



Inter - Society Color Council Quarterly Newsletter

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email: isccoffice@iscc.org

address: Inter-Society Color Council 712 H Street NE, Suite 1640
Washington, DC 20002

*Credits: Marek Piwnicki
Shen'ao Rail Bike, Taiwan*

Directors Corner

Sandra Sampson

Canned Color

A can of 48 Crayola Crayons limited my color application at first, but that soon grew to 64 Crayola Crayons with the sharpener in the back of the box, followed by a shoebox of crayons (who puts their crayons back in the box?). What I didn't know was how far that can of "Different Brilliant Colors" would travel with me and define my design.

Thanks to my Dad, I grew up with a darkroom in our house. I did mostly black and white photography. But as color photography emerged, we added this to the darkroom too. Back then, color photography was complicated, and it was challenging to get the colors to print correctly.

My early application of color through watercolor, acrylic, gouache, sign painting, and pen and ink I learned at Oregon College of Art in Ashland, Oregon. The school was run by three Art Center College of Design graduates, and everything was created by hand. After graduating with an Associate's degree in Communications, I went off to find work with my new color and design skills in tow.

Because of my photography and design background, I started working for a commercial printer in their pre-press department. The process repro camera fit into two rooms and was the largest camera



I had ever seen. My darkroom skills were put to use photographing artboards for commercial 4/C printing with this reproduction camera that fit into two rooms. We photographed the designer's artboards and did separations for the press by hand. This color pre-press knowledge carried forward as I went to school for advertising, graphic design and packaging. It was not long before I realized that pre-press did not hold enough color and design creativity for me, and I was not inclined to spend the rest of my life in a darkroom. In addition, the art created by designers who did not know the printing process and separations fueled my need to become a designer.

I created a portfolio from my studies at Oregon College of Art that landed me a scholarship to the Art Center College of Design in Pasadena, California. Studying Graphics/Packaging, my color theory class was taught by Judith Crook who authored our black and white color textbook, "Color Theory and Application." At the time, good color instruction books were hard to find so she created her own. In other classes, we painted color endlessly using acrylic paint and gouache in graphic shapes and abstract or realist paintings. Back then we didn't have Apple Macs yet, so everything was created by hand. Luckily, there was a Holland computer available to curious students. This computer had three CRT monitors and a computer input board 3 by 8 feet. Judith allowed me to do all my color theory work on the computer. As far as I know, no one had done this before at Art Center.

Color was my favorite subject at Art Center; at the time I graduated, color design positions were limited so I went into advertising and graphic design. Color application opportunities were aplenty in print. It was essential to ensure that the colors would print correctly using the color notations and in-person press checks. Monitors back then were no guarantee what you saw would be what you get.

Over the years, I have applied color in photography, large format printing, print, identity design, packaging, product development, materials design, spaces, and tradeshow and showroom design. Rendering color surface pattern designs or textiles is most fascinating as different color combinations redefine the pattern's appearance completely and quickly.

Communicating color accurately is a challenging task. The color knowledge gap between the designers and the color scientists makes that much more complicated. Color science has had a few improvements over the last 30 years that some designers may have yet to learn in school. In Ms. Crook's class, we also studied *Munsell® Student Chart* and *A Color Notation*, which still reside in my color library today. The ISCC Munsell Centennial in 2018 helped me further learn how to bridge that designer-to-color scientist gap by opening doors to color science knowledge and tools. Since then, my ability to provide scientists with what they need to create a color for client needs has become more technical, familiar and fun!

I see the importance of connecting designers, color scientists and educators with a broad range of color knowledge, and sharing that knowledge provides opportunities for everyone to apply color in new ways.

As a board member, I see the value of growing connections and closing the gap between color science and application across all disciplines.

I am an independent designer with over three decades of experience in graphic, color, product and materials design. In 2001, I founded a multi-disciplinary design studio, Simple Modern Style, Vital Color™, that focuses on transforming color, trend, consumer preferences, and market research into engaging color designs. Throughout my 19 years at CMG, I have continuously volunteered on committees, the board, and the executive committee and I am currently Vice President of Education bringing color education opportunities to the CMG members. At CMG, I helped launch Variable's Color Muse, CMG edition, to color design professionals. My work as a CMF Design Lead bridges the gap between color scientists and designers, opening doors to unique material colors and applications. I am an alumnus of Art Center College of Design, Eiseman Center for Color Information and Training, and Oregon College of Art. My ongoing passion for knowledge and innovations in color, materials, and design continually transforms the color design thinking that I apply throughout my work.



Sandra Sampson

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Terms end 2024	President	Ms. Maggie Maggio Smashing Color maggiemaggio@gmail.com
	President Elect	Dr. Jennifer (Jen) Kruschwitz Assistant Professor University of Rochester, Institute of Optics jennifer.kruschwitz@rochester.edu
	Secretary	Ms. Amy Woolf Amy Woolf Color Consulting, LLC amy@awcolor.com
	Treasurer	Mr. Jerald Dimas Color Communications, Inc. 4000 W. Filmore Street Chicago, IL 60624 USA +1 (773)-475-2575 jerdim@cccicor.com
	Past President	Dr David R Wyble Avian Rochester, LLC PO Box 1210 Webster NY 14580 dave@avianrochester.com
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	Justin Laird	Senior Color Engineer Apple, Inc. +1-408-896-4400 One Apple Park Way, 925-1MD2 Cupertino, CA 95014

Hue Angles

Grothendieck's Use of Equality

Michael H. Brill

Send contributions to mhbrill2001@gmail.com

I have recently been bothered by the multiple meanings of “=” or its common-language proxies “equates to,” “is equal to,” “comprises,” or “is.”

A clear example from computer programming is the distinction between “A equals B” and “If (A equals B).” The first instance is an instruction to copy the contents of B into the location A so as to over-ride A’s original contents; the second instance is to use the current contents of A and B to make a decision. The dichotomy had to be solved by a distinction in notation. Obviously the first instance received the prized “=” sign, and the second made do with “.EQ.” (in FORTRAN), and “==” in C.

Another example is the usage “z comprises x,” which in common language means “z consists of x,” but in the legalese dialect (particularly in patents) means “z contains x.” Legal documents betray the second meaning when, after “z comprises x,” they say “z further comprises y.” Unlike the computer-program example, this dichotomy is never explicitly clarified. (Let inventors be warned!)

In color science, there is a one-two punch of examples.

Punch 1 is elementary. The distinction between metamers and isomers* is a reason to use a squiggly equals sign for “match in color” and an ordinary equals sign for “match in spectrum.” Simple linear algebra connects one with the other, and the result simplifies the general problem of color from n dimensions to 3. Both in 3 dimensions and in n dimensions, the match is transitive: If A matches B and B matches C, then A matches C. That is one of Grassmann’s laws, which are axioms of colorimetry.

Punch 2 is more problematic: A metameric match is not at a point in a 3-dimensional space but has a significant uncertainty. The uncertainty-convolved match (the best you can get from our present experiments) can be expressed by “A is less than a just-noticeable

*The word isomer is an underutilized word that was borrowed by Ostwald from the chemistry lingo. In color science, it refers to a color match where the two colors match at all wavelengths, so will match for any illuminant.

difference (JND) from B.” This violates transitivity. Joseph B. Keller [3] described an (impractical) experimental plan to banish the need for the uncertainty-convolved match, or alternatively to coin the term “really match” for the unattainable Grassmann match.

Despite this conundrum, color scientists have been able to find practical ways to proceed. Two paradigms collide (color as a linear vector space and color as a space whose points are ill-determined within a JND). Somehow, the mathematical intuition of color scientists finds an acceptable way to distinguish the term “color match” as used by these paradigms.

Such discussion touches uncomfortably on philosophical questions in ontology, entification, and epistemology.

A nearby neighbor of philosophy is pure mathematics. I recently learned that serious mathematicians are also concerned with the multiple meanings of the equal sign. It started when I encountered Caroline Delbert’s article in Popular Mechanics [1]. In turn, Delbert cited a research-level article (actually more of an editorial) by Kevin Buzzard from the Imperial College of London. That article is “Grothendieck’s Use of Equality,” a title so stylishly enigmatic that I adopted it for this column. Here is the Abstract:

“We discuss how the concept of equality is used by mathematicians (including Grothendieck) and what effect this has when trying to formalise mathematics. We challenge various reasonable-sounding slogans about equality.”

(I am reminded of a slogan from Orwell’s Animal Farm: some animals are more equal than others.)

Buzzard focuses on the problem of applying AI to prove theorems automatically, making intuitive decisions just as human mathematicians do. AI based theorem-proving software is now unable to invent the right categories within which to define “equality” of members of the category. An example of category selection is

the proposition $2+2 = 4$. Can I say this is always true? If “ $2+2$ ” is numerically evaluated and compared to the numerical evaluation “4,” the answer is yes. But the alpha-numeric string you have to type is more arduous for “ $2+2$ ” than for “4.” That would make the answer no. The designations “numerical evaluation” and “alpha-numeric string” are categories that may or may not be felicitous in proving theorems.

In pure mathematics, the ambiguity of “equal” is much more subtle, sometimes arising from collisions of paradigm (perhaps resembling the one I mentioned for color matching). There’s a whole field called category theory that ponders this sort of problem.

Mathematicians now seem to want a more rigorous definition of equality. Buzzard says that as soon as we have this sorted out, the way will be cleared to an AI system that can prove theorems as well as mathematicians do. Other mathematicians agree with him.

I am not an expert in pure mathematics, but it seems to me that the way ahead may not be as easy as Buzzard implies. Reaching the Grail of AI is not a foregone conclusion to this story of equality.

Note: Alexander Grothendieck (1928-2014) was a German-born French mathematician who co-created the field of algebraic geometry. Many consider him to be the greatest mathematician of the twentieth century, but he is not as well known as others because of his lower publication output and because of his controversial political views [4]. Buzzard cites one work by Grothendieck [5].

References

1. Caroline Delbert, *Mathematicians are suddenly rethinking the equals sign*, Popular Mechanics, 12 June 2024.
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2. Kevin Buzzard, *Grothendieck's use of equality*
<https://arxiv.org/abs/2405.10387> posted to ArXiv May 2024.
3. M. H. Brill, *Joseph B. Keller at NJIT: A more precise color-matching theory*, ISCC News #394, 16 (November 2001).
4. https://en.wikipedia.org/wiki/Alexander_Grothendieck.
5. A. Grothendieck, *Elements de geometrie algebrique. I. Le langage des schemas*, Inst. Haute Etudes Sci. Math Sci. Publ. Math. (1960) no. 4, 228.

The Glamorous World of ASTM E12

John Seymour

ASTM E12, the committee on Color and Appearance, met June 12 and 13 in Philadelphia. In this article, I will share some of the highlights that I found interesting. Questions? Send me an email: john@johntheguy.com. I probably don't know the answer, but I can certainly direct you to someone with a better answer than me.

P&B (without the J)

There is an old adage in carpentry that you should “measure once and cut twice.” Or... wait... maybe it was “cut twice and measure once?” I can only remember the adage for sure after the third cut. We expect that if we measure the same piece of wood twice, we will all always get the same length. But if we track measurements very closely, we will see some variation.



Figure 1 – Not a clean cut

The edge of a piece of wood is not perfectly flat. Since the two-by-four in Figure 1 was cut by me, I know it is not quite perpendicular to the edge. As a result, the length you measure depends on which side you measure.

Parallax can be an issue when using a tape measure, since the surface is curved. The picture (Figure 2, left) was taken with the camera on the left and tilted one way. The picture at the right was the opposite

configuration. One image shows 10 inches plus one graduation. (Or is it one and a half?) The other shows a measurement of 10 inches minus two graduations. Since I am such a great math guy, I know right away that one graduation is equal to $1/54$ th of an inch, and two are equal to $1/18$ th. (Believe it or not, some folks might get this wrong!)



Figure 2 – Parallax is not a metrologist's friend

Then of course, there is the thermal expansion of the spring steel. A 25-foot tape measure will get longer by 20 thousandths of an inch when the temperature goes up by ten degrees. Every carpenter worth their salt will have this number memorized! And what about the effect of humidity on wood?!?!?!?

These examples illustrate the basic problems with metrology (the science of measurement). Sample presentation, temperature, humidity and other unknowns may affect the measurement. The measurement may depend on the person making the measurement and may depend on the model of the instrument. Users should understand the reliability of the data and test method, that is, the precision of the measurement to decide whether the method of measurement meets the needs of the application.



Figure 3 – This micrometer is a bit of overkill for cotton ball inspection

The next image (Figure 4, at left) is a comparison of two of my rulers. The one above left is a steel ruler. The one below left is a clear plastic ruler. The two are lined up at the one-inch mark, but at the ten-inch mark, the plastic ruler has clearly fallen behind.

This image demonstrates bias between the two measurement devices. One can expect that measurements of lengths of about 10 inches made using the plastic ruler will average about 1/32nd of an inch longer than those of the steel ruler. Which one is correct? The image at the right (Figure 4), with my high-falutin' digital micrometer, suggests that there might be some bias in the steel ruler as well.

For ASTM standards that explain test methods, it is mandatory to report the precision and the bias (AKA P & B) that one can expect when using the test method. Precision has a precise meaning in ASTM-speak. It is a measure of how much variation there is between replicated measurements of the same quantity. If the measurements

are taken one after the other with no change to conditions, we call this repeatability. If something changes between measurements (e.g. a different operator, significant time lapse, or different lab), we call this reproducibility.

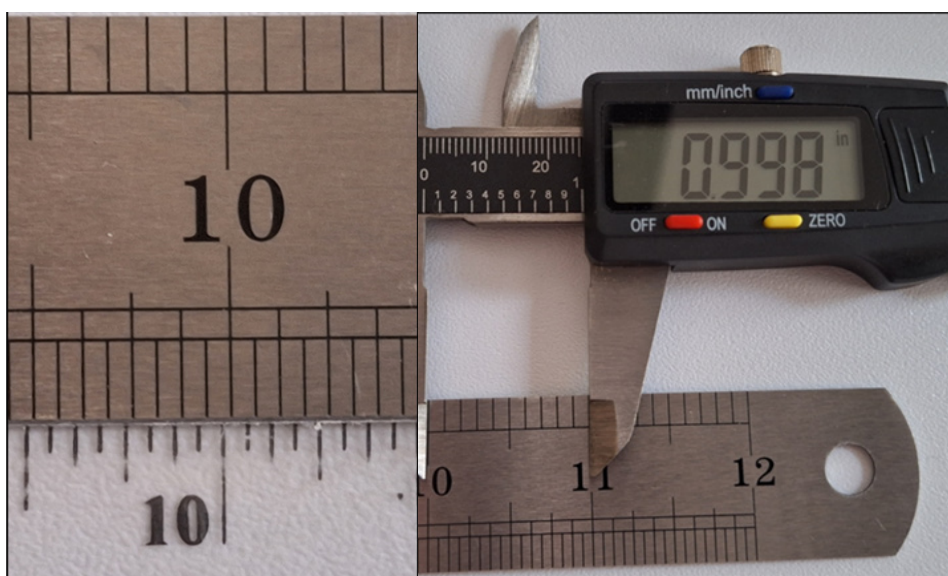


Figure 4 - Intra-instrument agreement

I had the privilege to get to know Bill Vogelsong when I was just starting my career in color science. (He passed away in 1999.) One pithy statement that he made has stuck with me: “Back in the day we had two instruments that didn’t agree. We didn’t know which one was right. We just assumed that the more expensive one was correct!” So, the micrometer (which cost me about \$20) will be correct until a machinist comes along with his \$100 model.

But this still doesn’t guarantee zero bias. According to ASTM’s Form and Style for ASTM Standards: “Bias is a systematic error that contributes to the difference between the mean of a large number of test results and an accepted reference value.”

Accepted reference values are sometimes in the form of established constants in nature, for example, a spectral emission line from a gas discharge lamp. But for many measured quantities, there is an official reference, such as the platinum-iridium sphere stored in Paris that up until recently was the standard reference for one kilogram.

For ASTM D523, the standard that defines how to measure specular gloss of non-metallic surfaces, the primary standard is a highly polished piece of black glass with an index of refraction of 1.567 at 589 nm. This is the calibration point of 100 percent gloss.

We can claim accuracy only if we have traceability, which means that we have a documented and unbroken chain of comparisons of measurements and instruments that goes back to a national standards lab such as NIST in the USA or NRC in Canada.

This was a long-winded introduction to one of the actions at the June meeting of ASTM E12. The standard I just mentioned, D523-2014 (2018) was last modified in 2014 and was reviewed without changes in 2018. It is due for review, and it was decided to run a new ILS (Inter-Laboratory Study).

This study is called a round-robin test. A set of samples with various amounts of gloss are sent on a pub crawl from one participating lab to the next, with everyone measuring the gloss of the samples and sharing their results. At the end, the samples are sent back to where they originated to assure that the samples had not changed during the process.

Ideally, these measurements are statistically analyzed to provide a P & B (precision and bias) statement. Unfortunately, something went wrong. It could have been a thumb print, a scuff, or the sample faded from light exposure—we don't know what! The last five labs reported measurements on one of the samples that were statistically different. Furthermore, when the samples returned home, the home base continued that trend. The unfortunate conclusion is that this one sample had changed in some way during the course of the round robin.

The standard ASTM E430-23, which describes a slightly different method for determining gloss of very glossy surfaces is also getting a new P&B statement.

Seeing color in 3D

Using a color measurement device that does not have enough precision to reach the tolerances that your customer has requested is a recipe for failure. But how to test this?

With one-dimensional data, this is a relatively well-established discipline largely based on the t test on normally distributed data that we all learned in Stats 101. This can be used to tell us if our “gauge” is “capable,” and if not, how much averaging is needed to get the precision where it needs to be. This is the topic of the current version of ASTM E1345-1998 (2019), the one last modified in 1998 and last reviewed in 2019.

There is a gap between what industry needs and what this standard provides. In industry, the currency is the ΔE color difference. Production tolerances are usually given in terms of the many ΔE color difference equations. The current version of this standard advocates the use of Stats 101 techniques on each of the individual components of color.

If you have a copy of that version standard, hang on to it, because it will soon be a collector’s item. E1345 is currently being rewritten from scratch.

Many Monte Carlo simulations were performed, with hundreds of millions of pseudo-random color values giving their lives to test four possible methods for extending the existing approach to color differences. One of the four rose to the top, and the standard is currently being rewritten to accommodate this.

Quantifying “I can’t see you”

When I joined ASTM E12 committee on Color and Appearance, Forrest Gump told me that ASTM E12 meetings are like a box of chocolates. You never know what you’re going to get. And so it was with the June meetings!

This is perhaps a bit of an oversimplification, but the job of ASTM E12 is to provide definitions – definitions of instruments for measuring color and other appearance attributes, and calculations derived from those measurements. If everyone abides by those definitions, then we can be assured that measurements from different places can be meaningfully compared.

It is relatively common for vendors to approach the committee to broaden existing standards. “We found a different way to measure this property, could you change the spec to include our approach?” If the committee can be convinced that the new method provides essentially equivalent results (usually by a P&B study), then the standard will likely be modified.

It is somewhat less common for a vendor to approach the committee to define the quantification of some property that doesn’t exist in the portfolio. When we opened our box of chocolates at the meeting, we found one of these. The vendor manufactures “privacy glass” – glass that can change between see-through and can’t-see-through. (Sounds pretty cool, right?) They want an ASTM standard that defines a method to measure the privacy of their product. How do you measure privacy? What is the physical quality that renders a piece of glass private? The question is more complicated than it sounds, since there are multiple physical laws that can be exploited to make something can’t-see-through. The simplest approach is black spray paint. When a hapless light ray reflects from my face toward the glass and encounters the carbon black in the paint, it gets absorbed. My smiling mug can’t be seen on the other side. The privacy of a pane of glass could be assessed by measuring how much light is absorbed.

White spray paint is a second approach. Ostensibly, this is no different from black spray paint, but the physics is entirely different. When the ray of light encounters the titanium dioxide in the white paint, it is not absorbed, but rather it bounces off. Sometimes it may continue more or less in the “I am going to get through this glass” direction, and sometimes it may reflect back toward my side of the glass. If the layer of white paint is thick enough, the light ray will encounter enough of these 50-50 coin flip decisions that it finally exits on the original side of the glass. The privacy of a pane of glass also depends on how much light is reflected back.

Then there is the glass brick window that you might see in a bathroom. Both sides of the brick have wavy contours that distort the image on the other side. When I shower in front of the glass brick window, I don’t worry about whether the neighbors are seeing me. The privacy of a pane of glass is more complicated than just a function of how much light is absorbed and how much is reflected back.



Figure 5 – The builders of my house felt that this provided privacy

The image in Figure 6 shows yet another way to assure privacy. If an object is right next to frosted glass, you may be able to make out details, but the minor scattering of light means that objects further away from the glass are indistinct. Is this to be considered in the way to measure privacy?

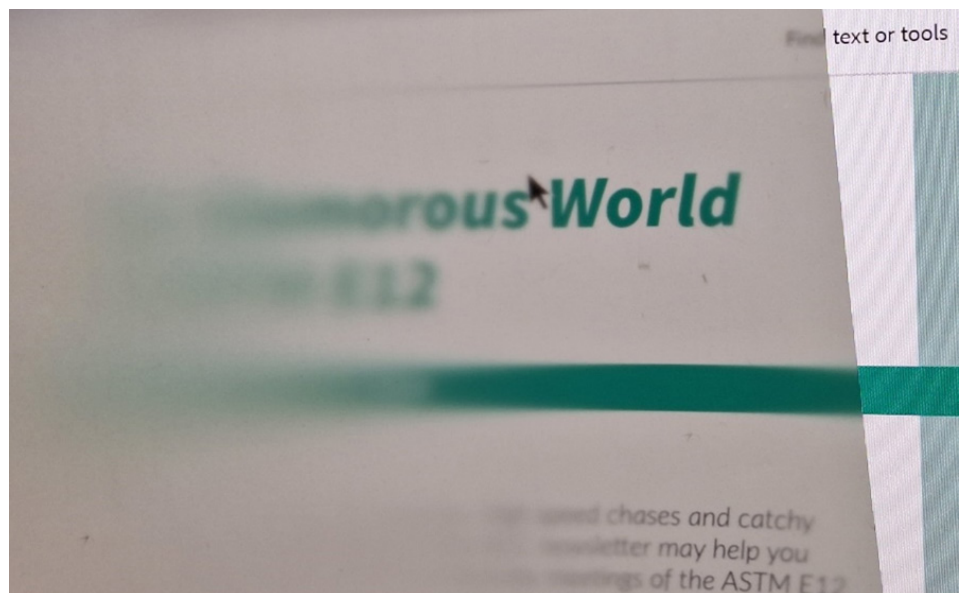


Figure 6 – Frosted glass provides privacy if you are far enough away

The one-way mirror is yet another example of how physics can be exploited to assure privacy. In this case, the glass is partially silvered so it looks like a mirror. On the other side of the glass, the room is darkened. In this way, the light reflected from the glass overwhelms the small amount of light going through the glass.

This company will do a presentation at the next ASTM meeting in West Conshohocken, Pennsylvania on Jan 29 and 30, 2025. I am personally intrigued by the question of how one would design an instrument to measure “privacy” and look forward to learning more!

Arthur W. Springsteen, 1948-2024

ISCC lost a great friend, supporter, and former Director. Art Springsteen, president and CTO of Avian Technologies, LLC, passed away on May 28, 2024. A memoriam will be published in an upcoming ISCC News.



Call for Entry

Color Shifts: Color as Communication

Visit Organization Website

Contact Email: ArtEx@iscc.org

Entry Deadline: 1/15/25

Days remaining to deadline: 169

Entry Fee (Entry Fee): \$30.00

Work Sample Requirements

Images | Minimum: 0, Maximum: 3

Audio | Minimum: 0, Maximum: 2

Video | Minimum: 0, Maximum: 2

Total Samples | Minimum: 1, Maximum: 3

COLOR SHIFTS: Call for Entry

Call Type: Exhibitions **Eligibility:** International **State:** New York

How does color affect how we communicate? What perspectives and experiences are evoked through color? Can color shift and reframe our viewpoints? This exhibition explores the role of color in communication in the arts, design, sciences, and humanities, and the way color can be used to shift our perspectives. We invite creative explorations of color from all directions.

How does the materiality of light and color:

- shape or shift our perceptual experiences and communication?
- reframe ideas?
- impact meaning in data visualization?
- enhance and shift perspectives in marketing?
- affect cultural bias?

We invite submissions from all creatives at all levels in all media: artists, scientists, designers, students, faculty, industry professionals,

and anyone interested in creatively expressing color through physical and digital materials – all are welcome.

Sponsored by The Color Council, **COLOR SHIFTS is part of the Color Impact 2025: Color as Communication conference** at Rochester Institute of Technology in upstate New York. ISCC advances the knowledge of color as it relates to art, science, industry and design. Each of these fields enriches the others, furthering the general objective of color education. This will be a virtual exhibition, and all works will be displayed at a conference event and on the Color Impact 2025: Color as Communication website.

Awards

A Best of Show will be awarded for each of these categories: Student, Amateur, Professional

Jurying Process

To further our interdisciplinary approach, we have selected Jurors: Alteronce Gumby, Ann Lindberg, and Jayanne English. Jurors are asked to consider design skills, technical elements, and presentation; and the expressive, imaginative, conceptual or innovative content of the work. Jurors will keep a balanced show in mind but are not required to select a specific quota in each medium or color focus.

Jurors:

Alteronce Gumby

Alteronce Gumby is an artist and local of New York City. His artistic practice includes painting, ceramics, installation, performance and film. Alteronce earned his BFA from Hunter College and his MFA from Yale School of Art. Alteronce's inspirations include the cosmos,

and he is an active member of the Amateur Astronomers Association and the Planetary Society.

His most recent exhibitions include Dark Matter at Allentown Art Museum and The Color of Everything at Nicola Vassell Gallery. He has participated in numerous residencies such as the Rauschenberg Residency (2019) and was the 2016 recipient of the Harriet Hale Woolley Scholarship at the Fondation des Étas-Unis in Paris. Alteronce's work has been featured in publications such as ARTnews, Artnet, Artsy, BOMB, Brooklyn Rail, Cultured, DAZED, Frieze, Surface and Vogue. Alteronce recently completed his first documentary, **COLOR**, with John Campbell, exploring the nature of color globally. He is currently preparing for his next solo exhibition at Nicola Vassell Gallery in November 2024.

<https://www.alteroncegumby.com>

Ann Lindberg

Anne Lindberg is a visual artist working in sculpture, drawing, and dimensional textiles. Recent work includes graphite and colored pencil drawings on mat board and architecturally scaled, site-responsive sculptural installations created with volumes of fine chromatic thread. Her process involves optics, ideas, a paced and daily conversation with place, and how she negotiates physicality. Her goal is to encourage a fluid state of perceptions, contemplate place, affect change, adapt, and inform decisions in the making of her work. She has shown her work extensively. Recent solo and group exhibitions include Hangar Y (Paris), Madison Museum of Contemporary Art, The Textile Museum at George Washington University Museums, Everson Museum of Art, Arkansas Museum of Fine Arts, Figge Art Museum, and The Museum of Arts and Design. She holds a Bachelor of Fine Arts from Miami University, Oxford, Ohio, and an MFA from Cranbrook Academy of Art, Bloomfield, MI. Grants received include Omni International Residency, Painters and Sculptors Joan Mitchell Foundation, and Mid-America National Endowment for Arts fellowship.

<http://www.annelindberg.com>

Jayanne English

Jayanne English is a Senior Scholar in the Department of Physics and Astronomy at the University of Manitoba, where she investigates galaxies' structure and kinematics and how galaxies evolve and does scientific visualization. She was awarded the 2021 Qilak Award for Astronomy Communications, Public Education and Outreach by the Canadian Astronomical Society/Soci  t   Canadienne d'Astronomie (CASCAS). Although she is renowned for constructing astronomy outreach images for the public, which garner millions of hits on the internet, this award was in part for her engagement with artists and the collaborative works they have produced. She received membership in the Order of Canada in 2023 for interfacing artistic literacy and aesthetics with scientific visualization. As Associate Professor at the University of Manitoba, she trained the next generation of experts and emphasized the links between art and science. She received her Ph.D. in Astronomy and Astrophysics at the Australian National University, Bachelor of Science in Physics and Astronomy from the University of Toronto, and diploma in General Studies from the Ontario College of Art and Design University.

<http://www2.physics.umanitoba.ca/u/english/>

Application Requirements

Entry Materials

We are seeking creative expressions from across the spectrum of media and professions. We encourage creatives to submit art in any style as well as the visual expression of scientific exploration. There are no size limitations. For 3D work, consider uploading video documentation to better represent your submission in the round. There is a three-minute time limit for audio and visual files.

Examples (but not limited to):

Digital Media: All forms of new media including animation, video and photography

Arts: Visual arts, crafts, dance, performance, poetry, music, light installations, and graphic or industrial design

Environmental Design and Architecture: Including Interior Design, Textile Design, Visual Marketing, Product Design

Visual Representations of Research Data: A 3D output of data, a graphic representation of color data, or novel use of color in data visualization

Please upload the highest quality possible because that file will be exhibited. File format and size specifications can be found at:

<https://www.callforentry.org/artist-help-cafe/uploading-media/>

Eligibility Criteria

We invite submissions from all creatives at all levels, in all media: artists, scientists, designers, students, faculty, industry professionals, and anyone interested in creatively expressing color through physical and digital materials – all are welcome.

Entry Categories

Student, Amateur, Professional

Everyone working at all levels in art, design or science disciplines are encouraged to apply for this competition. Entrants must be 18 years of age or older to apply.

Enter works according to your level of experience – Student, Amateur or Professional.

Jurors will choose artworks for the exhibition from each division and works will be juried against others in the same division. The divisions are competitive. The number chosen for display is limited and depends on the volume of applications. Invited participants will be asked to submit a two-minute video statement about their work.

Roland Connelly, Sr.

Roland Lee Connelly, Sr., 78, of Mount Gilead, North Carolina, passed away at his home, surrounded by loved ones on July 4, 2024.

Roland was born November 30, 1945, to Wilbur Wesley Connelly, Sr. and Edith Logan Lee Connelly in Spartanburg, South Carolina. In addition to his parents, Roland is predeceased by his son, Christopher Barrett Connelly. Roland was an Eagle Scout and received his Masters of Color Science degree from Clemson University. Living in Greensboro for many years, he was a member of Alamance Presbyterian Church; after retiring to Lake Tillery, Roland attended First Baptist Church in Mount Gilead, where he served as president of the board of deacons. He was a member and past president of the Civitan Club of Mount Gilead and the Fairway Shores Homeowners Association. He served on the Montgomery County planning board. He was President of the Hemophilia of North Carolina (now known as Bleeding Disorders Foundation of North Carolina). He was on the Board of Directors to establish and build the Ronald McDonald House in Chapel Hill.



He is survived by his darling wife of 57 years, Lynn, his beloved son, Lee (Roland Lee Connelly, Jr.) of Kernersville, his brother, W. Wesley Connelly, Jr. and wife Patricia of Cummings, Georgia, and many nieces, nephews, cousins, and extended family. He was adored and will be missed by his constant (canine) companion, Maggie.

Although Roland was native to South Carolina and thrived at Clemson University, he was a long-time transplant to North Carolina. He served in the U.S. Army as a First Lieutenant. Roland and Lynn married in 1967 and have been a cherished love story ever since.

Roland began his color career as color lab manager at Burlington Industries, and then started his own company, SheLyn. SheLyn was purchased in turn by other, larger companies in the industry. Roland was keenly engaged in supporting industries to manage color QC correctly. He was key to implementing standardized methods to evaluate and communicate information related to color. Roland's activity in the standards organizations meant that his contributions were not limited to a single company. Instead, his work benefited all industries that control color.

Roland was a brilliant and curious scientist, and an engaging teacher in the field of color science. Roland's professional and extra-curricular activities were marked by leadership and service. He was active in ASTM (American Society for Testing and Materials), ISCC (Inter-Society Color Council), and AATCC (American Association of Textile Chemists and Colorists). He held technical and leadership positions in these organizations, including serving

as President of both ISCC and AATCC. He also received the AATCC Chapin Award for Service, the AATCC Technical Committee on Research Award, the AATCC Education Award, and the ISCC Macbeth Award for outstanding contributions in the field of color. In retirement, Roland served on the board of Hunter Lab, a leading supplier of color evaluation hardware and software. He was a frequent lecturer and author of numerous papers on topics such as Lighting, Colorant Formulation, Quality Control, Supply Chain Management, and Instrumental UV Calibration. He served many years as the U.S. spokesman for color measurement in ISO TC38, Textiles.

Anyone who had the pleasure of being in Roland and Lynn's orbit knows that they are the warmest hosts, the most generous friends, and the most helpful humans when you need something. If you need a tool, or a ride, or a boat ride on the lake, or a peach daiquiri, they are ready to assist. Every community that has been lucky enough to intersect with Roland and Lynn has seen their stewardship,

commitment and skills. Roland was committed to technical organizations during his working life, and he demonstrated the same engagement with River Keepers, Civitans, neighborhood association, local faith community, and more.

Roland will be deeply missed by all who knew him and loved him. Roland's affection for Clemson University and his commitment to education can be supported by contributing to the Connelly/Perkins Graduate Fellowship at Clemson University. <https://members.aatcc.org/store/conperk/2440>

This note from a long-time colleague captures the spirit of Roland and Lynn Connelly: "Whenever I was in their presence, Lynn and Roland always brought lightness and goodness. To know and work with them has been a privilege that I will not forget."

Fluorescent Fridays

Luanne Stovall

Upcoming Event

The Fluorescent Friday team is currently working on the 2024-25 schedule. Stay tuned for our next color-focused event.

Recent Event

May

Fluorescent Friday spotlighted Design students and faculty from the Universidad Austral de Chile.

Los Rios en Colores / The Rivers Region in Colors

Check out the video on the ISCC YouTube channel:

https://www.youtube.com/watch?v=2o1Jy7Oh_sE&t=1682s

Speakers:

- Elisa Cordero-Jahr, Professor, Project Coordinator
- Ingrid Calvo Ivanovich, Color Designer, Research Consultant
- Catalina Garcia, 2023 program graduate
- Florencia Rodriguez, student
- Diego Araneda, student
- Gènesis Alvarado, student

How the use of a curated color palette can capture the identity of a region

For May's Fluorescent Friday event, Elisa Cordero-Jahr, Ingrid Calvo Ivanovich, and their team of design students from Universidad Austral de Chile shared their remarkable journey to create a living document that captured the chromatic identity and cultural heritage of the Los Rios region in Patagonia, Southern Chile. The project culminated in a catalog, website, and exhibition in the university art gallery,

Professor Elisa Cordero-Jahr introduced the project goals and provided an overview of the process that began with in-depth fieldwork to collect color samples from every corner of the region, which were then systematically analyzed using multiple color systems. By immersing themselves in the landscape over numerous field visits (accompanied by a geographer and a forestry engineer) the students collected a myriad of color samples from the rocks, soils, shells, plants and atmospheric conditions throughout 12 municipalities, seasonal climate changes, and diverse ecosystems (63 rivers, 11 lakes, mountains, wetlands and glaciers). To analyze the samples, the team applied rigorous color science methods, guided by a substantial collection of on-site watercolor sketches and field notes.

How the students measured the colors of rocks, shells, plants, soil and atmospheric elements

Lab Assistant Catalina Garcia explained that this component of the process relied on visual comparisons, and shared the tools and methodologies that included the Natural Color System (NCS), NCS Color Pin, and Munsell Color Charts to identify and categorize the colors of their samples. Another key tool was a viewfinder window that provided an onsite way to determine visual comparisons via direct observation. In the next phase, they cataloged swatches in an Excel file with each color's geographic location, field notes, and RGB, CMYK, HEX, and CIE Lab Color Codes. Finally, the team chose a palette of swatches (48 colors from over 300 original sample colors) to represent the Los Rios region and organized them into an NCS color box that was showcased in the exhibition.

Ingrid Calvo Ivanovich described another critical dimension of the project. She discussed the steps involved in selecting and naming a representative color palette that showcased the region's diversity (e.g., Morado flor de la pluma or s2050-R60B). She emphasized the importance of preserving the cultural significance, because one of the project outcomes was for the palette to serve as a cultural heritage ambassador "for different people to use <them> all around the world."

After the 48-swatch palette was named, the next phase involved structuring new palette variations with criteria that Calvo Ivanovich outlined. She challenged the students to move beyond the entrenched “hue paradigm” (the traditional approach where colors such as red, yellow, green are positioned as a palette’s sole organizing principle). Instead, students were tasked with composing palettes that celebrated the degree of lightness or value, and the percentage of colorfulness (saturation) as fundamental components of a cohesive palette design. Ingrid’s challenge also included other key conditions such as perceived temperature and proportion. She connected this innovative design methodology to her role as a team member of the Colour Literacy Project with its goal to provide practical solutions for 21st century color education.

For the final presentations, Florencia Rodriguez, Diego Araneda and Gènesis Alvarado shared their explorations based on the methodologies that Ingrid introduced. The results were stunning. Each student’s unique palette variations demonstrated compelling evidence that a dynamic upgrade to 21st century color education can provide real-world applications that are meaningful, empowering and deeply inspiring.

Los Rios en Colores illuminates the potential of color literacy as a catalyst for transformative educational experiences, while fostering deeper connections to place, history, and community.

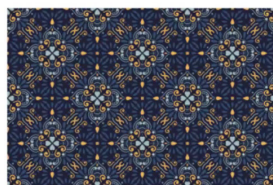
Instagram: <https://www.instagram.com/colorrios/>



Rule 62, Palette #2
Contrast in proportion of different brightness and saturation among them.



variation 1



variation 2



variation 3



NCSs 7010-R90B
Azul cielo de Chihuahua

NCSs 1515-B20G
Verde mar de Los Molinos

NCSs 5030-R90B
Azul mar de Chan-Chan

NCSs 2040-R90B
Azul cuesta Los Ahiques

NCSs 0585-Y20R
Amarillo flor de matico

How? - The Methodology



Fieldwork



Color Lab

How? - The Methodology



Color measurement / Visual Assessment



In Situ Watercolor / Atmospheric Color

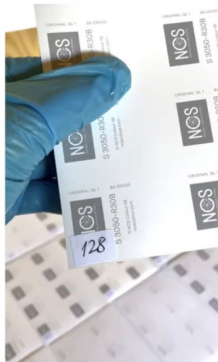
Color samples



Color box



Color swatches

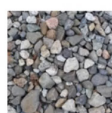


File number



Color strips

Measurement of objects in the Lab / Visual comparison



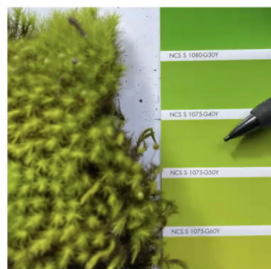
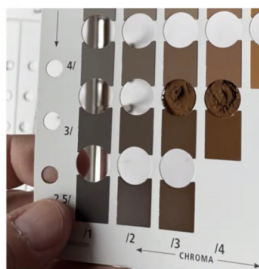
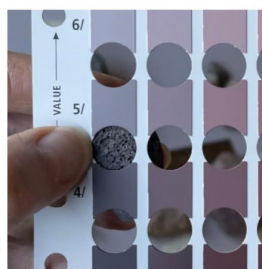
Rocks



Soils



Plants



The **Inter-Society Color Council** created **FLUORESCENT FRIDAYS** as an online platform for international university students from diverse color-related disciplines to share their research and network with color professionals. The goal is to build a global student chapter that positions color as a multidisciplinary STEAM model (Science, Technology, Engineering, Arts, Math) and provides state-of-the-art color research by scientists, artists, designers, industry professionals and university students.

ISCC Annual Meeting

The ISCC Annual Meeting for ISCC members will take place on Zoom on Saturday, October 19 from 3 to 5 p.m. EDT.

The agenda for the annual meeting will include the monthly ISCC Board of Directors (BOD) meeting. During the BOD meeting, members of the Colour Literacy Project (CLP) team will present a summary report on the results of Phase 1 - Beta-Testing at the K-12 level and share plans for Phase 2 - Beta-Testing at the post-secondary level.

During the second part of the meeting there will be a Feedback Session hosted by the Visual Identity Project (VIP) team members. Over the last year, the VIP team made many changes and updates to the ISCC website. As work on improving the website continues, this will be your chance to chime in with your user experience and let us know what you think about the current look, navigation and content of the website.

The third part of the meeting will include award presentations.

Following the meeting, everyone is invited to a virtual happy hour at the October ISCC Colorful Connections hosted by Amy Wolff.

Colour Literacy Forum

Luanne Stovall

Colour Literacy Forum #8 The Interaction of Colour and Light

The Colour Literacy Project launched Colour in Context, a 4-part series in March. Forum #8 was the second forum in the series.

Colour in Context Series - Part 2 took place via Zoom on Thursday, June 13, 2024.

Talk 1: Colours of Objects and Colours of Illumination by David Briggs

David is the Vice President of the Colour Society of Australia, Co-chair of the AIC Study Group on Art and Design, and a member of the Steering Team of the Colour Literacy Project. His published work includes the websites The Divmensions of Colour and Colour Online, and a chapter on Colour Spaces in the Routledge Handbook of Philosophy of Colour. David has taught classes for art and design, including Understanding and Applying Colour, an eight-week online lecture course through the National Art School in Sydney, Australia.

Talk 2: Lighting Colours and Colouring Light by Sylvia Pont

Sylvia is the Antoni van Leeuwenhoek Professor of Perceptual Intelligence at Delft University of Technology in Delft, Netherlands, where she coordinates the Perceptual Intelligence Lab (π-lab), a center of expertise on perception and design of multisensory experiences and smart products, services and systems. Her research includes studies in design, perception, and optics of light and its interactions with materials, shapes and spaces.

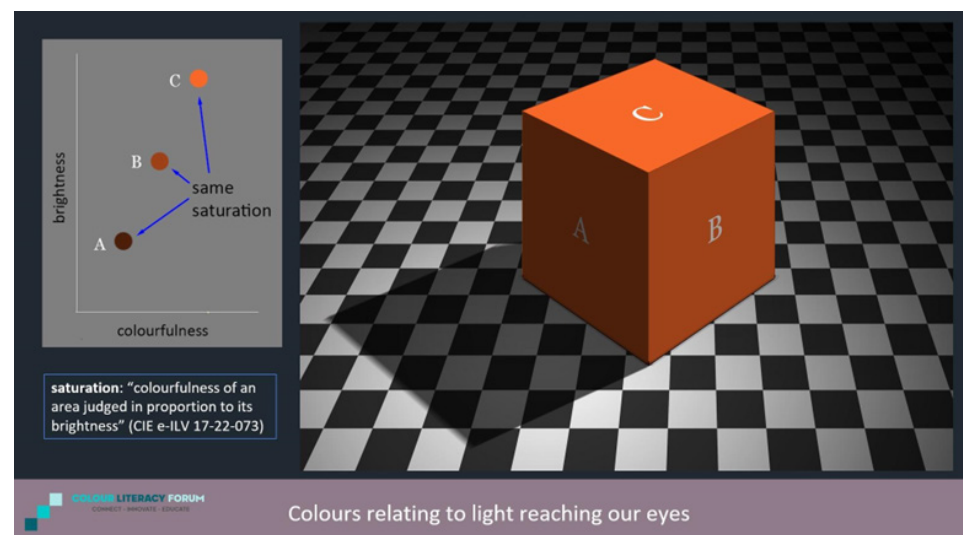
Talk 3: Light and Colour in Urban Colour Composition by Kine Angelo

Kine is an Associate Professor with more than 20 years of experience as an Interior Architect, specializing in colour in architecture. A member of the faculty of Architecture and Design at Norwegian University of Science and Technology in Trondheim, Norway, she is a full-time lecturer and researcher in the Department for Architecture and Technology. Her overall aim is to promote colour and material gestalt in architecture and urban space through research, architectural education and public outreach.

Three Talks and a Panel Discussion

Before introducing the guest speakers, Forum host Luanne Stovall welcomed the audience and introduced the forum theme. She noted that the session would explore how different contexts influence our perception of color in various shapes, objects, materials, spaces and lighting conditions with examples drawn from both research and design.

In his talk, David Briggs pulled back the curtain on our view of the world to provide a tour of the fundamental workings of human color perception. He described the attributes of perceived color -- hue, lightness, chroma, brightness and colorfulness or saturation -- and explained how our visual system transforms the visual input into estimates of illumination and object reflectance, leading to our perception of object colors and illumination colors. He also discussed color constancy, the uncanny phenomenon where objects appear to maintain a stable color despite wide variations in illumination. Later in the talk, David applied these concepts to the visual properties of an orange cube, explaining how object color and illumination color are superimposed in our visual experience. He emphasized the remarkable nature of our color perception, which presents us with estimates of illumination and reflectance without requiring our conscious attention and concluded that "It seems to us that our eyes simply detect directly the colors of an object, and it doesn't occur to us how extraordinary this perception really is!"



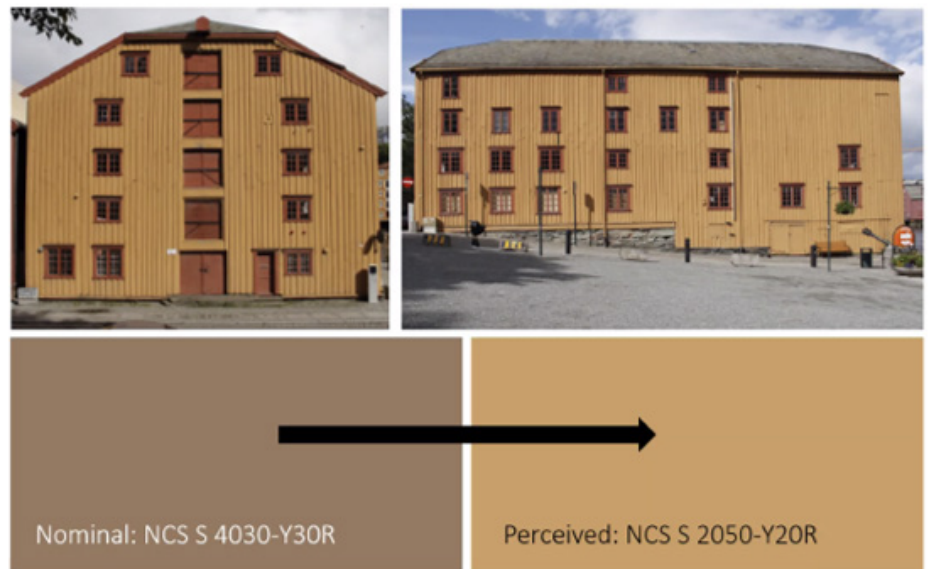
In the next presentation, Sylvia Pont delved into the complex interactions between color, light and material properties. She began by explaining the concept of color metamerism, where colors look different under varying lighting conditions, due to the relationship between the light spectrum and the reflected light from the surface of material objects. Through a series of DIY exercises, she demonstrated how factors such as Rayleigh scattering can dramatically impact our color perception not only in small-scale settings but also in larger spaces, and in the atmosphere as well. One exercise involved filling a glass vase with water and a small amount of milk powder. An LED lamp was positioned directly above. When the light was on, a color gradient appeared that was bluish at the top and yellowish toward the bottom. She explained that these unexpected hue shifts are called Rayleigh scattering, a wavelength-dependent phenomenon that happens when shorter wavelengths scatter the light more than longer wavelengths. This is why the daytime skies appear blue and sunsets glow with red light near the horizon. Through her comprehensive explanations and engaging DIY demos, Sylvia inspired a deeper appreciation of the complex interactions between the light and the materials, in the world around us.

Kine Angelo's talk focused on the importance of the visual tectonics of color and light in architectural design. With examples from her teaching and research, she emphasized the fundamental importance of the interplay between light, material properties, and color perception in the built environment. "Current research estimates that approximately 80% of our perception, cognition and activities are mediated through vision, with form and colour a key feature. It could be argued that we should put more emphasis on the visual qualities of colour in architecture."

She also covered concepts such as warm and cool colors, and active and passive colors. She explained the difference between nominal and perceived color by referencing a student exercise. In the exercise, students identify the facade color by moving close up (nominal color) and compare the samples to the same color viewed from a distance (perceived color) where the atmosphere can cause a shift in hue and tone.



Students estimate color from different perspectives of the facade of a building



Source: Karin Fridell Anter – «What colour is the red house».

Nominal colors

Next, she shared a selection of architectural projects where color tectonics were effectively used to enhance the forms and amplify certain details for more visual impact like drawing attention to supporting pillars for safety purposes or alternating facade colors along a street for more “push and pull” variety. Kine’s closing advice was to look around and notice how much our perception is shaped by the interaction of different contexts that can change the color and shape the story.

Following the three presentations, Colour Literacy Chair and ISCC President Maggie Maggio moderated a panel discussion with the speakers that included a Q & A with the audience.

Resources:

Briggs, DJC (2023). *Colours of Objects and Colours of Light*. Keynote address, Colour Society of Australia National Conference, Colour Sense and Sensibility, Perth, October 12-15, 2023,
<https://www.youtube.com/watch?v=ii9dWIG9nOY>

Colour Literacy Forum #9

Stay tuned for more information about Forum #9, Part 3 of the Colour in Context Series - Historical Context planned for Friday, October 4!

The Colour Literacy Forum is a virtual platform featuring presentations and interactive conversations focused on expanding 21st century color education at the university and post-secondary level. The Forum is an international effort of the joint ISCC/AIC Colour Literacy Project and Cumulus Association, the leading global association of art and design education and research.

The goal of this global collaboration is to recognize color as a meta-discipline that strengthens the bridge between the arts and sciences, aligns color education with current research and design needs, provides cutting-edge resources, and offers dynamic networking opportunities for all stakeholders. For more information, see <https://colourliteracy.org/colour-literacy-forum>.

Note: The ISCC is a U.S.-based organization and the terms in its newsletter follow the rules of American English unless a specific word appears in a title. For instance, in the name of the initiative "Colour Literacy" the word "Colour" follows the British spelling, because it's the official name of the project.

Colour Literacy Forums are organized by the AIC-ISCC Colour Literacy Project with:



Calendar 2024

September 9-11	ICC Spectral Imaging Experts' Day Gjovik, Norway https://www.color.org/events/spectral_imaging.xalter
September 11	ISCC Colorful connections 3-4 PM (US Eastern) virtual event https://iscc.org/events
September 17-19	AIC 2024 Midterm Meeting Color Design, Communication and Marketing Sao Paulo, Brazil- https://aic2024.org/
September 19	Detroit Color Council presentations by Bill Fischer and Terry Comte Clinton Township, MI- https://detroitcc.org/upcoming-events/
September 22-25	IES Street and Area Lighting Conference Atlanta, GA https://www.ies.org/events/street-area-lighting-conference/
September 23-26	Óptica Frontiers in Optics + Laser Science Denver, Colorado Colorado Convention Center https://www.frontiersinoptics.com/home/
September 23-25	SPE CAD RETEC Sail Away with Color Technical Conference Tampa, FL https://specad.org/2024-cad-retectm-homepage/
September 25	Color Pigment Manufacturers Association Fall Meeting (CAD RETEC) Tampla, FL https://www.pigments.org/news-resources/events/
September 29- Oct 4	2024 NAPIM Annual Convention/Technical Conference, Milwaukee, WI https://www.napim.org/aws/NAPIM/pt/sd/calendar/352795/_PARENT/layout_details/false
Oct. 2	Color Marketing Group ®,Colorspeak™ webinar, Digital Color Rendering Experience Virtual https://colormarketing.org/event/colorspeak-october-2024-10-2/
Oct 6-8	AATCC Textile Discovery Summit, The Westin Savannah Harbor, Savannah, Georgia https://www.aatcc.org/summit/
Oct. 18-19	Society for Color and Appearance in Dentistry 15th Annual Conference Miami, FL https://www.scadent.org/events/miami-2024
Oct 19	ISCC Annual Meeting 12:00 -3:00 PM Eastern Standard Time virtual meeting https://iscc.org/events
Oct. 21	ASPRS 2024 International Technical Symposium https://my.asprs.org/ASPRSMember/Events/Event_Display.aspx?EventKey=2024SYMP

Oct 28–Nov 1	IS & T Color Imaging Conference Montreal, Canada https://www.imaging.org/IST/IST/Conferences/CIC/CIC2024/CIC_Home.aspx
Oct 29–Nov 1	Illuminating Engineering Society Street & Area Lighting Conference (IES) Indianapolis, Indiana https://www.ies.org/events/street-area-lighting-conference/
Nov. 7	UF/FL-ASPRS Fall Geospatial Workshop Apopka, FL https://my.asprs.org/ASPRSMember/Events/Event_Display.aspx?EventKey=FALL2024
Nov 12 - 14	AATCC Joint Meetings at ASTM 2024 Committee Week D13 https://www.aatcc.org/aatcc-events/research/
Nov. 15	Call for Presentations and Short Courses for ISCC Color Impact 2025 Color as Communication https://iscc.org/CI25-Call
Nov. 20 - 21	AATCC Testing Standards Exhibition at Functional Fabric Fair Portland, OR Oregon Convention Center https://www.aatcc.org/aatcc-events/fff-portland/
Dec. 4	Color Marketing Group®, Colorspeak™ webinar, Color Harmony in the built environment: A practical workshop on leveraging color data values for design precision, Virtual event https://colormarketing.org/event/colorspeak-december-2024-4/
Dec. 12	E12.10 Retroreflection December 2024 Committee Week Orlando, Florida https://specad.https://member.astm.org/meeting/event
2025	
Jan. 29-30	E12 Color and Appearance January 2025 Meeting West Conshohocken, PA https://member.astm.org/meeting/event
Feb. 2-6	IS & T Electronic Imaging 2025 Burlingame, CA https://www.imaging.org/IST/IST/Conferences/EI/EI2025/EI2025.aspx?hkey=d482d703-518a-45a4-9741-0491be32d129
May 13-15	Society for Information Display - Display Week https://www.displayweek.org/
June 16-18	ISCC Color Impact 2025 Rochester, NY https://iscc.org/Color-Impact-2025
Oct. 20-24	AIC 2025 Taipei 16th AIC Congress

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 LLC

P.O. Box 716

Sunapee, NH 03254

Website: <https://aviantechnologies.com>

Contact: Kathy Springsteen

Email: kathy@aviantechnologies.com



Datacolor

5 Princess Rd

Lawrenceville, NJ 08648

Website: <https://www.datacolor.com>

Contact: Zhiling Xu

Email: ZXu@datacolor.com



Konica Minolta Sensing Americas

101 Williams Drive Ramsey, NJ

Website: <https://sensing.konicaminolta.us/us>

Contact: Jodi Baker

Email: jodi.baker@konicaminolta.com



Radiant Vision Systems LLC

18640 NE 67th Court

Redmond, WA 98052-6728

Website: www.RadiantVisionSystems.com

Contact: Scott McLead

Email: info@radiantvs.com

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isccoffice@iscc.org

Editor: Madelaine Yafet

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