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

April 2012 **N.Y.M.S. (973) 470-8733** **Volume 6 (26) Number 4**

Meeting Announcement

2012 Winter-Spring Lecture Series

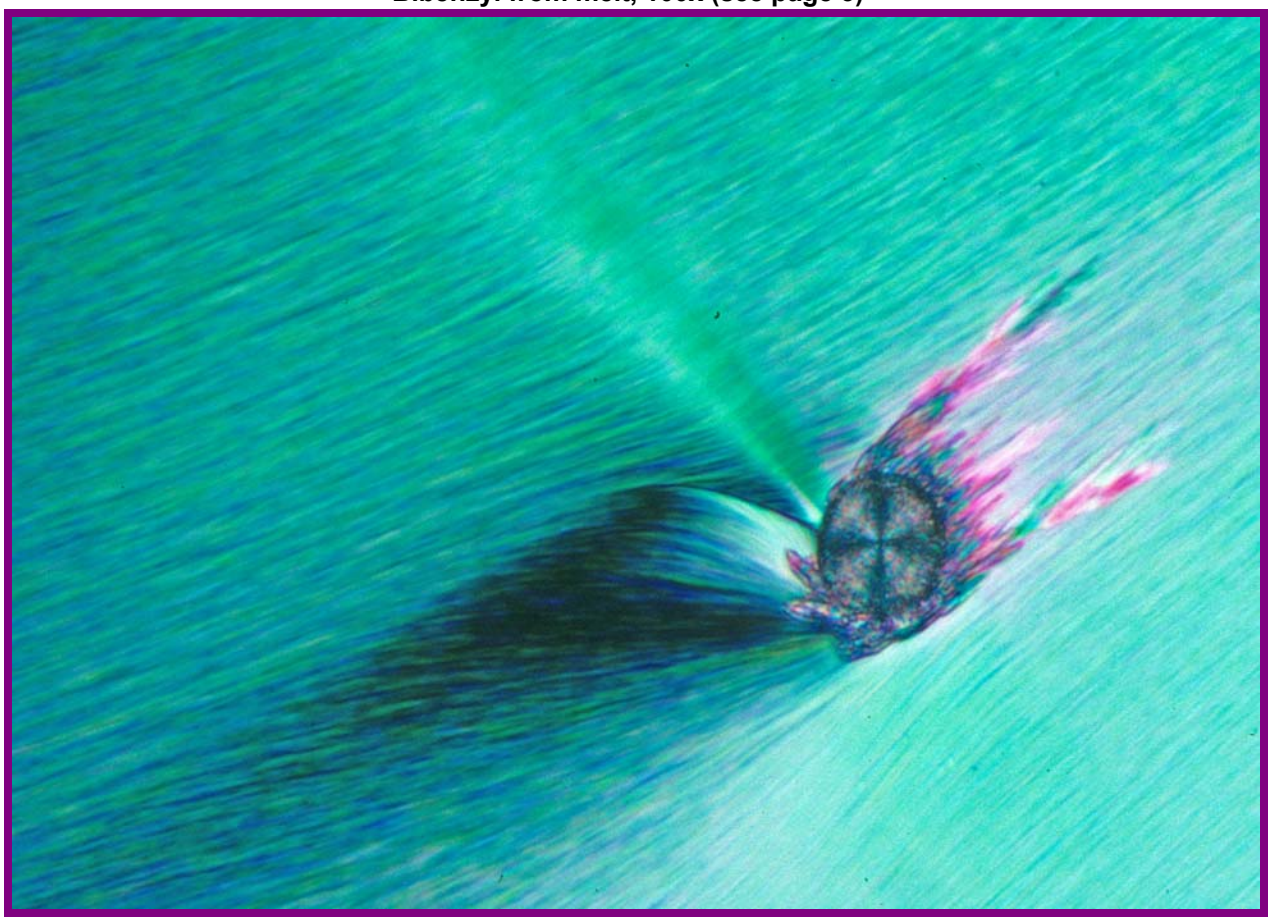
April 2012, Date, Time & location to be announced

Microscope Day 2012 is almost here!

The 10th annual Microscope Day at John Jay is in its final planning stages. Please stay alert for news as the timing details and agenda will be made available in the next few days. As usual, Mic Day will include a variety of presentations and exhibits of interest to microscopists and scientists.

Mic Day will be free and open to all, so please join us!

Bibenzyl from melt, 100x (see page 3)



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

Awards Committee
Chair: John A. Reffner
Members
Jan Hinsch
Don O'Leary
Mel Pollinger

Dues and Addresses
Please remember to mail in your Dues to Mary McCann, Membership Chair (see this page for address).

Junior (under age 18) $10 Annually
Regular $30
Student (age 18 or above) $20 Annually
Supporting $60 Annually
Corporate (includes one advertisement in NYMS News) $175 Annually
Life $300 (payable within the year)
To avoid missing notices:
Notify Mary McCann and 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 by visiting the NYMS website.

***From The Editor*… if you have email:** Getting the newsletter by email means you receive an **extended pdf version** that cannot be sent by "snail mail." Even if you continue your USPS delivery of the newsletter, NYMS needs your email address for reporting priority events and special news. Being able to contact you by email means better communication between us.

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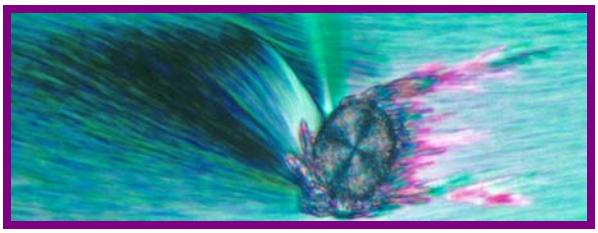
Dues for 2012 is now due!

Buy and Read a Good Book on Microscopy.



From Page 1

Bibenzyl from melt, 100x taken by polarized light with a mica plate between the polarizer and the specimen. The imaging system used was an Olympus OM2 camera loaded with 35mm Kodachrome KPA atop a Bausch & Lomb - LC Petrographic microscope, The image was shot at ASA 12. The Bibenzyl had been melted at 140°C and cooled quickly on a cold plate, then allowed to slowly crystallize at 20°C over a period of 24 hours. The image was in a small section of the melt [and reminded me of what the Starship Enterprise might look like if it were to crash into a green Vulcan sea.]

Preparation, image and fantasy by Mel Pollinger

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Getting More Colors Out of Polarized Light

Adding new colors to the usual polarization colors can be accomplished with a minimum cost and easy-to-find materials – most of which are probably in your home at this time. Cellophane, thin mica sections, plastic containers, just to name a few. Simply needed are two pieces of linear polarizing material, one polarizer over the light source below the specimen and another, also called the analyzer, between the specimen and the eyepiece. The mica or cellophane, etc. can rest atop the polarizer. Try this, if you haven't already. Mel

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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.

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MICRO-**micro**

This is truly awesome. I could spend hours playing with it.

I went to look at the home page (without the /scale2) and there is more good stuff there, but the one that that the link takes you to is the best, (not that the others are not worth more exploration) -- I will go back there too
I can't imagine how much time and talent it took to make this.

I once read a book about string theory and after I was done, I felt that I had learned nothing that had anything to do with the real world. This Scale2 project really helped me to understand how inconceivably small the strings are (if they exist at all)

William Isecke
(Newsletter contributor)

http://htwins.net/scale2/

AT EAS – Mark your calendar
Tuesday Afternoon, November 13, 2012
New York Microscopical Society's Ernst Abbe Memorial Award
Honoring Skip Palenik, Microtrace, LLC

Chair: John A. Reffner, John Jay College, CUNY

Corrected links from March 2012 Newsletter

http://www.ucl.ac.uk/GeolSci/micropal/diatom.html

http://www.sandatlas.org/

http://www.sand-atlas.com/en/links/

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NYMS Welcomes Visitors

Although most NYMS events and meetings are held in Clifton, New Jersey on Sundays, the building may be opened for visitors at other times providing an appointment is made with Don O'Leary or Mel Pollinger at least two days prior to the desired appointment time. NYMS Headquarters at Clifton, NJ will be open by appointment only to members from 8:00pm to 10:00 pm most Tuesday evenings.

Those members wishing to visit must call Don O'Leary or Mel Pollinger to confirm. Don's cell-phone number is (201) 519-2176 or email: dkoleary@verizon.net. Mel's Home phone number is (201) 791-9826 or email: pollingmel@optonline.net

Dues for 2012 is now due!

Need to use a Microscope?

The various microscopes that are presently set up on the main floor of the New York Microscopical Society building in Clifton, N.J. are there for the use of its members.

Microscope Cleaning Kit

A complete set of tools and accessories to keep your microscope in optimum operating condition. The kit is put together by our Curator/Educational Chairman and available directly from NYMS for only $35.00 plus shipping & handling, or may be purchased at a meeting. Call or email Mel Pollinger or Don O'Leary for details (see page two for contact numbers).

Also: Slide boxes **100 capacity**, used: $5.00 while they last

Awards Given by the New York Microscopical Society

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

Answer to Mystery Photo for March 2012

Dinosaur coprolite (fossilized dung)
Correctly guessed by Michael Reese Much, RMS EMS

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Mystery Photo for April 2012

Want to take a guess? Send it to me by email or call me: pollingmel@optonline.net, (201) 791-9826

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Additional Historical NYMS Supplements Email Newsletter recipients will also be getting copies of NYMS Newsletter pdf back-Issues from 2007. Copies of older newsletters will be sent as I convert them.

Got something you want to sell, trade or publish in the Newsletter and/or on the website? Write, call or send an email message to:
201-791-9826 or pollingmel@optonline.net (images ok)
or
Mel Pollinger, Editor
NYMS Newsletter
18-04 Hillery Street
Fair Lawn, NJ 07410

Supporting Member

NYMS Newsletter Extended Section, April 2012

In This Section: Directions to NYMS

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 Houton.

From Route 46 coming from west:
Take Broad Street Exit in Clifton and follow Directions above from GW Bridge.

From route 46 coming from East: 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 ProspectAve.. 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

A SUBSTITUTE PHASE CONTRAST ATTACHMENT

ERIC V. GRAVÉ

Made in United States of America
Reprinted from
TRANS. AMER. MICROS. SOC., 96(3). 1977

A SUBSTITUTE PHASE CONTRAST ATTACHMENT

ERIC V. GRAVÉ
College of Physicians and Surgeons, Columbia University,
New York, New York 10032

GRAVÉ, E. V. 1977. A substitute phase contrast attachment. *Trans. Amer. Micros. Soc.*, 96: 393–397. Methods for converting a brightfield condenser into a phase contrast condenser and making a centering telescope are described. The single substantial expense is the purchase of a phase objective; otherwise only photographic techniques and materials are required.

Phase contrast illumination, so important in research and teaching, may be out of reach for many small biology departments throughout the country. Phase contrast attachments are indeed so expensive that attempts to find a substitute date 30 years back, when Kempson et al. (1948) suggested a "Simple Method for Phase Contrast Microscopy." The paper was supplemented by Baker et al. (1949). Their suggestions are highly sophisticated and ingenious and require a well-equipped workshop and considerable mechanical skill, the most difficult task being the conversion of a brightfield objective into a phase contrast objective. It is for this reason that Ross (1967) abandoned the idea of manufacturing a phase objective, suggesting that the objective be purchased and expense reduced by converting a brightfield condenser into a phase condenser. German microscopists, Häussler (1970) and Gerlach (1975), accepted this solution. Very recently, Sorgenfrey (1976), reviving an idea by Wilska (1953), coated the backlens of an achromat (of older vintage with an accessible backlens) by holding it for 0.5 sec intervals over a candle flame, then partially removing the deposit with a lathe, leaving a ring-shaped coating of soot on the lens. Here, again, it has to be said that this method has obvious shortcomings, the most serious one being that

it can be applied only by people who own or have access to a lathe and the skill to handle it.

In the present paper, a method is suggested which requires only photographic equipment, materials, and moderate skill. It is assumed that a darkroom is available, that it has an enlarger, a single lens reflex 35 mm camera with tripod, bellows, or extension rings, and a viewing box (which can be improvised). The only substantial expense is a phase objective for which a 40× lens is recommended, since it provides the widest range of magnifications (from 160× with a 4× ocular to 640× with a 16× ocular). One more (though inexpensive) item needed is a 5× eyepiece, for making the centering telescope. Such an eyepiece is available from Edmund Scientific Co., Inc., Escorp Bldg., Barrington, N.J. 08007 (Catalog No. 26700 lot 39B).

First Steps

Start by converting the ocular into a centering telescope, necessary to coordinate the phase ring and the annular diaphragm in the condenser. The ocular has to be considerably extended. The eyelens is removed, not to be needed again. In its stead, the eyelens of a high power ocular (15× or higher) will be used. The extension is done in two steps. First, a stop is made to prevent the ocular from falling back into the microscope, as it would if used for normal microscopical observation. This stop is easily made with a length of black photographic tape, ¼ inch wide, three layers of which are wrapped around the lower end of the eyepiece body, ca. ¼ inch distant from the site of the field lens (Fig. 1A).

Next, make a sleeve. It should have an inside diameter corresponding to the ocular's outside diameter, fitting snugly but not so tight that it cannot slide up and down for focusing. A sheet of 4 × 5 inch Kodak film with a "thick Estar base" or an old "bad" negative of this size and strength serves well as material. The film is cut to a size 3 × 5 inches long, then tightly wrapped around the eyepiece to make a sleeve 3 inches long. While the film sheet is wrapped over the ocular, a glue (such as Duco cement) is applied carefully only to those areas *which are not in contact with the eyepiece.* (The glue will stick better if both sides of the film are roughed up with sandpaper before it is applied.)

To allow the glue to harden, a piece of string is wound over the film for a few hours until it is well dried. After hardening, the sleeve should be strengthened with another piece of photographic tape (¾ inch wide). Again, three layers of tape will be sufficient. The finished sleeve (Fig. 1B) will serve to lift the eyelens of a high power ocular further away from the phase ring. The eyelens (Fig. 1C) itself is put loosely over the opening. Some high power oculars are short enough so that the complete ocular can be put into the sleeve to serve in this assembly (Fig. 1D).

Conversion of Condenser

Next, convert a brightfield condenser into a phase condenser. Photographic techniques seem to be the easiest and most accurate way of handling this problem. The first step is to make a close-up photograph of the phase ring on the backlens of the objective. Position such a lens upside down on a lightbox, which, of course, has to be steadied. The sleeve just made for the centering telescope comes in handy for this purpose, provided it was carefully done. It will hold the objective in exactly the vertical position. Any 35 mm SLR camera which (mounted on a tripod) is equipped for close-ups can be used to photograph the phase ring. I have used a Nikon camera equipped with a 55 mm Micro-Nikkor

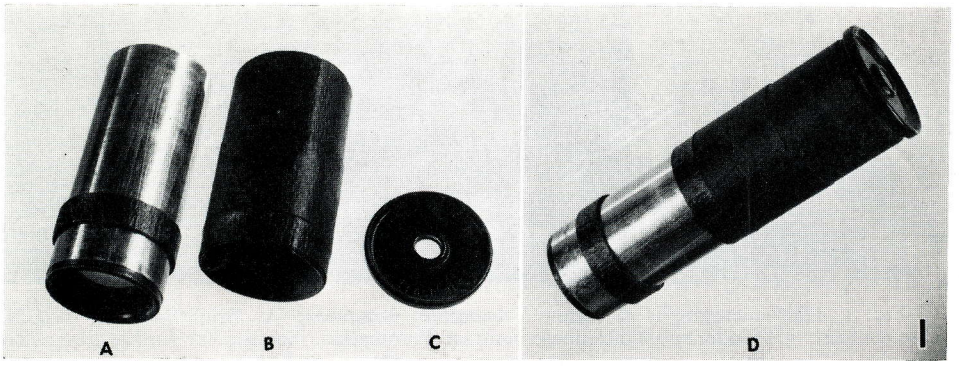

FIG. 1. Conversion of ocular into centering telescope. A. Ocular with home-made stop. B. Sleeve. C. Eyelens of high power ocular. D. Assembled ocular in sleeve. See text for further explanation.

f3.5 lens. Vivitar extension rings or bellows which fit the Nikon camera were used. The Vivitar extension set consists of three rings of different lengths; 36 mm, 20 mm, and 12 mm. A close-up with all three rings (providing 68 mm extension) and the 55 mm lens fully extended yields a negative of a slightly magnified phase ring (Fig. 2A). In most phase contrast systems, the annular diaphragm is a bit narrower than the phase ring. The purpose of this is to make the coordination of phase ring and condenser ring easier and to prevent any light leaks which would result if the condenser ring could not be completely covered by the phase ring. For this reason, the negative shown in Fig. 2A has to be reduced by a very small amount. This is done by removing the 12 mm extension ring (or drawing in the bellows for approximately the same amount), shortening the extension to 56 mm. Thus a second negative of smaller magnification (Fig. 2B) is obtained. If both negatives are now superimposed and held together with tape a negative of a

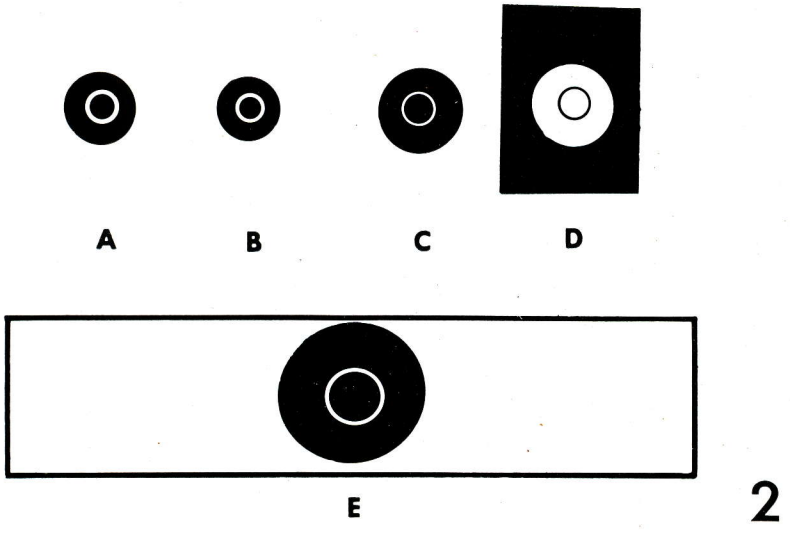

FIG. 2. Negatives of phase ring (A–E). See text for explanation.

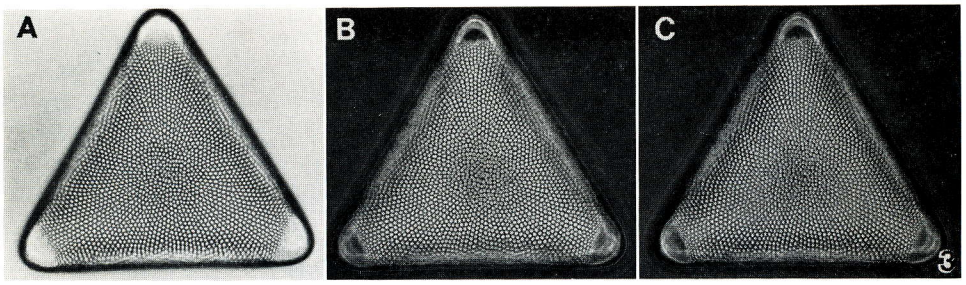

FIG. 3. Photomicrographs of diatom *Triceratium formosum*. A. Brightfield. B. Regular phase contrast. C. Under substitute phase contrast illumination. See text for further discussion.

slightly thinner phase ring results (Fig. 2C). Rephotograph it by projection with an enlarger at a scale of 1:1 to get an internegative (black on white) (Fig. 2D), from which an annular diaphragm of the correct size can be made through enlargement (Fig. 2E).

CONDENSER RING DIAMETER

Determining the correct diameter of the condenser ring is the next step in the process. The following directions permit one to measure the size with the help of the centering telescope. First the objective is focused on any available preparation and the illumination adjusted according to Koehler's principles. The eyepiece is replaced by the centering telescope and the preparation is removed. With the eyelens of a 15× or 20× ocular placed on the sleeve opening, the phase ring can be focused by moving the sleeve up and down until the ring appears sharp. (If the light is too bright, reduce the intensity with neutral density filters or a ground glass.) An inexpensive transparent plastic ruler with a mm scale, available in most stationery stores, is inserted in the space between the condenser and the filter holder. The inner or outer diameter of the ring as it appears when viewed through the centering telescope can then be read on the ruler.

Finally, the internegative (Fig. 2D) is used to make an enlargement of a ring of the indicated size on sheet film. The correct outside diameter should be between 7–9 mm. For this writer's microscope, a Zeiss RA stand with a 40× N.A. 0.65 phase objective and an achromatic, aplanatic brightfield condenser, the proper size turned out to be 8 mm (Fig. 2E).

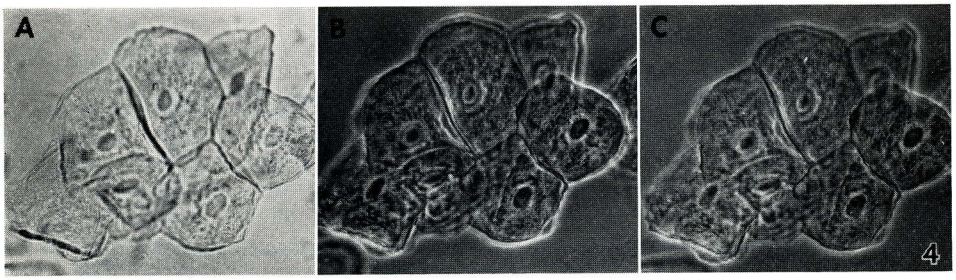

FIG. 4. Photomicrographs of living cheek epithelium cells. A. Brightfield. B. Regular phase contrast. C. Under substitute phase contrast illumination. See text for further discussion.

All photographic operations should be made on Kodalith Ortho 35 mm or sheet film and developed with Kodalith or Kodak D-11 developer.

Commercial phase condensers provide a mechanism to move the ring diaphragm horizontally and vertically for adjustments. This is a great convenience but also makes phase contrast so expensive. The same operation is not too difficult if done by hand. If the condenser ring (Fig. 2E) is printed on a narrow strip of film 3½–4 inches long and mounted on a 1 × 3 slide with a drop of mounting medium on both ends, it can be held with both hands and moved about until both rings are centered. If, after centering, the condenser is racked up and down it will be observed that the ring gets smaller or larger. The perfect position is achieved if the bright condenser ring is just inside the dark phase ring with no leaks anywhere.

Applied Results and Discussion

There are different types of brightfield condensers. For each microscope which is to be converted to phase, the proper condenser top lens has to be determined to make the substitute phase illumination work. I have checked out three different condensers. When using the ordinary Abbé-type 2 lens condenser, the top lens must remain in place. For the achromatic-aplanatic condenser of Zeiss, the 1.4 top lens has to be replaced by the 0.63 lens. With the three lens condenser of Leitz, the top lens should be removed, the intermediate lens left in.

In Figs. 3 and 4, two different specimens were selected to demonstrate the merits of the substitute phase contrast illumination. Fig. 3A shows the diatom *Triceratium formosum* photographed in brightfield; Fig. 3B was photographed with regular phase contrast; Fig. 3C shows the result with the substitute. Little difference in image quality can be detected for the phase pictures; the brightfield photomicrograph is clearly inferior. Fig. 4 shows living cheek epithelium cells. Fig. 4A is brightfield; Fig. 4B is phase; and Fig. 4C is substitute phase. The latter does not quite reach the same contrast quality that the commercial phase provides. It demonstrates, however, a distinct image improvement using substitute phase compared with the poor results achieved with brightfield.

In photographing Figs. 3 and 4, the photographic conditions remained constant throughout. No filters were used to improve contrast; all prints were done on the same grade of projection paper. Actually, Fig. 4C could have been improved by using a green filter for the negative and a harder paper for the print.

Literature Cited

Baker, J. R., Kempson, D. A. & Brunet, P. C. J. 1949. A simple method for phase-contrast microscopy: improvement in technique. *Quart. J. Micros. Sci.*, 90: 323–329.

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Sorgenfrey, W. 1976. Eine Amplitudenkontrast-Einrichtung—selbst gebaut. *Mikrokosmos*, 65: 179–184.

Wilska, A. 1953. A new method of light microscopy. *Nature*, 171: 353.

Microscopes on New York-New Jersey Ocean Waters and Beyond.

At the end of last summer, on the cruise vessel American Princess, while returning to Breezy point, I observed phyto and zooplankton with a Brock microscope. Last early February on the schooner Tara docked at the Battery Park Harbor, near tip of Manhattan, I stared in wonder at the image of a spiny bright multicolored spider crabe-star fish like creature, echinoderm? It was on display on a monitor linked to a sophisticated inverted Leica microscope. To know how these two experiences are relate to NYMS' outreach, please read on. You need not take any Dramamine to enjoy the story.

In last October's newsletter I reported on NYMS' outreach exhibition at the New York State Marine Education Association (NYSMEA) Conference which took place in early June. Dr Merryl Kafka is our contact with that organization. During the summer she is a guide for marine and shore ecology and dolphin watches on day cruises from Breezy Point on the American Princess. NYSMEA has asked for NYMS again to participate with their Conference which will be held this year in the Bronx at the State University of New York Marine Academy June 9th. Here, before going on, I must impose on you a plea to come be a NYMS outreach volunteer; it does get to be fairly taxing doing some of these outreaches alone. Teachers, student teachers, their students and NYMS need your support. Thank you. Now let us return to our story.

Merryl and I have discussed and continue to talk about having a day cruise with an exclusive NYMS collaboration for plankton identification with microscopes. To familiarize myself with the at sea and on the waves situation this would represent, and my for my own pleasure, I went for an afternoon of dolphin watching on the American Princess. It was the day before Hurricane Erika was to hit New York. The ocean was fairly calm, the weather beautiful and hot, the air wonderful and I had the nice surprise to find that fellow NYMS member, Ben Dubin-Thaler and his girl friend Lynn were sharing the occasion. On the way back Merryl announced the day's cruise, NYSMEA and the American Princess Captain Mike were honored to have NYMS representatives on board and who willing to provide information about the Society as well as helping out with algae observations with their microscope.

I'll wrap up the rest of the adventure of that day. Outside, up on deck, we had been searching for hours, without a hint of any whale we were thinking might seek some shelter near the shore because of what was brewing off the Carolinas. We were over the Hudson Canyon, which makes the Colorado Canyon look like a small ditch. It was getting late; we were on our way back to the continent, feeling sort of disappointed but recognizing that it was still a special day despite no sightings and not yet quite giving up. Suddenly in the distance we started seeing groups of dolphins jumping and diving we followed them and were treated to a plentiful number of frolicking schools of various species. Somewhat vivid memories came back to me of once seeing many porpoises leaping and plunging like that in the distance on a blue ocean when I was a small boy on the deck of the Ile de France.

I came across another French vessel, the schooner named Tara, two months ago during what was supposed to be winter here in NYC. I remembered becoming aware the Tara and it's mission a couple of years before from "Thalassa" a program of current events, all ocean, shore and navigation related, broadcast on French cable. The Tara's expedition to survey the whole world's oceans biological response to climate change was reported with great enthusiasm and excitement. Seeing those two big plankton tow nets and micro-life images got my attention at the time and were soon forgotten. That changed in February with a random chance of an invitation by the fashion designer Agnes b, to visit the Tara. Naturally I didn't think twice about accepting such an opportunity since I work at Stuyvesant High School, a few minutes walk away.

The next day after school, I was welcomed aboard. In a few words I told them I worked in science and that several of my students were doing research on coral sustainability. One of crew, speaking to me in English said they were doing "outreach." That resonated with me because of our New York Microscopical Society outreach efforts. It occurred to me that I ought to tell them that I am a NYMS Fellow and would like to write an article about their project and keep in touch. With that idea in mind I approached Romain Touré, who is, I didn't know at the time, the "Key Man" of the Tara Expeditions and Agnes b's nephew. I told him I wanted to know about their microscopical methods and instruments. He gave give me a run down of the operation showing me first the "rosette" of sampling modules able to go down two kilometers, then the collection nets which are also used to obtain viruses for DNA genomic research. I was shown the wet lab where sample processing takes place, bar coding and preservation in liquid nitrogen for later analysis in European, Asian and USA research institutes and universities. Then we went below deck to the dry lab where the on-board microscopy, specimen imaging and identification is done. It had an impressively miniaturized cell sorter and a flow-cam able to save a continuous stream of plankton images for identification and research.
Before leaving I asked Romain if I could bring a group of students. He invited us for a private tour. Two days later, after school, four teachers and four students came with me to board the Tara.

Judy, one the students who will be studying at MIT next fall, wrote Romain this thank you note:

It was incredible after studying technology like Niskin sampling bottles, rosettes, plankton tows, and water filtration systems--to actually stand on a research vessel and see them in person. It was even more surreal and exciting to learn that the Tara is a successor to the Fram and Fridtjof Nansen's expedition in the 1890's, which I had read and talked about multiple times in my Oceanography class. The design and engineering of the ship were fascinating to hear about, and I am very grateful that we had the opportunity to tour the ship and imagine what life must be like during long voyages. Thank you for such a fun, informative, and insightful experience; I hope that in the future we'll hear more of Tara's travels and your work.

To know about and see the Tara's work go to www.taraexpeditions.org and to experience one of the expedition scientists, Christian Sardet's undertaking go to www.planktonchronicles.org

Bon voyage.

Guy De Baere

JERRY RESNICK MEMORIAL PRESIDENTIAL AWARDS

These awards are presented by the individual member associations of SCONYC to an individual or organization that has contributed to the goals of the association as exemplified by SCONYC's second president, Jerry Resnick. A man of integrity and vision, Jerry Resnick is remembered as a champion for quality science education in New York City schools and in schools across the nation.

The Previous New York Microscopical Society awardee was Jean Portell (2011)

This year the New York Microscopical Society's Awardee is:

Benjamin Dubin-Thaler

Ben brings science to young New York City students, particularly to those adolescents in schools without labs or equipment allowing for hands-on science education. So in 2007, just after receiving his Ph.D in cell biology from Columbia University, he bought a 1974 San Francisco transit bus off Craigslist and converted it into a Bio Bus, equipping it with computers, microscopes and a lab.

Since Spring 2008, more than forty thousand students across two thousand miles have boarded the BioBus. Over half of the schools we visited last year lack the resources to fund the BioBus experience themselves.

In this setting he has been serving 10,000 students a year visiting public schools and offering after-school programs across New York City. He also provides informal educational programs during school calendar breaks and in summer in New York and across the nation reaching an additional 10,000 people in camps, parks, museums, community gardens, and urban farms. Students leave the BioBus inspired not only by the possibility of building their own dreams, but also by the fascinating complexities of the natural world and the idea that, as a scientist, they could dedicate their lives to exploration. After using some of the world's best scientific equipment under the guidance of passionate science professionals, we regularly hear our students proclaim, "I want to be a scientist!" and "I never knew science could be so cool!" Students just can't get enough, coming back after school and during their lunch periods for more.

He is committed to a program of radical sustainability. The now called Cell Motion Bio Bus is carbon neutral; it's energy needs are provided by solar panels, a wind turbine, and an engine that runs on vegetable oil waste. To carry out his mission he depends on volunteer PhD level scientists, other science professionals and students. They welcome the opportunity to contribute their time for what better cause than sharing knowledge, discovery, ideas and learning with tomorrow's young citizens.

Edited by by Guy DeBaere

New York Microscopical Society
Bernard Friedman Memorial Workshops
Use of the Microscope *& Polarized Light Microscopy*
April 28, May 5, 12, 19, 26, June 2,9, 2012

A basic course on light microscopy which will cover the following topics:
Theory of microscopy*, *Kohler Illumination
***Diffraction Theory*, Contrast Methods**
Polarized light*, *Phase Contrast, Interference
Hoffman contrast, Rheinberg, Dark-field & oblique Illumination

An advanced course on polarized light microscopy which will cover the following topics:
The nature of polarized light
The origin and interpretation of interference colors
Birefringence and crystal orientation, The Indicatrix
Compensation and variable compensators
Interference figures and their interpretation

The workshop will consist of seven consecutive Saturdays of lectures and hands on labs to cover the theoretical and practical aspects of microscopy. The course instructors are *Jan Hinsch* formerly of Leica Microsystems, Inc., Dennis O'Leary of Micro-Optical Methods, *Mary McCann of McCann Imaging*, *John Reffner* of John Jay College and N.Y.M.S. Instructor *Don O'Leary*.

WHEN: **April 28, May 5, 12, 19, 26, June 2,9, 2012. 10AM to 4 PM**

WHERE: **One Prospect Village Plaza, Clifton, NJ 07013, accessible by public transportation. Information on car pools and transportation will be provided.)**

COST: **$695 for NYMS members, $725 for non-members (includes membership) Lunch and course materials are included. Checks made out to NYMS.**

HOW: **Register using form below. Limited to the first 12 registrants.**
Send form to: Don O'Leary, 10 Sampson Street, Unit 113, Saddle Brook, NJ 07663

FURTHER INFORMATION: Call D. O'Leary (201) 519-2176, E-mail: dkoleary@verizon.net

PLEASE MAIL THIS APPLICATION WITH YOUR PAYMENT

Registration Form Use of the Microscope & Polarized Light Microscopy
N.Y.M.S. Member_____ ($695) Non-Member_____($725), April 28 to June 9
Registration for Use of the Microscope only (4 Sessions)
N.Y.M.S. Member_____ ($395) Non-Member_____($425), April 28 to May 19
Registration for Polarized Light Microscopy Only (4 Sessions)
N.Y.M.S. Member_____ ($395) Non-Member_____($425), May 19 to June 9
Name_____
Address_____
City_____State_____zip_____
Phone (W)_____(H)_____

e-mail address_____.

Please send your application and payment directly to:

NYMS Spring 2012 Courses
c/o Mel Pollinger, Treasurer
18-04 Hillery Street
Fair Lawn, NJ 07410-5207

Dear NYMS Member,

Dues Are Due in January

NYMS Membership dues for 2012 are now payable. We are in the process of setting up a full program of speakers, courses, workshops and celebrations at our Clifton headquarters in 2012. NYMS values your support and participation.

Please make sure to include your current email address. Email communications are particularly useful for announcing any short-term program changes, and provide convenient means for sending supplementary materials. In addition email saves paper and postage - and saves you space. If you have a web site related to your microscopy interests please let us know – we'll add it to the roster.
And--Please include any of your Contact information that has changed in the last two years.

NYMS MEMBERSHIP CONTACT INFORMATION
Name:
Email address: (please print clearly) _____
Address for Newsletter? Email :__Y/N Home _____
Work _____
Microscopy Related Website _____

Address:
Telephone: Work_____ Home:_____

Microscopy interests:
I do Light ____Electron _____ Other (what?) _____ microscopy
I use microscopes at Work _____ Home_____
I use microscopes for Research _____ Teaching _____ QC _____ Hobby _____ other _____
Mostly I view specimens that are: Biological ___ Industrial _____ describe? _____
Or Other (what?)
I also enjoy viewing (what?)_____
In microscopy I am a Professional _____Amateur _____ Beginner_____

Are you interested in working on NYMS Committees? Awards ____ Membership ____ Education ____ Library ____ Finance ___ Curator ___ Program ____ Publications ____ History _____

Checks should be made out to NYMS. Updated contact information may be included with your check to the address below, or it may be sent by email to me at mccanns@tiac.net,
Mary McCann
Regular Membership: $30 per year. Supporting Membership: $60 per year. Life Membership is $300, payable within 1year Corporate Membership: $175
Junior Membership (18 or under): $10
Student Membership (over 18 & a student) is $20

Thank you for your response!

Mary McCann
NYMS Membership Chair
161 Claflin Street
Belmont MA 02478

N.Y.M.S. Items for Sale

N.Y.M.S Microscope Covers

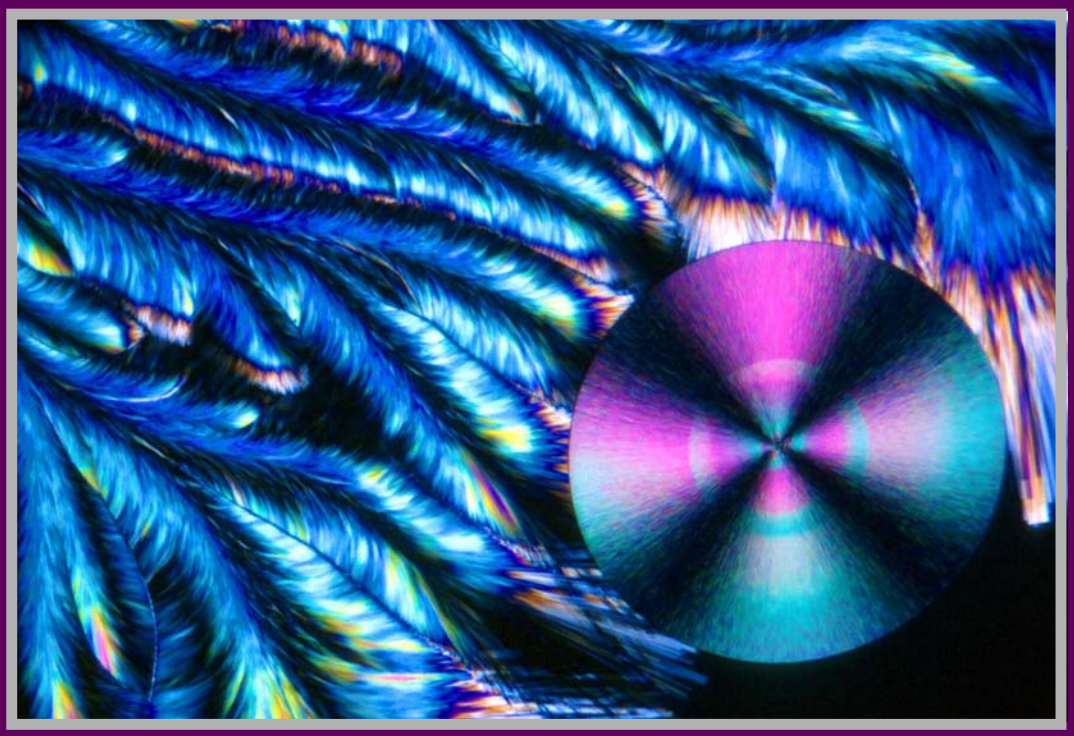
Number	Size	Member Price	List
MT-003	Small Microscope or Stereo	$ 18.00	$ 20.00
MT-004	Lab Microscope or large stereo	$ 23.00	$ 25.00
MT-005	Large Lab Scope	$ 28.00	$ 30.00
MT-009	Large Lab Scope with Camera	$ 31.00	$ 33.00
MT-010	Universal scope with camera	$ 36.00	$ 40.00
MT-012	X-large Scope	$ 45.00	$ 50.00

N.Y.M.S. Microscopes

Dissecting Microscope	$ 59.00	$ 99.00
H.S.Student Microscope	$169.00	$199.00
H.S.Student Microscope (Fluorescent)	$179.00	$215.00
H.S.Student Microscope(L.E.D.)	$199.00	$240.00

Other Items

N.Y.M.S. Pens	$ 5.00
N.Y.M.S. Glossary	$ 20.00
N.Y.M.S. Paperweight	$ 12.00
N.Y.M.S. Patch	$ 5.00
N.Y.M.S. Lapel Pin	$ 10.00
N.Y.M.S. Microscope Cleaning Kit	$ 35.00



Diphenoxybenzene, 100x

Polarized light (P1162937)

Photomicrograph by Mel Pollinger