

Dr. Erich S. Uffelman
Bentley Professor of Chemistry
Washington and Lee University
Phone: 540-458-8040
Email: uffelmane@wlu.edu

Dr. Erich Stuart Uffelman: Brief Biography
Erich Uffelman graduated as the Outstanding Senior Chemistry Major in Bucknell

- (15) France, M. B.; Uffelman, E. S. "Ring-opening Metathesis Polymerization with a Well-Defined Ruthenium Carbene Complex: An Experiment for the Undergraduate Inorganic or Polymer Laboratory" *J. Chem. Educ.*, 1999, 76, 666-665.
- (14) Bartos, M. J.; Gordon-Wylie, S. W.; Fox, B. G.; Wright, L. J.; Weintraub, S. T.; Kauffmann, K. E.; Münck, E.; Kostka, K. L.; Uffelman, E. S.; Rickard, C. E. F.; Noon, K. R.; Collins, T. J. "Designing Ligands to Achieve Robust Oxidation Catalysts. Iron Based Systems" *Coord. Chem. Rev.* 1998, 174, 361-390.
- (13) Collins, T. J.; Gordon-Wylie, S. W.; Woome, C. G.; Horwitz, C. P.; Uffelman, E. S. "Oxidation Catalysis" *PCT Int. Appl.* (1998), 62 pp. CODEN: PIXXD2 WO 9858735 A1 19981230 CAN 130:111826 AN 1999:27764
- (12) Zhang, X.; Uffelman, E. S.; Collman, J. P. "Bridged, crown-containing tetraphenylporphyrin metal complexes as water-soluble oxygen carriers." U.S. (1995), 24 pp. Cont.in-part of U.S. 5,274,090. CODEN: USXXAM US 5384397 A 19950124 CAN 123:143544 AN 1995:383026
- (11) Collins, T. J.; Bartos, M. J.; Gordon-Wylie, S. W.; Fox, B. G.; Kauffmann, K. E.; Münck, E.; Rickard, C. E. F.; Weintraub, S. T.; Uffelman, E. S.; Wright, L. "Designing Ligands to Achieve Robust Atom-Transfer Oxidation Catalysts," *J. Inorg. Biochem.* 1995, 59, 33-39.
- (10) Collman, J. P.; Zhang, X.; Herrmann, P. C.; Uffelman, E. S.; Boitrel, B.; Straumanis, A.; Brauman, J. I. "Congruent Multiple Michael Addition for the Synthesis of Biomimetic Heme Analogues," *J. Am. Chem. Soc.* 1994, 116, 2682-2682.
- (9) Collman, J. P.; Zhang, X.; Lee, V. J.; Uffelman, E. S.; Brauman, J. I. "Regioselective and Enantioselective Epoxidation Catalyzed by Metalloporphyrins," *Science (Washington, D.C.)* 1993, 261, 1404-1411.
- (8) Collman, J. P.; Zhang, X.; Uffelman, E. S. U. S. Patent 5 274 090: 1993.
- (7) Collins, T. J.; Kostka, K. L.; Uffelman, E. S.; Weinberger, T. "Design, Synthesis, and Structure of a Macrocyclic Tetraamide That Stabilizes High-Valent Middle and Later Transition Metals," *Inorg. Chem.* 1991, 30, 4204-4210.
- (6) Collins, T. J.; Nichols, T. R.; Uffelman, E. S. "A Square Planar Nickel(III) Complex of an Innocent Ligand System," *J. Am. Chem. Soc.* 1991, 113, 4707-4709.
- (5) Collins, T. J.; Powell, R. D.; Slebodnick, C.; Uffelman, E. S. "Stable Highly Oxidizing Cobalt Complexes of Macrocyclic Tetraamide Ligands," *J. Am. Chem. Soc.* 1991, 113, 8442-8445.
- (4) Collins, T. J.; Kostka, K. L.; Münck, E.; Uffelman, E. S. "Stabilization of Mononuclear Five-Coordinate Iron(IV)," *J. Am. Chem. Soc.* 1990, 112, 5637-5639.
- (3) Collins, T. J.; Powell, R. D.; Slebodnick, C.; Uffelman, E. S. "A Water-Soluble Manganese(V)Oxo Complex: Definitive Assignment of a Mn-O Triple Bond Infrared Vibration," *J. Am. Chem. Soc.* 1990, 112, 8999-9001.
- (2) Collins, T. J.; Slebodnick, C.; Uffelman, E. S. "Chromium(V)Oxo Complexes of Macrocyclic Tetraamide Ligands Tailored for Highly Oxidized Middle Transition Metal Complexes: A ¹⁸O-Labeling Reagent and a Structure with Four Nonplanar Amides," *Inorg. Chem.* 1990, 29, 3432-3436.
- (1) Collins, T. J.; Uffelman, E. S. "The First Macrocyclic Square Planar Cobalt(III) Complex Relieves Ring Strain by Forming a Nonplanar Amide," *Angew. Chem. Int. Ed. Engl.* 1989, 28, 1509-1511. f

Courses Currently Taught:

Chem 110	General Chemistry
Arth 356	Technical Examination of 17th Century Dutch Painting
Chem 156	Science in Art
Chem 250	Intermediate Inorganic and Bioinorganic Chemistry

Courses Previously Taught:

Chem 111	General Chemistry
Chem 206	Survey of the Periodic Table
Chem 207	Synthesis of Inorganic Complexes
Chem 241	Organic Chemistry Lecture
Chem 242	Organic Chemistry Lecture
Chem 241L	Organic Chemistry Laboratory
Chem 242L	Organic Chemistry Laboratory
Chem 243L	Organic Spectroscopy Laboratory
Chem 252	Inorganic Chemistry Laboratory
Chem 254	Bioinorganic Chemistry
Chem 295	Special Topics in Solid State Chemistry
Chem 297A	Materials of 17th Century Dutch Art
Chem 297B	Instrumental Methods in Art Conservation
Chem 350	Advanced Inorganic Chemistry
Chem 399B	Imaging Science in Art and Medicine with Applications to Astronomy
Univ 202	Science in Art
Arth 380	Seminar in 17th Century Dutch Art
Arth 394	Technical Examination of Paintings

Research Interests

The Uffelman group uses portable XRF, digital IR photography, SEM-EDS, stereomicroscopy, FORS, RTI, hyperspectral reflectance imaging spectrometry and multispectral reflectance imaging spectrometry (and sometimes MS methods) to investigate art and cultural objects both in collaboration with other museums and universities as well as with W&L collections and faculty and staff.

The Uffelman group in the past developed a set of novel polyamide macrocyclic ligands in order to expand the fundamental chemistry and Green Chemistry applications of iron-catalyzed oxidation reactions.

These research programs have, to date, involved nine different undergraduates, who have gained experience in cultural heritage science or in synthetic inorganic chemistry.

Pedagogical Research (r)3 (on-)3 (n)4 (l)-2 (y</MCID0 12nda)4TJ 0 Tc 0 Tw [(di)-2 1.8-7 (f)3 (12 (n s)-

Uffelman has participated from 2005-2017 in helping teach the NSF CWCS Chemistry in Art Workshops run by Patricia Hill and Michael Henchman and Deborah S Uffelman and W&L hosted the 2008 workshop.

Undergraduate Research Students Supervised:

Ninety-three at W&L---many for more than one summer or semester [Tamara Hopkins, T. R. Kinsey, Ryan Aday, Matthew Smith, RobaE32 Tyisn Aaior Hil isan An ATf 0 -1Td ()Tj EJya yaatl (t)-2 (

Technical Art History” [Jennifer Mass and C. Richard Johnson Project Directors; Uffelman PI] co-Awarded December, 2015---\$87,630

NU ACCESS (Joint program between Northwestern University and the Art Institute of Chicago) “Multispectral Imaging, Fiber Optic Reflectance Spectrometry, Portable X-Ray Fluorescence Spectroscopy, and Infrared Imaging Applied to Works Relevant to the Cadmium Sulfide Degradation Problem at the Art Institute of Chicago” Project grant to Uffelman, Awarded August, 2015---\$3,000

National Science Foundation---“MRI: Fiber Optic Reflectance Spectrometry and Multispectral Imaging Applied to University Collections of Art and History at Washington and Lee University” (CHE-1337481) Uffelman Project Director, Awarded September, 2013---\$87,630

Teagle Foundation---“The Global Classroom: Integration of Spring Term Abroad Courses with Winter and Fall Term Student Learning.” Funding for collaborative pedagogical development and assessment involving Union College, Gettysburg College, and Washington and Lee University [Dr. Marc Conner, Project Director; Uffelman, faculty participant] Awarded May, 2012---\$230,000

Lenfest Foundation---Funding for collaborative research between Winterthur Museum, University of Delaware, the Barnes Foundation, and Washington and Lee University on CdS photodegradation in works by Matisse and his contemporaries [Dr. Jennifer Mass, Project Director; Bob Opila, Jonathan Church, Barbara Buckley, Uffelman CoPIs] Awarded February, 2012---\$113,000

Howard Hughes Medical Institute---Funding for teaching innovation in quantitative science [Dr. Helen l’Anson, Project Director; Carrie Finch, Fred LaRiviere, Simon Levy, Robert Humston, Bob Stewart, and Chris Connors, HHMI Committee; Uffelman faculty contributor] \$1,000,000

National Science Foundation---“MRI: Acquisition of a Variable Pressure Scanning Electron Microscope at Washington and Lee University” (EAR-26360) [Dr. Jeffrey Rahl, Project Director; Dr. Ken Van Ness, CoPI; Uffelman, Senior Investigator] Awarded September, 2011---\$355,319

National Science Foundation---“Portable X-Ray Fluorescence, Digital IR Photography, and Stereomicroscopy Applied to University Collections of Art and History at Washington and Lee University” (CHE-0959625) Uffelman Project Director, Awarded January, 2010---\$119,678

National Science Foundation---“MRI: Acquisition of a Liquid Chromatograph Time of Flight Mass Spectrometer to Enhance Research at Washington and Lee University and Virginia Military Institute” (CHE-0922599) Awarded September, 2009---\$282,226 [Dr. Lisa Alty Project Director; Uffelman one of two other CoPI’s]

Washington and Lee University---Class of '65 Excellence in Teaching Award: “Broadening the Impact of Art Conservation and Art Conservation Science at W&L, Nationally, and Internationally” Awarded April, 2008---\$6,000

Associated Colleges of the South Mellon Faculty Renewal Grant “Whose Art Should be Conserved?” Awarded April, 2008---\$5,000

Jeffress Research Grant Renewal H-

Interviewed by local news WDBJ7 regarding an analysis of an important chair in the collection of the Rockbridge Historical Society---facilitated by Eric Wilson. A short video clip of the interview was shown on the local news on November 12, 2019

Assisted with researching an important chair in the Rockbridge Historical Society's

Assisted with research at Stichting Restauratie Atelier Limburg in Maastricht (6/3-6/6/19) along with my students, Lindsey Hewitt and Darcy Olmstead.

Assisted with research at the Dordrechts Museum in Dordrecht (5/27-31/19) along with my students, Lindsey Hewitt and Darcy Olmstead .

Assisted Barbara Buckley, Dr. Jennifer Mass, Dr. Adam Finnefrock, Madison Whitesell,
and Sydney Collins with

several paintings in their collection, especially a Lucas van Leyden painting of great interest to our colleagues at the Rijksmuseum in Amsterdam. June 27-28, 2016.

Hosted a visit to W&L by Dr. Priscilla Gannicott and four of her students so that they could examine a painting in the Lynchburg College collection using our equipment and so that we could give them research experience with multiple nondestructive techniques. June 21, 2016.

Visited Catholic University in Washington, DC, with my two research students (Mallory Stephenson and Daniel Monteagudo) and with Emory Emerita art historian Dorinda Evans to use IR imaging and UV-induced visible fluorescence to study a possible Gilbert Stuart Lansdowne Portrait. June 16, 2016.

Visited the White House in Washington, DC, with my two research students (Mallory Stephenson and Daniel Monteagudo) and with Emory Emerita art historian Dorinda Evans to use IR imaging and UV-induced visible fluorescence to study their Gilbert Stuart Lansdowne Portrait. June 16, 2016.

Visited the US House of Representatives in Washington, DC, with my two research students (Mallory Stephenson and Daniel Monteagudo) and with Emory Emerita art historian Dorinda Evans to use IR imaging and UV-induced visible fluorescence to study their possible Gilbert Stuart Lansdowne Portrait. June 16, 2016. Funded by W&L Lenfest Grant.

Travelled to Bismarck, ND to help teach the National Science Foundation cCWCS Chemistry in Art Workshop. I gave MANY presentations and helped with lab setup and take down. One week intense workshop. June 5-12, 2016.

Travelled to Randolph College to give a talk to the SpheX Club of Lynchburg at their annual meeting---was hosted by W&L alumnus Theodore (Ted) Craddock. "Scientific Adventures with Cultural Heritage Objects". June 1, 2016

Visited a paintings conservation atelier in Antwerp, Belgium and gave a day long tutorial/workshop on X-ray Fluorescence spectroscopy to over a dozen conservation trainees. May 20-22. 2016.

Travelled with University Development/Alumni Office Staff to the Midland, TX W&L Alumni Chapter to give a talk to the Texas alumni "Scientific Adventures with Cultural Heritage Objects". April 1-3, 2016.

Presented a poster at the 251st National American Chemicals Society Meeting in San Diego “Fiber optic reflectance spectroscopy and multispectral imaging used to access cadmium sulfide degradation in cadmium yellow paint in paintings by Louise Herreshoff” Mallory Stephenson, Brett Becker, Eleni Timas, Erich S. Uffelman, Patricia Hobbs, Jennifer L. Mass, John Delaney, Kathryn A. Dooley; San Diego, CA. March 13-17, 2016. INOR-899. Funded by W&L and by myself.

Travelled to Piedmont Valley Community College and gave the keynote lecture for their 2YC3 Conference (the 212th national conference on chemical education at US community colleges) using the portable X1 (1)1 (2)TJ6.8 (a)4 ()-5 (n)1 (sBl)49ae pam1 (2)TJ6.8 (a)4m1 D. Mh a

Gave a lecture at the cCWCS NSF Sponsored Advanced Chemistry in Art Workshop at Villanova University on IR imaging and demonstrated our InGaAs IR camera 6/10/12

Attended the Gordon Conference on Scientific Methods in Cultural Heritage Research at West Dover, VT and presented a poster 7/29-8/3/12

Gave two academic seminars at Drake University in Iowa on March 2 and 3, 2011:
 “The Analytical Chemistry of XRF”--given to a senior analytical chemistry class
 “The Unvarnished Truth”--given to a studio art/art history class.

Gave a public evening lecture at Drake University in Iowa on March 3, 2011 “Great Dutch Coverups”

Gave two academic seminars at the University of Maryland to the Art History graduate students on April 18, 2011:
 “Types of Science in Art Courses”
 “Great Dutch Coverups”

Gave an academic seminar at Davidson University to a physical chemistry class on April 22, 2011:
 “Physical Chemistry of XRF”

Attended the National American Chemical Society Meeting in San Diego, CA and presented two research posters 3/27-3/30/11

“[Iron complexes of macrocyclic tetradentate triamide ligands as activators of hydrogen peroxide for the catalytic bleaching of Orange II dye](#)” Full Text” By Uffelman, Erich S.; Lemon, Allison M.; Malachosky, Edward W. From Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, 2011 (2011) QR-765.

“[Examination of significant cultural heritage objects using GCMS, LCMS, and portable XRF: Identification of inorganic pigments and organic binding media](#)” By Uffelman, Erich S.; Alty, Lisa T.; Fuchs, Ronald W.; Sturdy, Lauren F.; Bowman, Danielle S.; Lemon, Allison M.; Malachosky, Edward W. From Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, 2011 (2011), CHED-98.

Attended the AIC National Meeting in Philadelphia, PA and presented a research poster with Lauren Sturdy 6/1-6/3/11 “George Washington’s Chinese Export Porcelain: Using XRF Analyses to Distinguish between an Original and a Fake” Lauren F. Sturdy, Danielle S. Bowman, Ronald W. Fuchs II, Erich S. Uffelman

helped with instrument demonstrations

Attended the National American Chemical Society Meeting in Philadelphia and gave one poster 8/17-8/20/08 'Catalytic studies of an Fe(III) macrocyclic tetradentate triamide complex with hydrogen peroxide" poster 8/19/08

Gave invited seminar "Science in Art: Technical Examination of 17th Century Dutch Paintings" at Ferrum College. 10/31/08

Gave two invited seminars "Macrocyclic Polyamide Ligands & Field Multinuclear NMR at Washington and Lee University" and "Science in Art: Technical Examination of 17th Century Dutch Paintings" at Ursinus College. 11/10/08

Gave three lectures at the NSF CWCS Chemistry in Art Workshop at Colorado College (travel funded by the NSF) 7/22-7/27/07

"Examining Paintings" 7/24/07

"Paintings Conservation" 7/25/07

"Course Structure" 7/26/07

Attended the National American Chemical Society Meeting in Boston. gave one talk and gave one poster 8/19-8/22/07

"Science in Art: Technical Analyses of 17th Century Dutch Golden Age Paintings" talk on 8/19/0

"Catalytic studies of an Fe(III) macrocyclic tetradentate triamide co6 (trrrr5)-4 -6 (Hx) (i)-6Tj hyd (oc)4g

Uffelman, E. S. "Science in Art: Technical Analyses of 17th Century Dutch Golden Age Paintings", National Science Foundation Workshop, Millersville University, June 9, 2005.

Uffelman, E. S. "Science in Art: Technical Analyses of 17th Century Dutch Golden Age Paintings", Associated Colleges of the South Science Education Reform W. M. Keck Foundation Workshop, Furman University, September 17, 2005.