Hi Everyone,
As the incoming president of ISCC, I am excited to help continue the growth in the education and outreach programs of ISCC over the past few years. When I joined ISCC in 2016, I went to the resources page of our website and read about “ISCC’s Structure and Mission.” At the time I knew very little about the organization and I was immediately struck by the repetitive use of the word “public” in the section on Aims and Purposes.

What hit me the most at the time was the fact that, even though the stated mission of ISCC is to provide education to the public at large, I’d never heard of ISCC in my thirty years of working with color and teaching color workshops for artists and professional designers. How did I find out about ISCC? I learned about ISCC when my sister, Pam, arranged for me to meet longtime members Dick and Margie Ingalls in 2015. When Pam and Dick first met, he told her he was involved in color research. Pam told him about my passion for everything color, and he asked if I was a member of the ISCC.

They shared their stories and opened the door to ISCC for me. I would not have joined without meeting them. Now, after several years of serving on the board and volunteering on committees, I believe even more strongly that our main purpose is providing up-to-date, interdisciplinary color education opportunities for both our members and for the public at large.

In doing so, our programs not only help expand the public’s awareness of color but also provide opportunities for making personal connections to color colleagues and the color curious from around the world.

See the article Expansion of ISCC Programs later in this newsletter (page 31) for a summary of ISCC past and upcoming conferences and programs.
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<td>Ms. Maggie Maggio</td>
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## ISCC NEWSLETTER

- Issue 502, Spring 2023
- ISSN 2021-012X

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- **ISCC Programs**
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Hue Angles
The Minefield of Color Ownership

Michael H. Brill and Hugh S. Fairman

When overseeing the intellectual-property process in a company devoted to color, one regularly is asked whether a color can be “owned” by dint of trademark or copyright. The stock answer is no for copyrights and a qualified yes for trademarks. Whenever you select a color for a product or its packaging (or a company’s logo), you must carefully avoid colors that are already trademarked by one of your business competitors. It is a matter of legal opinion whether a business is to be regarded as your competitor. If so, then as far as your business is concerned, these colors are essentially owned by the trademark-holders. If you use the trademark colors (in any of a broad range of contexts), the owners are likely to sue you, which will surely be expensive and also block the sale of your product until its color is changed or until the court case is resolved.

An article written a decade ago describes several trademarked colors: John Deere green (or, more saliently, a specific green and yellow), Target red, T-Mobile magenta, UPS brown, Tiffany blue, University of Texas burnt-orange, University of North Carolina blue, Home Depot orange, Caterpillar yellow, and 3M purple.

The stock answer to our initial question is a bit too simple, as we will now show. What follows might be considered too much information, but we will proceed anyway.

How do you know you have picked a safe color? As metrologists, we naturally seek refuge in measured numbers. We’d like to define a quantified color space (accompanied by an agreed-upon illuminant/observer for object colors or a white point for emissive displays). Within that space, we’d like to know where the property line is that delineates colors that are owned from colors that are free to be used.

Surprisingly, however, color-trademark litigations proceed with no quantitative evaluation, only the verdict of a jury in a courtroom under available light and in the context decided by the lawyers. Even the system of color names (often Pantone colors) has no rhyme or reason.
It looks as if color space has turned into a minefield of ownership (perhaps worthy of the double entendre “mine” field). One of us (HSF) has had personal experience as an expert witness. Here are some details.

Only three things may be unqualifiedly trademarked in the United States: a brand name, a logo or a slogan. Trademarking a color alone is available only under very limited circumstances. Colors that are functional (e.g., the color of a medicinal pill that is used to identify the drug) or colors that are purely aesthetic are not trademark-eligible. If a trademarked logo is colored, the color or color combination is included as a property of the logo. Thus, a color may become associated with the brand, as say Coca-Cola red or John Deere green. That immediately raises the question as to what are the protected tolerances around a logo-protected color? The answer is that there are no formal guidelines. That will be decided by a jury who will be instructed to find an interference if they think the intent of the color choice was to imitate the trademarked logo in the consumer’s mind. Obviously, the farther you get from the trademarked color, the better your chances.

There is another way in which a color may become protected by law. Although it is not registerable, a product’s “trade dress,” which is its overall appearance including color, design and markings, may be claimed for protection against others duplicating it. A good example is the Coke bottle. That distinctive shape and the green glass constitute Coca-Cola’s trade dress. Notice that no other cola company uses green glass. Yet almost all breweries package at least part of their output in green glass.

That raises another issue. Trademark protection applies only to the product lines or industries in which they are granted. You are free to make your product in John Deere green if your product is not a tractor or farm machinery. What if you had a product that wasn’t a tractor or farm machinery but could possibly be made by John Deere—say, a mailbox? You probably should go to John Deere and license the green and yellow combination from them for mailboxes. They will give you an exclusive for mailboxes in their green and yellow, and farmers everywhere will rush to buy your box.
Is there a common-law trademark? Yes, there is, but it applies only locally. You can open a store called “Jones’s Grocery Store” and you can choose the color and the typescript for placing over the front door. No one else can use that logo, even if it is unregistered, but that’s going to protect you only in your small town. Someone in the town down the road a bit, or someone across town if the town is big enough, can use the same device with impunity. Again, the criterion will be intent to imitate.

Registration of a trademarked logo will, however, provide nationwide coverage, and will imply an additional benefit. You will receive protection from foreign goods that infringe your trademark from being imported.

The minefield of the situation remains: How close, or how far away, does your color have to be from a registered trademark to be unassailable? Pick a color that can’t be confused with the protected color or you might find out the answer to this question the hard way.

Given these circumstances, the idea that a color is “owned” is defensible—no more fictitious than our deeming a condominium to be “owned” by its occupant when its defining walls are not. Furthermore, the metaphor of a minefield is not too extravagant.

Neither of the authors are lawyers, so the information contained here is not to be taken as legal advice. The information is intended to be a jumping-off point for further discussion within the ISCC.
The ISCC News No. 224 (1973) was a very extensive 36-page Annual Report Issue summarizing the events of the ISCC Annual Meeting that took place from April 29 – May 3, 1973. The newsletter was unique for three momentous reasons. First, it was the first time in ISCC’s 42-year history that it was able to produce a newsletter containing pages that were in color! It was also the first time that the newsletter was able to include a full-color photo insert for all members to enjoy! Finally, it was the most substantial accounting of the activities of a very busy ISCC Annual Meeting, as evidenced by a detailed Table of Contents that cataloged the Council’s undertakings in 1973!

FIRST-EVER ISCC COLOR COVER

In the words of R. W. Burnham, the Newsletter Editor, the birth of the first ISCC color cover:

...has gone a long way toward cementing the relationship between the artistic and scientific elements of our color community. A new cover in color has put color into the publication, to help replace words about color, or at least to augment them in a very significant way.

The decision to “put color into the publication” was an epic milestone for the premier national organization in the United States that dealt with color both at home and on the international stage through the International Color Association (AIC). It was also long overdue considering that ISCC was founded in 1931!

The number of people and industries involved in producing this color cover was typical given the resources and technology available in 1973. This color cover was made possible by the following efforts:

- Cover design by Don Genaro and Valerie Pettis of Henry Dreyfuss Associates
- Color reproduction by Charles Dyker of Progressive Color Corporation
- Oxford Paper Company, Division of the Ethyl Corporation, Richmond, Virginia, courtesy of Richard Hunter, ISCC President
- Technical reproduction advice from Milton Pearson of Rochester Institute of Technology
- Graphic arts consultation from Peter Little of Kodak
- Copying by Mimeoform Service, Inc.

They produced enough covers for five years of newsletters. A quick look at the Newsletter archive (http://www.iscc-archive.org/Newsletters/) shows that this color cover was last used for Newsletter No. 251 November-December 1977.
The first issue of 1978 featured the Inter-Society Color Council name with the visible portion of the electromagnetic spectrum in color underneath it. This new title page, which lasted for many years (1978-2019), was a far cry from a complete color cover! It seemed like a step backwards. But perhaps the Council felt it was necessary in order to avoid the issues associated with making a full color cover to last for many years of publications.

When incorporating the new color cover in 1973, one of the problems faced was determining the best method of overprinting volume data for each issue. Later, the overprinting problem went away as the printing industry advanced and more technologies became available to not only printing companies but to the public at large. Thus, today in 2023 we can produce color overprints, sometimes with a smart computer and a push of a button. The convenience and proliferation of modern-day technologies often makes us forget how difficult things were years ago when these technologies did not exist. I hope this article helps us reflect on where we are today and be thankful for our ISCC colleagues of the past, who helped us get here!
First-ever ISCC Color Photo Insert

Once again, ISCC Newsletter Editor Burnham decided that a color organization should incorporate color photos into its publications if possible. The National Geographic Society provided ISCC with the opportunity to do so. In the 1973 book called The Alps, the National Geographic Society granted ISCC permission to reproduce the following color photo in its newsletter.

This original image was photographed by Gerhard Klammet. There is a legend behind the photo that reads:

Brilliant in sunlight, the distant summit of the Heimgarten overlooks the village of Kochel, half caught in frosty mist. In clear air, skiers take advantage of neighborhood slopes; a family follows a well-packed hillside lane.
Progressive Color Corporation in Rockville, Maryland reproduced the photo for ISCC. It was included as a color insert in the mailing of ISCC News No. 224. Thus about 600 ISCC members, both individual and Member Body members, received this beautiful color image. Burnham encouraged ISCC members to submit their own photos so that they could start a tradition of including color inserts with every newsletter. This new tradition was short-lived. It lasted for the remainder of 1973. Stay tuned for a preview of the remaining color inserts in future 2023 Newsletters.

**Detailed Table of Contents for 1973 Annual Meeting**

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It is evident from the Table of Contents for the 1973 Annual Meeting that ISCC was very active in many different areas. In addition to the Executive Officers, there were many active Board appointed Committees: Finance, Godove Award, Membership, Publications, International Color Association, and Problems. There were 15 Subcommittee Reports for 15 different Problems. It is instructive to go to the Newsletter archive (http://www.isccarchive.org/Newsletters/ISCCNews224.pdf) to learn more about the color problems that each Subcommittee was trying to solve in 1973. Also, there were 29 Member-Body Reports included in this Newsletter. Once again, a trip to the Newsletter archive demonstrates the variety of color activities that these Member-Bodies participated in with the Inter-Society Color Council.

**Ralph Evans’s Citation for 1973 ISCC Godlove Award**

The recipients of the coveted 1973 Godlove Award were the husband-and-wife team, Leo Hurvich (Harvard graduate) and Dorothea Jameson (Wellesley graduate). Ralph Evans gave the citation, which was printed in ISCC News No. 224. Hurvich and Jameson were psychologists, who dedicated their entire careers to studying the psychology of color. Psychologists and color scientists were often at odds with each other on many different color topics. But Evans reminded us that ISCC was founded on one very important principle: “the intention that the subject of color would be approached from the standpoint of all disciplines rather than just one.”

This led Evans into a short discussion of the Helmholtz vs. Hering approach to color, citing them as being so different that there was no “common ground” between the two. He defined the Helmholtz trichromacy approach as being “based on the physics of the stimulus and the eye as light receptor, which has led to the science of colorimetry as we know it today.”
He described the Hering opponent color theory approach as starting “from what an observer actually sees and trying to work back to causes.” Thus psychologists, like Hurvich and Jameson, were strong proponents of Hering throughout their color careers.

This led Evans straight to a discussion of one of the aims of ISCC, the description and specification of color. He described the difference between description and specification of color as a “gulf.” In the 42 years that ISCC had been in existence, Evans felt that color specification had been well characterized by a colorimetric science and the description of color had been “firmly established through refinement of color order systems.”

But what was sorely needed was the ability to calculate the description based on the specification of color! Given a well-defined color stimulus, it still was not possible to calculate the color an observer would see!

Evans felt that the gulf between description and specification was identical in size to the gulf between the Helmholtz and Hering color theories! Evans firmly believed that if color exploration, research and knowledge could lead to a bridge between Helmholtz and Hering, then this valuable bridge would lead to a bridge between the description and specification of color.
The work of Hurvich and Jameson was an excellent start at building the bridge between the Helmholtz and Hering color theories. The heart of their 25 years of work was “the establishment of a quantitative basis for the Hering theories, using the specifications established by CIE colorimetry.” Their success established an important link. Evans’ assessment of what was needed for the link to become a bridge was to use the valuable color vision theories to abstract the results into more workable terms. Evans urged ISCC to take up the work completed by Hurvich and Jameson to determine how to fully predict color appearance from a colorimetric specification.

**Acceptance Remarks by Dorothea Jameson and Leo Hurvich**

Jameson and Hurvich were truly honored to be the recipients of the coveted 1973 ISCC Godlove Award. Ralph Evans’ citation touched them in a special way, especially because their work from the late 1940s to the early 1950s was performed in Evans’ Division at Eastman Kodak Company. Even after they left Kodak, Ralph Evans remained a supporter and strong proponent of their work.

Their technical talk enumerated what they had learned about color vision as it related to the opponent-process theory. They discussed the theory’s usefulness and acceptance in two ways: (1) Stating it in quantifiable terms which allowed them to experimentally test quantitative psychophysical data, and (2) Verifying that spectrally opponent neural responses exist in physiological experiments.

They went on to explain how perceived contrast and assimilation effects can result from the spectrally and spatially opponent organization of the visual system. These effects were illustrated by showing slides of contemporary paintings by Josef Albers and Richard Anuszkiewicz.

**Teamwork is the Name of the Game**

In the Secretary’s Report, Fred Billmeyer wrote about the passing of Deane B. Judd in 1973. Judd was a staunch supporter of ISCC since its inception in 1931. He was a Member-Body delegate for the Optical Society of America from 1933 until his death in 1973.
Here is a listing of the roles that Judd served within ISCC during his 42 years of membership:

- Vice-Chairman from 1936-1937
- Chairman from 1940-1943
- Newsletter Editor for Science
- Recipient of first Godlove Award in 1957
- President’s Advisory Committee Member
- Publications Committee Member
- Finance Committee Member

He held most of these Committee positions until his later years. Judd was a very loyal and dedicated ISCC member for his 42-year tenure. Billmeyer quoted a poem by I.H. Godlove as a description of Judd’s commitment to the Council.

It’s not the brains or genius
Nor the money that we pay,
It’s the close cooperation
That’s bound to win the day.
It’s not the individual
Nor the Council as a whole
But the everlastin’ teamwork
Of every bloomin’ soul.

This poem struck me as very special because it speaks to an unspoken ISCC tenet that has been in place since its birth in 1931. Teamwork is and always has been the key to ISCC’s success. This teamwork is a beautiful thing because we do it as volunteers who care about the development and advancement of color in our country. Thank you to all of you who are part of our collaborative team in 2023.
Creativity at Work in Education, Art, and Science: An Interview with Peter Donahue

Interviewed by Jean Hoskin, Color Impact 2023 Steering Committee

Peter Donahue is an art educator, painter, cartoonist, and graphic designer. He will present a Keynote at Color Impact 2023 titled: TikTok as Color Theory’s One-Room Schoolhouse. I had the great pleasure to interview him about his experience in color and how he moved from English major to color science.

Although Peter may have had to discover a lot of his teaching material on his own, he is a very thorough researcher and sets an excellent example for his students on exploration, testing, and analysis. Through exploring the internet for quality color tools, information, and people, he found his way to the Colour Literacy Project. His energy and his enthusiasm and his laugh are infectious. You will not want to not miss his keynote.

JH: What sparked your interest in color?

PD: I give credit to my grandmother, who was a retired teacher. Her hobby was painting, and she would have Bob Ross and Helen Van Wyk on TV. She was also a bit of an entrepreneur. She started her own company sending out art kits. In a lot of ways, she inspired what I am doing now. She taught me oil painting, and I remember learning the traditional design-based color theory of Arthur Wesley Dow. Growing up, I was always interested in art, but I got serious about 10 years ago because I started working in digital media and discovered that the traditional color theory did not match [with digital colors].

JH: I assume that moving into digital drove your science-based approach in color.
PD: Yes, and discovering James Gurney’s book Color and Light: A Guide for the Realist Painter. Gurney has a great blog that I used as a resource when I was getting into web comics on a tablet. I was working with the HSL color picker, but the colors were represented in RGB or CMY and it just did not jive. I was struck by Gurney’s metaphor that the traditional color wheel was like a clock with the numbers in the wrong place. About 5 years ago, I started experimenting with mixing different primaries in oil painting. I asked the question “Wow, Can I really do this?” That is when the real science kicked in.

Three years ago, I was appointed chair of art and design at my school. We were developing a foundation course when the pandemic happened, and the students were at home. I could not send paint home with every kid, so I looked for resources for color theory available for the curriculum. I wanted the color theory to match for both the digital students and the traditional media students. Not able to get science-based color theory resources from art suppliers, I created my own teaching kits for mixing [colors] using CMY pencils. I also created my own color wheel. This is when the deep dive really happened.

JH: What color sources do you read and recommend to students?

PD: The references that inform my teaching are Bruce MacEvoy’s Handprint.com, David Briggs’ huevaluechroma.com, and Jan Koenderink’s book Color for the Sciences, where I like his attitude.

JH: How do you determine the amount of science to teach your students?

PD: This is the driving question for me. I teach 9th graders who might have red, yellow, blue mixing theory from middle school and that is about it. I try to aim for the amount of science that is just below too much. But the nice thing about TikTok is I can quickly see what works and what does not. An example of what is too much science is the Kubelka-Munk equations to model paint mixture. There is high level math there, but I scale it back to the question, “Are you aware that pigments have spectral profiles?” I show a yellow pigment spectral profile and a blue pigment spectral profile and what happens when I combine them. It is still a reach, but some students can visualize it without a math or science background.
An intuitive sense from the diagrams may get them thinking about how it works. Some will get this, some will not, but [a] good number will get farther in their journey and that is what I aim for. In education, this is Vygotsky’s Zone of Proximal Development The concept is just out of reach. But the students can see it and work though it with assistance. That is where I want to be.

**JH:** What are the top color misbeliefs that you are trying to dispel?

**PD:** What Bruce MacEvoy calls “the color wheel fallacy” and that if this is my chart, I can predict the resulting color mixture. The key to this is complements. A lot of my discussion online is that pigment complements are not visual complements. People think I am confusing additive and subtractive mixing. People are aware that there are different mixing models, but they do not understand how they relate.

Another misbelief is the perspective that color is a wavelength. There is confusion between the input with the output. I do not call a wavelength by a hue name, but by its length. I am working on a cartoon book with a character walking through color theory and what it might look like to see all the wavelengths all the time. I do not know how long it will take to complete. The textbook diagrams are always too organized. For instance, textbook diagrams of Newton’s spectrum or colored rays bouncing off or being absorbed are always too organized.

**JH:** Of all that you’ve learned about color since you started your deep dive, what do you think are the most useful color concepts to share with your students?

**PD:** I think it is the insight that different hues reach their full saturation at different lightnesses. If I can get a 9th grader to wrap his or her head around that, then the rest is easy.

A lot of what we have been doing in the Colour Literacy sessions with that has got me thinking more about it and what kind of three-dimensional models will make that click for students.

In my own art, I have been experimenting with isoluminant palettes. I ask: “Can I even make it work in oil paint and why?” I was inspired by an illustration on David Briggs’ website, where a painting is broken into lightness information, and hue and chroma information. The hue information is all at the same lightness level, so you get this “sparkle” that occurs without the value contrast.
I like being able to pull apart luminance from hue and saturation in that way. I like the color sphere for getting students to that point, but the next point is to get students to see that pure yellow is high value and pure violet is low value and why.

**JH:** Why do you call Tik Tok the perfect laboratory?

**PD:** If you are a teacher, it is a place where you can get immediate feedback on whether what you are trying to teach is effective. You can immediately turn around and try a different strategy. I compare developing a curriculum to building a cruise ship: It takes a long time to build before you launch, it is hard to steer, and you cannot quickly turn corners. Tik Tok is constantly in motion. I can post a video, see comments, and by the next day turn around and do it a different way. It is a perfect way to test. I must demonstrate complex ideas in a simple way, since I only have a minute or so to keep someone’s attention. I have found a lot of great ways to discuss color that I can then bring to my classroom.

**JH:** Tell me about your painting.

**PD:** I do not have a lot of time to paint. I am happiest between realism and abstraction. I like the stuff that is more about the color and let go of form. I like to do florals or landscapes, where I can use that as a basis to riff, to play with color relationships or to play with pigments. It is not so much what the painting is of, but what I can play with. I do mostly oil and some watercolor for small studies. My digital work is mostly cartooning. I do webcomics, which gives me another excuse to play with palettes with color harmonies and with telling story through color.

**JH:** How does your digital design differ?

**PD:** I have published two webcomic volumes with Kickstarter over the past 8-10 years. The story is set between the World Wars in eastern Europe. The characters are anthropomorphic animals because they are more fun to draw. I try to approach the use of color in the comic from a design perspective, so I like to explore color-scripting in a non-representational way. For example, the most recent post had a value under-painting in magenta/purple then I carved out lights and darks. I experiment with what palette to use around that and what mood it creates. The purple panels were on top of the page and in the panels below the drawing is a hallway lit by a gas lamp, so the colors are all yellow to emphasize that the setting is different.
JH: In your art, do you ever intentionally focus on a scientific concept?

PD: Yes, I recently did a series on ways to interpret Bruce MacEvoy’s pigment chart. He took spectrophotometer readings and charted them in CIECAM to show the relationship of the pigment colors to each other. I asked, “What if I visualize this using some type of diagram and then painted the cells with the pigment that is represented by that position?” I started with a Voronoi Diagram Generator and painted a chart of all the red, orange, blue, and turquoise pigments I had handy. The intensity decreases as the color moves toward the center. The size of the cell is based on how far away the color is from everything else, so some areas of the pigment colors are smaller. I wanted to embark on geometric abstraction that was inspired by how we chart pigments.

Recently I am getting into iso-luminant palettes. I am mixing by eye. I am trying to get all the values equal, and it is quite a technical challenge. I would like to develop more representational work. “What if I were to paint a landscape all in the same value?” I am getting a spectrophotometer to measure my mixtures. Finally, I have done a few paintings with palettes designed for accessibility by people with color vision deficiencies.

JH: What do people ask you?

PD: They ask what are my qualifications? My response is: I am just a teacher, who was faced with a problem and ended up going down the rabbit hole. In my research I have found many people like me.

Resources:

https://www.handprint.com/HP/WCL/cwheel06.html
http://www.huevaluechroma.com/
https://en.wikipedia.org/wiki/Voronoi_diagram
https://simplypsychology.org/Zone-of-Proximal-Development.html
In this column, I highlight articles in Color Research & Application by ISCC authors. The most recent issue, 48(2), features one ISCC member’s article.

**Investigating the agreement between polarized and unpolarized densitometry in offset lithography printing**

Devin J. Schneider | Bruce L. Myers | Bilge Nazli Altay

[https://doi.org/10.1002/col.22840](https://doi.org/10.1002/col.22840)

Measuring things that change is problematic. This problem can be seen in process control of printing, particularly in cold set printing where the ink dries over a period of minutes or hours. As the ink dries, the surface becomes rougher and a 45:0 spectrophotometer (the standard geometry for the print industry) registers more of the specular reflection. Cold set ink becomes lighter and less saturated in the first few minutes after printing. In 1991, Celio, Ott, and Mast, then of Gretag, developed a densitometer that was cross-polarized. There was one polarizing filter on the light source, and another on the detector at 90°. In this way, nearly all of the specular reflection is eliminated, and measurements taken on press, milliseconds after printing, will match those taken hours later.

However, since then both polarized and non-polarized density measurements are used in the printing industry. In this research paper by Schneider, Myers, and Altay, the discrepancy between these measurements is discussed and the basic question is asked: Can you translate measurements between polarized and non-polarized density? The paper sets the scene with a discussion of reasons for polarization and acknowledges that there is a lack of consensus about whether polarized or unpolarized densitometry is better. In short, polarization minimizes the measured difference between measurements of wet and dry ink; but in doing so, it ignores the visual difference between wet and dry ink. Standard operating procedures using one or the other have become common, with printers in North America typically using unpolarized, and those in Europe using polarized densitometers.
To address the question of translation, tests were performed using cyan ink applied with a proofing press to coated and uncoated papers, and measured with several densitometers immediately and at several later stages of drying. Measurement differences attributable to polarization are larger with uncoated paper, as is the change in ink density over time as it dries.

The authors show that there are linear relationships between polarized and unpolarized density measurements that do not depend on ink dryness.

Concluding, they present two affine (linear with offset) equations to transform between unpolarized and polarized density, coated paper having a slightly higher-slope equation than uncoated. However, they also caution that their results are relatively narrow, and many real-world practicalities might make these transformations less accurate in any given pressroom.

Presumably these equations will be useful for translating specifications or expectations for ink and paper combinations between continents!

Please note that the authors of the paper and I share the same employer, Rochester Institute of Technology, but I was not involved in or aware of this work.
**ISCC Webinars**

*Ann Laidlaw and Dave Wyble*

There were two recent webinars, one on March 9th and one on April 12th.

**March Webinar**

In March, we heard from Dr. Roland Fleming, of Giessen University, who presented How We Learn To See “Stuff.” Dr. Fleming was recruited after delivering a similar keynote at the IS&T Color Imaging Conference last November. He described several fascinating experiments where his team learns how people extract the physical properties of objects using only visual clues. If you missed the talk, this is well worth a watch. We had about 55 attendees from the U.S., Canada, several European countries, and from most of the other continents too. The talk was followed by a rousing set of engaging questions.

**April Webinar**

On April 12, Nuria Estape, of Archroma, presented Upcycling Waste into Timeless Colors. Ms. Estape described how waste that is otherwise destined for landfills or burning can be used in the creation of new products, in particular textiles. About 23 people attended from the U.S. and many countries around the world.

Many thanks to these two presenters for sharing their time and expertise with the ISCC community. If you have ideas about an interesting webinar, please contact us at seminars@iscc.org.
**Recent Event**

Friday, April 21

Color & Light: Spotlight on RIT Munsell Color Science Lab

**Speakers:**

Christopher Thorstenson, Assistant Professor, Color Science and Munsell Science Laboratory (MCSL), Rochester Institute of Technology (RIT); Che Shen, Ph.D. candidate, MCSL at RIT; Leah Humenuck Ph.D. candidate, MCSL at RIT; Lighting students at the MCSL at RIT.

Faculty and students from MCSL at RIT will present ongoing research that studies the human perception of color, lighting, and its applications.

The topics will include work modeling color and light adaptation, harnessing low-cost lighting and imaging systems for the purpose of preserving cultural heritage, and investigating whether the Helmholtz-Kohlrausch effect extends to LED lighting.

MCSL lighting students will be presenting a class research project studying the Helmholtz-Kohlrausch (HK) Effect, which suggests that some hues appear brighter than their luminance alone would predict.

The HK effect has been studied for reflective colors and emissive displays, while this project is testing whether it behaves in a similar way for LED illumination.

**February Event**

Where Color Science Meets the Consumer in February, Fluorescent Fridays highlighted state-of-the-art research taking place at Zhejiang University, Hangzhou China, in the Colour Engineering Lab (CEL) at the College of Optical Science and Engineering. Guest speakers were Dr. Ming Luo (Ronnier) and Dr. Yuechen Zhu (Grace) with students Hui Fan (Fiona), and Molin Li (Merlin). The CEL lab is focused on academic research related to color science, imaging science and illumination engineering and actively collaborates with leading companies to develop innovative technologies. Members are also devoted to the development of the national and international standards.

Presentations were focused on the vital intersection where consumers engage with the color science research conducted in Dr. Luo’s lab.
The first speaker was Dr. Luo, who identified the territory as a weave of Imaging Science, Color Science, and Illumination Engineering. Applications include image fidelity, the aesthetics of creating picturesque images, and the use of color scales for imaging. He gave an overview of colorimetry for non-scientists, allowing the audience (students, artists, designers, scientists, “color-curious” public) to gain insight into how our perception of color is affected by technology –– from different types of light sources and materials to the unique demographics of each observer. Dr. Luo explained that the goal of the research is to have a positive impact on the visual comfort and wellbeing of the public.

Dr. Zhu, Hui Fan, and Molin Li provided fascinating insights about how color science research works to achieve the quality of color reproduction that we prefer in devices like our cell phones and computer monitors. Their presentations included information about how color metrics are used to perform color specification, discrimination and appearance; the aesthetics of memory color (how we like to remember things rather than how things might actually look in a reproduction); and examples of how to apply colour science on mobile imaging devices to achieve colour fidelity and enhanced reproduction.

**Presenter Bios:**

**Dr. Luo** is a Full Professor at the College of Optical Science and Engineering, Zhejiang University (China). He received his Ph.D. from the Bradford University (UK) on colour science in 1986. He is a Fellow of Society of Dyers and Colourists, and of Imaging Science and Technology. He has also been an active member of the International Commission on Illumination (CIE).

**Dr. Zhu** received her Ph.D. from Zhejiang University on Optical Engineering in 2021. Now she is a post-doctor at Zhejiang University. Her research interests include color appearance model and image processing,
**Hui Fan** (Fiona) received her B.S. in Optical Engineering from Nankai University and is currently a Ph.D. student supervised by Professor Luo at Zhejiang University. Her research work is on camera spectral calibration and multispectral imaging.

**Molin Li** (Merlin) received his B.S. in Optical Engineering from Shenzhen University and is currently a Master student supervised by Professor Luo at Zhejiang University. His research work is on color appearance under the High-Dynamic Range (HDR) condition.

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. Hosts for Fluorescent Fridays are “John the Math Guy” Seymour, an applied mathematician and color scientist and Adjunct Professor at Clemson University, and Dr. Lina Cárdenas, an assistant professor at the school of design at the Pontificia Universidad Católica de Chile and former member of the ISCC Board of Directors.

We are in the process of planning Fluorescent Friday events for the Fall and Spring ’24 season, reaching out to international colleagues in universities who conduct rigorous, forward-thinking research with their students in the arts, design, and sciences. Stay tuned for updates!
The Colour Literacy Forum is a virtual platform featuring presentations and interactive conversations focused on updating and expanding 21st century color education at the university level.

The Forum is an international, collaborative effort of the joint ISCC/AIC Colour Literacy Project and Cumulus to align higher level color education with current design needs in the culture.

The goal of this global collaboration is to develop an interdisciplinary STEAM (Science, Technology, Engineering, Arts, Math) model that aligns color education with current needs in the culture, provides cutting-edge resources, and offers dynamic networking opportunities for all stakeholders. See https://colourliteracy.org/colour-literacy-forum for more information.

**Upcoming Forum (Save the Date)**

Visual Literacy – Color & the Perceiver
Thursday, June 15, 1:15 pm EST (in person and via Zoom)
Zoom link: [https://iscc.org/event-5243397](https://iscc.org/event-5243397)

Join us for Colour Literacy Forum #5, Visual Literacy – Color & the Perceiver, which will take place at Color Impact 2023. This forum is the third in a 4-part series about color perception. (The first focused on color and light, the second on color and materials).

Color is a perceptual experience, and each perceiver has a unique point of view. In this forum, our speakers will investigate the relationship between color vision and visual literacy, which can be described as our ability to navigate through the world using information provided by our visual system, our memories, and other sensory input.

Be part of the forum in person (or via Zoom) to learn how color perception works, and why designers from all industries need to be aware of variations in color vision among the population – to realize the real-world applications that can enhance our well-being and ensure access to resources for everyone.

Stay tuned to learn about the panel of speakers!
Summary of Past Events

Color & Materials: Past, Present & Future was the second in a 4-part series of Forums that, together, create the foundational cornerstone of 21st century color literacy, where the phenomenon of color is defined as a dynamic process involving light, matter, each perceiver, and the unique context of the surrounding environment. The next three forums in the series are being planned for the 2023 season.

Talk 1: Past - Colors of the Ancient World

Archaeologist Dr. Carolyn Boyd, Shumla Endowed Research Professor in the Department of Anthropology at Texas State University, illuminated the relationship between color and materials by unearthing the story told by prehistoric hunter-gatherers of the Lower Pecos Canyonlands of Texas and Coahuila, Mexico. They created some of the most colorful, complex and enduring rock art of the ancient world. She shared insights about her journey of discovery researching the White Shaman Mural, an ancient visual narrative telling the cosmic story of the birth of the sun and the beginning of time. Unlike previous scholars who have viewed the rock art as random and indecipherable, Boyd demonstrated that the White Shaman Mural was intentionally composed as a deeply layered visual narrative. Artists depicted and animated the actors in this narrative through the image-making process, including paint ingredients, the painting sequence, and a semantically charged, color-coded graphic vocabulary.

Boyd’s research methods include a formal analysis of the art to document and describe the diagnostic pictographs and digital microscopy to reveal the mural’s painting sequence. Ethnographic observations of indigenous groups living in Mesoamerica have provided Boyd with insights into the framework of ideas and beliefs that informed production of the narrative and the rich cosmology it communicates.

For more information, visit https://shumla.org/

“Color is the language of the gods.”
– Dr. Carolyn Boyd
Talk 2: Present - The Concept of Cesia (Visual Appearance Other Than Color) Examples in Architecture

Dr. José Luis Caivano, professor at Buenos Aires University, in the School of Architecture, (where he also leads the Color Research Program refers to the perception of the different spatial distributions of light) addressed the concept of cesia, which includes all the visual sensations spanning from transparency to translucency, matte opacity to mirror-like appearance –– passing through glossy appearance in lightness to darkness. He showed that color and cesia are different aspects of the perception of light, and that both contribute to the visual appearance of objects.

Dr Caivano explained that color appearance deals with lightness and darkness, but there are aspects that cannot be described by the three classical color dimensions (hue, lightness, and chroma). For this reason, dimensions of cesia can be added to further specify a color sensation. Forum participants learned that cesias are defined by three dimensions or variables: perceived permeability (from opaque to transparent), perceived diffusivity (from regular or clear to diffuse), and darkness (from light to dark). In both color and cesia the relationship between stimulus and sensation is not fixed but depends on three main factors – illumination, object, and observer – and is affected by other factors such as visual context, adaptation, contrast, etc.

For more information, see https://colorysemiotica.wordpress.com/publicaciones/.
Talk 3: Future - Sustainable Wood-based Structural Color

Noora Yau, designer and Ph.D. candidate in the Department of Design, School of Arts, Design and Architecture at Aalto University (Finland) and Konrad Klockars, Ph.D. candidate in the Department of Bioproducts and Biosystems at Aalto University focused their presentation on sustainable design using structural color seen in nature’s brightest colors – like those found in peacock feathers or butterfly wings. Yau and Klockars showed how these eye-catching vivid colors are created through microscopically small nanostructures.

Unlike pigments or dyes, this visual phenomenon arises from the physical structure of a material, without the need for any particular light-absorbing compounds. They shared how shiny or glittery effects – very popular in fashion and design today – are usually created using environmentally harmful pigments, plastics, and metallic foils.

The visual opportunities of this new method of generating color are explored by altering the shape, color and texture of the materials onto which the color is applied.

Participants learned that Yau and Klockars’ forward-thinking sustainable alternative has the capacity to create the future of glittering effects. Through materials such as wood-based structural color, the process can lead to a green transformation in the effect pigment industry.

For more information, see https://structuralcolourstudio.com/about/
Color Impact 2023: Color and Human Experience – Keynotes

Dave Wyble

The conference is just about six weeks off. The program is set, and registration is open. Each day will start with a one-hour keynote presentation leading into the morning sessions. Each keynote talk was selected to bring a different perspective to the conference. As you know, the color interests of the ISCC membership span the breadth of the field, including artists and designers, scientists, and technologists.

These are all represented by both experts and practitioners. And of course, we also support the teachers who educate all the others!

What fields do our keynote speakers represent?

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<thead>
<tr>
<th>Day</th>
<th>Keynote Speaker</th>
<th>Details</th>
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<tbody>
<tr>
<td>Monday</td>
<td>Domicle Jonauskaite Experimental color psychologist</td>
<td>Domicle, who studies the relationship between color and emotion, will discuss Color Response.</td>
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<tr>
<td>Tuesday</td>
<td>Kory Stamper Lexicographer</td>
<td>Kory will discuss the language of color.</td>
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<tr>
<td>Wednesday</td>
<td>Peter Donahue Art educator, painter, cartoonist, graphic designer</td>
<td>Peter, who is new to ISCC but not new to color, will talk about how he has taken color science education to the masses via his Tik Tok channel, Color Nerd.</td>
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<tr>
<td>Thursday</td>
<td>Roy Berns Science educator and researcher</td>
<td>Roy will talk about the reproduction of artwork.</td>
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Each day the keynotes will be followed by a wide range of contributed presentations that will continue until the lunch break. Please visit the conference website at [https://www.iscc.org/CI2023](https://www.iscc.org/CI2023) for much more detail on all the talks, and the afternoon activities as well. I am very much looking forward to seeing all of you in Rochester in June.
Expansion of ISCC Programs

Maggie Maggio

Over the past five years, the educational programming of ISCC has expanded by leaps and bounds. In 2018, ISCC successfully hosted the ISCC Munsell Centennial Symposium in Boston. We joined up with TAGA in 2019 for a one-day meeting in Minneapolis that included a special ISCC strategic planning session. In 2020, when the Yale Conference was canceled due to Covid-19, we held the first ISCC Color Impact Conference (CI2020). It turned out to be a very successful one-day Virtual Symposium on Color Education. In 2021, the second Color Impact Conference included three days of virtual presentations on Color and the Built Environment. In June, ISCC will host an in-person conference for the first time in five years when we meet at Rochester Institute of Technology (RIT) for Color Impact 2023 – Color and the Human Experience (CI2023). This live conference coincides with the celebration of the 40th Anniversary of the Munsell Color Science Lab.

Expanding Our Programs

Student outreach became a priority following the strategic planning session in 2019. We launched the Fluorescent Fridays (FF) program in 2020 to shine the spotlight on the color research of university students around the world. Since then, we have hosted 12 FFs!

In 2022, ISCC started hosting the Colour Lit Project’s Colour Literacy Forums to showcase cutting edge color education. Aimed at the post-secondary level, the Forums feature presenters with topics to inspire a reframing of the traditional art and design color curricula. The fifth Colour Lit Forum will be held in person at CI2023 in Rochester and will be one of ISCC’s first hybrid events. Register for the event on this site: https://iscc.org/event-5243397.

This year, on International Color Day, we started Colorful Connections, a monthly online gathering of color colleagues which are hosted alternately in the mornings and the evening to make it possible for you to join the event from different parts of the world. Following a short presentation on a timely topic, attendees join break-out rooms for informal networking, open discussions about anything of interest, and the chance to create new connections.
There are a few factors that have contributed to the recent expansion of our educational programming.

- The first is the transition over the past 20 years from an organization made up primarily of member bodies – i.e., discipline-specific organizations with a focus on color to an organization of individual members. The current membership consists of color experts and enthusiasts across many disciplines who are interested in making connections, sharing research, and learning about color from an interdisciplinary perspective. In addition to the personal benefits of being an individual member, I know many members who share my commitment to expanding the availability of quality color education to both color professionals and the public-at-large.

- The second factor is the worldwide growth in virtual programming during the COVID pandemic, which led to FF, Color Literacy Project Forums, and eventually Colorful Connections. Our outreach is global!

**Future Planning**

In February, the ISCC Board of Directors, committee chairs and key volunteers attended an afternoon Leadership Retreat. The purpose of the retreat was to identify the organization’s goals for 2023. As a result, we identified five short-term goals for this calendar year:

1. Streamline and standardize the procedures for hosting and publicizing ISCC events.
2. Complete the work of the Visual Identity Project (VIP) by updating the website and creating a branding guide for events and publicity.
3. Create a Student Support Program that includes inviting student participation on the board, coordinating Fluorescent Fridays, determining the criteria for awarding student scholarships for attendance at professional conferences, and possibly re-starting a Student Chapter.
5. Host the ISCC Color Impact 2023 conference at RIT in June.

The first goal reflects the importance of planning and hosting excellent webinars, Fluorescent Fridays, Colour Literacy Forums and Colorful Connection gatherings. With so many events on our schedule, and so many volunteers involved in publicizing, hosting, and presenting these events, we could use help coordinating our expanding annual calendar. In a new role for the ISCC President-Elect, Dr. Jennifer Kruschwitz will be taking on the responsibility of Events Calendar Coordinator, while former ISCC Secretary, Jean Hoskin, will act as Events Publicity Coordinator. Jean is writing and sending the ISCC email updates as needed. To distinguish the email updates, which go out to all the ISCC contacts from the Quarterly ISCC News, which goes out only to ISCC members, she recently suggested a new name for the email updates: The Wavelength. Or, as we have already started calling it, The Wave! Jen and Jean will work together with the events chairs to design an efficient planning system for events.

The second and third goals, though important, are taking a back seat for now as we get ready to host the ISCC 2023 Conference in June at RIT. Look for updates on the website redesign and student outreach goals in future newsletters.

Here are details on the fourth and fifth goals:

**Rich Memorial Lecture**

ISCC board member Anthony Calabria has accepted the appointment to chair the Danny Rich Memorial Lecture Committee. The inaugural Rich Memorial Lecture will occur on June 14 at the Wednesday evening reception of the ISCC Color Impact 2023 conference. This tribute to Danny will be a hybrid event so that you can attend virtually if you are not able to be at the conference in person. We are thrilled that Danny’s wife, Phyllis, and daughter, Amanda, will be joining us as we remember Danny and honor his contributions to ISCC and the color community worldwide. Registration for this special event is open on the ISCC website at [https://www.iscc.org/CI2023](https://www.iscc.org/CI2023).
Color Impact 2023 – Color and the Human Experience

The Steering Committee, chaired by Past President, Dave Wyble, has put together a stellar five-day program which includes “sitting” in the morning to listen to talks by presenters from around the world and “doing” in the afternoon with options to attend short courses, workshops and/or go on tours to various centers of interest at RIT. For detailed information on the Color Impact 2023 and its keynotes, see the article by Dave Wyble on page 33.

See the conference website at https://www.iscc.org/CI2023 for registration and details.

An Invitation

All the growth in the ISCC events calendar over the past few years was made possible only through the work of many, many volunteer members. If you are interested in joining any of the Events Committees, please get in touch with me. You will have lots to do – and lots of fun doing it!

A huge thank you to all the volunteers working on ISCC events. We are taking our educational programs and outreach to a whole new level!
Selected Papers

Authors of selected papers will be invited to submit their papers for publication in special issues of prominent international color journals. These journals include Journal of AIC, Color Research and Application and Color Culture and Science Journal.

Best Poster Presenter Awards

The Colour Group of Great Britain’s Robert W. G. Hunt International Poster Award will be presented to the three best-selected posters. Also, there will be an award for the best poster presenter. There is excitement over the selected journal papers and best poster presentations! These are wonderful opportunities for ISCC members and all who have submitted papers for this AIC Congress! ISCC members are encouraged to take advantage of early registration, which will be coming soon.

Please visit the website for details [https://aic2023.org/registration](https://aic2023.org/registration)
On Wednesday evening during Color Impact 2023, the conference reception will include two talks honoring our late friend and colleague, Dr. Danny C. Rich. We will gather at the University Gallery on the campus of RIT (just a short walk from the dorms) for a few hours of reflection, camaraderie, and of course lots of food and fun.

A special tribute to Danny Rich will be offered by Paula Alessi and Roy Berns. The inaugural Danny C. Rich Memorial Lecture will be delivered by David R. Wyble and is titled “Illuminating Color Measurement.”

During the initial socializing time, a slide show will run featuring submissions to the Art Exhibition. This will be a most memorable evening for everyone who attends.
## Calendar 2023

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<tr>
<th>Date</th>
<th>Event Description</th>
<th>Location</th>
<th>Website</th>
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<tbody>
<tr>
<td>May 21 - 26</td>
<td>SID display Week 2023 Los Angeles, CA</td>
<td><a href="https://www.displayweek.org/">https://www.displayweek.org/</a></td>
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<tr>
<td>June 4 - 8</td>
<td>Optical Design and Fabrication Congress Quebec City, Quebec Canada</td>
<td><a href="https://www.optica.org/en-us/events/congress/optical_design_and_fabrication_congress/">https://www.optica.org/en-us/events/congress/optical_design_and_fabrication_congress/</a></td>
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<td>June 8</td>
<td>ASTM Committee Week Retroreflection, Color and Appearance Meeting E12.10</td>
<td><a href="https://member.astm.org/meeting/search-keyword?keyword=E12">https://member.astm.org/meeting/search-keyword?keyword=E12</a></td>
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<td>June 14</td>
<td>Danny Rich Memorial Lecture Virtual and In-person Rochester Insititute of Technology 6-9PM EST</td>
<td><a href="https://iscc.org/CI23-Schedule">https://iscc.org/CI23-Schedule</a></td>
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<td>June 15</td>
<td>Colour Literacy Forum Virtual 1:45 - 2:45 PM EST</td>
<td><a href="https://iscc.org/event-5243397">https://iscc.org/event-5243397</a></td>
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<tr>
<td>June 19 - 23</td>
<td>IS &amp; T Archiving 2023 Oslo, Norway in person</td>
<td><a href="https://www.imaging.org/IST/IST/Conferences/Archiving/Archiving2023/Archiving2023_Home.aspx?hkey=e9598c63-ad8a-4ecd-8c90-a5408d6509b2">https://www.imaging.org/IST/IST/Conferences/Archiving/Archiving2023/Archiving2023_Home.aspx?hkey=e9598c63-ad8a-4ecd-8c90-a5408d6509b2</a></td>
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<tr>
<td>June 22 - 23</td>
<td>ASTM E12 June Meeting 2023 ASTM Headquarters 100 Barr Harbor Drive, West Conshohocken, PA</td>
<td><a href="https://member.astm.org/meeting/search-keyword?keyword=E12">https://member.astm.org/meeting/search-keyword?keyword=E12</a></td>
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<tr>
<td>Date</td>
<td>Event Description</td>
<td>Location</td>
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<td>Aug 3-5</td>
<td>IES 2023 Annual Conference, Chicagoland Renaissance Schaumburg Hotel and Convention Center</td>
<td><a href="https://www.ies.org/events/annual-conference/">https://www.ies.org/events/annual-conference/</a></td>
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<tr>
<td>September 12-14</td>
<td>AATCC Textile Discovery Summit Greenville, South Carolina</td>
<td><a href="https://www.aatcc.org/aatcc-events/summit/">https://www.aatcc.org/aatcc-events/summit/</a></td>
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<tr>
<td>Nov. 10-11</td>
<td>SCAD Annual Conference Chicago Marriott Downtown</td>
<td><a href="https://scadent.org/events/newportbeach-2023">https://scadent.org/events/newportbeach-2023</a></td>
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</table>
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.

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ISCC would like to thank the following people for their time and talents to make this issue.

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