ACS Chemistry for Life™

Chicago Section

The Chemical Bulletin

http://chicagoacs.org

APRIL • 2016

CHICAGO SECTION AMERICAN CHEMICAL SOCIETY
MONTHLY MEETING
FRIDAY, APRIL 15, 2016

Angelo's on York
247 N. York Street
Elmhurst, IL 60126
630-833-2400

DIRECTIONS TO THE MEETING

From the North - Take I-290 East to N York St (Exit 12) and turn left on York St going south to 247 N. York St.

From the South - Take I-294 North and merge onto 290 West. Take exit 13B to merge onto IL-64W, North Ave. Continue West to York St. and turn left (south) to 247 N. York St.

From the East - Take I-290 West to exit 13B and follow directions above (South)

From the West - Take I-88 East to I-294 North and merge onto 290 West. Then follow the directions above (South)

PARKING: Go directly to parking lot for self-parking.

REGISTRATION & SOCIAL HOUR WITH CASH BAR	**5:30 – 6:30 P.M.**
DINNER	**6:30 – 7:30 P.M.**
INTRODUCTORY REMARKS BY MARY JO BOLDINGH, CHICAGO SECTION CHAIR	**7:30 – 7:45 P.M.**
LECTURE BY DR. BILL CARROLL	**7:45 – 8:45 P.M.**

IN THIS ISSUE

Dr. Bill Carroll, past president of the ACS, Owner of Carroll Applied Science, LLC, and currently Adjunct Professor of Chemistry at Indiana University

Statistics and the Shirelles: How Physical Sciences Thinking Informs Popular Music Analytics

Abstract:

Human beings love lists, especially lists of the "Best of All Time." But very seldom can direct comparison be made between things that had their heydays in different times—whether football teams,

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home run hitters, boxers or even songs. So how might you get to a list of the "Best" records of all time? Is that only a subjective determination—"It's what I like"—or are there objective measures that could be used?

This talk starts that analysis by comparing the history on the Billboard charts of records that were popular between 1958 and 1989, including the methodology for creating the charts and how it varied with time. Then various schemes for determining the strongest charting songs are compared.

Oh yes—and there will be some audio lists including the 20 strongest charting records of those 32 years. And some surprises: Not one of them entered the charts after 1983. The reasons are kind of surprising.

In the end we'll learn how various data handling and thinking techniques used in the physical sciences help with the analysis of music charts, and how a number of different approaches can be brought to consensus by these techniques. Yes, that's right. It's Moneyball for popular music.

MENU

- Salad
- Minestrone Soup
- Mostaccioli with Marinara
- Chicken Vesuvio (Garlic and Rosemary in a White Wine Sauce)
- Eggplant Parmigiana (Baked and Breaded with Marinara and Mozzarella Cheese)
- Spumoni
- Coffee/Tea

Cash Bar

The cost is $30 to Section members who have paid their local section dues, members' families, and visiting ACS members. The cost to members who have NOT paid their local section dues and to non-members is $32. The cost to students and unemployed members is $20.

Dinner reservations are required and should be received in the Section Office via phone (847-391-9091), email (**chicagoacs@ameritech.net**) or website (**http://chicagoacs.org/meetinginfo.php?id=108&ts=1456857685**) by noon on Tuesday, April 12. PLEASE HONOR YOUR RESERVATIONS. The Section must pay for all dinner orders. No-shows will be billed.

Biography:

Dr. William F. Carroll, Jr. holds a Ph.D. in Organic Chemistry from Indiana University, Bloomington, IN. He received an M.S. from Tulane University in New Orleans, and a B.A. in chemistry and physics from DePauw University in Greencastle, IN. He retired from Occidental Chemical Corporation in 2015 after 36 years, and now heads his own company, Carroll Applied Science, LLC. He is also Adjunct Professor of Chemistry at Indiana.

Bill is a member of the Board of Directors of the American Chemical Society (ACS), having served as Chair between 2012 and 2014. He is also a Past President (2005), one of three living members to hold both offices. He is a Fellow of the AAAS and the Royal Society of Chemistry. In 2009 he was chair of the Council of Scientific Society Presidents.

Bill has chaired numerous committees for industry associations, and served on expert groups commissioned by the United Nations Environment Programme, the US Environmental Protection Agency and three states — most recently the California Green Ribbon Science Panel.

Bill has received Distinguished Alumni Awards from both Indiana and DePauw as well as the Harry and Carol Mosher Award from the ACS Santa Clara Valley Section, The Public Affairs Award from the Chicago Section, the Henry Hill Award, sponsored by the ACS Division of Professional Relations, and the Michael Shea Award from the Division of Chemical Technicians.

He holds two patents, and has over seventy-five publications in the fields of organic electrochemistry, polymer chemistry, combustion chemistry, incineration, plastics recycling—and popular music history.

"CHEM SHORTS" For Kids

Underwater Volcano

Kids, this is a demonstration of what occurs in the ocean and what would have occurred in the formation of some islands like Hawaii. This was inspired by the "3 Scientists Walk into a Bar" Facebook page - **https://www.facebook.com/3Scientists/videos/614648762010171/**

Materials:

- colored wax pieces
- water
- sand
- a hot plate, fifth burner, or stove-top
- a colorless glass vessel that can be heated (Pyrex beaker?)

You will certainly want the help of an adult on this.

Try this:

- Add several chunks of the wax, the total amount equivalent to a C battery, to the glass vessel.
- Cover the wax completely with sand and add about an inch of sand above that.
- Add water so that you have an inch of water above the sand.
- Add heat. As heat is added, watch closely for the wax to escape through the surface of the sand.

The sand represents the Earth's crust and the water symbolizes the ocean, while the wax is like the molten magma (or lava once it escapes the Earth's crust). Magma is a liquid because it resides below the Earth's crust in the mantle of the Earth where the temperatures can be on the order of 700°C to 1300°C.

As the wax melts it pushes up against the Earth's crust and eventually creates a fissure or crack in the crust through which it can rise. The water (once it cools) will allow the liquid "lava" to cool and solidify. The "island" that you created is probably floating on the water. This would not be the case in the middle of the Pacific Ocean. As soon as the lava hit the cold ocean water it would cool and solidify and the island would be built up from the fissure all the way to the ocean's surface.

To view all past "ChemShorts for Kids", go to: **http://chicagoacs.org/articles.php?article_category=1**

Paul Brandt

CHICAGO SECTION AMERICAN CHEMICAL SOCIETY
BALANCE SHEET

	Dec 31, 2015
ASSETS	
Current Assets	
Checking/Savings	
CHASE BANK	22,484.33
Northern Trust Bank	-312.70
Total Checking/Savings	22,171.63
Accounts Receivable	
Accounts Receivable	-395.00
Total Accounts Receivable	-395.00
Other Current Assets	
Gibbs Medal Inventory	12,041.72
Prepaid Expenses	216.49
S-N Self-Managed Equities	211,369.47
S-N Self Man. Corp. Gov. Bonds	631,310.32
S-N Self Managed Cash Account	476.17
S-N Self Managed Gen Money Mkt.	203,628.89
S-N Self Managed Mutual Funds	40,665.62
S-N Self Managed Other Invest.	29,799.88
S-N Self Managed Preferred	45,788.03
S-N Self Managed Unr. Cap Gains	-26,924.53
Undeposited Funds	1,090.00
Total Other Current Assets	1,149,462.06
Total Current Assets	1,171,238.69
Fixed Assets	
Security Deposit	781.67
Total Fixed Assets	781.67
TOTAL ASSETS	**1,172,020.36**
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Other Current Liabilities	
Contingency Reserve Fund	37,525.03
Freud Trust Endowment Fund	6,289.96
General Endowment Fund	22,697.50
Holding Fund	1,998.03
Ipatieff Library Endowment Fund	18,721.02
Lishka Scholarship Endow. Fund	81,470.68
Marshall S. Smoler Endowment	38,935.32
Meeting Place Reserve Fund	166,882.36
Payroll Liabilities	2,100.70
Project SEED Endowment Fund	49,828.82
Schaar Scholarship Fund	16,929.59
Scholarship Endowment Fund	658,900.16
Scholarship Operating Fund	43,566.99
W. Gibbs Medal Endowment Fund	34,366.42
Total Other Current Liabilities	1,180,212.58
Total Current Liabilities	1,180,212.58
Total Liabilities	1,180,212.58
Equity	
Opening Bal Equity	7,473.46
Retained Earnings	-35,196.96
Net Income	19,531.28
Total Equity	**-8,192.22**
TOTAL LIABILITIES & EQUITY	**1,172,020.36**

PROFIT AND LOSS

	Jan - Dec 2015
Income	
Affiliate Membership Dues	30.00
Chem. Bull. Advertising	3,480.00
Donations	1,399.00

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Educational Registration	140.00
Gibbs Meeting Registrations	2,650.00
Income from Event Sales	218.81
Investment Transfer	0.00
Local Section Dues	29,772.50
Meeting Registrations	16,076.72
Miscellaneous Revenues	1,100.00
Nat'l Allottments & Commissions	26,411.05
National ACS Reimbursments	22,486.91
Project SEED Income	6,050.00
S-N Self Managed Earnings	66,638.16
Total Income	**176,453.15**
Expense	
Awards	1,069.71
Chair	254.50
Chair-Elect	250.20
Chem. Bull. Production	2,790.00
Chemical Bulletin Advertising	150.00
Chicago Board Liaison	200.00
Community Affairs	18.00
Comptroller1,121.59	
Credit Card Exp Dinner Mtg.	312.17
Dinner Meetings	16,598.26
Dinner Subsidies	1,125.00
Employment	216.67
Gibbs Arrangements	11,393.07
High School Education	949.00
Hospitality	797.25
House	1,639.18
Illinois State Fair	1,500.00
Insurance	1,968.00
Minority Affairs	109.41
Office	1,425.03
Payroll Expenses	38,086.03
Postage	110.37
Program	906.98
Project SEED	10,000.00
Public Affairs	250.00
Rent	10,557.24
Scholarships	19,000.00
Secretary	617.48
Telephone	1,541.93
Travel (Councilor)	30,208.62
Treasurer	10.00
Web	1,214.99
Womens Chemist Club	216.67
Younger Chemists	314.52
Total Expense	**156,921.87**
Net Income	**19,531.28**

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CHAD MIRKIN WINS DAN DAVID PRIZE

The Northwestern International Institute for Nanotechnology Director, Chad A. Mirkin, has received the 2016 Dan David Prize in the Future Time Dimension for his trail-blazing breakthroughs in nanoscience that hold great promise for improvement of our world.

The Dan David Prize in the Future Time Dimension is awarded to an outstanding individual or organization who has significantly contributed to the development of the field of nanoscience and its multifaceted applications in medicine, material sciences and technologies. The prize is a joint international corporation and is endowed by the Dan David Foundation and headquartered at Tel Aviv University **http://www.dandavidprize.org/**.

Mirkin shares the $1 million prize with Paul Alivisatos, University of California, Berkeley and Lawrence Berkeley National Laboratory, and Sir John Pendry, Imperial College London.

All of the 2016 Dan David Prize laureates will be honored at an award ceremony May 22 at Tel Aviv University.

The mission of the Chicago Section of the ACS is to encourage the advancement of chemical sciences and their practitioners.

SCIENCE EDUCATION TURNS TO THE STATES

The February 1 issue of C&ENews article made it very clear that three ACS members, Donald Wink, Thomas Higgins, and Susan Shih, all of the Chicago Section, got Senator Mark Kirk's (R-Ill.) attention. Kirk helped pass the Every Student Succeeds Act, replacing the No Child Left Behind law. The bill, passed last July in the House of Representatives, had almost no mention of science and so the three chemistry professors contacted their senators. And because of this, testing for science is mandated at least once in elementary, middle school, and high school. **https://cen.acs.org/index.html**

A COMPANY YOU SHOULD KNOW

The McCrone Group, Inc., a world leader in microscopy and materials analysis, consists of three businesses: McCrone Associates, Inc., an analytical services laboratory specializing in solving challenging materials issues; McCrone Microscopes & Accessories, LLC, an instrumentation and technical guidance company; and Hooke College of Applied Sciences, LLC, a provider of microscopy education and training.

Founded in 1956, McCrone Associates, Inc. (MA) is proud to be celebrating 60 years of providing analytical services to its clients. Since its inception, MA has been a pioneer in the development of new microanalytical techniques and instrumentation.

In 1962, the company became the world's first analytical services laboratory with a laminar flow cleanroom to process and handle client samples.

In 1965, MA acquired one of the first transmission electron microscopes for commercial consulting: an RCA Scientific Instruments EMU-4 for high-resolution imaging of unknowns and/or contaminants. MA scientists pioneered the ground-breaking development of the first 'table-top' electron microprobe, for which they received a US Patent and an IR-100 award in 1969 from Industrial Research magazine. The company was again recognized in 1973 with an IR-100 award for its development of a vacuum X-ray powder diffraction camera with 500-1000 times higher sensitivity than existing cameras. Through their research, MA scientists also developed one of the first micro-IR instruments two years before such an instrument became commercially available. This was achieved by combining an infrared (IR) microscope with a spectrometer, and it performed the first micro-IR analyses on microscopic samples.

In 1986, Donald A. Brooks, President & CEO, established The McCrone Group, Inc. (TMG) to include the analytical services of McCrone Associates, Inc.; the asbestos and environmental auditing services of McCrone Environmental Services, Inc. (this company was later sold); and the microscope and microscopy supplies sales of McCrone Accessories & Components (now McCrone Microscopes & Accessories, or MMA).

Within a year of establishing TMG, their business growth stimulated relocation to a newly-designed, custom built 26,000 square-foot laboratory and office space in Westmont, IL. In recognition of TMG's contributions to the high technology community in Illinois, Brooks received the Illinois High Tech Entrepreneur Award in 1987.

In 2004, Brooks added Hooke College of Applied Sciences, LLC (HCAS), a learning center providing education and training in material sciences. With their continued growth, the TMG facility was expanded in 2005 to 66,700 square feet.

Today, McCrone Associates offers unmatched analytical capabilities through the skills and experience of their expert scientists and their array of state-of-the-art instrumentation. Specializing in ultramicroanalysis, MA offers microscopy, spectroscopy, and chromatography methods for investigational analysis and research. MA's scientists are able to collect, characterize, and identify extremely small amounts of materials (down to picograms in mass), whether the samples are forensic evidence for a murder or bombing case, contaminants in pharmaceutical products, pigments from a masterpiece or document, the tail-rudder bearing from a B-2 bomber, or any other contaminants or unknowns. Instrumentation available at MA includes light, scanning electron, and transmission electron microscopy; infrared, Raman, and x-ray spectroscopy; gas and liquid chromatography; and mass spectrometry.

Continuing its legacy of excellence and integrity, MA established a comprehensive Quality Management System, developing formal policies and procedures to provide quality assurance consistent with recognized standards. MA is accredited to the requirements of ISO/IEC 17025:2005, conforms to current Good Manufacturing Practices (cGMP's 21 CFR parts 210, 211, and 820), and is registered with the FDA, GDUFA, and DEA. The majority of sample preparation is performed in cleanrooms certified to ISO 14644 Class 5 standards. MA continually strives to improve its quality management system to ensure confidence in laboratory results.

MMA offers an ever-growing line of products and services for microscopists, including the design of custom microscopy systems, a comprehensive array of software and hardware installations, specialty glove box systems, on-site training programs, and microscope calibration and repair. The products offered include Nikon microscopes and metrology equipment, Olympus microscopes, Linkam heating/cooling stages, Hirox digital microscopes, JEOL NeoScope Plus benchtop SEMs, Retsch milling equipment, a variety of digital imaging systems, and a wide range of laboratory supplies.

HCAS provides a variety of hands-on microscopy education and training programs for industrial and government professionals, educators, and laboratory personnel. HCAS instructors are subject matter experts who bring a wide range of backgrounds, skills, and experience to the classroom. In addition to their regular courses, HCAS has trained more than 400 forensic trace evidence examiners through a program funded by a National Institute of Justice grant.

Working with local colleges and universities, HCAS developed a "3+1" program to allow undergraduate students to obtain a bachelor's degree in chemical or applied microscopy. Students study for three years at their home university or college to gain a solid liberal arts education and the required degree prerequisites in chemistry, biology, math, and physics. During their fourth year, students study at HCAS where they are immersed in practical hands-on training courses in chemical microscopy and materials analysis, and learn alongside industry professionals.

The McCrone Group offers online references and resources. The McCrone Atlas of Microscopic Particles (**www.mccroneatlas.com**) is a free particle reference tool for scientists, microscopists, and criminalists engaged in materials characterization and particle identification. Modern Microscopy (**www.mccrone.com/mm**) is a compendium of articles, tips, and tutorials related to microscopy and microanalysis written by TMG scientists and contributing scientists from around the world. Monthly webinars (**www.mccrone.com/webinars**) are offered on a range of topics related to analysis, microscopy, and instrumentation.

For more information, visit **www.mccrone.com** or phone Dr. Kent L. Rhodes, 630-887-7100.

SOMEONE YOU SHOULD KNOW

Tim Marin is one of our quieter members of the Chicago Section. He co-chaired the Program committee with Frank Jarzembowski. Many of you probably didn't know that he had been working in the background helping with our monthly meetings a couple of years ago. Tim is a native Chicagoan, having been born on the southwest side of Chicago. His father was a high school English teacher and later became an administrator. His mother was an elementary school office assistant. Tim has one sister who is a genetic counselor. He believes that he is the first person in his entire extended family to go into science.

Tim knew early on as a young child that he would someday go into science. He was always interested in science and it was very difficult for him to select an area of study, but he chose chemistry for practical reasons. Tim earned credit by taking the advanced placement chemistry exam which put him a year ahead in the college chemistry program. He earned his B.S. in chemistry from Benedictine University in Lisle and went on to Northwestern University in Evanston to work on his Ph.D. in physical chemistry. His advisors were Ken Spears and Joe Hupp and his dissertation was on "Vibrational Effects in Electron Transfer and Radiationless Decay". Dr. Marin completed his studies by doing a postdoc at Argonne National Lab in the chemistry division with Dave Bartels and Chuck Jonah in the radiation and photochemistry group.

Interestingly enough, he started at Benedictine University as an undergrad and went back to Benedictine, where he is currently an associate professor. He also continues to hold a guest appointment at Argonne National Lab. Tim is assigned to the chemistry department but primarily teaches physics courses and is the physics lab coordinator. A typical day at Benedictine is a combination of lecture and lab courses with plenty of service-oriented meetings involving the University Center for Mission and Identity. His favorite project involved working with collaborators from the Notre Dame Radiation Laboratory studying the vacuum ultraviolet spectroscopy of a variety of supercritical fluids at the Synchrotron Radiation Center at the University of Wisconsin in Madison.

Dr. Marin has been an ACS member since 1995, when Mike Winkler, one of his undergraduate chemistry professors encouraged him to join. Tim's involvement in the ACS has included national, regional and local activities. He has attended and presented at a variety of national, regional and local meetings. Tim served as the faculty sponsor for Benedictine University Student Members of the ACS Chapter for seven years. The Benedictine University Chapter actively runs a National Chemistry Week event every year. He has also served as a guest speaker for Theology on Tap events in the Catholic Diocese of Joliet, discussing the interface of faith and science, where inevitably chemistry topics come up for discussion.

You can always learn something about an individual by asking who they would want to eat lunch with, dead or alive. Tim chose Sir Isaac Newton because he feels that he is probably the most brilliant and innovative scientist who ever lived. He goes on to say that Newton had many intriguing ideas about God and the nature of the cosmos.

Tim has a big, friendly dog named Simon which is a malamute mix. Dr. Marin is not married nor does he have children. He states that his true love is music and he has been performing ever since he joined the school band with his clarinet in 4th grade. Nowadays he is primarily a bassist and plays semi-professionally with several groups. In fact, he has a gig nearly every weekend and plays primarily jazz. As you can tell, he would have been a musician if he did not follow the path of science. Tim is also a composer and has scored multiple pieces of music for a full symphony.

Dr. Marin's final words of wisdom to all of us: "If the scientist isn't dead yet, don't barium!"

Fran Kravitz

PROJECT SEED SCHOLARSHIP

Imran Khan received a 2015-2016 Project SEED College Scholarship, a one-year non-renewable Alfred & Isabel Bader Scholars scholarship in the amount of $5,000. Khan is a graduate of Niles West High School, in Skokie, Ill. He conducted research at Loyola University, in Chicago, under the guidance of Rick Holz. The research is titled "Catalytically Important Residues in NHase." Khan is majoring in integrated science at Northwestern University.

CALENDAR

April 2: The Marie S. Curie Girl Scout Chemistry Day program at North Central College.

April 2: Washington University Chemistry Tournament for HS students.

April 9: The Marie S. Curie Girl Scout Chemistry Day program at Valparaiso University.

April 11: University of Chicago Stieglitz Lecture by Dr. Andrew Myers, Harvard University. Kent Chemical Laboratory, 4:00 – 5:30 pm. **http://bit.ly/1VomBkP**

April 22: Earth Day: The Great Indoors – Your Home's Ecosystem

April 25: Deadline for the Illustrated Poem Contest (K-12) for "The Great Indoors – Your Home's Ecosystem" Earth Day. **http://chicagoacs.org/Chicago_Section_Community_Activities**

April 30: You Be The Chemist Illinois State Challenge at Lewis University

May 7: The Marie S. Curie Girl Scout Chemistry Day program at College of Lake County, Grayslake.

May 14: STEAM Conference, Northeastern Illinois University. **http://www.steamconf.org/**

May 20: Chicago Section ACS Willard Gibbs Award Banquet. Dr. Laura Kiessling, University of Wisconsin, Madison, is the recipient of the 2016 Willard Gibbs Medal.

May 28: Chicago Section Scholarship Exam at North Central College.

August 11-21: The Illinois State Fair in Springfield. Come volunteer at the ACS booth. **http://chicagoacs.org/Illinois_State_Fair**

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