



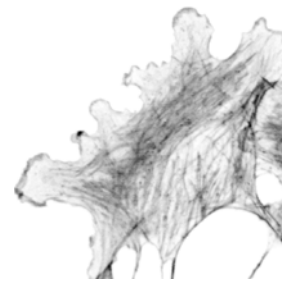
Why you should not use JPEG for scientific digital images

There are several valid scientific reasons for avoiding the use of the JPEG image file format. Wikipedia rightly says that “JPEG is a lossy compression method – it removes information from the image – it must not be used in astronomical or medical imaging or other purposes where the exact reproduction of the data is required.”

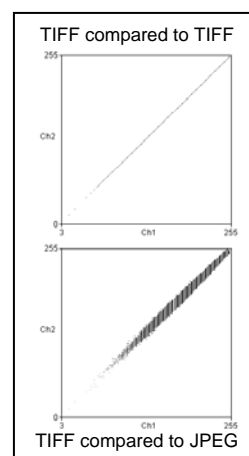
One rationale often given for using JPEG is that the file size is much smaller, and using JPEG will keep the lab from running out of hard disk space. Given the ready availability of cheap and large hard disk drives, storing significant amounts of data is neither difficult nor expensive. Proper data management requires that the original source file be kept. Given the increased scrutiny of published digital images to detect inappropriate manipulations, having the original source data is one way to protect yourself against allegations of misconduct.

Perhaps the most important reason to avoid JPEG is that the compression algorithm permanently changes the data. Digital images are a grid of numbers, with each grid space containing a number that represents the grayscale or color intensity for that pixel. Since the intensity values are numerical, with a little math we can compare the images to see if they have been changed. We all learned that a number subtracted from itself is equal to zero. If you take a TIFF image (*the recommended file format for digital images*) and subtract an identical TIFF image from it, the answer is a black image (intensity = 0). If you subtract a JPEG image (*saved using a 70% quality factor*) from the TIFF image show here, you will get a distribution of values from -34 to +6. If we compare the value for each pixel in both images and plot it on a graph, we can see that TIFF compared to TIFF gives a linear correlation. If we plot the TIFF vs. the JPEG we can see that while the data still correlates, there is much greater variability.

Please be aware that each time you save a JPEG file, the software re-runs the compression algorithm. Compressing the file multiple times degrades the image, with no additional reduction in file size.



Confocal image
(contrast inverted for printing)



ARIBI Spring workshop – Saturday, March 7, 2009

The purpose of this workshop is to highlight current research focused on the application of advanced imaging approaches to biomedical problems. The poster session is open to all members of the imaging community and provides an opportunity for labs to highlight their current work in an informal atmosphere that promotes discussion and collaboration.

Registration and Abstract submission were opened February 13th. Please register and submit an abstract via the ARIBI website at: <http://www.aribi.arizona.edu>. Registration is free, but you must register to receive the final agenda and abstract listings, as well as reserve a lunch. Registration will close on March 3rd, 2009. If you have any questions, please contact Merry Warner at warnerm@email.arizona.edu or 626-8557.

Agenda: http://swehsc.pharmacy.arizona.edu/exppath/core/news/pdf/other/ARIBI_Program-spring2009.pdf

Students eligible for awards for microscopy-related posters

The Arizona Imaging and Microanalysis Society invites undergraduate and graduate students to present a poster about their microscopy-related research at the society's annual meeting. The meeting is being held March 12, 2009 in the South Ballroom of the Student Union. This meeting has a long standing commitment to serve as a supportive and constructively critical forum for students. The meeting offers an opportunity to hone a student's skills in front of a friendly scientific audience, as well as the possibility of winning a Students' Award. Two student poster awards (one for life sciences and one for physical sciences) of \$150 will be given for the best poster/presentation. Contact Doug Cromey to see the full details of this announcement.