markets and tested: 1) Characteristics of light: luminous flux emission, opening angle, color, color temperature, color rendering index, luminous intensity, burning time and time to reach 60% of light, 2) Energy consumption: power, watt equivalence, energy efficiency or low energy label and energy consumption per 1000 hours, 3) Duration: life of the bulb, number of switch-on and switch-off cycles, and lumen maintenance factor. The analysis of the results verified that the LED lights complied with the current regulations. See the detailed tables of results for the many tests in the article Photometric and colorimetric analysis of LED luminaires for interior lighting design.

Comparisons in Perception of Facial Skin Brightness, as Influenced by Differences in Skin Color: Asian Observers

Human skin color has been considered one of the most important colors to get correct in photography, imaging and printing for over 50 years. However, there is great variability; to understand what observers see, the topic of skin brightness was examined in the next article. In Comparisons in perception of facial skin brightness, as influenced by differences in skin color: Asian observers Yuanyuan He, Taiga Mikami, Suguru Tanaka, Kumiko Kikuchi and Yoko Mizokami discuss the results of a cross-cultural comparison of brightness perception of various skin colors as judged by observers from three Asian countries (Japan, China and Thailand). The four skin colors used in the experiment were the average skin color attributed to Japanese, Thai, Caucasian and African skin. It was shown that there is a difference in the influence of facial color on the brightness perception of facial skin, even among Asian countries. To understand the causes of differences in skin perception requires further study of the influence of the observer's ethnicity, cultural setting and living environment on the brightness perception of facial skin.

A New Analytical Method for the Evaluation of Cosmetic Pigments

Commonly there are standardized methods for color determination available for quality control of conventional pigments for color and strength differences of dispersed pigment for visual or instrumental pigments used in paints and other materials. However, in the industrial application of cosmetics production, the colorimetric analysis of cosmetic pigments requires special consideration including the three optical properties of hiding power, tinting strength and color. Greciel Egurrola and Johnbrynner Garcia present A new analytical method for the evaluation of cosmetic pigments. Their method involving instrumental evaluation of the optical and colorimetric properties of the pigments and a new dispersion method poses a faster, more affordable alternative for evaluation of pigments for cosmetics with less color interference and higher consistency of results than other current methods.

Alternate Medium for Improved Wet Milling of TiO2 Suspensions in Vertical Sand Mills

In another industrial application dealing with pigments, John George, Manikuttan PK, Suresh Babu G and Sreenish Sreekumar introduce an Alternate medium for improved wet milling of TiO2 suspensions in vertical sand mills. Titanium dioxide is the

most widely used white pigment across industries because of its whiteness and opacity. The properties of TiO2 pigment, including dispersibility and durability, are determined not only by the type of TiO2, but also by the finishing process which determines the size of the TiO2 particles. In the new process using zirconium silicate which was used as a replacement for the more commonly used silica sand or glass beads, it had a significant impact on the final pigment. Because of its higher density, the naturally occurring zirconium silicate sand separated during mineral separation of ilmenite from beach sand and proved to be an effective deagglomeration medium in vertical sand mills to attain the desired particle size distribution of TiO2 pigment without any contamination. The resultant finished pigment displayed superior pigmentary properties and durability in paints.

Traditional Colour Theory: A Review

It seems as if everyone has a color theory; you can find color theories in fields as diverse as physics, phenomenology, psychology, linguistics, vision science, art and design. Zena O'Connor presents a review of color theories that focus on pigment color exploration and application in art, design and architecture. In Traditional colour theory: A review, she discusses sets of primary pigment colors that can be used to create a large gamut of color nuances, considerations of color harmony and provides guidelines for color exploration and application. She covers color theories beginning with Tobias Mayer (1758) through Albert Munsell (1915) and the later theories of Itten and Albers in the 1960s. As Dr. O'Connor states, the "Constructs that evolved within traditional colour theory continue to occur and have relevance especially in respect to the construct-based lingua franca that is still widely used in applied design, design of the built environment and across multiple industry sectors." They are used as a foundation in color education, and provide a base from which to explore new information, color technologies and applications.

Azurite Blue in the Qing Dynasty

Color is a critical component of nonverbal communications from the red of a stop light to the specific color in flags. Traditional colors became associated with different arenas, religions, or ethnic groups and among diverse nationalities and served as a communication technique to let people know the status of the person or building where the color was used. Such colors may be considered a part of the cultural heritage of a nation. In the next article, Azurite blue in the Qing dynasty, Ran Wang, Minghui Wang and Renzo Shamey report on the history of azurite blue and its color classification. In particular, they studied nine formal garments from the Qing dynasty (1636-1912) to characterize the specific colorimetric attributes of azurite blue, which fall in the Natural Color System (NCS) range from R50B to R80B. The azurite blue color was most likely generated by dyeing fabric using indigo and rhubarb root. The delicate difference in the hue between the blue colors of the royal robes against those of the officers' clothes is likely due to the slight differences in the dyeing quality and the procedures employed.

The Inheritance and Creative Design of Traditional Color Scheme Based on Modern Consumer's Psychological Perception: Taking Chinese Traditional, Decorative Pattern's Color Collocation as an Example

Remaining with the theme of traditional colors, the article The inheritance and creative design of traditional color scheme based on modern consumer's psychological perception: Taking Chinese traditional, decorative pattern's color collocation as an example explores the use of traditional color schemes and new design methods in the development of modern products. The author Bing Xu explains that traditional decorative patterns are a very precious and unique part of a nation's culture and heritage. The color in the patterns provides a strong relationship with their nation's deep cultural psychology and connotation for the people associated with their cultural roots. Xu uses digital image processing technology and data modeling methods to explore more scientifically the inheritance and innovation of traditional color schemes in design to achieve traditional color's creative design in products to meet the expectations of modern consumers.

The Emotional Design of Product Color: An Eye Movement and Event-Related Potentials Study

The next article, The emotional design of product color: an eye movement and event-related potentials study, describes physical responses of customers when they are deciding which product to purchase. Man Ding, Meijia Song, Huining Pei and Yu Cheng tried to determine the internal cognitive mechanism of the participants' emotional changes when a person was making a purchase decision by studying the person's eye

movements and measuring event-related potentials. They found that the mean blink duration, blink rate and average pupil diameter were significantly correlated with the emotional score; the larger the average pupil diameter, the higher the participant rated the particular item. The eye movement trajectory and hot spot maps showed that the participant's interest in the products was focused on the main area and less on the details.

Effect of Previsualization Technique on Different Types of Veneering Porcelain

The last two articles in this issue are color applications in dentistry. Both articles deal with materials used by dentists to restore parts of a tooth or replace a lost tooth. In dental restorations, color is determined by many factors including: the material of the core, thickness of porcelain, fabrication technique and surface properties of the restoration, plus tooth color, cement thickness and color, soft tissue color, lighting and shade determination system. Shade matching has been the go-to method of selecting the appropriate color for a restoration of a tooth, and it is usually done by visual comparison to shade guides. Omnia Saleh, Amr Eletreby and Tarek Salah suggest a different method, which they call "previsualization." In the article, Effect of previsualization technique on different types of veneering porcelain, they report on a study of a new organic liquid binder, which was developed to allow precise modeling of unfired porcelain and detection of its color. The modeling liquid affects the translucency of the veneering porcelain within limits, but does not affect the color change nor the flexure strength of the veneering porcelain. They conclude that the modeling liquid could be used with specific cases of complicated buildups and that further investigations should be made on the effect of the modeling liquids on other properties.

Stain Resistance and Surface Roughness of CAD/CAM Processed Hybrid Ceramic

The color of a restored tooth can change over time by staining, which is exacerbated by changes in the roughness of the surface of the restoration. In their article, Ana Leticia Silva, Rocio Geng Vivanco, Rafaella Tonani-Torrieri and Fernanda Carvalho Panzier Pires-de-Souza analyze the Stain resistance and surface roughness of CAD/CAM processed hybrid ceramic. In particular, they evaluate the resistance to staining by coffee and surface roughness alteration of CAD/CAM processed hybrid ceramics, including a resin-based composite, ceramic and hybrid ceramic materials after 30 days of repeated immersion in coffee, brushing and polishing with two different polishing kits; and compare it with a ceramic and a resin-based composite. They study the importance of selecting the appropriate restorative dental material for each clinical case, as well as, the need for proper professional maintenance of esthetic restorations, including polishing.

The issue closes with two book reviews. José Luis Caivano reviews Juan Serra Lluch's book Color for Architects. Roy Osborne provides a review of Pioneers of Color Science by Renzo Shamey and Rolf Georg Kuehni. Both of these books should be important additions to any Color Scientist's library.

Color Impact 2021

For Built Environment

Jean Hoskin

Color Impact 2021 For Built Environment was held as a virtual conference from June 12 to June 15, 2021. The Inter-Society Color Council and the International Association of Color Consultants - North America collaborated on the conference for over 2 ½ years due to the pandemic. It was with great anticipation that we finally met our invited speakers and excited participants.

Each of the five sessions was opened by an inspirational and informative keynote presentation, which was later followed by an engaging Q&A. Speaker information is available on the Color Impact 2021 website and registrants have access to the videos. If you could not attend, you missed the surprising personalities that cannot be captured on the website or in an email.

Keynotes:

- Shashi Caan is a very innovative and exciting thinker bridging science and art and engaging all the senses.
- Kory Stamper can make even a story of the color gray humorous as she described the bottom-up process of language as "usage in the wild."
- Eve Ashcraft described her inspiration collection as a "cabinet of curiosity" and then was very practical about working in the color industry with big design firms when her paint color selection and display for Ralph Lauren was "crashed."
- Massimo Caiazzo told us "color is not just decoration," that we "need balance like freedom" and then gave an impromptu and charming tour of his studio.
- In the final session, Jill Pilaroscia provided many thoughtful, scientific examples of perception applied to design. She said she is not just creating a color design, but "answering a question, solving a problem."

The 133 attendees represented 24 countries and 6 continents with North America and Europe having the greatest representation. The focus of the conference was the Built Environment, so 75% of the attendees listed Architecture or Interior Design as their industry, but others included education, art and science plus combinations of all of the categories mentioned.

We asked "Why you are attending?" and the responses were varied:

- To keep up with color information and current research
- To participate in the exchange of knowledge
- To reconnect and meet new people
- The presentations are both design and technical
- I am passionate about color
- I am a graduate student and want to learn more about color
- I attended the 2020 conference and found the information valuable.

A comprehensive summary of the three days was emailed after the conference by Verena M. Schindler, a presenter and AIC Chair of the Education Study Group.

"The Inter-Society Color Council (ISCC) is a regular member of the International Color Association as well as the International Association of Color Consultants-North America (IACC-NA). Warmest congratulations to the organizers Maggie Maggio, Jean Hoskin, Amy Woolf, Ellen Divers, Laura Mercurio, Lindsay Thivierge, Karen Collins, Luanne Stovall, and technical direction by Dave Wyble.

It was an extraordinarily well-organized online event, which also provided space for personal interaction. The talks were stimulating, attractive and captivating. Past, present and future approaches gave insights as to how color in the built environment has been changing over time. Some basic and constant elements, however, were recurrent despite divergent viewpoints.

Presenters Saara Pyykko, Marcia R. Cohen, Leslie Harrington, Sandra Sampson, Rachel Harris, Renzo Shamey, Maurizio Rossi, Ellen Divers, Sheri Petersen, Karen Collins, Margaret Portillo, Genesis Okken, Juan Serra, Ann Laidlaw showed that color in the built environment includes not only color but also extends to an entire array of disciplines. Enlightening insights also include striking cross-cultural interactions that are manifest in both research and realized projects, as well as that art and science form an entangled pair.

Another strength of the conference was the insight that researchers and designers deal with colour in very different ways. One such interesting viewpoint comes from Ellen Divers. Her paper Beyond hue: the affective response to value and chroma was published in The International Scientific Conference of the Color Society of Russia: Selected Papers. 2021, pp. 154–159, http://color-lab.org/files/283/bop_rucolor2020_with0.pdf.

Those who did not have the opportunity to listen to Verena's talk on The International Impact of Jean-Philippe Lenclos' Methodology "The Geography of Color," are urged to attend Jean-Philippe Lenclos' AIC CADE Award 2021 Lecture that he will deliver online at the 14th AIC Congress 2021 in Milan. https://www.aic2021.org/.

Thank you ISCC!
Colorful regards,
Verena M. Schindler "

Report on 2nd ISCC Symposium on Colour Education

Maggie Maggio

The 2nd Annual ISCC Symposium on Color Education was held virtually on Saturday, June 25, 2021. This year's event was designed as a Color Impact 2021 post-conference gathering specifically for color educators.

There were 96 color colleagues from 19 countries registered for the event, and most people registered for free because it was included in the registration fee for the Color Impact 2021 conference held two weeks prior.

The event was hosted on the GoToTraining platform, a first for ISCC. The morning and afternoon sessions were chaired by Maggie Maggio and Robert Hirschler, co-chairs of the Joint ISCC/AIC Colour Literacy Project, with technical support provided by Dave Wyble. Following the event, videos of the presentations were posted on a password-protected page of the Color Impact 2021 website for registrants not able to attend the event in person.

Speakers were available at the end of their session for a 30-minute Question and Answer (Q&A) period. The platform for the Q&As was Zoom. The Q&A sessions were hosted by members of the Colour Lit Project with Luanne Stovall and Robin Kingsburgh joining Maggio and Hirschler as moderators in the Zoom rooms. The longer format Q&A sessions were an engaging part of the Symposium. One of the lessons learned is that we should record the Q&A sessions as well as the talks!

Program Summary

The theme of this year's Symposium was "Perspectives on Colour Education." The first session included talks by four color educators from different disciplines who presented each of their approaches and featured student work from their innovative courses. The second session featured broader presentations by color educators looking ahead to the future of color education.

First Session

Keynote: Why Color?

The conference opened with a talk and slide show by David Batchelor. As an artist and author of the seminal book, Chromophobia, Batchelor spoke about his concern that our built environment is becoming colourless and showed a number of his projects that are all focused on celebrating color in sculptural form. The pieces ranged in scale from environmental installations such as "Chromolocomotion" (2014), which combined large, brightly colored Perspex pieces arranged into a 30-foot by 60-foot Tetris-like sculpture and suspended over the Grand Terrace at St Pancras International Train Station in London to a series of mini-sculptures that were displayed behind him in his studio as he gave his presentation. At the end of his talk, he reflected that, as difficult as the pandemic has been for the UK and the world, he felt grateful for the opportunity to spend the past year in his studio with "far fewer interruptions" which allowed time for new work to emerge.

On Site Insight

Following the keynote, Jennifer Logun, Adjunct Associate Professor at Pratt Institute in NYC, spoke about the recent redesign of the two-semester, freshman LCD (Light Color and Design) core program. Established at Pratt as a Bauhaus-inspired course in 1939, the LCD class became synonymous over the years with the use of ColorAid. Although the new curriculum was refocused on individual creative processes, it continued to be dependent on the use of standard exercises and ColorAid papers. Jennifer spoke in great detail about the results of the most recent shift that she made this past year teaching the LCD course without traditional art materials and without the tried and true assignments. She said the reason for the shift was that "I want my studio to be the first toe in the water of a life-long relationship with color regardless of the field they pursue." The talk was accompanied by representative slides of student work.

Subtractive Color Mixing as a Support for Color Memory

After comparing the difficulties encountered in both short and long-term color memory and noting that color constancy and color memory are connected, Agata Kwiatkowska-Lubańska from the Jan Matejko Academy of Fine Arts in Kraków, Poland, listed a number of questions about color memory that she was interested in researching. Her talk focused on one of the questions -- "Can color memory be developed?" To help answer this question, students participated in exercises that tested their ability to look at three samples and then find the samples in a set of 400 colors. Students were surprisingly successful at remembering their colors. She then shared the results of a mixing exercise, where the color swatches were prepared with the same acrylic paint to be used by the students, so that precise reproduction of each color was technically possible.

The experiment consisted of two parts: in the first part, the students received 9 color swatches, which they had to mix as precisely as possible during the classes (3 hours). The aim of this preliminary assignment was to check if the group knew the rules of acrylic paint mixing. During the subsequent classes, each student's task was to remember and mix the 9 colors, which were presented in turn, 3 colors in each set. Her conclusions were that working with paint turned out to be a very good exercise for developing color memory and that color memory is much better than we think.

Connecting Optics Learning Outcomes through Color by Use of a Monochromator

Up next was ISCC board member, Dr. Jennifer Kruschwitz who teaches a course in Geometrical Ray Optics at the University of Rochester Institute of Optics. Offered in the fall of sophomore year, the course involves tracing the angle of refracted rays through optical systems. In the course students use basic high school algebra, geometry and trigonometry to calculate the refractive index. Kruschwitz featured an aspect of the program with hands-on explorations using prism monochromators and grating monochromators to measure angle relationships using different lights. The goal of the unit is to connect math to the experiments while reinforcing observation skills. Jen stressed that monochromators are simple to build and easy to use, and demonstrated in slides that they can be used to enhance classroom theory with colorful, hands-on lab exercises.

The Art of the Three-Color Process

In the last talk of the first session, Rebecca Michaels from the Tyler School of Art and Architecture in Philadelphia advocated for teaching students from all disciplines the three-color process of photography as a way to viscerally understand color theory and more importantly, how the additive and subtractive primary colors used in reproductive photographic processes actually function. Following a fascinating look at the history of the three-color process, which involves making three separate exposures through three color filters onto black and white film and superimposing the images to form a full-color image, Michaels shared historic images by artists and images of work by her students that included intentionally incorporating the "glitches" in the alignment of the three-colors as an opportunity to add layers of meaning to the photographic art form.

Second Session

Following a break for lunch, the Symposium reconvened for the second session with a Keynote by Robert Hirschler.

Keynote: Bauhaus Influence on Colour Education: a Critical Homage

Hirschler made the point that there was no specific curriculum for teaching color at the Bauhaus. Instead, the subject of color was integrated into the workshops by the teachers including Kandinsky, Albers, Klee, Itten.

In the summary of his talk he made four points:
At the Bauhaus, a group of extremely talented artists revolutionized the way colour should be taught.
The way colour was taught by them is still relevant – Practice Before Theory.
Much of the colour theory they taught is by now outdated and questionable.
The problem: Most of today's "colour educators" have only a superficial knowledge of the rich heritage of "Bauhaus Colour."

He concluded his talk by saying that "I think we have to be thankful to these great men for drawing attention to the importance of color, for showing that color must be taught in a different way, and forget what they are saying about theory. Theory was not their strong point, but they were great educators and we should learn and digest what they were trying to say."

Applying Albers Concepts to Creating Scientific Data Visualizations

Teresa Marie Rhyne presented a detailed summary of her use of Albers concepts to visually organize large amounts of data in order to reduce the amount of time it takes to produce computer weather simulations. The complete time series movie of the hurricane data, entitled "WRF (Weather Research Forecasting) Simulation of Hurricane Katrina" is available on YouTube at http://www.youtube.com/watch?v=26Ws2aj8J0I

Colour Design Training Itinerary: A Framework for the Future of Color Education

This doctoral research of the next presenter, Ingrid Calvo Ivanovic, is focused on the development of a Colour Design Training Itinerary (CDTI). The CDTI will be an expansive educational framework for organizing a variety of different training paths in color education courses worldwide. The CDTI framework is currently under construction and is being built through consultation, involvement and collaboration with colour teachers from different countries and backgrounds. The talk concluded with an inspiring "walk-through" of the website in progress which highlighted the complex nature of teaching color while providing easy navigation through the many interconnected topics of colour education.

Update on the ISCC/AIC Joint Color Literacy Project: Beta-Testing New Approaches to Elementary Colour Education

To conclude the event, Maggie Maggio presented an update on the Colour Literacy Project. The Color Literacy Project (CLP) launched Phase Two in January 2021. The goal of the second phase is to engage teachers in the process of evaluating new and existing materials for use on the future resource center.

The first round of beta testing was focused on teachers from two elementary schools, one in England and one in Canada. CLP members met virtually with the teachers for six hours of professional development training spread out from March to May of this year. The teachers in Manchester participated together at the school during staff meeting time while the teachers at Clinton participated from home since the school was closed for the pandemic at the times scheduled for the workshops. The beta test partner schools are:

St Teresa RC School in Manchester, England
Coordinator: Colette Harrison
Students: 239; ages: 3-12

Clinton Elementary PS in Toronto, Canada
Coordinator: Liz Pead
Students: 350; ages: 4-12

The first round "Eye-Opener Series" consisted of two two-hour virtual workshops: Workshop One: Perception of Color,Workshop Two: Language of Color, Workshop Three: 3D Models of Color. Each workshop was divided into six hands-on exercises designed to engage the teachers in the experience of seeing beyond the simple categories of color based only on hue in order to appreciate the immense variety of colors perceived in everyday life.

There were a few technical glitches, but the feedback was overwhelmingly positive with the teachers excited about taking what they learned into their classrooms this fall. The next workshops with the partner school teachers will take place in the fall with the beta testing of the STEM to STEAM Series.

Post Event Reception

At the request of a few of the participants, the Zoom platform was used for a spur-of-the-moment 30-minute virtual reception after the closing of the Symposium. The reception provided attendees with the opportunity to meet face-to-face with fellow attendees in a series of short breakout room sessions and was a fitting end to a day of inspiring presentations.

2020 Macbeth Award Update

The 2020 Macbeth award was presented to Roland L. Connelly, Sr on May 11, 2021. The delay was due to the impact of COVID on travel, as well as the time required to recreate this cherished and unique ISCC award. ISCC had run out of the physical award and had to have more produced. ISCC member Ann Laidlaw presented the award to Roland Connelly in Mt. Gilead, NC.

Fluorescent Fridays

Building an International Student Chapter

NEXT GENERATION COLOR! We are excited to report that Fluorescent Fridays are off to a colorful start—the fourth event in the series took place on June 25. The format was rapid-fire mini-talks. Each of the six university students described their cutting-edge research that ranged from exploring immersive color appearance in augmented reality, designing a synesthetic installation of color and sound, developing Ultra-Deep Black for cotton textiles, and color mapping six-thousand-year-old Iranian architecture, to integrating color and comfort in rehabilitation spaces, and exploring food waste with pigment-producing bacteria to develop vibrant hues for wearable textiles.

WHO Lili Zhang, Munsell Color Science Laboratory at Rochester Institute of Technology; Kaitlin Reynolds, Interior Design at the University of Texas; Shahriar Salim, Program of Fiber and Polymer Science at North Carolina State University; Maryam Mohammad-Gholipour, Colorist-Architect at the International Islamic University Malaysia; Vanessa Mardirossian, Textile Design at Concordia University; Breanna McGrath, Architecture at the University of Florida.

GOING FORWARD With four Fluorescent Fridays under our belts (October, February, April, June) we are looking forward to next steps. It has been amazing to meet such talented, dedicated and passionate university students who are leading the next generation of color. By the end of the summer, the ISCC website events page will feature a form for students to propose research topics for future events. Stay tuned for the next series of Fluorescent Fridays kicking off in September!

Special thanks to the Fluorescent Fridays team: Lina Cardenas, Jean Hoskins, Jennifer Kruschwitz, Maggie Maggio, Michael Murdoch, John Seymour, Renzo Shamey, Luanne Stovall

ISCC Webinar Report

May Webinar: The Greying of Norway

On May 12, 2021, Kine Angelo presented The Greying of Norway. Kine Angelo (pronounced keen-ā) is currently Associate Professor in the Faculty of Architecture and Design at Norwegian University of Science and Technology (NTNU), lecturing and performing research in the Department for Architecture and Technology.

The talk perfectly set the stage for Color Impact 2021, exploring the slow change in the coloring of Norwegian architecture. Houses and buildings that once featured reds, yellows, and greens have been making a dramatic change toward a uniform, achromatic color scheme. Kine walked the audience through this change, relating the social and political conditions that led to the current, largely neutral, color schemes.

The webinar drew about 50 attendees from a broad international and interdisciplinary audience, including attendees from academia and industry, and those from Romania, Spain, The Netherlands, Portugal, Hong Kong, Canada and of course Norway.

Please check the ISCC website at www.iscc.org for upcoming events.

ISCC Officer/

Board of Director Nominations and annual meeting

This fall the ISCC will be holding elections for three Directors. Directors serve three year terms on the Board of Directors.

If you have any suitable nominees in mind, please email any of the following Nominations Committee members:

Dr Renzo Shamey, Chair	rshamey@ncsu.edu
Ms Maggie Maggio	maggiemaggio@gmail.com
Ms. Rachel Schwen	rschwen@valspar.com
Dr. Danny C. Rich	Danny.Rich@sunchemical.com
Ms. Amy Woolf	Info@awcolor.com
Ms. Kate Edwards	KEdwards@datacolor.com

Our sincerest thanks to our outgoing Directors: Dr. Lina Cardenas, Dr. Danny C. Rich, Ms. Luanne Stovall and Ms. Amy Woolf. We very much appreciate your years of service on the Board.

2021 Annual Meeting

The 2021 ISCC Annual Meeting will be held in hybrid format (in person and online) on Monday September 20, starting at 2pm EDT. The specific agenda will be announced in August or early September. We do know now that the meeting will take three parts:

- The first hour will be a presentation by NIH researcher Bevil Conway, entitled "The neuroscience of color and what makes primates special"
- After a short break, we will move into the formal reports from the Board, as required by the By-laws. This will include input from the general audience as time permits.
- Once the official proceedings are completed, we will adjourn and open an informal "Colorful Cocktails" Zoom meeting for a fun social event to end the day.

Bevil Conway's presentation and the official Annual Meeting will be held using the GotoTraining platform. The in-person aspect of the Annual Meeting will be held at the Rochester Institute of Technology. Anyone wishing to attend in person must contact Dave Wyble who will make sure you get all the details regarding accommodations and other logistical information. Whether in person or online, we would encourage all ISCC members to attend the annual meeting. It is a great way to stay in tune with the happenings of the organization, as well as giving you a forum to share your thoughts directly with the Board of Directors.

Godlove Award

Committee Members and Nominations Needed

The Godlove Award was established by Mrs. Margaret N. Godlove in memory of her husband, Dr. I. H. Godlove. The fund was presented to and acepted by the ISCC during the 25th Anniversary Meeting of April 6, 1956. The award is usually, but not necessarily, presented biennially in odd-numbered years. At this time we are simultaneously seeking nominations for this award, as well as committed members who are willing to help process the nominations.

The Godlove Award is the most prestigious award bestowed by the Inter-Society Color Council, and honors long term contributions in the field of color. Candidates will be judged by their contribution to any of the fields of interest related to color, whether or not it is represented by a Member-Body. A candidate's contribution is to be considered in the light of the objectives of the Council as defined in Article II of the Constitution. This 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 upon original contributions of the nominee. The candidate need not have been active in the affairs of the Council, but they must be current or former members of the ISCC. All candidates must have had at least five years experience in their particular field of color.

Godlove Award Nominations should include the following information:

1. The name and full address of the nominee.
2. A sentence or two giving the specific reason for the award's bestowal. This will normally form the basis for the citation presented to the successful nominee.
3. A narrative (up to one-page) of the nominee's contribution and its significance.
4. A curriculum vitae for the nominee, as well as any other material deemed useful.
5. The name of the person or Member Body or Award Committee who prepared the nomination with appropriate contact information.

Note: Confidentiality of the nomination is of the utmost importance. The nominating individual/group must ensure that the nomination is not disclosed to the proposed nominee. If any of the above information cannot be obtained without risking disclosure, then the information should be omitted from the nominating letter.

Nominations should be submitted using the form found at: www.iscc-archive.org/UniversalNominationForm.pdf

This form can be filled out, scanned and emailed to president@iscc.org or printed, completed and sent to:

Dr. David R Wyble
ISCC President
PO Box 1210
Webster NY 14580

Calendar 2021 - 2022

2021	
Aug 2-6	NAPIM Summer Courses 12 PM – 5 PM CDT https://www.napim.org/index.php?option=com_jevents&task=icalrepeat.detail&evid=19&Itemid=150&year=2021&month=08&day=02&title=napim-summer-course-2021&uid=6a53ce60d3f8f5ef1ddf6f37940b0102
Aug 5-7	Illumination Engineering Society Annual Conference, Virtual Info: https://www.ies.org/events/annual-conference/
Aug 26-27	Farbe, Raum und Gesundheit (Color, Space and Health), Berlin, Germany Organization: Deuetsches Farbenzentrume.V. Zentralinstitut Fur Farbe in Wissenschaft und Gestaltung deutsches-farbenzentrum.de
Aug 30-Sept 3	AIC 2021 14th Congress Info: https://www.aic2021.org/program-at-a-glance/
Aug 6-7	Illuminating Engineering Society Annual Conference https://www.ies.org/events/annual-conference/
Aug 5-7	Illumination Engineering Society Annual Conference, New Orleans, Louisiana Info: https://www.ies.org/events/annual-conference/
Aug 23-25	Techtextil, North America, Raleigh, NC, 2021 Info: https://techtextil-north-america.us.messefrankfurt.com/us/en.html?us/en.html
Aug 30-Sept 3	AIC 14th Congress Milano, Italy 2021 Info: https://www.aic2021.org/
Sept 8,9,10	Sexo, Color y Erotismo, Mexico City, Mexico II Congresso International y V Encuento Mexicano del Color amexinc.mx
Sept 10-11	SCAD 2021 Annual Conference Info: http://www.scadent.org/events/chicago-2021

Sept 19-22	SPE CAD RETEC Color On My Mind Info: Coloring the World of Plastics™ https://specad.org/cad_retec_2021_homepage/
Sept 20-22	IST London Imaging Meeting 2021 https://www.imaging.org/site/IST/IST/Conferences/LIM/LIM_Home.aspx
Oct 11-15	NAPIM Fall Technical Conference 8:00 AM – 5:00 PM https://www.napim.org/napim-event-list
Oct 20-22	SOCMA Week 2021 New Orleans, LA https://www.socma.org/events-meetings/socma-week-2021/
Oct 22-24	Dye Chem World Tirupurr, Tamil Nadu, India https://sdc.org.uk/event/dye-chem-world/
Early Nov	IST CIC29 https://www.imaging.org/site/IST/IST/Conferences/CIC/CIC_Home.aspx
Nov 10-11 **Virtual day: Nov 12**	NYSCC Supplier's Day, New York, NY https://nyscc.org/suppliers-day/
Nov 12-13	SCAD 2021 Conference http://www.scadent.org/events/chicago-2021
Dec 9	ASTM Retroflection December 2021 Committee Week E12 Meeting Atlanta, GA
Jan 26 2022	ASTM Color and Appearance E12 mrrting Houston, TX https://www.astm.org/MEETINGS/

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.

Datacolor

5 Princess Rd
Lawrenceville, NJ 08648
Website: https://www.datacolor.com/
Contact: Mike Brill
Email: MBrill@datacolor.com

Avian Technologies LLC

P.O. Box 716
Sunapee, NH 03254
Website: https://aviantechnologies.com
Contact: Art Springsteen
Email: arts@aviantechnologies.com

Radiant Vision Systems LLC

18640 NE 67th Court
Redmond, WA 98052-6728
Website: www.RadiantVisionSystems.com
Contact: Shaina Warner
Email: info@radiantvs.com

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isccoffice@iscc.org

Editor: Madelaine Yafet

Layout and Design: Lina Cárdenas, Gala Altermatt

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