Inter-Society Color Council *News*

Issue 477 Winter 2017

Board of Directors Corner

Hi! My name is Nurhan Becidyan and this is my second round of being chosen to serve on the ISCC Board of Directors. My earlier stint was from 2005 to 2008 (I was active during the 75th anniversary of ISCC). My involvement with ISCC was an important addition to my professional life as I learned a lot through close interaction and conferences.

I have been involved with color and colorants for most of my professional life which started 40 years ago after I graduated from the Institute of Paper Chemistry, Appleton, WI with an MS degree in Pulp and Paper Engineering. I started in the color business at the fluorescent brightener end (that was used in paper manufacturing) and gradually progressed to paper and leather dyes when I joined Sandoz Ltd. in Turkey. Then I added organic and inorganic pigments and masterbatches to my portfolio. As time went on, I kept adding other colorant types: starting with daylight fluorescent pigments and UV and IR fluorescent pigments and ending with the addition of one of the latest discoveries in the color business: the high performance phosphorescent pigments (strontium aluminates).

During the last 25 years of my business life, I was the CEO of a medium sized company, United Mineral and Chemical Corporation, that did not manufacture anything, but was very much involved technically in all aspects of the products that we sold. We were not only importing and distributing high purity metals, various colorants and chemicals; we also provided technical service to our clients and our suppliers. My personal involvement was with specialty colorants. This field had become my hobby and I personally handled UV & IR fluorescent pigments and also dabbled in super phosphorescent (strontium aluminate) pigments. I was involved to such an extent that I even dealt with patent infringement issues and also helped one of our customers obtain a patent in use for UV fluorescent pigments in ID cards.

I can definitely say that ISCC has played a very important role in my "technical" life. Interaction with people who were much more knowledgeable than me, who were passionate about "COLOR", who were willing to share their experiences with me (or whoever wanted to know more) were extremely invaluable! Conferences, the ISCC *News*, private communications all helped me in my quest to learn more.

This winter newsletter will feature a summary of the ISCC Workshop that was held during CIC 24, a summary of the ISCC Annual Business and Awards

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Terms end 2018

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Board of Director's Corner continued

Meeting, a description of our next webinar which will be held on International Colour Day, information on the 2017 meeting that will be held with CORM and more details on the one-time special event (ISCC-AIC) to honor Albert Munsell in 2018.

Nurhan Becidyan, *Retired CEO and President of United Mineral and Chemical Corporation*

ISCC 2016 Annual Business and Awards Meeting - San Diego

The ISCC 2016 Annual Business and Awards Meeting was held in San Diego, California on Friday, November 11. After a warm welcome from the President, John Conant, he gave his President's Report. We have an active group of Officers and Directors serving on the Board, which meets monthly via teleconference. In 2016 there were three webinars: "The Right Paint Color to Help Hide a Helicopter", "The Chemistry and Physics of Special Effects Pigments and Colorants", and "Teaching Color Science Online". The 2017 Meeting will be a joint meeting with The Council for Optical Radiation Measurements (CORM) in August at the Lighting Research Institute at Renssalaer Polytechnic Institute in Troy, NY. The 2018 Meeting will be a joint celebration with AIC to honor the legacy of Albert H. Munsell on the 100-year anniversary of his death. This centennial celebration will take place from June 11-15 at the Massachusetts College of Art and Design in Boston. (There will be more on this celebration in the newsletter on page 8.)

John presented the Treasurer's Report on behalf of Cameron Miller, our Treasurer. We currently have 93 Individual Members with 4 Sustaining Members. The total of our bank and PayPal accounts is about $62,320. We are financially in excellent shape with low overhead costs..

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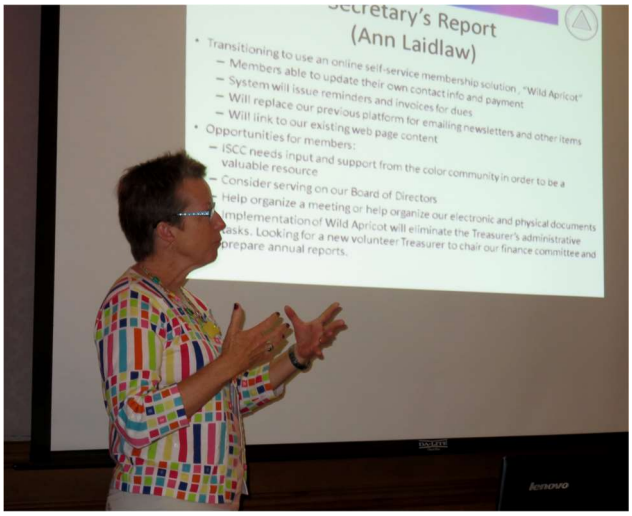
ISCC 2016 Business & Awards Meeting continued

Ann Laidlaw presented the Secretary's Report. First she talked about our transition to a new online



self-service membership solution called "Wild Apricot". ISCC members will be able to update their own contact information and pay their dues online. This system will issue reminders and invoices for dues payments. It will replace our previous platform for issuing newsletters and distributing other electronic notices to our membership. It will link to our previous webpage content so the transition to this new platform should be transparent to the membership. Next Ann discussed opportunities for our members. The ISCC needs input and support from the color community so that we can continue to be a valuable resource both in the USA and to other countries. Ann put some suggestions out to ISCC members indicating how they can help. Members should consider serving on our Board of Directors. Having a fresh pool of people to draw from brings in new ideas. We could use help organizing meetings and our great wealth of electronic and physical documents. Finally, after we have successfully implemented "Wild Apricot", the Treasurer's administration tasks will be eliminated. Cameron Miller has served as Treasurer for a very long time and we thank him for all his hard work, but it is time for him to move on. So we are looking for a new volunteer Treasurer to chair our Finance Committee and prepare Annual Reports. Finally Ann shared the slate of new Officers and Directors that were being balloted in December and voted on by early January. (The election results appear in this newsletter on page 21.)

Next came a short report on the International Colour Association (AIC). The ISCC is the regular member country from the United States to the AIC. AIC's Environmental Colour Design Study Group has become a Member Body of ISCC. AIC's 2016 Annual Report was distributed to all ISCC members via email. ISCC endorsed Leslie Harrington who was elected to the AIC Executive Committee to finish out Nancy Kwallek's term. The AIC 2016 Interim Meeting in Santiago, Chile was summarized in *ISCC News* Issue 476. The AIC 13th Congress will be held in Jeju, Korea in 2017. More information on this Congress can be found in this newsletter on page 11. ISCC will celebrate International Colour Day on March 21, 2017 by holding a webinar. More information on this webinar can be found in this newsletter on page 7.

ISCC has an ongoing historical initiative. Please visit our website for a current list of treasures that Marjorie Ingalls is parting with: http://iscc.org/resources/IngallsInventory.php. ISCC artifacts are housed at the Hagley Museum and Library in Wilmington, DE. Please visit http://iscc.org/resources/hagley.php for more information about this collection. We could use help going through the scanned documents from the Hagley. Please contact isccoffice@iscc.org if you are interested in helping with this initiative.

Our Secretary, Ann Laidlaw, gave John Conant, our outgoing President, a Certificate of Appreciation.

Many thanks to John for leading us over the past two years. Many thanks to Cameron Miller, as our outgoing Treasurer, who has served for the past six years. Cameron has helped the financial profile of ISCC thrive. We sincerely appreciate Cameron's dedication to this office for so many years! Outgoing Directors, Paula Alessi and Kim Vlaun, were also thanked for their three years of service on the Board of Directors.

Two of our members were recognized for significant service by being awarded Honorary Membership status. According to our By-Laws: "Any person

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ISCC 2016 Business & Awards Meeting continued

who, as a Council member, has rendered signal service to the Council or to those fields served by the individual Member-Bodies of the Council, in such manner as to aid in accomplishing the objectives of the Council, is eligible for Honorary membership". This year President John Conant presented Honorary Membership to Dr. Ellen Carter:

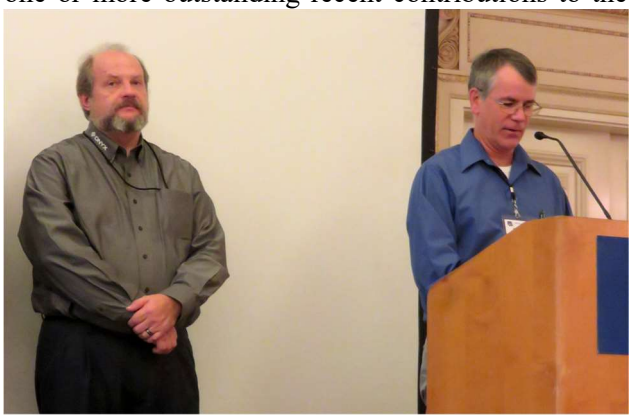
John also presented Honorary Membership to Jack Ladson:

Ellen and Jack are to be congratulated on these well-deserved awards!
Paula J. Alessi, *ISCC News Editor*

Macbeth Award Presentation

The 2016 ISCC Business and Awards Meeting concluded with the Macbeth Award Presentation to Dr. Maxim Derhak. The following citation was given by Dr. Dave Wyble:

There are four awards periodically presented by the ISCC: Honorary Membership, for significant service to the organization or to related fields, which you have just seen presented to Jack [Ladson] and Ellen [Carter]; the Nickerson Award for long term service to the Council, most recently awarded to Rolf Kuehni; the Godlove Award for long-term contributions to the field of color, presented in 2015 to Anna Campbell Bliss; and the Macbeth Award for one or more outstanding recent contributions to the



field of color. The Macbeth award was established by Norman Macbeth Jr, in honor of his father, Norman Macbeth and was first presented in 1972. Today we honor Dr. Maxim Derhak with the 2016 Macbeth Award. Max's contribution, quoting from his nomination:

> "[Max has brought] to the public a method of color management based, not just on the theoretical CIE illuminant D50 colorimetry, but on the spectral properties of the color stimulus functions. This provides a greater flexibility to those modeling the process color output of devices such as digital printers and presses and provides a framework for the inclusion of many special colors, known as spot colors or brand colors."

This framework became a formal specification of the International Color Consortium (ICC) in 2016, and is known as "iccMAX." The naming, we are assured, refers to its maximum color management potential, and is in no way reflective of its primary author. If you attended this morning's workshop, you know of the important addition this work brings to color management. If you did not, corner Max later today and find a comfortable chair. His passion for this work means you will not receive a shallow overview of this deep topic. I am confident that along with the completion of his doctorate, Max would consider iccMAX among the seminal accomplishments of his professional career

Max's work towards this began in 1990 at Onyx Graphics in Salt Lake City. He has held several positions at Onyx, and as of 2012, he is Principal Scientist, directing research and development of core image processing and color management technologies.

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Macbeth Award Presentation continued

For much of his 25+ years at Onyx, he has been very active in the ICC and is now the organization's co-chair. Max has also served in IS&T, participating at the committee level of the Color Imaging Conference. In the middle of that incredibly busy professional life, he moved his family to Rochester to complete his Ph.D. in Color Science at the Rochester Institute of Technology. As of 2015, we are pleased to call him Doctor Derhak. It is at RIT that I really got to know Max, and today I am pleased to call him not just a colleague but also a friend. His ability to balance a demanding career and his most important life's work - raising his five children (with his wife) - serves as an inspiration to all who know him, mostly because he just seems to be so darn good at both.

Please join me again in congratulating Max Derhak for receiving the 2016 Macbeth Award.

Dave Wyble, *Avian Rochester, LLC*

CIC 24 Report

The ISCC Meeting in San Diego was part of a joint meeting with the 24th Color Imaging Conference (CIC 24) sponsored by the Society for Imaging Science and Technology (IS&T). The dates for CIC 24 were November 9-11, 2016. CIC 24 attracted a large group of attendees. CIC 24 was prefaced by a day of short courses on Nov 8, including "Fundamentals of Spectral Measurements for Color Science" by Dave Wyble. The conference opened on Nov 9 with a keynote presentation on "Full Color Computational Imaging with Diffractive Optics", by Wolfgang Heidrich of King Abdullah University of Science and Technology. This was followed by sessions on *Colorful Viewing*, *Beyond the Rainbow,* and *Colorful Matter*. Attendees enjoyed a poolside reception and opportunity to interact with colleagues and speakers. The next day's program included sessions on *Do You See What I See?* (exploring color vision and revisiting MacAdam ellipses), and a quick review of the many posters. The afternoon featured a keynote presentation on "Google Street View: Unique Challenges of Collecting Imagery at Global Scale", by Luc Vincent and Ram Clement of Google. This fascinating presentation gave a 10-year overview of Google Street View, including developments in the cameras and vehicles used, and the challenges and solution required for accurate and useful images. Google Street View is not limited to street scenes – the system includes museum interiors, underwater vistas, and a raft trip down the Grand Canyon. Attendees then enjoyed a reception and time to discuss posters with the authors and review the various technology exhibits. The evening session featured a presentation on "3D Color Printing in Stop Motion Animation", by Brian McLean and Rob Ducey of Laika Animation Studios.

Friday, Nov 11 featured the ISCC workshop on "The Life of a Color". This workshop began with Mark Fairchild's "From Photon to Brain: The Perception of Color", followed by Kelly Kovack discussing "The Design of a Color", for Leslie Harrington. Max Derhak reviewed "The Management of a Color", and Ann Laidlaw completed the session with "The Manufacturing of a Color". Many thanks to

Workshop speakers from left to right: Kelly Kovack, Max Derhak, Ann Laidlaw and Mark Fairchild

Dave Wyble for conceiving and organizing this workshop, which hit all the interest areas for ISCC members.

The following IS&T Awards were given out at this CIC 24:

- The **Raymond C. Bowman Award** for excellence in imaging education, was presented to **C.-C. Jay Kuo** (The University of Southern California) "in recognition of his work in education in the field of signal, image, and video processing for the last three decades, with an enduring impact on both the academic and industry realms."

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CIC 24 Report continued

- The **Service Award** was presented to **Vien Cheung** (University of Leeds) for her many roles in organizing IS&T color conferences for more than a dozen years and **Philipp Urban** (Fraunhofer Institute for Computer Graphics Research IGD) for helping establish and foster the new Electronic Imaging conference: Measuring, Modeling, and Reproducing Material Appearance
- The **Raymond Davis Scholarship,** given to an advanced-level undergraduate or a graduate student with an academic and/or research focus in a field related to imaging, went to **Antonio Fiore** (University of Maryland) for his interest in biomedical optics.

The final session of the 24th Color Imaging Conference included sessions on *Illuminating Color* and *Wrangling Color*.

The ISCC will again be a cooperating society for the 25th Color Imaging Conference in 2017. We hope to see you there!

Ann Laidlaw, *ACL Color Consulting, LLC*

ISCC December Webinar Summary

The ISCC held its last webinar of 2016 on Monday, December 5th. The presentation was given by Professors Susan Farnand and Michael J. Murdoch from the Munsell Color Science Lab at Rochester Institute of Technology (RIT). The title of their presentation was *Challenges and rewards of teaching an online color science course.*

Susan and Mike have developed an online course called "Fundamentals of Color Science" intended to teach some color science basics to people from industry as well as to graduate students who want to learn about color. It is a 10-week course geared towards a small number of students. Each week the students have to read two selections (either papers or book chapters), take a quiz on each reading, participate in an online discussion of each reading, do a small project or online activity and deliver a 3 to 5 page project summary.

The quiz consists of 4 multiple choice questions aimed at determining if each student understood each reading. A student can take the quiz as often as they need to in order to get 3 of 4 questions correct.

After passing the quizzes, the students participate in an online discussion. This message-board style discussion takes the place of a roundtable discussion that is used in many classrooms. While it is not live, it provides a good learning forum, affording the students time to write thoughtful replies to one another. Students start the discussions by reporting what they found most important or interesting about the reading. A couple of examples of student generated discussion topics are

1. ΔE is one number that specifies a distance, but really tells you nothing about direction. Aren't more numbers/data necessary to thoroughly define and understand a color difference? If so, what might those be?
2. The Macbeth ColorChecker patches were designed based on film response. Do we need a new Macbeth ColorChecker for digital displays?

Next the student moves into the project phase. For the Color Order Section, the project is an online color order activity where the students are given an array of color patches and are asked to drag and drop them into some order that makes sense to them. The patches don't have to be arranged in rows. They can be ordered in circles, bunches or any other type of grouping that makes sense to them. Once they had an arrangement, they had to write an explanation of why they grouped the patches as they did. It was fascinating to see the wide variety of arrangements that the students came up with for the same set of patches. Quite a few of the arrangements were based on some variation of hue, lightness and chroma, but others were very unique! For the Color Vision Project, students were asked to take an online Farnsworth-Munsell 100 Hue Test, which was also a drag and drop activity. For the Color Measurement Section, Dave Wyble gives a very comprehensive video tour of a color measurement lab. It is about as close as you could get to an in-person tour. Coming up with an online Color Measurement project is very challenging because there is no hands-on lab experience. The students are presented with spectral reflectance data as if they had measured samples themselves with a spectrophotometer. They are then asked to look at precision and accuracy of the measurements. Susan and Mike are currently working on enhancing the course by developing a virtual

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ISCC December Webinar Summary continued

spectrophotometer with calibration capability, a drag and drop sample shelf, a spectral data plot, and downloadable spectral files with pre-computed variability. The next project involves using measurement data to compute tristimulus values, chromaticity coordinates, CIELAB values and ΔE values for color difference pairs. This is where the students study the effect of changing light sources and observers on computed colorimetric data. There are Chromatic Adaptation and Color Appearance projects. In the Color Systems Section, display characterization and color management are featured. Again, color display characterization cannot easily be done hands-on, so data are provided and the students compute the primary matrix and look-up tables necessary to characterize the display. The Color Management Section is about ICC profiling for an experiential project. They are given two ICC profiles and asked to look at the differences between the two after applying them to images on their computer. They are asked to explain the differences between the two profiles.

Susan and Mike opened it up to discussion from the listening audience. The first question was whether or not the students are expected to calibrate their monitors before beginning the course. In the first offering of the course, no display calibration was required. In the future, students may be asked to use or buy a low-cost display calibration device (under $200) for the course. Susan and Mike asked for suggestions of reliable low cost devices that they could recommend to the students. Generally, the students from industry are more likely to have calibrated displays than students from universities. Danny Rich provided suggestions and commented that there are some visual methods for calibrating displays, which could be used by the students. Mike added that most of the course activities do not require a calibrated display. Danny then commented that the Farnsworth-Munsell 100 Hue test could fail on a poorly calibrated display. Susan commented that she had a group of students take the Farnsworth-Munsell 100 Hue test with real samples and then do the drag and drop activity online on their own computers. The results were congruent so it worked well enough for academic purposes to teach the concept of the test, how it works and how to interpret the results. The next question was about how the students computed colorimetric data like XYZ, xy, CIELAB, and ΔE from the given spectral data. Mike said that they used their software of choice be it Microsoft Office EXCEL or MATLAB.

Mike and Susan closed by saying that they might add a project on image capture and have the students do some camera profiling. This would require the students to purchase a calibration chart like the Macbeth ColorChecker. They also might add to the reading list some of the new work that is going on in the area of gloss.

If you missed this webinar, you can view it by going to our website at:
http://iscc.org/resources/SeminarSeries.php

March Webinar on AIC International Colour Day

The ISCC has chosen to celebrate the AIC International Colour Day by hosting a webinar on March 21, 2017. On this day, AIC would like all member countries around the world to create memorable color activities and share them. March 21st was chosen as the day for this celebration because it is the equinox, where night (hours of darkness) and day (hours of light) are approximately equally long in all human cultures around the world.

The 2017 ISCC International Colour Day will be a webinar given by Mark Fairchild on March 21st from 2 to 3PM EST. The title of Mark's talk will be *"From Photon to Brain: The Perception of Color"*.

Mark will trace the fate of a photon from the surface of an object to the point a color appearance is experienced in the brain.

For details on how you can participate in this webinar, please visit: http://iscc.org/resources/SeminarSeries.php .

CORM/ISCC 2017 Joint Technical Conference – First Announcement and Call for Papers

The CORM/ISCC 2017 Joint Technical Conference and Business Meeting will be held in Troy, NY in cooperation with the Lighting Research Center at Rensselaer Polytechnic Institute. Mark your calendars with the dates of July 31 – August 2 to attend this conference. The conference themes include:

- **Topics in Solid State Lighting**
- **Optical Properties of Materials**
- **Display Metrology**
- **UV Radiometry**
- **Current Research Activities at NIST, NRC, & CENAM**
- **Emerging Professionals (Special Session)**

The Emerging Professionals session is open to students and professionals with less than 5 years' experience in the field of Optical Radiation Measurement, Measurement with Optical Radiation and other topics within the scope of CORM.

The CORM Technical Conference is structured to provide interaction between the optical radiation industry and National Metrology Institutes (NMI's) such as the National Institute of Standards and Technology (NIST), National Research Council (NRC) of Canada, and National Center for Metrology (CENAM) of Mexico. The ISCC Technical Conference is intended to further the Society's goal to stimulate work, to describe and specify color, to promote color applications and communications across diverse platforms, and to foster educational opportunities for color work being done in the public and private sector.

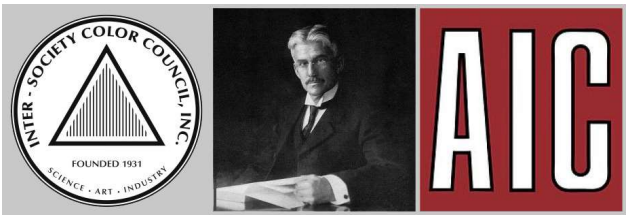
Here are some important dates to remember:

Deadline for abstracts is April 17, 2017;
Presentation materials are due by June 26, 2017.

If you are interested in submitting a paper, please contact Ann Laidlaw, the ISCC Conference Coordinator at ACL99colors@yahoo.com.

The conference will include the Grum Banquet and lecture. The ISCC will hold its regular Business and Awards meeting, and we will have a session for ISCC members to share ideas and discussion on educational and technical activity including webinars, online presence, and future meetings. Please watch the Newsletter for more details to come, and we look forward to seeing you in Troy this summer.

Joint ISCC - AIC Special Event 2018 Munsell Centennial Celebration



The year 2018 marks the 100-year anniversary of the passing of Albert H. Munsell (June 28, 1918) as well as the 75-year anniversary of the Munsell Renotation. The ISCC and AIC are excited to announce a once in a lifetime event to celebrate this milestone. The 2018 Munsell Centennial Celebration will take place from June 11-15th at the Massachusetts College of Art and Design (formerly known as Massachusetts Normal Art School when Munsell graduated and taught there).

The theme of the event is Munsell's Legacy: Inspiring 21st Century Color Concepts. This celebration will honor Munsell's legacy by centering the presentations around the three vertices of the ISCC logo; color in science, art and industry. Education, represented by the inside of the ISCC triangle, will be emphasized as it brings color concepts in science, art, and industry together. Each portion (science, art and industry) will begin with a **Historical** section outlining Munsell's contributions from the late 1880's until his death. That will lead into an **Evolution** section that will feature the milestones and significant events that have developed from Munsell's death up until the 21st century. Then there will be a **State-of-the-Art** section that will describe where color concepts are in 2018. Finally, each section will end with some talks on what the **Future** might hold for color in science, art and industry in the years beyond 2018.

As a scientist, Albert H. Munsell thought about the relationship between his psychological color order system and König's psychophysical chromaticity diagram. As an inventor, Munsell successfully patented a color sphere[1] a visual photometer[2], and a color chart[3]. As a painter and teacher, Munsell studied painting in Paris in the 1880s, had a passion for teaching color to aspiring artists in college and children and believed in standardizing the way color is taught. In 1907 and 1915 two editions of Munsell's'Color Solid Atlas' were published. The Mun-

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Joint ISCC-AIC 2018 Munsell Event continued

sell Color Company was founded in 1918 before his death. In spite of the fact that he never had the chance to witness it, Munsell's color order system was enjoyed by industry as an important contribution to understanding color for the century that followed.

During this centennial celebration, we wish to honor the legacy of Munsell by discussing the color evolution that has taken place since his death and projecting where the future of color will lie 20 to 30 years from now. The **Science** portion of this celebration will feature presentations on the science of color order, naming, and appearance systems. An example of a talk we might hear is how the Munsell value, chroma and 10 hues of his original Color Order System have evolved over the years into lightness and brightness computed from a variety of equations, saturation, colourfulness or vividness as a modern-day replacement for chroma and millions of hues. The **Art/Education** portion of this celebration will feature presentations on teaching artists and others about using color order systems. An example of a talk we might hear is how Munsell taught his system in the early 1900s compared to how it is taught to artists today. The **Industry** portion of this celebration will feature industrial applications of selection, specification and reproduction of colors. An example of a talk we might hear is how a system like Pantone with no order is thriving in industry today. Another example of a talk we might hear is how the proliferation of color pickers on softcopy devices has changed how we think about color order and color selection.

This 5 day Munsell Centennial celebration will be an ISCC Williamsburg-style event. Thus, it will feature a single track of in-depth presentations with thought-provoking discussion sessions. We hope to promote exchange of ideas among scientists, artists, and industrialists from around the world. **So please mark your calendars for June 11-15, 2018! This one-time special event will be a moment to reflect on the past century of progress in color, to look at where we are going, and to evaluate whether there are more fruitful directions we haven't yet pursued.**

The fundraising for this event is just beginning as are many other committee activities. If you are interested in more details about this celebration, please contact Maggie Maggio at maggiemaggio@gmail.com or Paula J. Alessi at geinhaus@frontiernet.net.

References:

1. U.S. Patent 640,792 Color Sphere and Mount, January 1900.
2. U.S. Patent 686,827 Photometer.19 November 1901.
3. U.S. Patent 824,374 Color Chart or Scale, June 1906

Call for Nominations for the 2017 ISCC Godlove Award

The Godlove Award was established by Mrs. Margaret N. Godlove in memory of her husband, Dr. Isaac H. Godlove. The fund was presented to and accepted by the ISCC during the 25th Anniversary Meeting of April 6, 1956. The award is usually, but not necessarily, presented biennially in odd-numbered years. The last Godlove recipient was the late Anna Campbell Bliss in 2015. (Thankfully she received it before she passed away!)

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

Nominations should include the following information:

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

Note: Confidentiality of the nomination is of the ut-

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2017 ISCC Godlove Award Nominations continued

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

Nominations should be submitted using the form, http://www.iscc.org/UniversalNominationForm.pdf This form can be filled out, scanned and emailed to isccoffice@iscc.org or printed, completed and sent to: ISCC Secretary, 7820B Wormans Rd. Suite #115, Frederick, MD 21701.

Call for Nominations for the 2017 ISCC Nickerson Award

The Nickerson Service Award is presented by the Inter-Society Color Council to honor long term contributions towards the advancement of the Council and its aims and purposes. The contribution may be in the form of organizational, clerical, technical, or other services that benefit the Council and its members. The candidates must be members of the Council and must have been active in the affairs of the Council.

Nominations should include the following information:

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

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

Nominations should be sent to the Chair of the Nickerson Service Award Committee:

Ann Laidlaw
ACL99colors@yahoo.com
136 E. Hill St
Decatur, GA 30030; t +1 336-420-1998

The deadline for receipt of nominations is Mar 15, 2017.

Note: Nominations received after Mar 15, 2017 will be retained for 2018. Nominations for the Nickerson Service Award may be considered to be "open" for submissions at any time. Future Nickerson Service Award committees will review nominations on hand for a given award period.

In Memory of Kenneth G. West

Kenneth G. "Ken" West, of Overland Park, KS, died on December 4, 2016 at the age of 94. "Ken

was born May 31, 1922, in Meta, MO, and had lived in the Kansas City area since 1929. He graduated from Paseo High School, attended Commercial Art School, and joined "Hall Brothers" greeting cards (Hallmark Cards) in 1941, as a Litho retouch artist. He enlisted in the Navy in 1942, graduated from the Naval School of Photography, and served with the AntiSubmarine Development Squadron, Atlantic Fleet (ASDEVLANT), Naval Air Station, Quonset Point, Rhode Island. There he met his future wife, Lacy Wikle, from Huntsville, Alabama. She had enlisted in the Navy W.A.V.E.s in May, 1945 and was attached to Ken's squadron. After the war, Ken returned to Hallmark Cards in June, 1946 as a Lithographic Cameraman. Lacy and Ken were married September 7, 1946, in Huntsville, Alabama. At Hallmark, Ken advanced through Supervisory positions and was appointed Manager of Photolithography in 1957. In 1962, he developed a unique, 6-color, art reproduction system for printing Hallmark greeting cards. In 1973, the Board of Directors elected him Corporate Vice President, Graphic Arts. He became Corporate Vice President for Graphic Services in 1977 and Corporate Vice President for Technical Development and Graphics Production in 1980. Ken was a member of the Inter-Society Color Council (ISCC), and a former Board Member of the Graphic Arts Technical Foundation (GATF). He was elected a lifetime member of the GATF "Society of Fellows" in 1978, (later known as the "Ben Franklin Society"). He was also a member of The Technical Association of the Graphic Arts (TAGA) and received the TAGA Honors Award in April, 1987" Ken received this prestigious TAGA Award "for his achievements in developing a standardized color reproduction system, designing and directing the

continued on next page

In Memory of Kenneth G. West continued

development of systems and equipment for mass production of high quality color reproductions for Hallmark Cards and other products that have become the **hallmark** of color quality in the printing industry."

Here is the remaining citation for Ken's TAGA Honors Award:

"Kenneth G. West has been interested in art, photography, science and music ever since he was a young man, when in 1941, he joined Hallmark Cards, Inc. as an artist to learn litho retouching. In 1942, he enlisted in the U. S. Navy, where he continued his education and experience in photography and lithography, which helped him when he returned to Hallmark to operate a process camera in 1946. At the time, greeting cards were reproduced in full color by a time-consuming hand drawn, color separation process using as many as 12 colors per subject. By 1951, West had developed 'Hallmark Colormaster Control', a standardized four-color process color reproduction system using densitometer control from camera through the press. Two years later, an 'extra red' was added to the system to improve Christmas and Valentine reds. In 1961, he was the first to introduce fluorescent pink (light magenta) as a process ink and the following year a sixth color (light cyan) was added to form the basic standard six-color reproduction system still in use at Hallmark today. He was instrumental in teaching his new techniques of standardized color reproduction to Hallmark's suppliers of printed cards.

"During the 1960's, West conceptualized and directed the development of specialized semi-automated color separation and halftone cameras using his analog computer system, 'Expozac'. Among other developments were separation negatives directly from three-dimensional art subjects; systems for altering halftone dot sizes in specific picture areas in the contact darkroom; a simple method for using halftone images as continuous tone masks; and many other innovative systems and equipment."

Ken will be missed by the ISCC and printing (TAGA and GATF) communities!

13th AIC Congress

2017 JEJU

Color & Health

AIC 2017 Congress Update

The 13th Congress of the AIC will be held in Jeju, Korea at the International Convention Center from October 16th – 20th. This Congress provides a unique forum bringing together researchers, academics, artists, architects, industrialists, engineers, designers, lighting experts and business leaders from all over the world. The host for this Congress is the Korea Society of Color Studies.

The abstract submission deadline has been extended to **February 28, 2017**. We encourage all ISCC members to submit an abstract in English of maximum length one page (between 300 and 500 words), to the submission website, which can be accessed via the Congress website **www.aic2017.org** Further instructions regarding submissions can be viewed on the Congress website. Authors will be notified as to whether their paper has been accepted as an oral or poster presentation by **April 30, 2017**. The submission deadline for final papers is **July 31, 2017**. Selected authors will have the opportunity to publish an extended version of their paper in a special issue of the Journal of the International Colour Association (JAIC).

Early online registration will be available on **July 31, 2017**. The late online registration deadline is **August 31,2017**.

Two of the keynote speakers are ISCC member, Roy Berns from the Rochester Institute of Technology Munsell Color Science Lab and Suro Hwang from Bihaedang (Korea Royal Silk Flower Museum, Korea. Five of the invited speakers are John Hutchings from the University of Leeds, UK, John Barbur from University London, UK, Haisong Xu from Zhejiang University, China, Jeong Tai Kim from Kyung Hee University, Korea and Tien-Rein Lee from Chinese Culture University, Taiwan.

Please mark your calendars for **October 16-20, 2017** to attend the AIC 13th Congress in Jeju, Korea!

New Online Membership Renewal System

Please watch your email for information about our new system for online membership renewal. We are launching a new membership service portal that will permit members to edit their own contact and privacy settings. Members will receive this email approximately **late Feb/early March 2017**. Emails from the new service will come from: "Iscc22@wildapricot.org". So please be on the lookout for this new email address.

Many thanks to Jodi Baker and Dave Wyble for their hard word in setting up this new system!

AATCC 2017 International Conference and Pre-Conference Event Announcement

The American Association of Textile Chemists and Colorists's (AATCC's) 2017 International Conference (IC) is a "must attend" event, with a pre-conference LED Lighting and the Retail Supply Chain Tutorial and presentations featuring industry leaders, plus opportunities to build and expand your professional network. A major industry event, the 2017 IC, will be held March 28-30 in Wilmington, NC, USA. The Pre-Conference LED Lighting and Retail Supply Chain Tutorial will be held Tuesday, March 28, from 2:00-5:15 p.m., before the AATCC International Conference in Wilmington, NC.

LED light sources are becoming an important part of the retail environment. To provide guidance and assistance navigating the challenges ahead, AATCC presents the LED Lighting and the Retail Supply Chain Tutorial. Speakers will provide an overview of the application of LED sources in retail, including managing color in a global supply chain and recent activity by AATCC and other standards organizations. The tutorial session will be taught by the ISCC secretary, Ann Laidlaw, ACL Color Consulting LLC and Roland Connelly, RoLyn Group Color Consultants. The tutorial is not included with the conference registration. A discounted tutorial registration fee is available to individuals attending the AATCC International Conference (IC).

The 2017 IC features a keynote presentation, educational tracks, a poster session, networking receptions, and the Awards Luncheon, where AATCC's most prestigious awards will be presented.

Joe Quinn, Senior Director, Walmart Public Affairs and Government Relations, will provide the keynote presentation entitled "Walmart: Investing in American Jobs."

Three concurrent educational tracks reflect the Association's three Interest Groups:

- Concept 2 Consumer® (C2C)

Sessions in the C2C track will focus on advances in digital printing and product design, standardizing in a colorful world, designing products—quality, care, sustainability and creativity, and approaching business for growth and innovation.

- Chemical Applications

The Chemical Applications track will address advances in dyeing technology, polymer and fiber modifications, odor management & evaluation, and the Herman and Myrtle Goldstein Student Paper Competition.

- Materials

Presentations in the Materials track will include natural and nature-inspired, healthcare, protective and military, and materials analysis.

Tabletop exhibits and sponsorship opportunities are available to promote a company's presence at this event. The sponsorships include sponsoring a morning break, carving station, Welcoming Reception, educational track, exit drawing giveaway, and more.

The conference, which will be held at the Hilton Riverside in Wilmington, is open to anyone who would like to attend. For more details regarding the educational tracks, accommodations, or to register for AATCC's Pre-Conference Event and/or the 2017 International Conference, visit www.aatcc.org/ic/.

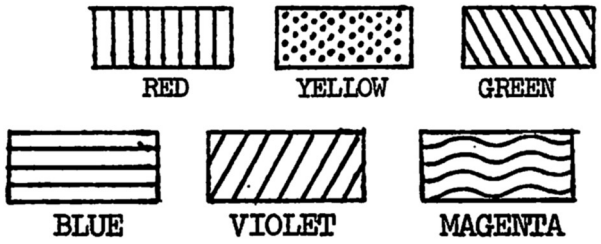
Squid Can Communicate by Changing Skin Colors and Patterns

Squid and other cephalopods communicate with each other for mating and fighting by changing colors and patterns of their skin. Their huge brains allow them to accomplish this. Chun-Chin Chia, a neuroscientist from National Tsing University in Taiwan discovered this by stimulating muscles controlled by the optic lobe in an oval squid. Squid can simultaneously exhibit different patterns and colors because each body part has its own control. So far 14 patterns (kind of like an "alphabet") have been discovered to repeat in a "mosaic within the optic lobe". It only takes one second for a squid to switch to a new pattern or color. For more information on these fascinating squid characteristics, please visit: https://www.wired.com/2017/02/squid-communicate-secret-skin-powered-alphabet/

A Blast from the Past: ISCC Newsletter 50 Years Ago

Number 186 – January - February 1967 on ISCC website

This 1967 issue is 19 pages long. There are quite a few articles worthy of note in this newsletter. An article called "Color in Black and White" describes Don F. Hill's black and white coding system for the six hues, red, yellow, green, blue, violet and magenta:



It is fascinating to read Hill's rationale for picking these symbols for each hue and further using these 6 coded symbols to represent about 200 colors.

By far, the most interesting article of this newsletter is "Walt Disney: Entertainer Nonpareil". Walt Disney was never an ISCC member, but it took a letter from H.S. Busby to Randall M. Hanes (Editor) via Dorothy Nickerson to convince the Editor that Walt Disney's creations applying "light, shade, color and its relationship to life should be recognized by ISCC". Most of what the Editor published came from The Art of Animation[1] and was written by Bob Thomas, who specifically called out how color was introduced and used in animation:

http://blog.truffleshuffle.co.uk/index.php/2013/05/did-you-know-xoxo/

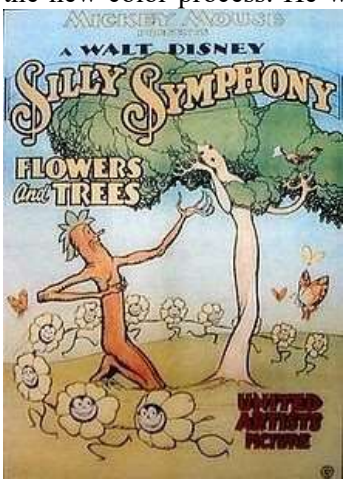
"If there was any medium that cried out for color, it was animation. Here was opportunity for unlimited use of color in dramatic and artistic terms. But color in animation had to wait until science made it possible.

"Early attempts at color in cartoons were meager. Although some live-action films in silent days were laboriously tinted by hand on the actual film, this was economically unfeasible with cartoons. They were still program fillers that had to be turned out in black and white as cheaply as possible.

"A suggestion of color was sometimes used by employing tinted film stock. Blue film might be used for a night scene, red for a big fire.

"Walt was halfway through a new Silly Symphony called 'Flowers and Trees' when he saw tests of Technicolor's new three-color process. 'That was what we'd been waiting for', he comments. 'When I saw those three colors all on one film, I wanted to cheer.'

"'Flowers and Trees' was a natural for starting the new color process. He wanted to junk what had been done in black and white and start anew. The story was a springtime scene with plenty of flowers, trees, birds, and sky to provide color appeal. Walt convinced Roy they should make a two-year exclusive deal for the use of the Technicolor process in cartoons.



https://en.wikipedia.org/wiki/Flowers_and_Trees

"The studio was pioneering all the way through 'Flowers and Trees'. Color had been used to give more tone to the black and white shorts, but its extensive use on celluloid had never been attempted in animated films.

"The colors of 'Flowers and Trees' may seem crude by today's standards, but they were immensely effective in 1932 when the impact of color was first being felt by movie audiences.

"The advent of color brought a new dimension to animation--and also many problems. It was simple to make characters legible in cartoons before color--the outlined figures would naturally 'read well' before a white background.

"A red character against a purple background might induce biliousness. A green figure standing before a green tree might disappear into the background foliage.

"The issue is often met by keeping the characters in lively colors and graying out the backgrounds. "'Look out the window and you will find there is gray in everything—the trees, the sky, the mountains', points out Art Riley. 'By painting our backgrounds with overtones of gray, we can make the scenes look natural and allow the animated figures to be legible.'

"Gray need not be a somber color, he adds. Warmth

continued on next page

A Blast from the Past continued

can be found in the gray-violets and gray-greens.

"Sometimes the formula can be reversed. An effective scene in 'Snow White' was created when the dwarfs were portrayed marching home from the mine. Their small figures were pictured in gray silhouette against a brilliant sky.

https://en.wikipedia.org/wiki/Heigh-Ho

"Color was not so much a problem in the shorts, in which a few minutes of bright eye-appeal could be a delight. Features were another matter. Eighty minutes of rampaging color would be more than an audience could take. So, with the advent of 'Snow White', Disney artists had to pace themselves on color and learn to use it for the most effective dramatic purpose.

" 'Snow White' was done in muted colors, yet the coloring was extremely successful.. The triumph was in the interiors, which were underpainted in gray tones to give the woodwork a rich, fairy-tale quality.

http://www.bedtimeshortstories.com/snow-white-and-the-seven-dwarfs-short-story

"With 'Pinocchio', the studio became a little bolder with colors, realizing the public could accept brighter tones, but still hesitated to use the more garish hues.

http://movieweb.com/pinocchio-live-action-movie-disney/

" 'Some critics accuse us of using color to create penny postcard kind of pictures', says Walt. 'Maybe they are right. But I'm glad that ninety percent of the people don't agree with them.'

"Colors in Disney features are not chosen with the simple ease of merchandising a postcard. They are the result of much study and discussion. Usually, between two and six combinations of colors are prepared for each sequence. The final decision is made by a group consisting of the director, layout man, background artist and color model supervisor. The latter is a girl from the Ink and Paint Department who acts as liaison between the production unit and Ink and Paint.

"The subject of a feature often keys the colors, just as it supplies the style of backgrounds. 'Bambi', for example, immediately suggests the uses of greens and browns for the forest scenes. The colors

http://disney.wikia.com/wiki/File:Bambi2-disneyscreencaps.com-7314.jpg

were often muted, as they would be in a real woodland setting.

'"The Disney artists have even employed the absolute absence of color for startling contrast. That was done in 'The Sorcerer's Apprentice', when Mickey first got into trouble over the misuse of magic powers.

"After a fierce struggle, he finally hacks up the broom that has been persistently fetching pails of water. The scene turns a deathly black and white, which in Technicolor has overtones of dark brown.

"Mickey shuts the door with great relief. But then the music begins to thump, like the sound of a revived heartbeat. When the door opens, a bright yellow shaft of light cuts through the gloom, signifying that life remains in the broken broom. And each tiny particle becomes a new broom, marching forward in a sunshiny glow. *continued on next page*

A Blast from the Past continued

https://50greatestscenesindisneyhistory.wordpress.com/2012/05/07/50-the-sorcerers-apprentice/
(Reference for both Sorcerer's Apprentice images)

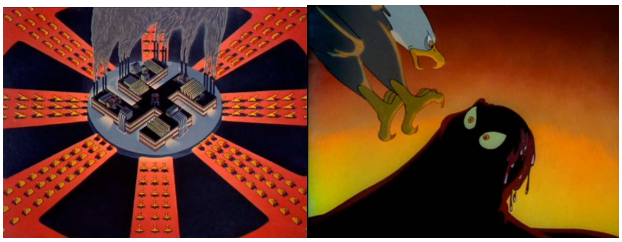
"One of the joys in using color in animation lies in the fact that you need not stick to reality. Striving for an other-worldly effect of mythology, the artists of the 'Pastoral' sequence in 'Fantasia' painted trees,

https://quixotando.wordpress.com/2011/05/19/24-frames-the-pastoral-symphony-fantasia-hamilton-luske-jim-handley-ford-beebe-1940/

mountains and skies in any color except what they would normally be.

"Through experience and study, the Disney artists have discovered which colors are most effective for certain uses. Blue is a restful color; it can be used in large amounts without displeasing. It is cool to the eye.

"Red suggests strong emotion--blood, battle, fire. Coupled with black, it can have an impact of violence. This combination was used to great effect in the wartime feature, 'Victory Through Air Power'.



https://forgottenfilmcast.wordpress.com/2012/02/07/victory-through-air-power/

"Purple is a symbol of royalty. Green denotes growth. The light, fresh green is useful for portraying spring, the warm, darker green for summer. The golden hues suggest autumn. Yellow brings to mind sunshine and life. And so on through the chromatic scale. Each color has a vital role to play, adding up to the dramatic whole."

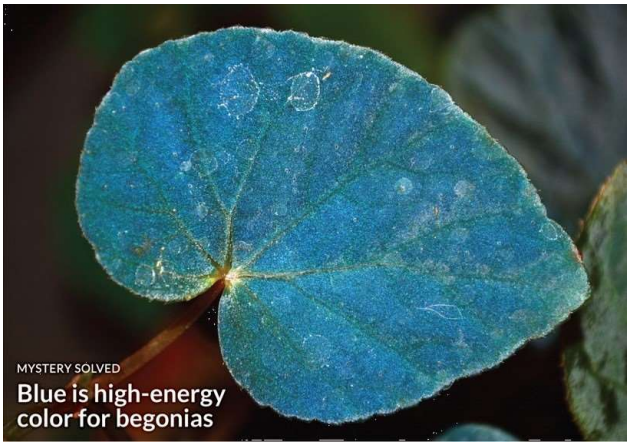
I hope you enjoyed this exploration of Walt Disney's use of color in animation as much as I did. I hope I brought the 1967 article alive by using images to illustrate the points that were being made. Walt Disney will live on in our hearts through the colors, scenes and characters that he created for us!

Reference:

1. "The Art of Animation, by Bob Thomas with the Staff of the Walt Disney Studio. Golden Press. Excerpts by permission of Walt Disney Productions."

Paula J. Alessi, *ISCC News Editor*

Blue Begonias?



Have you ever seen iridescent blue leaves on a begonia plant? Such plants contain a 'photonic crystal' that reflects blue light while absorbing red and green to help the begonia be a better energy producer. This comes from *Science News* December 10, 2016. For more information, please see: http://bit.ly/2h3q1wd

refractions
seemingly random musings on color

Women Who Created a Chromatic World:
Mary Gartside and Emily Noyes Vanderpoel

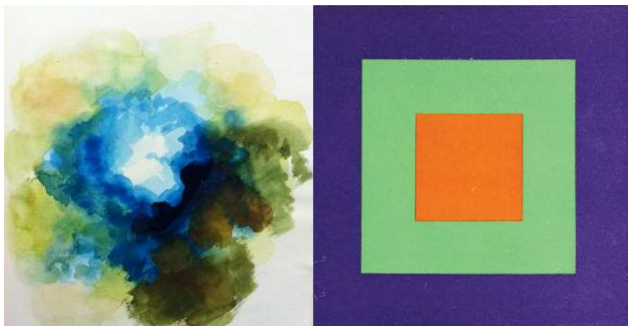


Fig 1: (left) *Blue*, Mary Gartside, from 'An essay on light and shade', 1805. Image: Alexandra Loske. (right) Emily Noyes Vanderpoel, *Plate V - Advancing and Retiring Colors* , Color problems; a practical manual for the lay student of color (1902) Hathitrust.org.

In *"Why Have There Been No Great Women Artists?"* (1971)[1], the feminist art historian Linda Nochlin turned the commonly accepted ideas of genius upside down. She demonstrated how greatness has as much, if not more, to do with social access (education, current ideas and trends, patronage, distribution etc.) as it does with unique traits and abilities. For the same reason that there are no 'famous Eskimo tennis players', women were often absent from the esteemed canon of Western art and science: the history of color and color theory is no exception. But recent scholarship[2] has begun to identify women who were actively involved in color research and whose insights and ideas have prefigured later developments more often associated with men. Mary Gartside in England, and Emily Noyes Vanderpoel in America are two such women. They both published books on color theory in their lifetimes, and characteristically presented their work as painting manuals under the guise and genre of flower painting and the decorative arts – areas befitting to women of their time. But these were more than the traditional 'manuals for ladies'. They were works of great originality and learning, and in many ways ahead of their time. Their ideas on color focused primarily on the phenomenology and experience of color, on color harmony, modulation and color relationships, ideas that prefigured some of the concepts and approaches to color theory that were later taken up and popularized by the other sex. Besides the content; however, both are remarkably similar for the striking beauty and originality of approach in their abstract and non-representational color 'illustrations' (Fig. 1).

Mary Gartside published three books on color in her lifetime. The most well known, *An Essay on Light and Shade* (1805)[3] presents an approach to color that, quite independently, arrived at many of the same conclusions as Goethe did in his *Zur Farbenlehre*, of a few years later, such as "the effect of colour combinations, the significance of light and shade in relation to tints, and the eye of the beholder as the centre and origin of colour perception."[4] Gartside's book was one of the earliest texts to divide colors into warm and cool, and to focus on the sensory effects of colors and their various combinations[5]. One of the most striking and original features of the book is the series of hand painted color 'blots' (Figs. 1 and 2) that accompany each color section, visually demonstrating various colour harmonies and contrasts. They are annotated with letters and symbols and betray a level of discernment and discrimination that is not surprising considering her work with flowers and painting. Additionally, they have been recognized as probably the earliest examples of abstract art[6], predating Kandinsky by nearly 100 years! Gartside's approach was practical, based as it was in the experience and use of color and is recognized today as bridging the gap between the more scientific approach of Newton and the experiential approach of Goethe.

Fig 2: Mary Gartside, (left) *Color circle*. (right) *Crimson*. From *An Essay on a New Theory of Colours, London,* 1808. Images: Alexandra Loske.

continued on next page

Women Who Created a Chromatic World continued

Nearly a century later, the American Emily Noyes Vanderpoel, a respected author on porcelains and other applied and plastic arts, published a curious book, *Color problems: A practical manual for the lay student of color* (1902)[7] .

Fig. 3: (left) Emily Noyes Vandepoel. *Color analysis of an antique rug*, Color Problems; a practical manual for the lay student of color (1902) Hathitrust.org. (right) Mrs. Emily Noyes Vanderpoel. Photo: Litchfield Historical Society.

The book provides a comprehensive overview of the main ideas of color theory at that time, as well as some original approaches to color analysis and interaction. Her book is lavishly illustrated with a great variety of color images, and like Gartside, displays a remarkable inventiveness. One example of such originality is a series of gridded squares (10 x 10) that analyze the proportions of color derived from actual objects (Fig.3), an approach ubiquitous in art departments today. Other examples (Fig.1) deal with color interactions in a square format that presage the iconic work of Josef Albers' *Homage to the Square* some fifty years later.

Though they never achieved the recognition and respect in their lifetime that their work deserved, these women are testaments to the human spirit, one that says - even in the remote tundras of the arctic, great tennis players are waiting to be discovered!

References

1. From *Art and Sexual Politics: Why Have There Been No Great Women Artists?* (eds. Thomas B. Hess and Elizabeth C. Baker; New York, Macmillan, 1971)
2. I am indebted to the work of Dr. Alexandra Loske for her work on Mary Gartside (http://www.sussex.ac.uk/profiles/107019). Thanks to John Ptak at *JF Ptak Science Books* for his blog on Emily Noyes Vanderpoel. (http://longstreet.typepad.com/thesciencebookstore/2010/12/what-color-is-an-unintentional-modernist-masterpiece-of-book-illustration.html)
3. Gartside, Mary, *An Essay on Light and Shade, on Colours, and on Composition in General* (London, Printed for the author, by T. Davison, and sold by T. Gardiner, 1805).Hawthorne, J. G., & Smith, C. S. (1963). *On Divers Arts: The Foremost Medieval Treatise on Painting, Glassmaking, and Metalwork*. Courier Corporation.
4. Loske, Alexandra (2010) *Mary Gartside: A female colour theorist in Georgian England.* Journal of Art History and Museum Studies, 14. pp. 17-30. ISSN 2041-1987 http://sro.sussex.ac.uk/2510
5. A. Bermingham, Learning to Draw: Studies in the Cultural History of a Polite and Useful Art (New Haven, CT: Yale University Press, 2000) 218.
6. R. Rosenberg and Max Hollein, eds., Turner – Hugo – Moreau. Entdeckung der Abstraktion (Munich, Hirmer Verlag, 2006).
7. https://archive.org/details/colorproblemspra00vand

Carl Jennings
University of Hawai'i

Please visit Carl's blog at http://cjenning.wix.com/refractions for comments and feedback on his articles!

Can Color Vision Work Like Coloring in a Black & White Picture?

This is a question discussed by Tina Hesman Saey, in *"Color Vision Strategy Defies Textbook Picture", ScienceNews* Vol. 190, No. 8, October 15, 2016. To view the complete article, please go to: https://www.sciencenews.org/article/color-vision-strategy-defies-textbook-picture?mode=magazine&context=192406

HUE ANGLES

(Send contributions to mbrill@datacolor.com and see http://hueangles.blogspot.com))

Nuances of Blue Vision

In the Jan/Feb 2007 issue (#425, p. 3) of *ISCC News*, I described a personal journey with Benham disks under colored lights. The below testimonial describes a journey that has a point of similarity (a variety of saturated colors evoked by a flickering flame), but which is offered with complete anonymity of the author, for reasons that will be obvious.

"I just read a fascinating article by Esther Inglis-Arkell at http://io9.gizmodo.com/why-viagra-tints-your-vision-blue-1685176169. The article begins with the question: 'One of the lesser-known side effects of Viagra is blue-tinted vision. How does a pill that's supposed to help men maintain an erection cause them to see the world as too blue?' The answer is that Viagra inhibits two related enzymes in the human body, phosphodiesterase 5 and phosphodiesterase 6. The effect of inhibiting the former is the desired effect of smooth-muscle relaxation so as to promote an erection. The effect of inhibiting the latter is to enhance visual sensation by the rods. I accept all the biochemistry proffered here, but I believe the visual effect of Viagra deserves a personal description, perhaps similar to the journey of Don Juan (by Carlos Castaneda or otherwise…)

"To say 'blue-tinted vision' is misleading, especially given the article's graphic of a blue-tinted pair of sunglasses. The light always appears brighter than expected, rather than darker as suggested by the sunglasses.

"Here are my own experiences, which may relate to rod vision but through a rather complicated mechanism.

"Within about an hour after taking the pill, if I sit in a relatively dark room and look at a patch of daylight through a window, a blue-white haze suffuses the patch and extends beyond its boundaries. Within the patch itself, the white is very bright and looks as if the scene outside is covered by an optical brightening agent and illuminated by a UV-active light source. Although the effect is stronger for peripheral vision, it persists when I stare directly at the patch.

"There is also an artifact due to moving objects, which I call the *bright spider web* effect. If I suddenly move a paper or other object that has an edge, an electric blue-white image of the edge will remain for about half a second. It is thin, possibly with corners (following the shape of the edge), and seems to reside in my peripheral vision: I have not had a direct look at it with my fovea. It doesn't occur every time an object moves in my visual field, but it can replicate multiple times in a single motion---hence the web-like appearance. I'll need to study it further. One exaggerated form of the effect occurred recently: When I moved my forearm in front of a bright background, a fuzzy, electric blue-white stripe remained that was much wider than the bright spider web: at least half an inch across, and sharper on the side where my forearm was. Like the spider web, it persisted for perhaps half a second. I found I could repeat the effect.

"Finally, there is an effect that seems to have nothing to do with blue tints. While I was sitting at night in front of a bonfire at a spa, the flickering flames elicited bright, Benham-like colors: Saturated greens, reds, yellows, and blues, winking in and out as the flicker went on. I knew this was the result of the pill because I had experienced no such effect upon visiting that fire the previous night without having taken the pill.

"In closing, I can confirm the reassurance of Inglis-Arkell: The visual effects of Viagra, like the performance-enhancing aspects, wear off after a few hours. Not to worry. Enjoy the experience."

Anonymous

Looking through these glasses will *not* produce the blue effect described here [image from Inglis-Arkell, *op. cit.*].

COLOR research and application

IN THIS ISSUE, February 2017

Welcome to a new year and the first newly expanded issue of *Color Research and Application*. We'll begin the issue by looking at colorimetry and basic measurement techniques. Then we move into application fields such as packaging, displays, lighting, textiles, and finally close with user responses. There is a lot here, so let us get started.

Tristimulus values, as defined by the International Commission on Illumination (CIE) in 1931, are the result of the calculation process that translates spectral readings to colorimetric responses. Therefore, they are the basis for much of color science. However, over the years as instrumentation has changed, the options in measurements affect the calculations of tristimulus values. Zhifeng Wang, Jiqiang Li, M. Ronnier Luo, Michael R. Pointer, Manuel Melgosa Latorre, and Changjun Li report on an extensive study of "Interpolation, Extrapolation and Truncation in Computations of CIE Tristimulus Values" and identify the procedures that provide the highest accuracy.

One of the changes in color measurement instrumentation over the years is the light sources used. With the light sources currently available, it is possible to have a much larger amount of ultraviolet light than with the traditional incandescent sources. This change especially affects the measurement of optically brightened materials, such as textiles and paper, which also have come into wider use. Having too much or too little UV radiation included in the measurement affects the usefulness of the instrument to predict the appearance of the paper or textile. In our next article, Li Yang presents a "Detailed Analysis of the UV Adjustment Techniques Used in Paper and Graphic Industries." In the article, he compares how accurately the total spectral radiance factor corresponds to the single assigned value assigned by an international reference transfer standard under three different illuminants for the conventional UV-adjusting with a moveable UV filter and numerical UV-filtering.

Continuing with the discussion of the amount of UV energy in the instrument illumination system, our next article is on the "Evaluation of Inter-Model Agreement Using ISO 13655 M0, M1 and M2 Measurement Modes in Commercial Spectrophotometers." When a paper sample contains brightening agents, it has been seen that different instruments **produce different measurements for the same sample** because the UV component in a measuring instrument lamp was not well enough defined for measurement and calibration. Now four measurement conditions for the UV component, identified as M0, M1, M2, and M3, are defined by the International Organization for Standardization in *ISO 13655:2009 - Graphic technology — Spectral measurement and colorimetric computation for graphic arts images*. The team of Abhay Sharma, Elaine Leung, and Richard Adams describe each of the measurement conditions and evaluate a newly available printed reference material, called the ChromaChecker™ Instrument Inspector, in order to assess its suitability as a "printed" Certified Reference Material.

Staying with printing, in our next article, Danny C. Rich, Robert T. Marcus, Veronika Lovell, and Ted Kreutz discuss "Modeling the Appearance of Metal-like Packaging Printing." For roughly 50 years, metallic flake pigments have been used in automotive paints to produce a distinctive appearance. However due to the very thin layers of ink used in printing, the addition of metallic flakes to inks did not have the same effect. It is only recently that advances in vacuum deposition of metals onto thin pieces of plastic film that are then post coating cut into very fine particles allows production of a pigment which can produce a film with almost any degree of mirror-like appearance. The authors examined many methods of measurement and evaluation of metal-like printing instrumentally and compared them to observers' evaluations of brilliance. They present a reliable scale for the measurement of metallic brilliance developed from readings of the specular reflectance factor and show that this scale is consistent with visual ranking of the percept of brilliance.

Our final article in the field of printing on packaging deals with the challenge of designing the packaging for transparent liquids. The package has many requirements: it must tell the buyer what is in the package and often has information about amount and content that is prescribed legally. However, it also should entice the potential buyer to pay attention to the item. So the design of the packaging and its labels and choice of color can be very important. This color selection can be even trickier when the container is clear and the buyer is able to see the color of the product inside. Therefore, Rupert Andrew Hurley, Rachel Randall, Liam O'Hara, Charles Tonkin, and Julie Christine Rice discuss the "Color

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Harmonies in Packaging."

Next, we move to a challenge in displaying images. The smartphone has become our little portable computer that seems indispensable to its user. We carry them everywhere and want to use them for many more purposes than just making a phone call. We need to be able to see the display whether it is bright sunlight outside or when we are awakened in the dark in the middle of the night. Our next authors took on the darker side of this challenge. Nooree Na and Hyeon-Jeong Suk decided to try to determine the optimal display color for comfortable use of smartphones at night under low illuminance, while not distorting the perceived quality of displays. In "A Optimal Display Color for Nighttime Smartphone Users" they found that a yellowish white with the RGB values of 255, 255, and 230 was the optimal display color for nighttime smartphone users regardless of display luminance or contents. This color also supports physiological comfort by reducing the blue light, which lowers the adverse effect on our biological clock, while providing psychological satisfaction.

Digital cameras are widely used to collect images of daily life, but can they be used as color measuring instruments? It must be pointed out that while they collect RGB data for each pixel in the scene, that data is specific to the camera used and the light source that is illuminating the scene at the moment the image is recorded. If the device-dependent RGB responses are accurately transformed into device-independent color values, then a camera can be used to measure the color information of an object. Several approaches have been taken to solve this problem. In our next article, "Estimating Spectral Reflectance from Camera Responses Based on CIE XYZ Tristimulus Values under Multi-Illuminants," Xiandou Zhang, Qiang Wang, Jincheng Li, Xiaohui Zhou, Yuechuan Yang, and Haisong Xu propose a method in which an image only has to be captured once under a single light source, and the CIE XYZ values under different illuminants are predicted from RGB camera responses. Then the spectral reflectance of the object is estimated based on the predicted CIE XYZ values. From their experimental results, they find that their proposed method compares favorably with currently recommended methods.

Our next article discusses the "Evaluation of the Visibility of Colored Objects under LED Lighting with Various Correlated Color Temperatures." Seongkwan Hong, Intae Kim, Yusin Kim, Hyunsun Kim, Arom Sohn, Anseop Choi, Minki Sung, and Jaeweon Jeong propose that the visibility of colored objects depends on a combination of the color brightness and the appearance perception of colored objects. LED sources will have different spectral power distributions than conventional light sources even when they have the same correlated color temperature. Thus, objects illuminated by the LED source could differ in visibility than when illuminated with conventional sources. So the authors performed experiments to 1) identify the relationship between luminance values and subjective brightness perception, 2) find subjective evaluations of the overall visibility concept of colored objects and 3) relate luminance calculation and measurement to the subjective response regarding a "visibility" concept of colored objects, including color appearance and brightness perception. The results of these experiments are reported in their article.

Ever since Berlin and Kaye's seminal study of basic color terms in culture, researchers have been expanding these concepts to other languages and cultures, and extending the ideas within a culture. In our next article, Liliana Albertazzi, and Osvaldo Da Pos focus on the Italian language and ask the following questions: 1) What colors are associated with particular words in relation to a specific language? 2) Do some words of that language denote colors which are particularly well defined? or 3) Do some words of that language denote colors which are confused with others? In "Color Names, Stimulus Color and Their Subjective Links," they report the strong consensus on the names of four basic colors, which correlate well with the unique hues and also found four colors exactly intermediate to these unique hues that had a particular focal color. They conclude that the most interesting finding, however, is that for Italian speakers these four mixed colors with their specific names (Lime, Turchese (Turquoise), Viola (bluish Purple) and Arancione (Orange) fall perceptually in the middle of each of the four quadrants formed in the hue circle by the four unique hues.

A color design/selection system for predicting the color trend based on aesthetic measures is proposed in our next article. Color trends are important in selecting the colors for the upcoming generation of products whether it is the next year's cars or the next spring season's clothing line. Shih-Wen Hsiao and Meng-Hua Yang use an analytic hierarchy process theory to evaluate the weights for the four major consumption style factors: Economy, Education, Culture, and Technology. They also developed images using the Practical Color Co-ordinate System (PCCS) and an aesthetic measure theory. Then the

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relationship among the consumption style factors and the 3-colored images of the product in question were used to construct a color trend based on market requirements. In "A Methodology for Predicting the Color Trend to Get a 3-Coloured Combination," they describe the technique and show how it is used in the case of automobiles. However, it can be used for other products as well.

In the textile industry, designers often spend much time and effort in choosing proper colors to get better visual effect for clothing or other textile products such as furniture upholstery or drapes. Even after the designer has in mind what is wanted, it may take much effort to transition to the actual fabric. Dyeing and re-evaluating with possible changes to get the desired effect, takes time and costs money. Thus, it is best if most of the work can be accomplished in the image stage. In our next article, "Recoloring Textile Fabric Images Based on Improved Fuzzy Clustering," Zhe Zou, Hui-Liang Shen, Xin Du, Si-Jie Shao, John H. Xin propose a new recoloring method. Recoloring, or colorization, is a popular image editing technique, which aims to modify or change the color appearance of an image. The experimental results show that the proposed method can produce natural and faithful color appearance on the images both printed and yarn-dyed fabrics, and outperforms the state-of-the art methods currently in use.

Does the color of the pill or capsule that a person takes affect the expectation of the consumer on the effectiveness of the drug? We know that color affects people's cognition, perception, and emotional response, and that certain colors are associated with specific responses, e.g., blue and green associated with quiet and calm. So in our next article, Da Tao, Tieyan Wang, and Tieshan Wang discuss their experiment on the "Effects of Color on Expectations of Drug Effects: a Cross-Gender and – Cultural Study." They asked 80 Chinese participants to classify each of seven single colored capsules and six differently colored two-piece capsules into one of four classifications of drug effects and then compared their results with studies involving participants with different nationalities. To quote the authors, "Our findings emphasized the importance of color in drug design and administration in support of drug differentiation, medication adherence and drug efficacy, and suggest gender and cultural implications on the basis of color to achieve better drug effects."

Luan Nguyen and Jacques Teller are the authors of our final article in this issue. Working in Local Environment Management and Analysis in a Department of Architecture, Geology, Environment and Construction, they find that the challenge is to provide statistical answers to these two questions: how is color organized in an urban environment? and how does it develop its own structure in the city? So, in "Colour in the Urban Environment: a User-Oriented Protocol for Chromatic Characterization and the Development of a Parametric Typology," they present a protocol that can be used to characterize chromatic attributes of an urban area and instrumentation, which they developed that allows the assessment of the homogeneous and consistent features of an urban district.

Finally, Michael H. Brill provides an erratum for the article "Calibrating Low-Scattering Samples using Kubelka-Munk Model" [Color Res Appl 2016;41:399-401]. Then we close this issue by briefly mentioning three new publications from the CIE: CIE Technical Report 220:2016 Characterization and Calibration Methods of UV Radiometers; CIE x042:2016 Proceedings of CIE 2016 "Lighting Quality & Energy Efficiency; and CIE s x043:2016 Proceedings of the 4th CIE Expert Symposium on Colour and Visual Appearance.

Ellen Carter
Editor, Color Research and Application

ISCC Election Results

The voting for new Officers and Directors closed in early January, 2017. Our new President-Elect is **Renzo Shamey** from North Carolina State University. Our new President is **Jerry Dimas** from Color Communications, Inc. Our new Past-President is **John Conant** from Aerodyne Research. Inc. Our dedicated Secretary remains **Ann Laidlaw** and the office of Treasurer is still open. Many thanks to **Cameron Miller** for continuing to do the job until we find his replacement. These Officers will serve two-year terms from January 2017 to December 2018.

The three new Directors are **Steve Linberg** from Amherst, Massachusetts, **Maggie Maggio** from Smashing Color, and **Anthony Stanton** from Carnegie Mellon University. These Directors will serve three-year terms from January 2017 to December 2019.

If you would like to contact any of the ISCC Officers or Directors, please see their contact information on page 2 of this newsletter or on our website at http://iscc.org/organization/bod.php

Please enjoy one last excerpt from the 1967 ISCC Newsletters Number 186:
"The following 'Peanuts' strip was drawn for Louis A. Graham (Individual Member of ISCC) after correspondence with Charles M. Schulz, and is reproduced here with the permission of the creator of 'Peanuts'."

Calendar

2017

Mar 15-17 **2nd International Workshop on Computational Models of the Visual Cortex (CMVC) as part of the Bio-inspired Information and Communication Technologies (BICT) Conference,** Hoboken, New Jersey, Info: http://bionetics.org/2017/show/home

Mar 28-30 **AATCC 2017 International Conference and Pre-Conference Event,** Hilton Riverside, Wilmington, NC, Info: www.aatcc.org/ic/
http://www.ivl.disco.unimib.it/cciw17/

Mar 29-31 **Computational Color Imaging Workshop (CCIW'17),** Milan, Italy, Info: http://www.ivl.disco.unimib.it/cciw17/

May 8-12 **3rd International Conference on Applications in Optics and Photonics (AOP 2017),** Faro, Algarve, Portugal, Info: http://www.aop2017.org

May 15-18 **IS&T Archiving Conference,** Riga, Latvia, Info: http://www.imaging.org/archiving

May 19-24 **17th Annual Meeting of the Vision Sciences Society (VSS 2017)** Trade Winds Island Resorts, St. Pete Beach, Florida, Info: http://www.visionsciences.org

Jun 6-7 **ASTM E-12,** ASTM International Headquarters, West Conshohoken, PA, Info: www.astm.org

Jun 13-17 **Vision in the Real World,** Center for Vision Research (CVR), York University, Toronto, Canada, Info: http://cvr.yorku.ca/conference2017

Jul 13-17 **13th Asia Pacific Conference on Vision,** Tainan City, Taiwan, Info: http://apcv2017.conf.tw/

Jul 31-Aug 2 **CORM/ISCC 2017 Joint Technical Conference,** Lighting Research Center, Renssalaer Polytehcnic Institute, Troy, NY Info: acl99colors@yahoo.com

Aug 10-11 **"The Thinking Eye… The Seeing Brain" Conference, London, UK,** Info: http://visionscience.conferenceseries.com/

Aug 27-31 **40th European Conference on Visual Perception (ECVP),** Berlin, Germany, Info: http://www.ecvp.org/2017/

Sep 11-15 **25th Coloring and Imaging Conference,** Lillehammer, Norway, Info: color@imaging.org

Oct 16-20 **AIC 13th Congress,** International Convention Center, Jeju, Korea, Info: www.color.or.kr

Oct 23-25 **CIE 2017 Midterm Meeting,** Jeju Island, Korea, Info: www.cie.co.at

Oct 26-28 **CIE Division 1 and 2 Meetings,** Jeju Island, Korea, Info: www.cie.co.at

2018

Jan 24-25 **ASTM E-12,** Sheraton, New Orleans, LA, Info: http://www.astm.org

Jun 11-15 **Joint ISCC/AIC Munsell Centennial Celebration,** MassArt, Boston, MA

Oct 1-5 **AIC Interim Meeting, Colour and Human Comfort,** Portuguese Colour Association, Lisbon, Portugal, Info :https://www.facebook.com/apcor.org

ISCC Sustaining Members

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

Avian Technologies	www.aviantechnologies.com	603-526-2420
Datacolor	www.datacolor.com	609-895-7432
Hallmark	www.hallmark.com	816-274-5111
Hunter Associates Laboratory, Inc.	www.hunterlab.com	703-471-6870

We could still use your help!

ISCC has positions in the organization that need filling. We can help identify a place for you depending on your skills and desires. Contact Nomination Chair John Conant, jconant@aerodyne.com

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ISCC Member Bodies

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

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

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

American Association of Textile Chemists and Colorists (AATCC)
American Society for Testing and Materials International (ASTM)
American Society for Photogrammetry & Remote Sensing (ASPRS)
The Color Association of the United States, Inc. (CAUS)
Color Marketing Group (CMG)
Color Pigments Manufacturing Association (CPMA)
Council on Optical Radiation Measurements (CORM)
Detroit Colour Council (DCC)
Gemological Institute of America (GIA)
Illumination Engineering Society of North America (IESNA)
International Colour Association Environmental Colour Design Study Group (AIC – ECD)
International Color Consortium (ICC)
National Association of Printing Ink Manufacturers (NAPIM)
Optical Society of America (OSA)
The Society for Color and Appearance in Dentistry (SCAD)
Society for Information Display (SID)
Society for Imaging Science and Technology (IS&T)
Society of Plastics Engineers Color and Appearance Division (SPE/CAD)