THREE TUTORIALS ON IMAGES:
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Images are important. We have IDL procedures that help you do images and we have prepared tutorials on images that explain things, including our procedures. The first below talks about the different kinds of color images—one, two, or three independent quantities. The second details how to do this in IDL. And the third tells how to use images for exploration and modification of data sets, and how to obtain numbers from them that you can use for science. Here they are:

1. Ordinary images display a single quantity, often surface brightness; we call these *one-dimensional* images. However, in a single image you can use color to display two or three quantities simultaneously. We call these *two-dimensional* and *three-dimensional* images, respectively. So appropriately enough this tutorial (`newdimensionalcolor.pdf` is entitled **1d2d3d: One, Two, and Three Dimensional Color Images**...

   (a) One-dimensional images; contrast; colortables; the colorbar

   (b) Non-gray one-dimensional color images: choosing the colortable.

   (c) Two-dimensional color images: intensity combined with a non-gray colortable; using nonsaturated colors to make perceived intensity orthogonal to color.

   (d) Three-dimensional color images: the orthogonality of red, green, and blue.

2. To make the three different kinds of image in **1d2d3d**..., you can follow the IDL codes in its appendicies. For a more explanation of these procedures, including how to position colorbars, considerable detail on several fronts, and a discussion of options, see *trdisplay.pdf*, which is entitled **TRDIDL: IMAGE DISPLAY, ANNOTATION, AND EXAMINATION WITH TIM ROBISHAW'S `display.pro` AND RELATED PROCEDURES**.

3. Don't forget our plotting handout. For annotating images, you need to know plotting; this is `bpidl.pdf`, which we alrready distributed; it's titled **BPIDL—BASIC PLOTTING IN IDL**.... In particular, it covers plotting up to five variables simultaneously using plotting symbols, color, size, and shape.

4. The above are oriented towards making nice plots for illustrative and presentation purposes. You also need to understand image processing—how to extract information from and manipulate images on your computer screen. Enter our introductory tutorial `ididl.pdf`: **Image Display and Manipulation in IDL (IDIDL)...Images with a Single 256-Entry Color Table**. It covers...

   (a) The X-window and your computer screen; pixels, bytes.

   (b) TrueColor, PseudoColor, the color table, combined color, decomposed color

   (c) Displaying the image with IDL's `tv` and with Tim Robishaw's `display.pro` .

   (d) Image manipulation, processing, contrast enhancement.