

## Newsletter

Of the

## **New York Microscopical Society**

1 Prospect Village Plaza (66F Mt. Prospect Avenue) Clifton, New Jersey 07013-1918 GPS: Latitude 40.8648N, Longitude 74.1540W



Oct 2017

Editor: (201) 791-9826

Volume 11 (31) Number 7

## NYMS Sunday, October 29<sup>th</sup>, 2017, Location: NYMS in Clifton, New Jersey Doors Open at 1pm, Lecture Meeting at 2PM

### 3-D Laser Holograms Under the Microscope Frank DeFreitas, Holoworld

DeFreitas will present on creation, study, enjoyment and transmission of three dimensional holograms. Of special interest for our Society is the amazing miniaturization achievable in recording 3-D and 2-D information holographically, and the recovery of such information using very basic stereobinocular microscopy. Very remarkable is the opportunity to microscopically study physical things in three dimensions and great detail, via holographic images and stereobinocular microscopes. Important and of great interest to DeFrietas are the broad dissemination of otherwise inaccessible information, and the wide distribution of opportunity to view and study singular and generally inaccessible physical things.

For nearly 35 years, Frank DeFreitas has developed holography systems and applications, and provided laser and hologram resources, training workshops and outreach programs and invited presentations, to all levels of science and technology education and industry. DeFreitas grew up around Philadelphia / South Jersey, a prime location in the earliest days of lasers and holography with local firms Edmund Scientific, Metrologic Laser, Holex Corp., The Franklin Institute, and more. He first saw lasers and holography in 1968 at the Edmund Scientific showroom store in Barrington, New Jersey, and first attended an holography exhibit in 1976 "Through the Looking Glass" presented at the Walnut Street Theater in Philadelphia at by the New York Museum of Holography. By 1983 DeFreitas had designed and built his own laser and holography studio in Allentown, PA. In late 1993 during the era of 14.4 kbit/s dial-up modems and NCSA Mosaic browsers, DeFreitas brought online the original Internet Webseum of Holography, his world-famous www.holoworld.com website went live in 1995, and he taught the first online class for holography through America On Line in 1995. During 1983-2016 DeFreitas consulted, lectured and taught at The Smithsonian Institution's Hirshhorn Museum and its Ripley Education Center, in Washington DC, The Franklin Institute, and the University of Pennsylvania Museum of Archaeology and Anthropology, both in Philadelphia, PA, Stevens Institute of Technology, Hoboken, NJ, the Liberty Science Center, Jersey City,NJ, The Discovery Center of Science and Technology, and Lehigh University's Physics Dept., both in Bethlehem, PA., California Institute of Technology, NASA / Northrop Grumman, AT&T, Lucent Technologies, U.S. Navy Drone LIDAR RGB Holographic Imaging, Fuji Film Corp., Dupont, the National Science Foundation's Urban Systemic Initiative and other NSF-funded programs, and many elementary, middle and high school, and college and university programs.

Frank DeFreitas is an elected member of the National Physics Honor Society Sigma-Pi-Sigma, and the American Institute of Physics, for his work in laser and holography educational programs. (See NYMS Supplement Section)

http://school-of-holography.teachable.com/



Save a Tree: Get The Extended Newsletter: By Email Only

## New York Microscopical Society Board of Managers (Officers Term 2017-2018)

President, Brooke Kammrath, bkammrath@newhaven.edu; (203) 931-2989, Vice President, John Scott, nyconsnfdn@aol.com; (646)339-6566, Curator, Archivist. Treasurer, Mel Pollinger, pollingmel@optonline.net; (201)791-9826, Facilities, Editor, Librarian. Secretary, Lou Sorkin entsult@aol.com, (914) 939-0917, Manager 2015-2018 Manager, Roland Scal, rscal@qcc.cuny.edu; (718)631-6071, 2016-2019 Manager, 2015-2018 Guy deBaere guydbaere@aol.com; (347)668-4798 Outreach Program Manager, 2015-2018 John A. Reffner jareffner@cs.com; (203)358-4539 Past President Manager, 2015-2018 John R. Reffner, Jr. jrr11p@gmail.com; (215)527-1882 Manager, 2015-2018 Andrew J. Winter, Education Chair Manager, 2016-2019 Seymour Perlowitz perlowitzs@hotmail.com; (718)338-6695 Manager, 2016-2019 Peter Diaczuk pedicoplanb@gmail.com;; Cell:(917)578-3049, Past President For additional information contact the Editor: Mel Pollinger at (201) 791-9826, pollingmel@optonline.net

Dues and Addresses Please remember to mail in your Dues to: Mel Pollinger Treasurer, NYMS 18-04 Hillery St. Fair Lawn, NJ 07410-5207

Junior (under age 18) \$10 Annually <u>Regular</u> \$30 <u>Student (age 18 or above) \$20</u> Annually <u>Supporting</u> \$60 Annually <u>Corporate</u> (includes one advertisement in NYMS News) \$175 Annually <u>Life</u> \$300 (payable within the year) To avoid missing notices: Notify Mel Pollinger if you have changed your address, phone or email.

### The Mission of the New York Microscopical Society is the promotion of

theoretical and applied microscopy and the promotion of education and interest in all phases of microscopy.

#### **Alternate Meeting Notifications**

Please note that due to time constraints in publishing, some meeting notices may be available by calling Mel Pollinger at 201-791-9826, or emailing: pollingmel@optonline.net

#### Awards Given by the New York <u>Microscopical Society</u>

The New York microscopical Society takes great pleasure in recognizing and rewarding individuals who have contributed to either the activities of the society or to furthering microscopy. These awards are described in our website and in a pdf file for our email newsletter recipients. All members are eligible to nominate individuals for these various awards, and are encouraged to do so. John A. Reffner, Awards Committee Chairperson

#### Awards Committee Chair: John A.

Chair: John A. Reffner

Members Jan Hinsch Peter Diaczuk John R. Reffner

#### To Order Your NYMS Lapel Pins Send a check in the amount of \$12.00 per pin to: New York Microscopical Society c/o Mel Pollinger, 18-04 Hillery Street, Fair Lawn, NJ 07410. To avoid shipping & handling charges, pins may be purchased directly at any NYMS meeting for \$10.00.



Mel Pollinger, Editor 18-04 Hillery St. Fair Lawn, NJ 07410-5207



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Please remember to pay your dues

Buy and Read a Good Book on Microscopy.

From: "Eastern Analytical Symposium & Exposition" <newsletter@eas.org> To: <pollingmel@optonline.net> Sent: Friday, June 23, 2017 2:52 PM

#### EAS 2017 Award Recipients

EAS Award for Outstanding Achievements in the Fields of Analytical Chemistry Prof. Janusz Pawliszyn, University of Waterloo EAS Award for Outstanding Achievements in Separation Science Dr. Christopher Welch, Welch Innovation, LLC EAS Award for Outstanding Achievements in **Chemometrics** Prof. Barry Lavine, Oklahoma State University EAS Award for Outstanding Achievements in Magnetic Resonance Prof. Bernhard Blümich, RWTH Aachen University EAS Award for Outstanding Achievements in Mass Spectrometry Prof. Scott McLuckey, Purdue University EAS Young Investigator Award Prof. Dwight Stoll, Gustavus Adolphus College EAS would also like to congratulate our 8 **Graduate and Undergraduate Student** Awardees

EAS| askeas@eas.org | 732-449-2280 | www.EAS.org



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Sulfanilamide crystallized from aqueous solution & imaged by polarized-light. See supplement front page of email newsletter.



Molecule rendition from Wikipedia

#### Mystery Photo for October 2017



Answer on pg 4

#### NEW YORK MICROSCOPICAL SOCIETY BULLETINS

The following original-print bulletins can be purchased by NYMS members.

The bulletins are limited in number and can be purchased, while they last, at \$2.00 each. Also available in limited supply are original-print NYMS journals While they last at \$10.00 each. The journals date back to 1896. The bulletins, Journals and other out-of-archive publications may be viewed at the NYMS Library in Clifton, New Jersey. If interested in owning a part of NYMS history, please contact Mel Pollinger by email pollingmel@optonline.net or by daytime phone at (201) 791-9826

Vol. 1 New York, N. Y., January, 1937 No.3 COLLECTING RECENT DIATOMS *By* JOSEPH F. BURKE

Vol. 1 New York, N. Y., February, 1937 No. -4 PREPARING RECENT DIATOMS *By* JOSEPH F. BURKE

Vol. 1 New York, N. Y., November, 1937 No.5 MOUNTING RECENT DIATOMS *By* JOSEPH F. BURKE

Vol. 3 New York, N. Y. June, 1951 No: 1 PREP ARA TION OF METAL FOR MICROSCOPICAL EXAMINATION by F. Gordon Foster Fellow, New York Microscopical Society Vol. 1 New York, N. Y., December, 1936 No.2

Vol. 1 New York, N. Y., December, 1936 No.2 MAKING A ROCK SECTION *By* GEORGE E. ASHBY

Vol. 1 New York, N. Y., February, 1936 No.1 THE MYCETOZOA

By ROBERT HAGELSTEIN

Vol. 2 New York, N. Y., April, 1944 No.1 THE HISTORY OF THE MICROSCOPE By ROBERT HAGELSTEIN

Vol. 1 New York, N. Y., January, 1940 No.6 MOUNTING INSECTS BY THE PRESSURE METHOD, *By* Roy M. ALLEN The bulleting are limited in number and can be

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#### A Not-For-Profit Educational Organization, (nyms.org) Page 3 of 4

## Visitors Always Welcome to NYMS

Although most of our lecture meetings, workshops and classes are held in the NYMS Clifton facility on the last Sunday in the months of Jan., Feb., Mar., May, Sep. & Oct. The building may be opened for special purposes at other times, by appointment only. For such an appointment, please contact Mel Pollinger by phone at (201) 791-9826, M-F noon to 9:30pm, or by email at pollingmel@optonline.net.

## From The Editor...

if you have an email address: Getting the newsletter by email means you can receive an <u>extended pdf version</u> that cannot be sent by "snail mail." Even if you only continue your USPS delivery of the newsletter, NYMS needs your email address for reporting priority events and special news. Being able to contact you quickly by email means better communication between you & NYMS= Mel

### Need to use a Microscope or Book?

The various microscopes and library are presently for use on the main floor of the New York Microscopical Society building in Clifton, N.J. To arrange for a visit, please contact John Scott, or Mel Pollinger (see pg 2 for details)

NYMS microscope slide collections are available for study at meetings and by appointment.

### Additional Historical NYMS Supplements

Email Newsletter recipients can also receive copies of NYMS Newsletter pdf back-Issues from 2007. Copies of older newsletters will be included in the supplement section as I convert them.

Upcoming NYMS events are noted on the NYMS website and in the NYMS Newsletters both printed and email versions.

Water spout from a garden fountain in Yonkers, New York. Photographed at 1/1000 second, F/8, Nikon D5000 DSL camera. Photo by Mel Pollinger

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Stereomicroscopy for Firearm Examiners The New York Microscopical Society is pleased to announce it has held its 3rd Annual Law Enforcement Lecture Series. The purpose of this lecture series is to explore various forensic science related topics and "real world" case work and find their nexus to the examination of microscopic evidence. During the fall of 2017 through the efforts of Andrew Winter and our NYMS Education Committee, we were fortunate to have as quest instructors: Dr. Peter Diaczuk with Penn State University, Mr. Alan Paris and Mr. Mario Gislao both with Leica Microsystems for a law enforcement workshop titled, Stereomicroscopy for Firearm Examiners.



Sent in by Jean Portell Subject: International Society of Tardigrade Hunters Blog - The International Society of Tardigrade Hunters

#### http://tardigradehunters.weebly.com

I recommend this modest no-pressure online site to anyone with an interest in water bears. Two years ago I posted a comment there -- mentioning NYMS of course and signing as Jean, then opting to be alerted if anyone commented. Twice since then (including today) I was alerted and revisited the site just to read what was posted. A nice experience! ~Jean





Supporting Member

A Not-For-Profit Educational Organization, (nyms.org) Page 4 of 4

# N.Y.M.S. SUPPLEMENT SECTION



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EAS GC Courses
McCrone Courses 2018
Directions to NYMS
NYMS Sales Items
Membership Application
Gallery page(s)

Sulfanilamide, 50x (P711709)v4x6x200: Polarized-light photomicrograph by Mel Pollinger

## **Laser Holograms and Microscopy**

Frank DeFreitas Allentown, Pennsylvania, USA

Holograms provide ultra high-definition recordings of three-dimensional objects and storage of data. The author looks at the history of holograms under the microscope, and shows a few projects of his own. Some of the most recent holograms have magnification optically encoded within the hologram itself, therefore *no physical lenses, sensors, computers, monitors or software are needed for magnification*.

### INTRODUCTION

Microscopy was the original reason that holography was invented. Dennis Gabor developed holography in 1948 with the hope of improving the resolution and field depth of the electron microscope (A New Microscope Principle, Nature, May 1948). Relying on the light of a carefully filtered mercury vapor lamp, Gabor had mixed success with early holograms. It wasn't until the invention of the laser in the early 1960's that holography began to see its full potential.



### HOLOGRAMS & THE MICRO WORLD

Holograms, those darlings of science fiction and museum gift shops, have been around for a half-century now. While there are various forms of holographic microscopy, I will be addressing two forms in particular: display holography and analog data storage. These techniques can be (relatively) easy to duplicate in the modern classroom, and bring renewed interest in the use and enjoyment of the microscope for students. There are many things that a hologram can do well, and in some cases better than any other method on Earth. There are two techniques that are important to us: storing massive amounts of densely packed information, and giving the most realistic three-dimensional images in the world. Objects within a hologram not only look convincingly real, but in many cases, they work as if they are real (a holographic lens functions the same as the 'real' lens that was used to record it). This leads many visitors to my presentations to ask: "What is real?" "What is a hologram?"



This portable holocamera, developed by Hughes Aerospace for NASA, was to fly on an Apollo mission to the moon. It would bring holograms back to earth. The holocam is on the left, a simulated moon soil hologram is on the right.

#### **APOLLO PROGRAM**

Here is an example of one of the earliest holographic microscopy projects. In the 1960's, Hughes Corporation developed a portable holocamera for inclusion for the National Aeronautics and Space Administration (NASA) Apollo program. This camera contained a pulsed ruby laser system, and its purpose was to take close-up laser holograms of moon rock and soil. These samples would then be brought back to earth and taken into the laboratory for microscopic examination.

It is interesting to note that this early experimentation was viewed on a retrofitted microscope with a mono eyepiece, not stereo. Due to the hologram recording threedimensional space, the entire field depth would still be available, albeit via a flat, 2dimensional view, not 3D. The system never flew to the moon. With traditional holographic microscopy, magnification is achieved by means of a wavelength change between recording and reconstruction. The field of view is a function of the resolution and size of the recording material. In the earliest days, silver halide emulsions were used. Modern recording now relies on very high-resolution photopolymer emulsions. Some of these materials can resolve up to 10,000 lines per mm, or greater.

I've been using holographic microscopy as a type of *hybrid* system: the creation of standard display holograms -- which are viewable under standard microscopes (and best with stereo microscopes). This led to my most recent attempts to encode the magnification capabilities within the hologram itself, since a hologram can function as an optical element on its own.



### **MY RESTORED MICROSCOPE**

I obtained my own Leitz-Wetzlar prism stereo microscope at an antiques market. It was in rather poor visual condition, but the optics were acceptable. It took a lot of care to bring it back to nearly pristine condition, and it now accompanies me to my holography presentations.

It was important that the holographic objects viewed under the microscope would appear three dimensional to the viewer. Especially since the objects themselves were no longer physically present. I would like to introduce the reader to several of my projects:

## Hologram Artifacts under 3D Microscope



Widow's Mite (lepton) coin. Judea. circa: 70 BC to 70 AD (left) actual coin; (right) 3D laser hologram of coin Both are right eye views from stereoscopic (3D) microscope

#### WIDOW'S MITE

As we have read, since the 1960's it has been shown that a hologram can take the place of an actual object under the microscope. This includes stereo microscope reconstruction.

In the above photo we see two images of a 2,000-year-old coin called a widows mite. This coin was in use when Jesus Christ walked the earth. On the left, we have the actual coin viewed through an eyepiece of a stereoscopic microscope. On the right, we have the holographic image of the coin on the left, also shown under the same microscope.

Of course, the holographic coin on the right is not there physically. But it can be examined just as if the real coin were present.

The quality of a hologram image is determined in part by the qualities of the light used to reconstruct it. 'Playback' or reconstruction, must be taken into consideration when recording the hologram.



#### **PERSIAN VASE**

Note how this Persian vase can be recorded as a thin film laser hologram. The thin film can then be placed under the 3D stereoscopic microscope for close examination.

This particular experiment shows that a 3-dimensional laser hologram of a large object can be a substitute for the actual object itself. It provides the examiner with the very same features, except that the actual object is not there, nor does it consume the same space.



### MOUNT OF OLIVES SOIL

The results of this experiment were very close to what NASA achieved with their Apollo holocamera. This is soil from the Mount of Olives. It shows that soil samples from the moon, mars or other body can be recorded onto lightweight photopolymer film. That film can then be examined in its entire 3-dimensional fidelity back on earth – far in excess of any current electronic resolution capabilities . . . without the need for the storage space or weight associated with bringing additional 'real' samples back.

With the advent of small, yet high-powered diode laser systems, a 21<sup>st</sup> century holocamera could be very compact and lightweight.

Today it is more likely for some sort of digital system to be employed. As with most imaging technologies, holography continues to move into the digital realm – although at a much slower pace than standard photography has. Today's digital holograms are still exposed onto very high resolution emulsions, notably photopolymer materials.



#### LORD'S PRAYER (Self-Magnification Type)

I am proposing that this is the smallest Lord's Prayer in the world today. Its imaging area size is smaller than the width of a human hair -- or less than 100-microns in diameter. We see it here greatly magnified from its original size in my laser studio / lab. If the size of the imaging area were enlarged to the size of a U.S. dime, the holographic image would be the height of a 16-story office building. It exists in a realm that is difficult to comprehend. Its detail is in the nanometer range.



The Lords Prayer hologram that you see above is made entirely of light. If you reach for it, your fingers pass right through it. It was created with a 100mw DPSS 532nm laser system on a vibration isolation table. It can be reconstructed, however, with a simple, inexpensive laser pointer from Wal-Mart. Its magnification optics are 'built in" to the holographic encoding. It can be projected onto a wall, screen or ceiling. It can be (and has been) sent secretly through the mail to anyone, anywhere in the world (see below).



### WHAT'S THE POINT?

Actually, the bottom line is what I'm referring to as "**stealth holography**". Relying on long-standing, common properties of holography, this micro text and image hologram (above) was placed under a postage stamp and mailed successfully. It can be 'read' with a simple laser pointer, but only by the recipient(s) knowing the proper laser beam to hologram orientation / geometry. As an example, the Holy Bible and Scripture can be sent to areas of the world where the Bible is banned.

The next self-magnifying micro hologram (below) has been embedded within an everyday greeting card. The information can be retrieved by a simple laser pointer. This particular hologram contains the Lords Prayer, and was recorded so that its magnification takes place without any external optical system components. In essence, the 'microscope' is built into the hologram itself. Can you find the hologram embedded in the card?



Again, text and images can be 'projected' out into space onto a wall, screen or ceiling by passing a laser pointer beam through the hologram area. The hologram is 'self magnifying', i.e. while the recorded image can be measured in microns, the reconstructed image can be easily read. If there is no physical microscope, is it still a microscope?

Otherwise, it remains camouflaged, calling no attention to itself, with no information whatsoever revealed under inspection.

This particular hologram (shown below in tweezers) contains the entire contents of the King James Holy Bible (1,245 pages / 773,000+ words):



## THE FUTURE

After 30 years in the field of holography, I continue to work on varying projects. Microscopy has gained my interest due to a fascination with just how small I can go. Public interest is moderate. So far, I've been invited to be a guest on several radio shows and I have been including micro holography during my presentations (from local groups to the Smithsonian and New York Hall of Science). I've participated in a web cast to Europe via Skype. All of this helps to promote both holography and microscopy.



It has not been common for standard holograms to be combined with microscopes in the classroom or in public, although it has been done. Mostly, holograms are shown in museums, galleries and shops as displays. As with many items today, larger is considered better. I didn't want to get caught up in the "biggest hologram' race. So I decided to go in the opposite direction: making the smallest.

On final important thing to remember is this: these micro holograms are *not* reduced images. That is, taking a normal sized image and making it smaller and smaller. In fact, *there are no "images" in the holograms at all*. It is beyond the scope of this report to go into exactly what the hologram does contain, its structure, or to even begin the discussion of how to make them (they're no longer very difficult to make). There is plenty of information available online, just type 'holography' in to any search engine. If there is enough interest, perhaps I can submit a step-by-step primer sometime in the future.

More detailed information is available at my holoworld.com web site.



In closing, if you happen to have a pair of 3D anaglyph glasses, put them on and view this final photo of my microscope (below). It should project out of your computer monitor or hand-held device. Left eye: red / Right eye: cyan.



References:

R.J. Collier, C.B. Burckhardt and L.H. Lin; Optical Holography, Real-image Applications, pp. 360-365, Academic Press, 1971

H.M. Smith; Principles of Holography, Holographic Microscopy, pp. 247-254, J. Wiley and Sons, 1971

H.J. Caulfield; Handbook of Optical Holography, Microscopy (Mary E. Cox), pp. 561-572, Academic Press, 1979

M. Wenyon, Understanding Holography, Holography as a Tool, pp. 109-111, Arco Publishing, 1978

F. DeFreitas; HoloWorld, The Widow's Mite and Hologram Bible, <u>holoworld.com</u>, 2012-2013

## Comments can be sent to Frank DeFreitas at

fdefreitas@holoworld.com

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## Frank DeFreitas



2017: DeFreitas exhibit at N Y Hall of Science World Maker Faire



2016: DeFreitas at Johnson College of Techn, Scranton, 3D laser holograms



## New York Microscopical Society 2017 Annual Banquet

What: Enjoy a wonderful Buffet Luncheon, including soft beverages (cash bar available) and desserts, with your fellow-members and guests. Also enjoy an

exciting presentation by (To be announced). An overall jolly time at one of the oldest restaurants in mid-town Manhattan; The Landmark Tavern.

When: Sunday December 10, 2017, from noon until 3:30pm.

Where: Landmark Tavern, 626 11th Ave., at W. 46th St New York City, NY Tel: 212-247-2562.

Cost: \$35.00 per person.

**How**: Reserve your place now\* by filling in the Reservation Request form below and mailing it along with your check to the Treasurer (see address below).

\*Reservation requests must be received on or before November 28, 2017

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Number attending \_\_\_\_\_\_ @ \$35/each = (write check amount) \_\_\_\_\_

Member name\_\_\_\_\_

Address

Phone\_\_\_\_\_ eMail\_\_\_\_\_

Send this form and payment to:

NYMS Banquet 2017 c/o Mel Pollinger, Treasurer 18-04 Hillery Street Fair Lawn, NJ 07410-5207

For additional information contact Mel Pollinger (201) 791-9826 or email: pollingmel@optonline.net

<u>Space is limited, so rush your reservation request in to reserve</u> <u>your place(s) asap.</u>

#### **New York Microscopical Society**

#### 3<sup>rd</sup> Annual Law Enforcement Lecture Series

#### Stereomicroscopy for Firearm Examiners

It can be argued that the microscope is an indispensable tool for the forensic firearm examiner. It is a versatile instrument, offers a tremendous amount of information about the sample, and is non-destructive, a feature specifically beneficial in forensic examinations. The drawback is that proper use and understanding of the microscope requires skills that are not taught in most academic curricula.

The New York Microscopical Society is pleased to announce it has held its 3<sup>rd</sup> Annual Law Enforcement Lecture Series. The purpose of this lecture series is to explore various forensic science related topics and "real world" case work and find their nexus to the examination of microscopic evidence. During the fall of 2017 through the efforts of Andrew Winter and our NYMS Education Committee, we were fortunate to have as quest instructors: Dr. Peter Diaczuk with Penn State University, Mr. Alan Paris and Mr. Mario Gislao both with Leica Microsystems for a law enforcement workshop titled, *Stereomicroscopy for Firearm Examiners*.

The purpose of this workshop was to offer an insight into the basic use and theory of these lowmagnification microscopes (or technically *macroscopes*), including some terminology. Leica stereomicroscopes were made available for all attendees to use during the workshop. Proper set-up and adjustments to the optics was covered, followed by the observation of various samples of spent bullets and cartridge cases, during the hands-on component. A portion of the workshop specifically addressed illumination options including recent advances in LED light systems.

This practical training was made possible thanks to Mr. Alan Paris with Leica Microsystems and Mr. Jack Kolator with Miller Precision Optical Instruments, Inc., who were generous enough to provide stereomicroscopes as well as other advanced Leica microscopes such as the Leica Digital Microscope DVM6 and the Leica Research Stereo Microscope M205, featured throughout the workshop and utilized by the attendees.



## NYMS 3<sup>rd</sup> Annual Law Enforcement Lecture Series: Page 2







## NYMS 3<sup>rd</sup> Annual Law Enforcement Lecture Series: Page 3









## NYMS 3<sup>rd</sup> Annual Law Enforcement Lecture Series: Page 4







### NEW YORK MICROSCOPICAL SOCIETY BULLETINS

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Vol. 1 New York, N. Y., January, 1937 No.3 COLLECTING RECENT DIATOMS By JOSEPH F. BURKE Vol. 1 New York, N. Y., February, 1937 No. -4 PREPARING RECENT DIATOMS By JOSEPH F. BURKE Vol. 1 New York, N. Y., November, 1937 No.5 MOUNTING RECENT DIATOMS By JOSEPH F. BURKE Vol. 3 New York, N. Y. June, 1951 No: 1 PREP ARA TION OF METAL FOR MICROSCOPICAL EXAMINATION by F. Gordon Foster Fellow, New York Microscopical Society Vol. 1 New York, N. Y., December, 1936 No.2 MAKING A ROCK SECTION By GEORGE E. ASHBY Vol. 1 New York, N. Y., February, 1936 No.1 THE MYCETOZOA By ROBERT HAGELSTEIN Vol. 2 New York, N. Y., April, 1944 No.1 THE HISTORY OF THE MICROSCOPE **By ROBERT HAGELSTEIN** Vol. 1 New York, N. Y., January, 1940 No.6 MOUNTING INSECTS BY THE PRESSURE METHOD, By Roy M. ALLEN From: To: Sent: Subject:

"Eastern Analytical Symposium" <newsletter@eas.org> <pollingmel@optonline.net>

ent: Wednesday, October 04, 2017 4:35 PM

Subject: Don't Miss Out on these Top Rated Short Courses at EAS



### EAS SHORT COURSES - Are A Great Training Opportunity!

Knowledge is the key to success in the laboratory enterprise, and the slate of EAS short courses provides real-world, tangible knowledge on a variety of topics. The instructors are experts in their specialties, and they communicate the important, and sometimes esoteric, nature of techniques and problems encountered in everyday laboratory work. You are sure to find topics that will provide essential knowledge and enhance your career in analysis.

**<u>Register</u>** to guarantee your spot in one of our one- or two-day courses.

Click on the course title below to link to course descriptions and instructor bios or download the full schedule

#### **Two-Day Short Courses**

Code	~ 2-Day Courses ~ Sun., Nov. 12 - Mon., Nov. 13 8:30am - 5:00pm	Instructor(s)
E17-01	Practical Gas Chromatography	Dr. Eugene Barry, University of Mass-Lowell Dr. Thomas Brettell, Cedar Crest College
E17-02	LC/MS: Theory, Instruments, and Applications	Dr. Guodong Chen, Bristol-Myers Squibb Dr. Ragu Ramanathan, Pfizer
E17-03	Chemometrics Without Equations Part 1 & 2 (combined course)	Dr. Donald Dahlberg, Lebanon Valley College Dr. Barry Wise, Eigenvector Research

Code	~ 2-Day Courses ~ Mon., Nov. 13 - Tues., Nov. 14 8:30am - 5:00pm	Instructor(s)
	Modern HPLC/UHPLC for Practicing Scientists	
E17-14	1 & 2: Fundamentals, Best Practices and	Dr. Michael Dong, MWD Consulting
	Applications	

Code	~ 2-Day Courses ~ Tues., Nov. 14 - Wed., Nov. 15 8:30am - 5:00pm (Holiday Inn)	Instructor(s)
E17-20	Troubleshooting Chromatographic Systems	Dr. Merlin Bicking, ACCTA, Inc. Dr. Douglas Raynie, South Dakota State University
E17-21	Quality by Design: A New Paradigm for the Analytical Laboratory: Part 1 & 2	Dr. Zenaida Otera Gephardt, Rowan University
E17-24	How to Develop Validated HPLC Methods: Rational Design with Practical Statistics and Troubleshooting	Dr. Brian Bidlingmeyer, Agilent Technologies Dr. Stanley Deming, Statistical Designs

#### **One-Day Short Courses**

Code	~ One-Day Courses ~ Sunday, November 12 8:30am - 5:00pm	Instructor(s)
E17-04	Introduction to Chemometrics Without Equations	Dr. Donald Dahlberg, Lebanon Valley College Dr. Barry Wise, Eigenvector Research
E17-07	Keeping Your Analytical Procedures in Compliance with the FDA: Validation, Documentation, and Investigation	Ms. Kim Huynh-Ba, Pharmalytik
E17-08	Introduction to Vibrational Spectroscopy for Real Time Analysis	Dr. John Wasylyk, Bristol-Myers Squibb Dr. Peter Larkin

E17-09	Interpretation of Mass Spectra with Practical Solutions to Problems	Dr. Mike Lee, Milestone Development
E17-10	Lifecycle Approach to Analytical Methods: Incorporating Quality by Design Concepts into Method Development, Validation, Verification and Transfer	Mr. Gregory Martin, Complectors Consulting

Code	~ One-Day Courses ~ Monday, November 13 8:30am - 5:00pm	Instructor(s)
E17-05	Intermediate Chemometrics Without Equations	Dr. Donald Dahlberg, Lebanon Valley College Dr. Barry Wise, Eigenvector Research
E17-15	Modern HPLC/UHPLC for Practicing Scientists <u>1: Fundamentals and Pharmaceutical</u> <u>Applications</u>	Dr. Michael Dong, MWD Consulting
E17-17	Process Analytical Technology/Quality by Design: Enhancing Effectiveness in the Analytical Laboratory	Dr. Zenaida Otera Gephardt, Rowan University
E17-18	LC-MS Method Development for Small Molecule Pharmaceuticals	Dr. Perry Wang, LC-MS Technical Expert
E17-19	Update on New Analytical Requirements of US Pharmacopeia General Chapters	Mr. Gregory Martin, Complectors Consulting

Code	~ One-Day Courses ~ Tuesday, November 14 8:30am - 5:00pm	Instructor(s)
E17-16	Modern HPLC/UHPLC for Practicing Scientists 2: UHPLC, Method Development, HPLC Operation, Troubleshooting and Biopharmaceutical Applications	Dr. Michael Dong, MWD Consulting
E17-22	Quality-by-Design: A New Paradigm for the Analytical Laboratory Part 1: QbD Fundamentals for Analytical Chemists	Dr. Zenaida Otera Gephardt, Rowan University

Code	~ One-Day Courses ~ Wednesday, November 15 8:30am - 5:00pm	Instructor(s)
E17-23 Quality by Design: A New Paradigm for the Analytical Laboratory Part 2: Design of Experiments for Analytical Chemists		Dr. Zenaida Otera Gephardt, Rowan University
E17-27	Getting the most from GC and GC/MS	Dr. Gregory Slack Dr. Nicholas Snow, Seton Hall University
E17-28	Evaluation of Trace/Ultratrace Impurities in Pharmaceuticals	Dr. Satinder Ahuja, Ahuja Consulting
E17-26	A Systematic Way for Analytical Chemists to Prepare for a Quality Audit or Regulatory Inspection	Ms. Kim Huynh-Ba, Pharmalytik

### Visit our website for more details on these Short Courses

## Click here to register on-line or by mail



Eastern Analytical Symposium, PO Box 185, Spring Lake, NJ 07762

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 From:
 "Eastern Analytical Symposium & Exposition" <newsletter@eas.org>

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 <pollingmel@optonline.net>

 Sent:
 Friday, September 08, 2017 11:36 AM

 Subject:
 Outstanding HPLC Courses - Separating EAS from the Rest of the Pack!



HPLC/UHPLC at EAS Check out what's happening this November 12-15 in Plainsboro, NJ!

## **HPLC/UHPLC Short Courses**

Modern HPLC/UHPLC for Practicing Scientists 1 and 2: Fundamentals, Best Practices and Applications

Monday, Nov. 13 and Tuesday, Nov. 14; 8:30am - 5:00pm Instructor: Michael W. Dong, MWD Consulting

This intermediate 2-day workshop will provide the analytical scientist with a clearer understanding and a solid working knowledge of the concepts, instrumentation, columns, pharmaceutical applications and practices (method development, HPLC operation and troubleshooting) of modern HPLC and UHPLC. The focus is on its practice in pharmaceutical analysis of small molecule drug substances and drug products. This workshop is divided into two 1-day sessions which allows attendees to register separately if desired. The first day is fundamentals and small molecule drug applications. The second day is UHPLC, method development, troubleshooting and other applications including characterization/QC of recombinant biologics. <u>Click here for more details</u>

## How to Develop Validated HPLC Methods: Rational Design with Practical Statistics and Troubleshooting

Tuesday, Nov. 14 and Wednesday, Nov. 15; 8:30am - 5:00pm Instructors: Stanley N. Deming, Statistical Designs and Brian Bidlingmeyer, Analytical Acumen

This two-day course offers practical training for the practicing scientist. This course takes the participant step-by-step through the concepts, techniques and tools necessary to develop validated HPLC methods. Learn a rapid, systematic approach to HPLC methods development that provides sustainable validation by using statistical process control (SPC) tools. Rather than developing the HPLC method and then validating it, this course proposes following a streamlined, iterative process to integrate the method development and validation activities. The approach is effective, efficient and productive. The emphasis is on practical issues associated with developing validated HPLC methods. *Click here for more details* 

All Short Course take place at the Crowne Plaza Princeton Conference Center in Plainsboro, NJ. You must register as a Full Conferee in order to take a short course. Register before Oct. 1st for discounted pricing.

Visit our website for a complete list of our <u>Short Courses</u> and <u>Technical</u> <u>Program</u> and all the other exciting happenings at EAS!

## Main Identity

- From: "Eastern Analytical Symposium & Exposition" <newsletter@eas.org>
- To: <pollingmel@optonline.net>

Wednesday, September 13, 2017 11:09 PM Sent:

Subject: Gas Chromatography at EAS! Check Out Our Short Courses & Presentations



## **GAS CHROMATOGRAPHY at EAS**

Check out what's happening this November 12-15 in our new location Crowne Plaza Princeton Conference Center in Plainsboro, NJ!

## Short Courses

### **Practical Gas Chromatography**

Sunday, November 12 - Monday, November 13, 8:30am - 5:00pm Instructors: Eugene Barry, University of Mass-Lowell, and Thomas Brettell, Cedar Crest College

This two-day course presents the fundamentals of gas chromatography with an emphasis on practical applications for users and method developers. Topics to be covered include theoretical considerations, use of computer searches for literature references and methods of analysis, modern instrumentation, including inlet, column, and detector technology, and the applications of these to effective qualitative and quantitative analysis. The theoretical portion of the course will focus on using the fundamental understanding of the chromatographic process to assist in obtaining a desired separation quality and run time. Click here for more details

#### **Troubleshooting Chromatographic Systems**

Tuesday, November 14 and Wednesday, November 15, 8:30am - 5:00pm Instructors: Merlin Bicking, ACCTA, Inc. and Douglas Raynie, South Dakota State University

This two-day course will provide guidance on identifying the causes of such problems, finding solutions, and preventing future problems. Basic LC and GC components will be discussed, and helpful hints will be provided on how to avoid certain problems and maximize the overall analytical efficiency in the laboratory. Students will learn about general troubleshooting strategies, common symptoms, and common solutions to common symptoms. This seminar provides practical technical information that is not available from any other source. *Click here for more details* 

#### Getting the most from GC and GC/MS

Wednesday, November 15, 8:30am - 5:00pm Instructors: Nicholas Snow, Seton Hall University and Gregory Slack

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This one-day course will enable users of GC and GC/MS to extend the power of their instruments to separate wider ranges of compounds with better sensitivity and fewer problems. Specific sessions will focus on method optimization for speed, sensitivity and/or ease-of-use, instrument set-up and qualification, troubleshooting and maintenance and effective combination of sampling, sample preparation, separation and detection to maximize method performance. *Click here for more details* 

> **Register** Now ۱

All Short Course take place at the Crowne Plaza Princeton Conference Center. You must register as a Full Conferee in order to take a short course. Register before Oct. 1st for discounted pricing.

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## Technical Program

Hear the latest gas chromatography topics at

these oral sessions:

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- Building the Future in Sample Preparation with Young Investigators (11/13 AM)
- Increasing High-Throughput from Sample Preparation to Engineering (11/13 PM)
- Modern Advances in Gas Chromatography (11/14 PM)
- Emerging Frontiers in High-Throughput Analysis for Process Research & Development (11/14 PM)

Visit our website for a complete list of our <u>short courses</u> and <u>technical program</u> and all the other exciting happenings at EAS!

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#### Main Identity



We look forward to seeing you in Chicago!



#### Directions to NYMS Headquarters

One Prospect Village Plaza (66F Mount Prospect Avenue) Clifton, NJ 07013 GPS: Intersection of Colfax & Mt. Prospect: Latitude 40.8656 N, Longitude 74.1531W, GPS: Our building: Latitude 40.8648 N, Longitude 74.1540 W

#### From George Washington Bridge:

Take Interstate Route 80 west to Exit 57A, Route 19 South. Take Route 19 to Broad Street and continue two lights to Van Houten Avenue. Turn Left. Go to second light, Mount Prospect Avenue and turn left. Building 66F is on the left side , one and a half blocks from Van Houton.

#### From Lincoln Tunnel:

Follow exit road to NJ route three west. Continue to Bloomfield Avenue exit. Turn right to Circle and go three quarters to Allwood Road West. Mount Prospect Avenue is a few blocks on the right (a small street) Turn right and go to first light (Van Houton) continue. Building 66F is on the left side , one and a half blocks from Van Houton.

#### From North:

Take Garden state Parkway South to Route 46 Clifton Exit. On 46 Make second exit to Van Houton Ave. Continue to third light Mount Prospect Avenue and turn left. Building 66F is on the left side , one and a half blocks from Van Houten.

#### From Route 46 coming from west:

Take Broad Street Exit in Clifton and follow Directions above from GW Bridge.

<u>From route 46 coming from East:</u> Take Paulson Avenue Exit in Clifton and follow to Second light, Clifton Ave turn right. Go to next light, Colfax, turn left, go three blocks and turn right on Mount Prospect Ave.. Building 66F is half block on right.

#### Public transportation from NY:

Take NJ Transit train from Penn Station to Secaucus Transfer Station. Change trains to Bergen Line to Clifton (call NJ Transit for schedules). From Clifton Station cross under tracks to first street and go left one block to Mount Prospect Street, turn right and Building 66F is one half block on Right.

#### If you plan to come by bus or train, please copy the links below into your browser:

http://www.njtransit.com/sf/sf\_servlet.srv?hdnPageAction=TripPlannerItineraryTo http://www.njtransit.com/sf/sf\_servlet.srv?hdnPageAction=BusSchedulesP2PTo http://www.njtransit.com/sf/sf\_servlet.srv?hdnPageAction=TrainTo

## New York Microscopical Society Items For Sale

29-Feb-2016

## N.Y.M.S. Microscope Covers

ltem #	Size	Member Price	List Price
MT-003	Small Microscope or Stereo, 15"W x 17"H	\$18.00	\$20.00
MT-004	Lab Microscope or Large Stereo, 20"W x 18"H	\$23.00	\$25.00
MT-005	Large Lab Scope, 22"W x 21"H	\$28.00	\$30.00
MT-009	Large Lab Scope with Camera, 9"W x 19"Deep x 23"H	\$31.00	\$33.00
MT-010	Universal Scope with Camera, 11"W x 25"Deep x 23"H	\$36.00	\$40.00
MT-012	X-large Scope	\$45.00	\$50.00
	N.Y.M.S. Microscopes (see below for im	ages)	

185	Monocular Dissecting Microscope	\$85.00	\$99.00
131	H.S. Student Microscope	\$190.00	\$245.00
131-FLU H.S. Student Microscope (Fluorescent)		\$200.00	\$255.00
125-LED H.S. Student Microscope (LED)		\$240.00	\$309.00
	Other Items		
	NYMS Glossary of Microscopical Terms	\$30.00	\$35.00
NYMS Patch Microscope Cleaning Kit* NYMS Lapel Pin		\$5.00	\$7.00
		\$40.00	\$45.00
		\$10.00	\$15.00



NYMS Engraved Pen



Model 131: Tungsten Model 131-FLU: Fluorescent





\$10.00

\$40.00

\$7.00

\$20.00

Model 125-LED Cordless

Model 185: 20x

## **New York Microscopical Society**



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I hereby apply for membership in the New York Microscopical Society

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Signature......Date..... NYMS Headquarters: One Prospect Village Plaza, Clifton, NJ 07013 Telephone (973) 470-8733

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Gallery-Oct. 2017, Page 1



Black Woolly Bear Caterpillar on road surface, Photo by Jeff Glover



Johnson & Johnson Band Aid Tough Strips (trade mark!) the final layer. It does not stick to the wound and permits air to reach the wound like a sieve. Orthoplan, polarized light, slightly uncrossed polars. Objective Plan 4/0.10, length of the long side 4.5 mm (DSC00590 6x4x100) Photomicrograph by Jan Hinsch



Malonic acid, 50x (P661104)a6x4x200: Polarized-light photomicrograph by Mel Pollinger



Cholesterol, 100x (P612502)a6x4x200: Polarized-light photomicrograph by Mel Pollinger



Gunshot Residue (GSR), Mag = 5.37 KX, (File GSR 1001), EHT=10.00 kV: SEM by Xiao Shan Law, Penn State



Sulfanilamide, 50x (P731406)b6x4x100: Polarized-light photomicrograph by Mel Pollinger