

# Mark D. Fairchild

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<b>Physical:</b>	Munsell Color Science Laboratory College of Science Rochester Institute of Technology One Lomb Memorial Drive Rochester, New York 14623 +1 585 475 2784
<b>Education:</b>	Ph.D., 1990                      M.A., 1989 Vision Science (Human Sensation and Perception), URochester  M.S., 1986                      B.S., 1986 <i>summa cum laude</i> Imaging Science, Rochester Institute of Technology
<b>Appointments:</b>	June 2017 - present      Rochester Institute of Technology Founding Head, Integrated Sciences Academy Professor & Director, PoCS / MCSL  Aug. 2010 - May 2017      Rochester Institute of Technology Associate Dean of Research & Graduate Education, College of Science Professor & Director, PoCS / MCSL <i>Color Science Program Director, 2008 - 2011</i> <i>Director, Munsell Color Science Lab, 2013 - 2017</i> <i>Director, Program of Color Science, 2013 - 2017</i>  July 1999 - Aug. 2010      Rochester Institute of Technology Professor, Imaging Science <i>Director, Munsell Color Science Lab, 1996 - 2008</i> <i>Xerox Professor of Color Science, 2003 - 2006</i>  July 1997 - Aug. 1998      Cornell University Visiting Associate Professor, Computer Graphics  July 1994 - June 1999      Rochester Institute of Technology Associate Professor, Imaging Science <i>Color Science M.S. Coordinator, 1991 - 1994</i> <i>Imaging Science Ph.D. Coordinator, 1994 - 1996</i> <i>Director, Munsell Color Science Lab, 1996 - 1999</i>  July 1990 - June 1994      Rochester Institute of Technology Assistant Professor, Imaging Science <i>Awarded Tenure: September 1993</i>  July 1987 - June 1990      Rochester Institute of Technology Instructor, Imaging Science

- July 1986 - June 1987 Rochester Institute of Technology  
Instructor, Color Science
- March 1986 - May 1986 Rochester Institute of Technology  
Adjunct Faculty, Department of Color Science
- Sept. 1983 - May 1986 Rochester Institute of Technology  
Research Assistant, Munsell Color Science Lab  
Student Assistant, Chemistry Library  
Mathematics & Physics Tutor, Special Services

### **Distractions in Viticulture & Enology:**

- Cornell University Viticulture & Enology Experience, CUVÉE, 2010  
University of Adelaide World of Wine: From Grape to Glass, 2016  
University of California, Davis Wine Tasting: Sensory Techniques for Wine Analysis, 2018-19  
New York Wine and Grape Foundation, New York Wine Industry Certificate, 2017  
Society of Wine Educators Certified Specialist of Wine (*program only*), 2017-18  
Society of Wine Educators Certified Specialist of Spirits (*program only*), 2018  
Wine and Spirits Education Trust (WSET) Level 2 Award in Wines and Spirits with Merit, 2017  
Wine and Spirits Education Trust (WSET) Level 3 in Wine (*program only*), 2018  
Wine and Spirits Education Trust (WSET) Level 4 in Wine (*program only*), 2018-19

### **Biographical Sketch:**

Mark Fairchild was born and raised in Trumansburg, New York where he graduated with honors from C.O. Dickerson High School. He entered Rochester Institute of Technology as a freshman in the Photographic Science program and graduated four years later with B.S. and M.S. degrees from that program, which had been renamed Imaging Science. He was a research assistant to Prof. Franc Grum in the newly formed Munsell Color Science Laboratory. Upon completion of his B.S. and M.S. degrees, he joined the Department of Color Science at R.I.T. and currently holds a tenured faculty position in the Program of Color Science (PoCS) and Munsell Color Science Laboratory (MCSL). He undertook a Ph.D. program at Rochester's Center for Visual Science, while continuing his work at R.I.T., earning that degree in 1990 after two and a half years of study. From 1996 to 2008, he was Director of the Munsell Color Science Laboratory, overseeing significant growth and the move to Color Science Hall, which has been renamed the "Munsell Color Science Laboratory". In 2010, he was appointed Associate Dean of Research and Graduate Education of RIT's College of Science. While continuing his work as Associate Dean, he resumed leadership roles in color science in 2013 by becoming the Director of MCSL and founding Director of PoCS. In 2017, Mark became founding Head of the Integrated Sciences Academy within RIT's College of Science while remaining Director of PoCS and MCSL, which became part of the Integrated Sciences Academy. The Integrated Sciences Academy is a novel academic unit that houses multidisciplinary science programs and promotes multidisciplinary research and education. Dr. Fairchild has been actively involved in research in the areas of colorimetric measurement and standardization, color perception, color vision, color-appearance modeling, digital color reproduction, image quality, and computer graphics. He has authored more than 300 papers, presentations, and technical reports in those areas. He has also supervised the graduate research of over 50 M.S. or Ph.D. students. The third edition of his book, *Color Appearance Models*, was published in 2013, following on the publication of the successful second edition in 2004 and first edition in 1997. Mark is also co-editor of the 2016 *Handbook of Color Psychology*. He spent the 1997-98 academic year on sabbatical leave as a Visiting Associate Professor in Cornell University's Program of Computer Graphics. Additional activities, honors, and awards are listed below.

**Professional Affiliations:**

**ISCC (Inter-Society Color Council)**

*Co-Chair, IG #II, Appearance, Vision, & Modeling, 1991-1992*  
*Chair, IG #I, Basic & Applied Color Research, 1992-1995*  
*Board of Directors, 1995-1998*  
*Chair, 67th Annual Meeting, 1998 (with OSA)*  
*Program Committee, 2<sup>nd</sup> Panchromatic Conference, 2000*  
*Macbeth Award Committee, 2004-2010*  
*Liaison with OSA, 2015-Present*  
*ISCC / AIC 2018 Munsell Celebration, Papers Chair, Core Committee 2016-2018*

**OSA (The Optical Society)**

*Fellow, 2012*  
*Senior Member, 2010*  
*Voting Delegate to ISCC, 1990-2015*  
*Liaison with ISCC, 2015-Present*  
*Representative to CIE, 2003-Present*  
*Councilor, Rochester Section, 1996-1997*

**SWE (Society of Wine Educators)**

**AAAS (American Association for the Advancement of Science)**

**USNC - CIE (Commission International de L'Éclairage)**

*Chair, TC1-34, Testing Colour Appearance Models, 1991-1999*  
*Reporter, R1-24, Colour Appearance Models, 1999-2003*  
*Reporter, R8-05, Image Appearance, 2003-2008*  
*Reporter, R8-08, Image Appearance Model Framework, 2008-2010*  
*Member, TC1-27, Specification of Colour Appearance for Reflective Media and Self-Luminous Display Comparisons, 1990-2011*  
*Member, TC1-48, Revision of CIE Document 15.2 Colorimetry, 1997-2004*  
*Member, TC1-52, Chromatic Adaptation Transforms, 1998-2005*  
*Member, TC1-55, Uniform Colour Space for Industrial Colour Difference Evaluation, 2005-2016*  
*Member, TC1-56, Improved Colour Matching Functions, 1999-2009*  
*Member, TC1-60, Contrast Sensitivity Function for Detection and Discrimination, 2002-2011*  
*Member, TC1-75, A Comprehensive Model of Colour Appearance, 2009-2015*  
*Member, TC1-82, The Calculation of Colour Matching Functions as a Function of Age and Field Size, 2012-2015*  
*Member, TC8-01, Colour Appearance Modeling for Colour Management Applications, 1998-2005*  
*Member, TC8-02, Colour Difference Evaluation in Images, 2000-2011*  
*Member, TC8-03, Gamut Mapping, 1998-2006*  
*Member, TC8-08, Testing of Spatial Color Appearance Models, 2003-2008*  
*Member, TC8-10, Office Lighting for Imaging, 2006-2015*  
*Member, TC8-11, CIECAM02 Mathematics, 2007-2016*  
*Advisor, JTC10, CAM16, 2017-2017*

**SID (Society for Information Display)**

*Technical Co-Chair, IS&T/SID Color Imaging Conference, 1994*  
*Technical Committee, IS&T/SID Color Imaging Conference, 1994-2004*

**CORM (Council for Optical Radiation Measurements)**

**IS&T (Society for Imaging Science and Technology)**

*Technical Committee, SPIE/IS&T EI Image Quality & System Performance Conference, 2003-2015*  
*Color Imaging Editor, J.Im.Sci.Tech., 1999-2002*  
*Scientific Technical Committee, CGIV 2002, 2008*  
*General Chair, PICS Conference, 2003*  
*Image Science Track Chair, International Congress of Imaging Science, 2006*

**ACM-SIGGRAPH (Association for Computing Machinery-Special Interest Group on Graphics)**

*Program Committee, Symposium on Applied Perception in Graphics and Visualization, 2006-2010*

**IEEE**

*Transactions on Image Processing, Associate Editor, Special Issue on Color, 1997*  
*Workshop on Color and Photometric Methods in Computer Vision, Program Committee, 2003*

**Multispectral Color Science**

*Technical Committee, 2001*

**International Workshop on Video Processing and Quality Metrics**

*Technical Program Committee, 2006-2014*  
American Society of Cinematographers  
*Member, Technology Committee Advanced Imaging Group, 2004-Present*  
TASCII (Tsinghua University Art & Science Research Centre, Color & Imaging Institute)  
*Member, TASCII Advisory Board, 2010-Present*  
HCCB (Houston Center for Biomaterials and Biomimetics of The University of Texas Dental Branch at Houston)  
*Adjunct Senior Scientist, 2011-Present*  
AIC (International Color Association)  
*AIC2015 / MCS2015 International Scientific Committee, 2014-2015*  
*AIC2017 International Scientific Committee, 2016-2017*  
*AIC / ISCC 2018 Munsell Symposium, Papers Chair, 2016-2018*  
TandemLaunch, Inc.  
*Fellow, 2015-Present*

### **Honors, & Awards:**

2018 Nickerson Service Award (Inter-Society Color Council)  
2017 Society of Motion Picture and Television Engineers (SMPTE) Journal Certificate of Merit Award  
2012 Scientific Divulcation Award of the University of Granada (Awarded 2013)  
2012 Fellow, The Optical Society (OSA)  
2010 Senior Member, The Optical Society (OSA)  
2008 Raymond C. Bowman Award (IS&T)  
2007 Davies Medal (Royal Photographic Society)  
2003 Fellow, Society for Imaging Science & Technology (IS&T)  
2002 Macbeth Award (Inter-Society Color Council)  
1995 C. James Bartleson Award (The Colour Group of Great Britain)  
Best Paper Award, *VPQM 2010 - International Workshop on Video Processing and Quality Metrics* (Fairchild)  
Best Paper Award, *2007 ITE/SID International Display Workshops* (M. Sakurai et al.)  
MERL Best Student Paper Award, *2013 IS&T Color & Imaging Conference* (Y. Asano et al.)  
Best Poster Presentation, *2007 IS&T/SID Color Imaging Conference* (Fairchild)  
Best Poster Presentation, *2004 IS&T/SID Color Imaging Conference* (R.Patil, Fairchild and Johnson)  
10-Year Author Award, *2002 IS&T/SID 10<sup>th</sup> Anniversary Color Imaging Conference*  
Best Poster Presentation, *1997 IS&T/SID Color Imaging Conference* (G.Braun and Fairchild)  
Best Poster Presentation, *1995 IS&T/SID Color Imaging Conference* (K.Braun and Fairchild)  
Images in the RPS Collection of the National Science+Media Museum (Bradford, UK)  
Image in the ISCC/AIC Munsell 2018 Symposium Art Show (Boston)  
Xerox Distinguished Lectureship  
NYSTAR-CEIS Technology Transfer Award  
IBM Faculty Award  
Du Pont Young Professor Grant  
Numerous Industrial & Government Research Grants & Contracts  
SPSE (IS&T) Raymond Davis Scholarship  
NALC William C. Doherty Scholarship  
National Merit Letter of Commendation  
New York State Regents Scholarship  
Highest Avg. in Mathematics, Greatest Proficiency in Science (C.O. Dickerson High School)

### **Graduate Students Supervised, Topics: (\*=Ph.D.)**

Amy North, Investigation of Observer Variability in Color Matching Functions  
Mike Stokes, Colorimetric Tolerances of Digital Images  
Brian Rose, Color Logic: Interactively Defining Color in the Context of Computer Graphics  
Nathan Moroney, Color Space Selection for JPEG Image Compression  
Elizabeth Pirrotta, Testing Chromatic-Adaptation Models Using Object Colors  
Audrey Lester, Color Reproduction of CRT-Displayed Images as Projected Transparencies  
Mike Mongeon, Image Transformation into Device-Independent Color ...

Rick Alfvin, Computational Analysis of Observer Metamerism in Cross Media Color Matching  
Susan Farnand, Effect of Image Content on Color Difference Perception  
\*Karen Braun, Color-Appearance Modeling for Cross-Media Image Reproduction  
Cathy Daniels, Effect of Surround on Perceived Lightness Contrast of Pictorial Images  
Dalei Huang, Monte Carlo Simulation of 2AFC Experiments  
Jack Rahill, Sensitivity Analysis of Nayatani's Color Appearance Model  
Chris Hauf, Iris Explorer Modules for Color Appearance and Reproduction  
Alex Vaysman, Color Image Quantization and Spatial Resolution  
Mihai Cuciurean-Zapan, Color Preference Reproduction of Ink-Jet Prints  
Garrett Johnson, High-Resolution Spectral Computer Image Synthesis  
\*Fritz Ebner, Preferred Color Reproduction, Gamut Mapping, and Constant Hue Perception  
Mark Shaw, Evaluation of Color Matching Functions and Observer Metamerism  
Barb Grady, Illuminant Sensitivity of Printing Materials  
Richard Suorsa, Color Identification under Simulated Chromatic Illumination  
Kathy Loj, Impact of ICC Monitor Profile Settings on Printed Images  
Jonathan Phillips, Evaluation of S-CIELAB using Halftone Color Patches  
\*Gus Braun, Color Gamut Mapping Algorithms  
Susan Lubecki, Performance Testing of ICC Profiles,  
Sharron Henley, Color Appearance for Cross-Media Comparisons in Mixed Adaptation  
Sergio Gonzalez, Fluorescence Spectrophotometry of Printing Materials  
Michael Sanchez, Lightness of Chromatic Video Colors  
Sun Ju Park, Black-Point Adaptation  
Meredith Graham, Color Image Quantization  
Jason Gibson, Color Discrimination in Images on Various Displays  
Barb Grady, Ink Jet Ink Optimization  
Scot Fernandez, Color Preference Reproduction  
Anthony Calabria, Image Contrast Perception and Modeling  
Jason Babcock, Eye-Movements in Color Imaging Psychophysics  
David Robinson, Psychophysical Red on EP Prints  
\*Garrett Johnson, Image Quality Metrics  
Scot Fernandez, Measuring Preferences with an Image Difference Metric  
\*Qun Sun, Spectral, Portraiture and Image Quality  
Xiaoyun Jiang, Illuminant Estimation Algorithms  
Xiaoyan Song, Chromatic Noise Perception and Modeling  
Rohit Patil, Image Rendering for Print Simulation  
Jim Leland, Image Processing Bi-Spectral Fluorescence Matrices  
Jim Hewett, Computing the Appearance of Mars Rover Images  
Tim Hattenberger, Augmented Reality and Image Difference Perception  
Joseph Stellbrink, Visual Masking of Display Defects  
\*Jiangtao Kuang, High-Dynamic-Range Image Tone Mapping  
Ken Fleisher, Perceptual Image Categories  
\*Hongqin Zhang, Visualization of Spectral Image Information  
Abhijit Sarkar, Assessment of Moving Image Quality  
Stacey Casella, Expansion of Content to Fill WCG Displays  
\*Rod Heckaman, Perceptual Color Gamuts and Brilliance  
John Grim, Review of Gamut Mapping  
Ping-Hsu Chen, Lightness Perception Above Diffuse White  
\*Susan Farnand, Image Content in Image Quality Assessment  
\*Adrià Forés Herranz, Measuring and Modeling Gloss Appearance  
\*Yuta Asano, Observer Metamerism and Observer Categories  
\*David Long, Spectral Imaging in Motion Picture Science  
Christopher Thorstenson, Measuring Physiological Changes in Skin Color  
Morteza Maali Amiri, Spectral Reconstruction from RGB Images and Cone Responses  
\*Fu Jiang, HDR Appearance & Reversibility of Chromatic Adaptation

**Books:**

A. Elliott, M.D. Fairchild, and A. Franklin, Eds. *Handbook of Color Psychology*, Cambridge University Press, Cambridge, UK (2015).

M.D. Fairchild, *Color Appearance Models, Third Edition*, Wiley-IS&T Series in Imaging Science and Technology, Chichester, UK (2013).

M.D. Fairchild and M. Melgosa, *La Tienda de las Curiosidades Sobre el Color (The Color Curiosity Shop, Spanish Translation)*, Editorial Universidad de Granada (2012).

M.D. Fairchild, *The Color Curiosity Shop, Abridged Edition*, MDF, Honeoye Falls, (2011).

M.D. Fairchild, *The Color Curiosity Shop*, MDF, Honeoye Falls, (2011).

M.D. Fairchild, *The HDR Photographic Survey*, MDF, Honeoye Falls, (2008).

M.D. Fairchild, *Color Appearance Models, Second Edition*, Korean Translation, Sigma Press, Seoul (2007).

M.D. Fairchild, *Color Appearance Models, Second Edition*, Wiley-IS&T Series in Imaging Science and Technology, Chichester, UK (2005).

M.D. Fairchild, *Color Appearance Models*, Addison-Wesley, Reading, MA (1998).

**Internet Resources:**

*The HDR Photographic Survey*, <[mcs1.rit.edu/fairchild/HDR.html](http://mcs1.rit.edu/fairchild/HDR.html)>.

*Color Curiosity Shop*, <[whyiscolor.org](http://whyiscolor.org)>.

*Ask A Color Scientist*, <[mcs1.rit.edu](http://mcs1.rit.edu)>.



**Publications & Presentations** (*Invited Presentations Follow Below*):

In Process: TU: Bidirectional Adaptation: CR&A

In Process: CT: Skin Reflectance: JIST

K. Masaoka, F. Jiang, M.D. Fairchild and R.L. Heckaman, Color gamut of multi-chromatic displays, *SID International Symposium Digest of Technical Papers* **50**, submitted (2019).

S. Morillas, M. Murdoch, and M.D. Fairchild, Gaussian noise perceptual masking in color images, *Journal of the Optical Society of America A* **36**, submitted (2019).

F. Jiang, K. Masaoka and M.D. Fairchild, Simulation and verification for color volume of HDR WCG display, *ITE/SID 25th International Display Workshops*, Nagoya, in press (2018).

A. Robinson and M.D. Fairchild, Recreating the Munsell crayon color spectrum, *Color Research and Application* **43**, 10.1002/col.22265 xxx-xxx (2018).

M.D. Fairchild, Unique hues & principal hues, *Color Research and Application* **43**, 10.1002/col.22261 xxx-xxx (2018).

F. Jiang, M.D. Fairchild, and K. Masaoka, Estimation of HDR WCG display color gamut volume, *IS&T 26th Color & Imaging Conference*, Vancouver, 344-349 (2018).

M.D. Fairchild, One wine many colors, *IS&T 26th Color & Imaging Conference*, Vancouver, (2018).

M.M. Amiri and M.D. Fairchild, A strategy towards spectral and colorimetric color reproduction using ordinary digital cameras, *Color Research and Application* **43**, 10.1002/col.22231 675-684 (2018).

S. Cai and M.D. Fairchild, Bidirectional individual corresponding colors data, *Color Research and Application* **43**, 10.1002/col.22228, 643-654 (2018).

S. Morillas and M.D. Fairchild, Using supra threshold color-difference ellipsoids to estimate any perceptual color-difference, *Journal of Visual Communication and Image Representation* **55**, 10.1016/j.jvcir.2018.05.022 142-148 (2018).

M.D. Fairchild, Munsell's legacy: Foundation and Laboratory, ISCC-AIC Munsell Centennial Color Symposium, Boston (2018).

S. Morillas and M.D. Fairchild, A supra threshold color-difference ellipsoids hybrid model for color differences, ISCC-AIC Munsell Centennial Color Symposium, Boston (2018).

A. Robinson and M.D. Fairchild, Recreating the Munsell color crayon color spectrum, ISCC-AIC Munsell Centennial Color Symposium, Boston (2018).

K. Masaoka, F. Jiang, M.D. Fairchild and R.L. Heckaman, 2D representation of display color gamut, *SID International Symposium Digest of Technical Papers* **49**, 1048-1051(2018).

M.D. Fairchild, The colors of wine, *International Journal of Wine Research* **10**, 13-31(2018).

M.J. Murdoch and M.D. Fairchild, Modeling the effects of inter-observer variation on color rendition, *Lighting Research and Technology* **49**, 10.1177/1477153517744387, 1-18(2017).

M.D. Fairchild, Individual differences in color matching & adaptation and illumination, *OSA Fall Vision Meeting*, Washington, D.C., *Journal of Vision* **17**, 10.1167/17/15/2a (2017).

M.D. Fairchild, Color perception: Contexts and individuals, *American Glass Guild Proceedings*, Rochester, (2017).

M.M. Amiri and M.D. Fairchild, Use of spectral sensitivity variability in reflectance recovery from colorimetric information, *Journal of the Optical Society of America A* **34**, 1224-1235 (2017).

B. Zhou, K. Grotton, A. Kruse, A. Skinner, S. DoVale, S. Farnand and M.D. Fairchild, Observer calibrator for color vision research, *IS&T Electronic Imaging 2017 Conference*, IQSP XIV, San Francisco, 59-63 (2017).

M.D. Fairchild, Spotlight Summary of “Method to determine degrees of consistency in experimental datasets of perceptual color differences” by Morillas et al., *OSA Spotlight on Optics*, Nov. (2016).

M.D. Fairchild, Individual differences in color matching and adaptation: Theory and practice, *IS&T 24th Color & Imaging Conference*, San Diego, 115-120 (2016).

M.J. Murdoch and M.D. Fairchild, Effects of inter-observer variation on color rendering metrics, *IS&T 24th Color & Imaging Conference*, San Diego, 187-191 (2016).

S. Cai and M.D. Fairchild, Individual corresponding colors data and chromatic adaptation transform, *IS&T 24th Color & Imaging Conference*, San Diego, 248-253 (2016).

M.D. Fairchild, From photon to brain: The perception of a color, *IS&T 24th Color & Imaging Conference*, San Diego, 291-293 (2016).

Y. Asano, M.D. Fairchild, L. Blondé and P. Morvan, Color matching experiment for highlighting inter-observer variability, *Color Research and Application* **41**, 530-539 (2016).

M.D. Fairchild, *Gustav Theodor Fechner*, in the *Encyclopedia of Color Science & Technology*, Springer, ISBN: 978-3-642-27851-8 (Online) (2016).

M.D. Fairchild, *Johan Adolf von Kries*, in the *Encyclopedia of Color Science & Technology*, Springer, ISBN: 978-3-642-27851-8 (Online) (2016).

M.D. Fairchild, *Gabriel Lippmann*, in the *Encyclopedia of Color Science & Technology*, Springer, ISBN: 978-3-642-27851-8 (Online) (2016).

M.D. Fairchild, *Joseph William Lovibond*, in the *Encyclopedia of Color Science & Technology*, Springer, ISBN: 978-3-642-27851-8 (Online) (2016).

M.D. Fairchild, *Stanley Smith Stevens*, in the *Encyclopedia of Color Science & Technology*, Springer, ISBN: 978-3-642-27851-8 (Online) (2016).

D.L. Long and M.D. Fairchild, Observer metamerism models and multiprimary display systems, *SMPTE Motion Imaging Journal* **125**, 18-29 (2016).

M.D. Fairchild, Individual differences in color matching and adaptation: Importance in lighting, *Light + Color: IES Research Symposium III*, Gaithersburg, (2016).



Y. Asano, M.D. Fairchild, and L. Blondé, Individual colorimetric observer model, *PLOS ONE* **11**, e0145671 (2016).

M.D. Fairchild and R.L. Heckaman, Measuring observer metamerism: The Nimeroff approach, *Color Research and Application* **41**, 115-124 (2016).

M.D. Fairchild, Color models and systems, in A. Elliott, M.D. Fairchild and A. Franklin, Eds. *Handbook of Color Psychology*, Cambridge University Press, Cambridge, UK (2015).

M.D. Fairchild, *Metameric Blacks: A Color Curious Column*, ISCC News #445 - 472 (2010-2015).

D.L. Long and M.D. Fairchild, Observer metamerism models and multiprimary display systems, *SMPTE Annual Technical Conference*, Hollywood, (2015).

M.D. Fairchild and Y. Asano, Custom color matching functions: Extending the CIE 2006 model, *The 10th Biennial Joint CNC/CIE and CIE/USA Technical Conference*, Toronto, Abstract 1 (2015).

M. Melgosa, L. Gomez-Robledo, M.I. Sure and M.D. Fairchild, What can we learn from a dress with ambiguous colors?, *Color Research and Application* **40**, 525-529 (2015).

Y. Asano, M.D. Fairchild, and L. Blondé, Spectral pseudoisochromatic images: Vision test for color-normal observers, *AIC2015 / MCS 2015*, Tokyo (2015).

M.D. Fairchild, Seeing, adapting to, and reproducing the appearance of nature, *Virtual Journal for Biomedical Optics* **10**, Issue 3, republication (2015).

D.L. Long and M.D. Fairchild, Reducing observer metamerism in wide-gamut multiprimary displays, *SPIE/IS&T Electronic Imaging Conference*, San Francisco, Volume **9394**, 93940T (2015).

A. Forés Herranz, M.D. Fairchild and I. Tastl, An abridged goniometer for material appearance measurements, *SPIE/IS&T Electronic Imaging Conference*, San Francisco, Volume **9398**, 93980G (2015).

M.D. Fairchild, Seeing, adapting to, and reproducing the appearance of nature, *Applied Optics* **54**, B107-B116 (2015).

D.L. Long and M.D. Fairchild, Modeling observer variability and metamerism failure in electronic color displays, *Journal of Imaging Science & Technology* **58**, 30402-1-30402-14 (2014).

C.P. Sisson, S.P. Farnand, M.D. Fairchild and B. Fischer, Analysis of color consistency in retinal fundus photography: Application of color management and development of an eye model standard, *Analytical Cellular Pathology* **2014**, Article ID 398462 (2014).

D.L. Long and M.D. Fairchild, Modeling observer variability and metamerism failure in electronic color displays, *IS&T 22nd Color & Imaging Conference*, Boston, 14-20 (2014).

Y. Asano, M.D. Fairchild, L. Bondé and P. Morvan, Observer variability in image color matching on an LCD monitor and a laser projector, *IS&T 22nd Color & Imaging Conference*, Boston, 1-6 (2014).

A. Forés Herranz, M.D. Fairchild and I. Tastl, Improving the perceptual uniformity of a gloss space, *IS&T 22nd Color & Imaging Conference*, Boston, 7-13 (2014).

Y. Asano, M.D. Fairchild, and L. Blondé, Development of a vision model for individual colorimetric observers, *OSA Fall Vision Meeting*, Philadelphia, (2014).

M.D. Fairchild, A.M. Tourapis and D. Singer, New high dynamic range content based on still imagery, ISO/IEC JTC1/SC29/WG11 MPEG2014/mXXXX (2014).

A. Forés Herranz, M.D. Fairchild and I. Tastl, Perceptual gloss space BRDF projection, uniformity validation, and lightness distance metric, *ACM Symposium on Applied Perception*, Vancouver 136 (2014).

M.D. Fairchild, The value of colorfulness, brilliance, and similarity, *LD+A*, Illuminating Engineering Society, 44:8 16-18(2014).

R. Cao, M. Castle, W. Sawatwarakul, M.D. Fairchild, R. Kuehni, R. Shamey, Scaling perceived saturation, *Journal of the Optical Society of America A* **31**, 1773-1781 (2014).

S. Farnand and M.D. Fairchild, Designing pictorial stimuli for perceptual experiments, *Virtual Journal for Biomedical Optics* **9**, Issue 7, republication (2014).

Y. Asano, M.D. Fairchild L. Blondé and P. Morvan, Multiple color matches to estimate human color vision sensitivities, *International Conference on Image and Signal Processing 2014*, Cherbourg, France, 18-25 (2014).

S. Farnand and M.D. Fairchild, Designing pictorial stimuli for perceptual experiments, *Applied Optics* **53**, C72-C78 (2014).

J. Preiss, M.D. Fairchild, J. Ferwerda, and P. Urban, Gamut mapping in a high-dynamic-range color space, *SPIE/IS&T Electronic Imaging Conference*, San Francisco, doi:10.1117/12.2039747 (2014).

M.D. Fairchild and R.L. Heckaman, Metameric observers: A Monte Carlo approach, *IS&T 21st Color & Imaging Conference*, Albuquerque, 185-190 (2013).

Y. Asano and M.D. Fairchild, Observer variability experiment using a four-primary display, *IS&T 21st Color & Imaging Conference*, Albuquerque, 171-176 (2013).

M.D. Fairchild, Seeing, adapting to, and reproducing the appearance of nature, *OSA International Conference on Light and Color in Nature*, Fairbanks (2013).

ISO 1254-5:2013, *Graphic technology — Prepress digital data exchange — Part 5: Scene referred standard colour image data (RIMM/SCID)*, International Organization for Standardization (2013). [Several images were contributed to this set of standard image data.]

M. Melgosa and M.D. Fairchild, *Inspiring future experimental scientists through questions related to colour*, 12th International Conference on Education and Training in Optics & Photonics, Porto, Portugal, 25 (2013).

Y. Asano, M.D. Fairchild and L. Blondé, Observer variability experiment using a four-primary display, *AIC Colour 2013*, Newcastle, 136-137 (2013).

S. Farnand and M.D. Fairchild, Evaluating complexity in photographic images using perceptual, eye-tracking, and segmentation methods, *AIC Colour 2013*, Newcastle, 133 (2013).

M.D. Fairchild, Color scales, *X National Congress of Color*, Valencia, Spain, 1 (2013).

K. Masaoka, R.S. Berns, M.D. Fairchild and F.M. Abed, The number of discernible object colors is a conundrum, *Journal of the Optical Society of America A* **30**, 264-277 (2013).

K. Masaoka, R.S. Berns, M.D. Fairchild and F.M. Abed, The number of discernible object colors is a conundrum, *Virtual Journal for Biomedical Optics* **8**, Issue 3, republication (2013).

M.D. Fairchild, Progress and poverty: An inquiry into color appearance modeling and increase of want with increase of wealth, *IS&T/SID 20th Color and Imaging Conference*, Los Angeles, 155- 157 (2012).

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M.D. Fairchild, Color appearance, color order, & other color systems, *ISCC Webinar*, August (2018).

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**Community Activities:**

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Member: Several Museums, Environmental, Meditative, and Humanistic Organizations.