MicroNews

San Francisco Microscopical Society

Volume 5, # 1

Have you paid your 2010 dues?

Happy New Year

2010 has started.

Help the treasurer by sending in your $12 now while your eyes & brain focus on this idea!

It is the best bargain of the new year.

Treasurer, 20 Drake Lane, Oakland, CA 94611

Make a Note: The next two meetings of the society are scheduled for January 12 and March 9, 2010

MICROSCOPISTS—EITHER WORK TOGETHER OR SFMS WILL FALL APART

Do you need a reminder that this is your organization? You, and only you can determine how to participate in the society in order to keep the spirit and the joy of microscopy alive and vibrant.

For several years the society has been guided by three members who have kept that spirit alive. We hope that you have enjoyed the fruit of their effort. They cannot be asked to continue to serve as the only directors, the only officers, to do the needed planning and to carry out the mission of the society. As good as their effort has been, and you can be a judge of that, there is in every group a need to revitalize, to explore and inject new ideas and to initiate fresh efforts to fulfill our charter. If you are uncertain as to our charter, our reason for being a society, let me turn to our constitution:

"***Section 2.*** *The object of this Society is* ***the promotion of the Microscopical Science in all its branches****, to be accomplished by the holding of meetings for scientific intercourse and discussion, by the reading and publication of papers relating to microscopical and kindred sciences, and by other suitable means."*

To accomplish this object, we need officers that form the board of directors. We have agreed to have four voting officers: a president, a vice president and program chair, a treasurer and a secretary. The immediate past president is an ex-officio member of the board but does not vote (except to break a tie vote?).

For two years we have not filled the position of president. The vice president has organized programs for over three years, the treasurer has also edited and published the Micro News four times a year, the secretary has served for many years and will not run again. **We need new blood, new ideas, new officers** or at the very least we need some of the old members who have served in the past to take another turn at being an officer (but that is an unlikely proposal to come to fruition). What we need is for you, the member of the society, to step up and say "I will help!" , "I will serve!" , "I will do my share!"

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INSIDE

Love is in the Air

When you open an issue of the National Geographic you expect to see some extraordinary images. The December 2009 issue is no exception as is demonstrated by the photographs by Martin Oeggerli who used a scanning electron microscope colorized by a software program to show the shape and surface of pollen grains. Martin Oeggerli is a Swiss molecular biologist who cooperated in this article with ecologist Rob Dunn, a professor at North Carolina State University. The fourteen images are worth a good deal of study since they illustrate the great variety that pollen grains have developed because of evolution. Pollen from flowering plants carry in each grain two sperm cells, one of which will travel through a long tube that develops, if the pollen lands on the stigma of the same species, and leads the sperm to the ovule to form a seed through fertilization. This form of sexual reproduction has been so successful in evolutionary terms, that now the vast majority of plants use this process of reproduction.

Individuals who study pollen are *Palynologists*. Their expertise has permitted a better understanding of past climate changes as they have identified pollen recovered from mud core

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Join The San Francisco Microscopical Society

Dr. Wolf Frommer

Communications:
Welcome Dr. Frommer

Dear SFMS:

Thanks for the welcome letter. I …. am happy to be part of the society. Since you asked, I am Director of the Plant Biology Department of the Carnegie Institution in Stanford. I learned about the Society at the event *[Enormously Microscopic Evening]* in San Francisco a couple weeks ago. Actually, one of my collaborators, David Ehrhardt, demonstrated some images from his confocal microscopy work at the event.*[Flourescent 3D microtubule structures in guard cells.]* I really liked the exhibition and the wonderful and simple technologies. *[See elsewhere in this issue.]*

We have quite some imaging capacity. We have several FRET *[fluorescence resonance energy transfer]* microscopes, two spinning disk confocals, a Leica point scanning confocal, David is building a super-resolution fluorescence microscope and we have a FLIM setup. Besides, we have of course lots of standard scopes.

I use mostly FRET for imaging metabolite concentrations in sub-cellular compartments of yeast, plant and animal cells.

Hope to meet you all soon.

Wolf

****

Wolf B. Frommer Director
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http://carnegiedpb.stanford.edu/

Officers of SFMS and their Responsibilities

(Continued from page 1)

You may think that any one of these offices will require endless hours of effort, but as one who has served as VP, then as presidents and now as treasurer, I am in a good position to say just how time consuming each of these tasks is likely to be. Read on. I will give you my honest evaluation for the offices I have held.

The duties of the President are listed in the constitution:

Section 4. *The President, …., shall preside at all meetings of the Society and of the Board of Directors; s/he shall appoint standing committees and supervise the general business of the Society. S/he shall make a report of the condition and progress of the Society in all its departments at the annual meeting, and at his/her pleasure, bring to its notice any important events of interest to it.*

The President is also the only official spokesperson for the society.

In order to have a president in the absence of one elected by the society, the board has rotated the position among the three remaining officers, each serving for a four month term, October through January, February through May and June through September. (This has placed a needless additional burden on the officers).

The practical and current task of the president is to guide the board members through the three (?) (at a minimum two) yearly meetings where planning and reports are made and budgets approved. The president's report to the membership in January can be written or verbal and now that board meetings are reported in Micro News, requires only a few minutes. The president has one of the easiest tasks on the board when each board member fulfills their duties. The role of the president of this society is a good place to learn and practice this leadership role.

No constitution created by a committee or by an individual is perfect and the society's could stand a healthy revision. That is work that can be reserved for a future committee. I mention this because the constitution is silent on the task of the vice president except to say that the VP acts in place of the president when the president is absent or incapacitated.

The Vice President has also been, for many years, the program chair. As the sub-title suggests, the program chair chairs a committee that plans the programs. It has been difficult to form such a committee. As a result, the entire board aids the VP with planning, suggesting who to contact and what kind of events to organize. It

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Officers of SFMS and their Responsibilities

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needs to be a cooperative effort since even five meetings a year represent quite a bit of planning and contacting of presenters and arranging facilities such as the Randall Museum. The task used to be monumental when nine meetings were scheduled each year and each meeting had to be advertised by sending out a flyer to try to interest members in attending the next meeting. Today the task is simpler since we use the Yahoo group notice and only hold five meetings that are also identified in the four issues of Micro News.

the promotion of the Microscopical Science in all its branches

The position of VP is vital to the organization since without good meetings there is no way to fulfill the original objective of the organization, ***the promotion of the Microscopical Science in all its branches*** . It requires the help and cooperation of all the board members and a VP who can follow through once given a good lead. Being facile with computers and cell phones is a great advantage.

As noted previously, the current secretary, Linda Wraxall, will not run for office and has served for many years as both the recording secretary and the corresponding secretary once the two positions were combined, as is permitted by our constitution. We need a secretary because records have to be kept of board meetings and events held by the society. The constitution describes the duties as:

Section 5. The Recording Secretary shall keep a record of the proceedings of the Society. S/he shall give suitable notice of the time and place of meeting of the Society, keep a duly classified list of the members, and attend to such other business in his/her department as the Board of Directors may direct.

Section 6. The Corresponding Secretary shall attend to the distribution of the publications of the Society to regular and other members entitled to the same, conduct correspondence with societies and individuals, notify members of their election and furnish them with membership cards.

If there is an outmoded section to the constitution, this is it! Keeping records of the proceedings is the main task and is correct. Notice and place of meetings is done by the VP and Program Chair through Yahoo Group (not even dreamed of when the constitution was written.) Keep a classified list of the members has become the logical duty of the treasurer since the treasurer knows who has paid dues. Distribution of Publications has been shifted to whoever produces the publication. Notifying members of their election is done at the meeting and needs to be noted in the minutes of the next board meeting. Sending out membership cards has been replaced by sending out welcome letters to new members

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Love is in the Air, continued

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samples taken from lake-bottoms. By identifying the dominant plant species, a chronicle of climate change (resulting in glaciations, drought, and periods of frequent rains) can be developed. This information has considerable application in paleontology and anthropology and in other sciences.

If there is a fault to be found with these illustrations, it is not with the technical rendering or the selection of colors that in most cases may not reflect the actual color of the pollen grains. The fault lies in the lack of scale and proper magnification. To describe the tiniest known pollen grains, from Forget-me-not (Myosotis sylvatica) as five one-thousandths of a millimeter across is perhaps a start but not a very useful tool when only one other pollen grain is given a measure as “fifteen times larger”. The use of a standard length bar in each picture might have been more of a clue to the size of the objects in each illustration. For all those of the general public who strive to become more knowledgeable in science, understanding the scale of the very small as well as the very large is both difficult and essential. Popular magazines should contribute to this needed growth of scientific literacy by facilitating such understanding through visual cues and accurate information. HS

National Geographic, Vol 216, No. 6 December 2009 pages122 –126 —-ooo—-

Next Meeting Tuesday January 12, 2010 at 7:30

The QX3+ digital Microscope is a multi-function digital camera for taking digital still images and creating time-lapse movies. The QX3 microscope also includes photo manipulation software that allows you to create and experiment with special effects and audio effects, inserted into the same images taken with the QX3.

DO YOU KNOW WHERE THIS COMES FROM? HELP ME

Astonishingly small, these carvings are microscopic in size and fit into the eye of a needle. They were downloaded into my computer with many other images but I have no idea from what source. H. Schott

Join The San Francisco Microscopical Society

A PROMISE GIVEN

The current board members all need to be replaced! They will continue to help those who are elected by being available as consultants and participating, as needed, in board meetings. We pledge to be very helpful to the new officers so you need not be concerned that you will be overwhelmed by the task.

Officers of SFMS and their Responsibilities

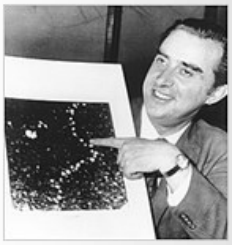
(Continued from page 3)

and is currently done by the treasurer.

As you can see, the job has been considerably reduced but remains essential in that someone must produce the minutes of the board meetings and record what took place at the regular meetings. Computer skills are vital to this task. It is also very helpful if you can take notes while others are talking. THIS JOB IS NOT ONLY IMPORTANT, IT IS ESSENTIAL IF WE ARE TO KEEP OUR NON PROFIT STATUS. We must be able to demonstrate that we are *educational and scientific* to maintain our tax exemption. Records demonstrate that we are meeting our objectives. We all owe a debt of gratitude to Linda Wraxall for the many years of service she has given to the society and the excellent job she has done keeping our records. Next time you see her, thank her for this work.

The treasurer is also a record keeper. The constitution assigns these tasks: ***Section 7.*** *The Treasurer shall attend to all receipts and disbursements of the Society, giving such bonds and furnishing such vouchers as the Directors may require. S/he shall collect all dues from the members, and keep an accurate account of all receipts and disbursements, furnish the Board of Directors from time-to-time, as they may require, with a list of members entitled to vote and make a general report to the Society at the annual meeting. The Treasurer shall pay no bill against the Society unless the same has been approved by the Board.*

In addition, the treasurer maintains the list of members, a database that includes addresses and other information, provides this list to the Micro News editor for making labels, deals with the bank and prepares a yearly summary for the board and membership



Albert Crewe in 1970 with a photo of individual thorium atoms.

First Image of an Atom ? **Not so fast!**

Albert V. Crewe, a physics professor who captured the first image of a single atom and later obtained the first images of atoms in motion, died November 18, 2009. He was Born Feb. 18, 1927, Crewe grew up in Yorkshire, in northern England, the son of an auto mechanic. He attended the University of Liverpool, where he received his doctorate and met his wife while with a group of students harvesting the postwar wheat crop.

A former director of Argonne National Laboratory near Chicago, Crewe died of complications from Parkinson's disease at his home in Indiana.

Crewe's breakthrough image of an atom was taken in 1970 with a scanning transmission electron microscope of his own invention at the University of Chicago, where he taught until 1996.

The uranium and thorium atoms that Crewe captured were magnified 1 million times. It was a significant breakthrough -- an atom is incredibly tiny, approximately 4 billionths of an inch in diameter. The event was met with quiet satisfaction by Crewe and his colleagues.

Correction: November 25, 2009

An obituary and a headline on Saturday about Albert V. Crewe, the University of Chicago physicist who in 1970 designed an electron microscope that captured images of individual atoms, attributed a distinction to him erroneously.

While he was indeed a pioneer in showing individual atoms, he was not the first physicist to do so. That feat had been accomplished at least once before, in 1955, when the Pennsylvania State University physicist Erwin Wilhelm Müller, with his graduate student Kanwar Bahadur, used a field ion microscope to view images of single atoms. Because of an editing error, the obituary also referred incorrectly to the Chicago Cyclotron, to which Dr. Crewe contributed. It did not contain superconducting components..

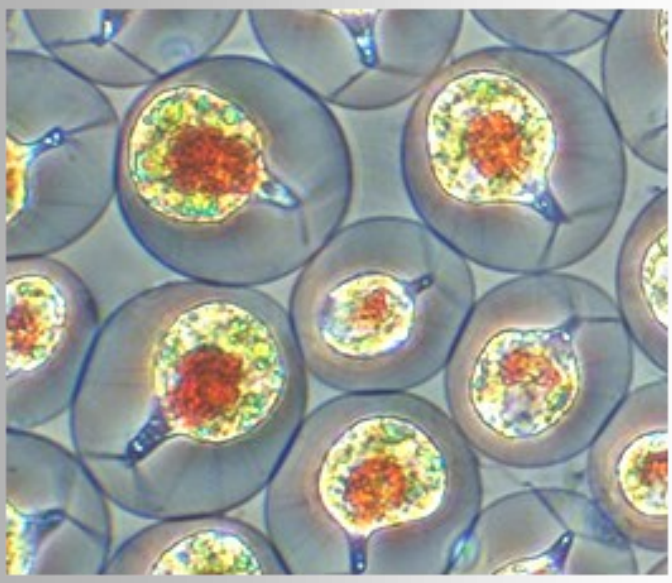
Illuminating the {Lilliputian}:

A gallery of images captured by light microscopy reveals the high art of the natural world.

These eight images are entrants to the Olympus BioScapes competition. A slide show with more images and stunning videos is on the web site www.scientificamerican.com/dec2009.

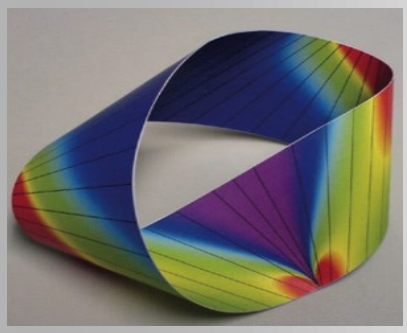
I was struck particularly by the image of algae cells arranged in a single layer. With a characteristic internal structure, each 40 microns wide cell contains a carotenoid pigment astaxanthin.

This pigment is used commercially to make farm-raised salmon pinker. The sample of these algae was recovered from a bird bath and photographed employing phase contrast illumination. HS



Dr. Mercola's best microsopic photography of the year?

http://articles.mercola.com/sites/articles/archive/2009/11/19/35-Years-of-the-Worlds-Best-Microscope-Photography.aspx



A mathematician confided
That a Möbius band is one-sided,
And you'll get quite a laugh
If you cut one in half,
For it stays in one piece when divided.

SEED MAGAZINE ON LINE MARTIN CHALFIE

Martin Chalfie is perhaps best known for his Nobel Prize-winning work on GFP, a jellyfish molecule that glows bright green when exposed to blue light. By injecting it into bacteria more than a decade ago to create the first tool for visualizing biological processes in living cells, Chalfie transformed the life sciences. "I realized this was going to be an extremely important tool," Chalfie says. "What I didn't know at the time was how far-reaching the impact of this molecule was going to be."

For almost my entire career, I've focused on a roundworm known as *C. elegans,* a tiny animal 1/25th of an inch long. Why the worm? One of the geniuses of Sydney Brenner, who started the field of studying this organism in the early 1960s, is that one can answer that question in several different ways. One is that it is a very good system to do genetics. The animal goes from an egg to an egg-laying adult in only three days, so you get many generations quickly. And the majority of the worms are self-fertilizing hermaphrodites, which makes it possible to maintain the effects of severe mutants through a significant number of progeny.

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Martin Chalfie

Join The San Francisco Microscopical Society

COPY THIS PAGE AND SEND IT TO A FRIEND OR COLLEAGUE, HAND IT TO A MICROSCOPIST, GIVE IT TO A SCIENCE-ORIENTED TEEN OR A SCIENCE TEACHER. HELP US GROW! THE MORE INTERESTED MEMBERS WE HAVE THE MORE INTERESTING MEETINGS WE CAN SPOONSOR.

Why should I join?

If you are an amateur:

Participate in exploration and discovery at our meetings and fieldtrips.

Develop a new and fascinating hobby.

Borrow a microscope to take home before buying your own.

Learn how to buy a good microscope.

Discover your micro-world at home.

Help children understand science.

Receive information, science articles, reports of meetings and activities of interest to members and microscopists.

If you are a professional:

Enjoy the company of professionals attending Society meetings.

Use our research grade Zeiss Ultraphot III microscope available to members who have participated in a training session.

Share in the tradition of scientific objectivity and serious endeavor with other professionals.

Improve the public's understanding of microscopy and scientific endeavors.

Add the Society to your resume.

Copy or fill in this half page:

Membership Application

San Francisco Microscopical Society

Instructions: Please provide all requested and marked with (*) information, if available, and enclose the $12.00 dues for the calendar year 2010 or pay $144 for Life Membership.

We welcome all interested individuals of any age.

Enclose a business card if available.

_____
*Print your name: First, Middle, Last

_____
*Print street address or mailing PO Box

_____
*City *State Zip 5 + 4

_____
*Print your e-mail

(_____)_____
*Home phone

(_____)_____
*Cell Phone

_____
URL

_____ _____
Occupation Age or Birth date

If you own one of more microscopes, briefly describe what you have and use the back for additional space. What is your special interest in microscopy?

_____

_____

_____

Mail to: SFMS Treasurer
20 Drake Lane
Oakland, CA 94611-2613

The Ant's great, great, great…

. .great aunt died by drowning in pine pitch.

It is a human quest to see past any obstruction. We climb to the hilltop to get a wider vista, to look for game, to spy on enemies, and to see further afield as if we could look into the future. The art of seeing has come a long way. We now have looked back in time to almost the beginning of time in astronomy, and we have seen the position of atoms on surfaces with atomic force microscopes. There is so much to see that we are constantly striving to see with greater clarity and better understanding every aspect of nature.

Amber, the sap of trees that has become hardened from its viscous state, has long been one of the best places to find insects and other organisms from the Cretaceous. Unfortunately, some ancient amber is opaque, hiding within it ancient trapped organisms. A brief article in the November 2009 issue of National Geographic illustrates an ant made of plastic that was replicated by scanning an opaque block of amber with synchrotron radiation, capturing the information in a computer and then building up the model in a 3-D plastic form through computer milling. While this only provides a surface image, these organisms do not have well preserved internal structures after 100 million years.

The work was done by French paleontologists Melvina Lak, Paul Tafforeau and their colleagues who sifted through 25 pounds of amber and found 1,000 fossils. Specimens included wasps, flies and spiders. It remains to be seen if in the future, such tiny models of ancient life will be widely available at universities for students of paleontology to study or if all such information will be digitized and viewed in 3-D with appropriate eyewear on the computer screen.

Some magnificent anaglyphs.

A red and a cyan filter are placed adjacently on the illuminator. Cyan lies halfway between green and blue. The images obtained by this method are called "anaglyphs" (superimposed stereograms) and the images show characteristic red-cyan colors.

The photos must be observed through red-cyan spectacles. By convention the red filter is on the left which results in the left eye receiving a slightly different image from the right

http://www.microscopy-uk.org.uk/mag/art98/diat.html Some magnificent anaglyphs of microorganisms. More at www.funsci.com

Martin Chalfie cont.

But one of the most profoundly important aspects of this animal is the fact that it's essentially transparent. We can look under the microscope and see all the nuclei of all the cells in the animal.

The worm's transparency is what led to the discovery of GFP as a biological marker. When I heard about GFP, I realized that we could see anything we want in a worm by labeling it with this molecule because the animal is transparent. The real advantage of GFP is it allows you to look in a living organism through time. You don't have to kill the animal, fix it, and permeabilize it. It's a very noninvasive way of getting a dynamic view of what's happening in biological processes. You just shine blue light on the organism and you get green light out of it, and it's so very, very nice.

One of the wonderful accomplishments of research on *C. elegans* is that we know how all of the 302 nerve cells communicate. This is remarkable. The worm is still the only organism that we know how all of its nerve cells are connected to each other. Based on work started by John White and Sydney Brenner, we have reconstructed the entire nervous system of the animal. So one of my friends decided to take an image from that research and color-code the cells to make this picture of "the mind of the worm."

The article on Martin Chalfie is abstracted from an interview done by Greg Boustead for Seed, a Science-Art-Society magazine that has a on-line component.

Google Seed to find the entire article.

A lot of our time is spent looking down a microscope at animals on Petri dishes and testing them to see if they are touch sensitive or not. GFP was a nice idea that came to us as an offshoot, but we spend much of our time identifying components that underlie mechanical sensors in cells. Biologists have a very good idea how we detect chemicals in the world around us. These chemical signals bind to proteins and that leads to a cascade of events that allows the cells to respond. —ooo—-

NEXT SFMS MEETING

SFMS

Volume 5 # 1

The QX3+ Digital Microscope

January 12, 2010 Tuesday

at the Randall Museum

A presentation by Henry Schott. (See page 3)

Stamp

FROM:

Micro News

San Francisco Microscopical Society
20 Drake Lane
Oakland, CA 94611-2613

TO:

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MEMBERSHIP INFORMATION

To join the Society,:
fill in the form available at
www. sfmicrosoc.org and mail it to the above address with your annual 2009 dues of $12.– made out to SFMS.

Life membership is $144.00

Correspondence

Suggestions re. SEM and *Noisebridge* for meetings.

Dear SFMS Dec 3, 2009

This is the first time posting here.(Yahoo-group). Bill Hill suggested that I make a post to the group with these late concerns last night after a computer workshop that he was attending here.

There is a good possibility that a SEM that was given to me by Mike Zach in 2003 will be donated to the group [called] *"Noisebridge* " a non-profit group pending some more negotiations with some members who have raised some objections that the instrument will be expensive to operate. *Noisebridge* operates by consensus and all people have to agree before any action can pass.

Turns out that the filaments are the only major reoccurring replacement item. They cost about $20 apiece & last 20 to 100 hours depending on the demands of use.

Still people need to have some training to use and care for the instrument.

Some kind of fall back should be available should agreement not be reached by *Noisebridge* members.

Mike Zach, a SFMS member, gave the instrument to me when he left UC Berkeley to move to Chicago's Fermi labs in 2003. The Microscopical Society did not have the space to receive the instrument and no one local at that time had the space or time to deal with the instrument.

I hated the idea that the instrument would end up with the scrap man and I had at the time another and far larger one.

So I gave it to another friend who lived in Berkeley near the university. It was inexpensive to hire a taxicab to haul the small instrument.

My friend, who lived in Berkeley, has since moved into San Francisco into a smaller apartment and has no time to play. He has decided to release the instrument back to me who faces a similar situation having gotten rid of my own lab and shop in favor of a common shared facility of *Noisebridge*.

I suspect that the SEM is not a high traffic use item and it is best situated in a clean low-use space such as a residential room under a single user.

Take a look at **www. noisebridge.net** to find out more as far as available space and time slots.

Microscopical Society meetings [could be held] at *Noisebridge* where there is more time without the boot time that we face at JD Randall Museum

There is also an elevator to lift heavy microscopes to the third floor where the group meetings are held. Parking is free on Mission Street after 6 PM.

Please leave only your reply on this web based forum unless you need some very private concern with me using e-mail.

Mike Kan