

FIFTY-NINTH ANNUAL MAY CONFERENCE

Sponsors:



**The Cleveland Section of the
Society for Applied
Spectroscopy**

Microscopy Society of NE Ohio



**The Cleveland Section of the
American Chemical Society
Analytical Topics Group**

The American Vacuum Society



**May 20, 2015
Dolan Science Center
John Carroll University
University Heights, Ohio**

**59th Annual
SAS/ACS/AVS/MSNO May Conference**

**May 20, 2015
John Carroll University
Dolan Science Center**

PROGRAM

- 7:00 a.m.** **Registration/Continental Breakfast:**
(Edward M. & Ann Muldoon Atrium)
- 8:00 a.m.** **Opening Remarks:** (Donahue Auditorium)
Brian Perry, President, SAS
- Mike Setter, Department Chair, Chemistry,
John Carroll University
- 8:15 a.m.** **Invited Address 1:** (Donahue Auditorium)
Chair: Min Gao, Kent State University
- William Landis, *University of Akron***
- “Mineralization of the Vertebrate Skeleton and Teeth:
A Possible Role for the Small, Non-Collagenous Protein,
Osteocalcin, Deduced from Electron Microscopy and
Immunocytochemistry”**
- 9:25 a.m.** **Break (20 minutes):** (Edward M. & Ann Muldoon Atrium)

Presentation Session I

(* indicates invited talk)

	Session IA Dolan A202 Chair: Dingqiang Li	Session IB Dolan A203 Chair: Peng Zhenmeng	Session IC Dolan E130 Chair: Adam Smith
9:45 a.m.	IA-1* "Applications of <i>In Situ</i> Environmental Transmission Electron Microscopy in Catalysis" Ruigang Wang <i>Youngstown State University</i>	IB-1* "Vibrational Spectroscopy of Adsorbed CO ₂ on the Surface of Nanostructured Sorbents" Steven Chuang <i>University of Akron</i>	IC-1 "Shedding Light on Water and Ice Interactions with Solid Surfaces" Emmanuel Anim-Danso <i>University of Akron</i>
10:10 a.m.	IA-2 "Early Stage Na ₂ SO ₄ Induced Type II Hot Corrosion Behavior of Pt/Cr-Modified β-NiAl Alloys at 700°C" Maryam Zahiri Azar <i>Case Western Reserve University</i>	IB-2 " Nanoparticle Characterization using spICP-Q-MS and FFF-ICP-Q-MS" Michael Plantz <i>ThermoScientific</i>	IC-2 "PolScope Made Easy, Inexpensive and Versatile" Seyyed M. Salili <i>Kent State University</i>
10:35 a.m.	IA-3 "Visualizing the True Structure of Materials with Quantitative 3D EDS Microanalysis" Tara Nylese <i>EDAX</i>	IB-3 "Liquid Crystals Confined in Micro- and Nano-Channels" Yubing Guo <i>Kent State University</i>	IC-3* "How do Animals Inherit Their Microtubule Organization Centers?" Tomer Avidor-Reiss <i>University of Toledo</i>

11:00 a.m. Break (10 minutes): (Edward M. & Ann Muldoon Atrium)

11:10 a.m. ACS/SAS Yeager Award: (Donahue Auditorium)
Chair: Rick Kus, De Nora Tech, Inc.

Kevin Budge, Kent State University

**"The Secret Life of DGPP: Physicochemical Properties and
Function of an Enigmatic Signaling Lipid"**

11:40 a.m. Lunch: (O'Connell Reading Room)

12:45-1:45 p.m. Poster Session: (Second Floor Hallway)

Presentation Session II

(* indicates invited talk)

	Session IIA Dolan A202 Chair: Wayne Jennings	Session IIB Dolan A203 Chair: Doug Rohde	Session IIC Dolan E130 Chair: Doug Jayne
1:50 p.m.	IIA-1 "Homogeneous Nucleation and Materials Analysis of Nanodiamonds Synthesized in an Atmospheric-Pressure Microplasma" Jonathan Cole <i>Case Western Reserve University</i>	IIB-1* "An Overview of Forensic DNA Technology" Carey Baucher <i>Cuyahoga County Medical Examiner's Office</i>	IIC-1* "Ecological and Economic Importance of Lake Erie: The Impacts of Harmful Algal Blooms and Current Research Efforts" Christopher Winslow <i>The Ohio State University</i>
2:15 p.m.	IIA-2* "Applications of XPS in Polymer and Surface Science" Zhorro Nikolov <i>University of Akron</i>	IIB-2* "Drugs: The Underbelly of our Society" Shaena Taylor <i>Cuyahoga County Medical Examiner's Office</i>	IIC-2* "Controlling Infectious Diseases at the Source" Christopher Woolverton <i>Kent State University</i>
2:40 p.m.	IIA-3 "Effects of Structural Phase Transitions on the 2D Conductivity at the Interface of Perovskite Oxides" Nicholas Goble <i>Case Western Reserve University</i>	IIB-3* "Trace Evidence at the Cuyahoga County Medical Examiner's Office" Daniel Mabel <i>Cuyahoga County Medical Examiner's Office</i>	IIC-3 "Characterizing Multi-Layered Food Packaging with Molecular Spectroscopy" Will Wihlborg <i>ThermoFisher</i>
3:05 p.m.	IIA-4 "Compositional and Thickness Measurements of Thin Films in the Scanning Electron Microscope" Richard McLaughlin <i>Oxford</i>	IIB-4* "The Use of Mass Spectrometry in Analytical Forensic Toxicology – Approaching the Blackbox" Harold Schueler <i>Cuyahoga County Medical Examiner's Office</i>	IIC-4 "Tracing Lipids and their Association with keratin in the Adhesive Gecko with Setae by NMR Spectroscopy" Dharamdeep Jain <i>University of Akron</i>

3:30 p.m. Break (20 minutes): (Edward M. & Ann Muldoon Atrium)

Presentation Session III

(* indicates invited talk)

	Session IIIA Dolan A202 Chair: Ina Martin	Session IIIB Dolan A203 Chair: Chris Holp	Session IIIC Dolan E130 Chair: Grahame Kidd
3:50 p.m.	IIIA-1* "Flexible Organic Transistors- Challenges and Prospects" Bjorn Lüsse <i>Kent State University</i>	IIIB-1 "A Novel Correlation Method for Hyperspectral Image Analysis" Leanna Ergin <i>Cleveland State University</i>	IIIC-1* "Use of Serial Blockface Imaging to Study Synaptopathy in Glaucoma" Samuel D. Crish <i>NEOMED</i>
4:15 p.m.	IIIA-2* "Microscopic Analysis of Space Solar Array Degradation:" Jeremiah S. McNatt <i>NASA-Glenn</i>	IIIB-2* "Aberration-Corrected Electron Microscopy and its Applications in Materials Research" Kai Sun <i>University of Michigan</i>	IIIC-2 "3-Dimensional Characterization of Resin-Embedded Biological Samples Using SBF-SEM and MEDSEM" Gabriella Kiss <i>FEI</i>
4:40 p.m.	IIIA-3 "A Modified Two-step Sequential Deposition Method with Addition of Quaternary Ammonium Salts for Planar-Architected Perovskite Solar Cells" Lili Wang <i>Case Western Reserve University</i>	IIIB-3 "Soft X-Ray Emission Spectroscopy-Coupled with New Field Emission SEM Technology, Coming Close to Doing the Impossible" Vernon Robertson <i>JEOL</i>	IIIC-3 "Study of Endosome Trafficking by Scanning Electron Microscopy (SEM)" Arpan De <i>Bowling Green State University</i>

5:05 p.m. Break (15 minutes): (Edward M. & Ann Muldoon Atrium)

5:20 p.m. Best Student Paper/Poster Awards
(Tom Steele, Regan Silvestri)

5:25 p.m. ACS Morley Lecture (Donahue Auditorium)
Chair: Mark Waner, John Carroll University

James Allan Cowan, Ohio State University

"Catalytic Metallodrugs – Toward a New Therapeutic Paradigm"

6:30 p.m. Reception (Edward M. & Ann Muldoon Atrium)

- 7:00 p.m.** **Program** (O'Connell Reading Room)
- Recognition of Meeting Sponsors** – Amir Avishai
- Bell Award Presentations** – Tom Steele
- 50-year Member Recognition** - Theresa Nawalaniec
- Morley Award Presentation** – Mark Waner
- Closing Comments** – Brian Perry
- 7:20 p.m.** **Dinner** (O'Connell Reading Room)

2015 May Conference Planning Committee

General Committee	Amir Avishai, Case Western Reserve University Sara Freeman, Ferro Corporation Wayne Jennings, Case Western Reserve University Min Gao, Kent State University Rick Kus, DeNora Tech Brian Perry, LORD Corporation Regan Silvestri, Lorain County Community College Doug Rhode, Lake County Crime Lab Mike Setter, John Carroll University Tom Steele, Lubrizol Corporation Ken Street, NASA-Glenn Research Center Bob Williams, Lubrizol Corporation Nanthawan Avishai, Case Western Reserve University
Corporate Sponsors	Amir Avishai, Case Western Reserve University Rick Kus, DeNora Tech Nanthawan Avishai, Case Western Reserve University Bob Williams, Lubrizol Corporation
Technical Program	Amir Avishai, Case Western Reserve University Brian Perry, LORD Corporation Min Gao, Kent State University
Publicity	Amir Avishai, Case Western Reserve University Min Gao, Kent State University Brian Perry, LORD Corporation
Finance	Bob Williams, Lubrizol Corporation Amir Avishai, Case Western Reserve University Nanthawan Avishai, Case Western Reserve University
Registration	Nanthawan Avishai, Case Western Reserve University Hao Qu, Momentive Performance Materials Nancy Kirclich, LORD Corporation
E. B. Yeager Award	Doug Rhode, Lake County Crime Lab
Student Paper Awards	Melanie Knowlton, LORD Corporation Regan Silvestri, Lorain County Community College Rick Kus, DeNora Tech Jeanette Killius, NEOMED

Student Posters	Kevin Otteni, LORD Corporation Wayne Jennings, Case Western Reserve University Tom Steele, Lubrizol Corporation Nicole Klingensmith, LORD Corporation Katie Moon, DeNora Tech Adam Smith, University of Akron Ina Martin, Case Western Reserve University Coleen McFarland, Envantage, Inc.
John Bell Award	Regan Silvestri, Lorain County Community College Tom Steele, Lubrizol Corporation Ken Street, NASA-Glenn Research Center Brian Perry, LORD Corporation Coleen McFarland, Envantage, Inc
Poehlman Award	Christina Mastromatteo, Lubrizol Corporation
Abstract Booklet	Brian Perry, LORD Corporation Nancy Kirclich, LORD Corporation

Society Officers

Society for Applied Spectroscopy

PRESIDENT	Brian Perry, LORD Corporation
VICE-PRESIDENT	Thomas Steele, Lubrizol Corporation
SECRETARY	Sara Freeman, Ferro Corporation
TREASURER	Robert Williams, Lubrizol Corporation

American Chemical Society

CHAIR	Theresa Nawalaniec, CSU
CHAIR-ELECT	David Orosz, Notre Dame College
SECRETARY	Anna Cronin, Great Lakes Science Center
TREASURER	John Moran, Notre Dame College

AVS, Ohio Chapter

CHAIR	Mohan Sankaran, Case Western Reserve University
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Microscopy Society of Northeast Ohio

PRESIDENT	Min Gao, Kent State University
PRESIDENT-ELECT	Nanthawan Avishai, Case Western Reserve University
PAST PRESIDENT	Amir Avishai, Case Western Reserve University
SECRETARY	Rick Kus, DeNora Tech
TREASURER	Hao Qu, Momentive Performance Materials, Inc.
TRUSTEE	Adam W. Smith, University of Akron
TRUSTEE	Midori Hitomi, Case Western Reserve University
TRUSTEE	Ina Martin, Case Western Reserve University

Ernest B. Yeager Award

In 1962, the Cleveland Section of the Society for Applied Spectroscopy established the Ernest B. Yeager Award, which now consists of a certificate and a three hundred dollar stipend. This award is made annually to an outstanding undergraduate student who is attending a college or university in Northeastern Ohio, and who has demonstrated an interest in some phase of spectroscopy. The award also carries a free one-year membership in the Society for Applied Spectroscopy.

Year	Recipient	Year	Recipient
1962	Eric A. Entemann	1989	Sheryl Tucker
1963	John H. Konnert	1990	No Award Given
1964	Sheldon J. Green	1991	Stephen C. Stone
1965	Cheryl H. Miller	1992	No Award Given
1966	Dale Wingeleth	1993	Baonian Hu
1967	Richard D. Ash, Jr.	1994	Amy L. Lusk
1968	Jon Mynderse	1995	John W. Cave
1969	Virginia E. Coates	1996	Michael Fiorentino
1970	Charles F. Cobb	1997	Jonathan Flad
1971	Gerald R. Cappo	1998	Christopher S. Callam
1972	Donald R. Diehl	1999	David T. Clark
1973	Fred A. Fortunato	2000	Adam Van Wynsberghe
1974	Douglas B. Rahrig	2001	David C. Oertel
1975	William Hart	2002	Richard L. Barger, Jr.
1976	John Havens	2003	Michelle Adams
1977	Thomas M. Leiden	2004	Tiffany Leigh Copeland
1978	Scott A. Raybuck	2005	Stacey Lynne Dean
1979	Jeff Weidenhamer	2006	Colleen M. Burkett
1980	Alexander Kondov	2007	Manasi Bhate
1981	Raymond E. Cline	2008	Nikolas Joseph Neric
1982	Marie Zaper	2009	Deacon J. Nemchick
1983	Brian L. Cousins	2010	Rachel V. Bennett
1984	Ka-Pi Hoh	2011	Daphne A. Guinn and Jennifer L. Miller
1985	Chris Scott	2012	Jean Quenneville
1986	Ann M. Mulichak	2013	Yihui Chen
1987	Rex Ramsier	2014	Jocienne Nelson
1988	Joy Gorecki		

2015 Ernest B. Yeager Award Recipient

Kevin Budge
of
Kent State University

“The Secret Life of DGPP: Physicochemical Properties and Function of an Enigmatic Signaling Lipid”

Ernest B. Yeager, the Frank Hovorka Professor Emeritus of Chemistry at Case Western Reserve University, was internationally known for his pioneering contributions to the fundamental understanding of electrochemical reactions and to the development of fuel cell and battery technology. During nearly 50 years on the Case Western Reserve faculty, he mentored 80 doctorate students and 45 post-doctorate fellows, authored 270 scientific papers and edited and co-edited 20 books. He was internationally recognized as an authority in physical acoustics and electrochemistry. His students and colleagues knew him for his uncompromising demand for excellence in research and scholarly writing.

Professor Yeager, 77, died March 8, 2002 in Cleveland, Ohio, after a long struggle with Parkinson's Disease.

John Bell Memorial Award

John Bell was a long-time member of the Society for Applied Spectroscopy (SAS). The Northeastern Ohio Science and Engineering Fair was one of John's special interests; he took great pleasure in representing our Society's local section as a judge at this event. Unfortunately, John died in November 1994. After his death, the members of the Cleveland Section of SAS voted to honor him by establishing the *John Bell Memorial Award*, for the Science Fair project which best uses or illustrates a principle of spectroscopy in an innovative manner.

Year	John Bell Award	John Bell Merit Award	Special Mention Award
1995	Mary Elizabeth Bruce		
1996	Jonathan Parkhurst		
1997	Lavanya Kondapalli		
1998	Justine Wang	Vivek Mathur	
1999	Elizabeth Long	Kara Urbanek	
2000	Elizabeth Wood	Srinivas Kondapalli Frank Pucci	
2001	Catherine T. Burke		
2002	Mallory Horejjs	Alia Evans Monica Sberna	Gabe Jakubisin Scott Brigeman
2003	Zenon Mural	Cecilia Michel Monica Benedikt	Matthew McPheeters Christina Beall
2004	Kevin Rinz	Emily C. Wirtz Sarah Lynn Martin	Gabrielle L. Petrie Zack Puskar
2005	Christine Debaz	Simone Duval Sara Yacyshyn	
2006	Ellen Napoli	Patrick Rinz Julia Juster	Brittney Williams Derek Poindexter
2007	Anna Faist	Mary Ryan Jennifer Haag	Rebecca Rabinovich Margarat Sivit
2008	Jonathan Sender	Shrey Shah Johnathan Ungvarsky	Daniel Kernan Peter Suwondo
2009	Katherine Reading	Johnathan Ungvarsky Morde Khaimov	Daniel Krentz
2010	Maddie Mooney	Katrina Feldkamp	Samuel Stroebel Leat Perez
2011	Kevin Yang	Emily Peterson	Sara Mann Jane Kim
2012	Jane Kim	Dongham Kim Maurice Ware	Paige Rogozinski Noah Nicholas
2013	Grace Gamble	Justin Boes	
2014	Alison Jin	Claire Chalkin Anjali Prabhakaran	Morgan Fink Kenna Marblestone

The 2015 John Bell Memorial Award Recipient

Christine Larson

*Cell Phone Spectrophotometer:
Measuring Light*

The 2015 John Bell Memorial Merit Award Recipient

Nicolas Kernan

*How do Quantum Laser Micrometers
Compare with Mechanical Micrometers?*

The 2015 John Bell Memorial Special Mention Award

Lauren Zipp

The Biosorption of Heavy Metals by Invasive Plants of Ohio

Ian Thompson

Refraction Action