

ENG 004 Lecture 19, Dec 4, 2012

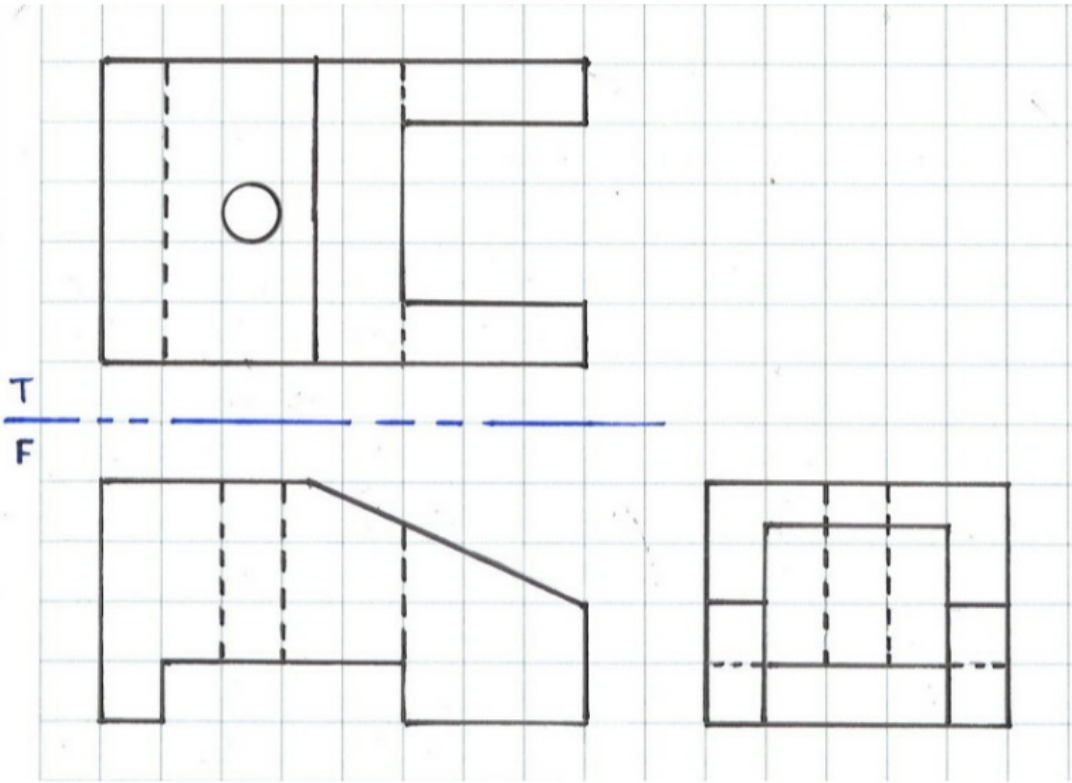
Announcements

- Homework #8 due Thursday
- Done with all chapters
- Final Exam: Friday December 14, 8 AM - 10 AM
 - Last Name A-L: Wellman 6
 - Last Name M-Z: Wellman 216

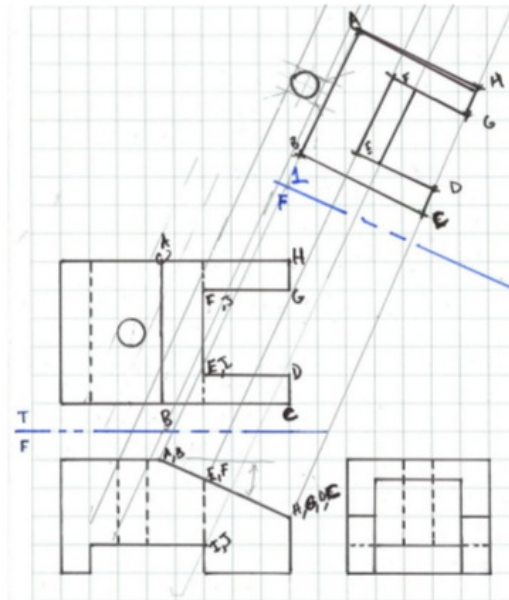
Topics

- Auxiliary View Example
- Figures and Charts

Auxiliary View Example



Auxiliary View Example



Information Graphic (Graph, Infograph)

Graphic visual representations of information, data or knowledge intended to present complex information quickly and clearly

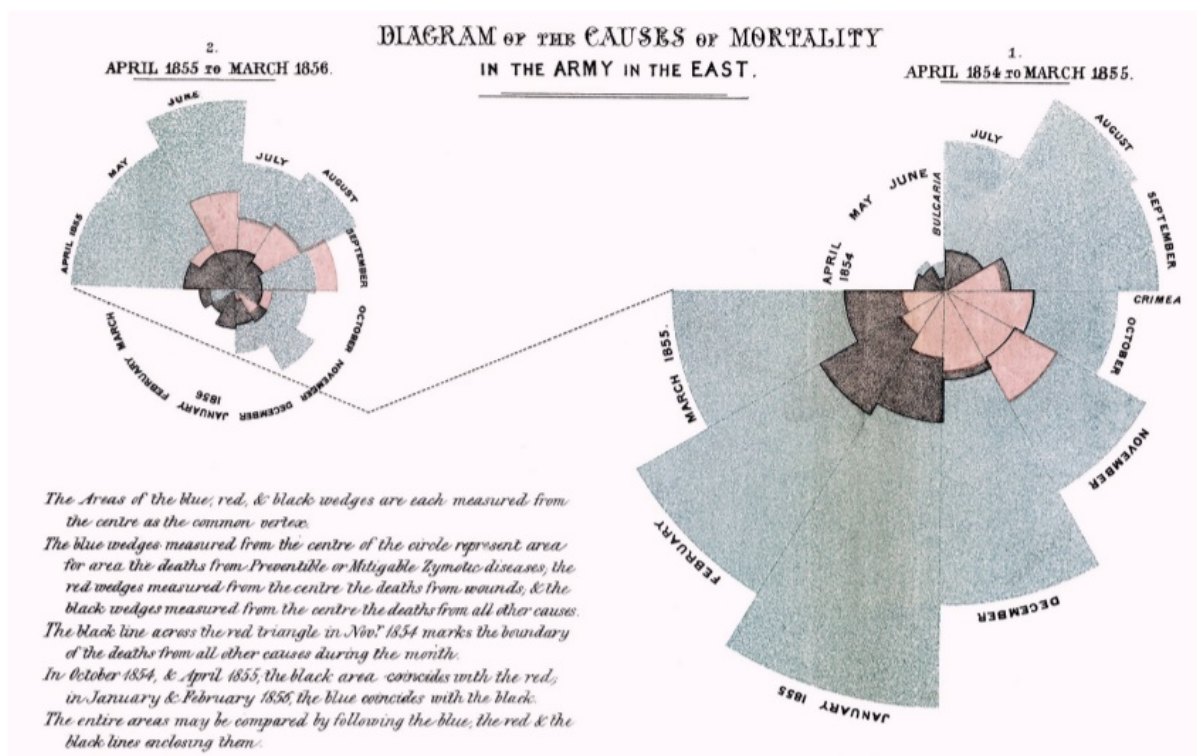
Types of data visualization

- Time-series
- Statistical
- Maps
- Hierarchies
- Networks

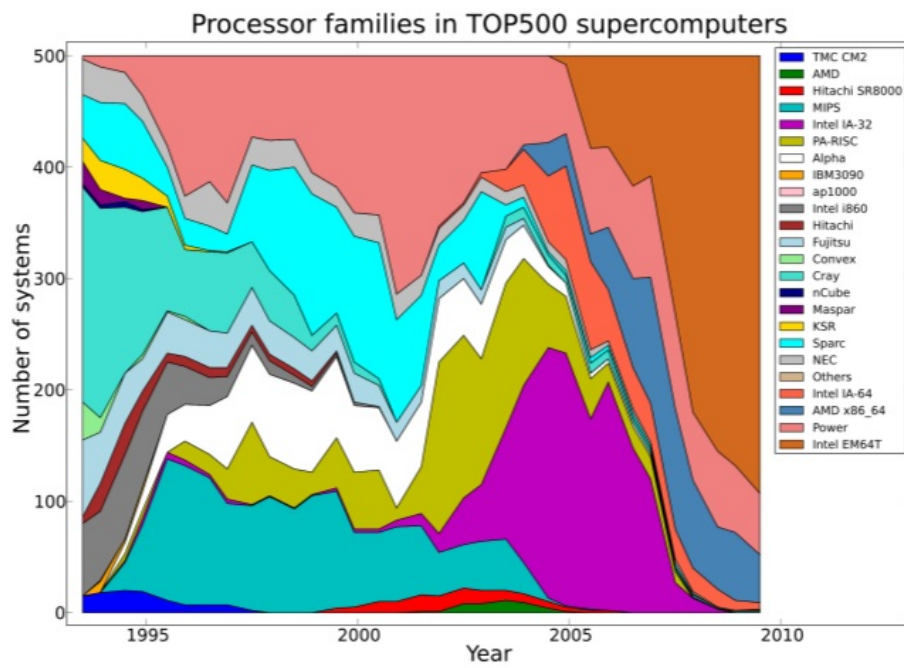
Metro Map



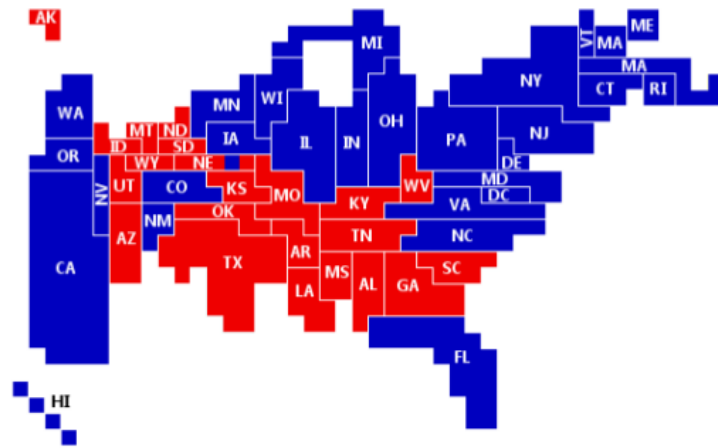
Polar Area Diagram



Stacked Graph

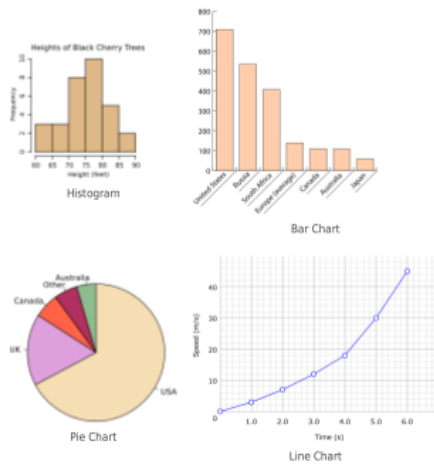


Cartogram



Charts

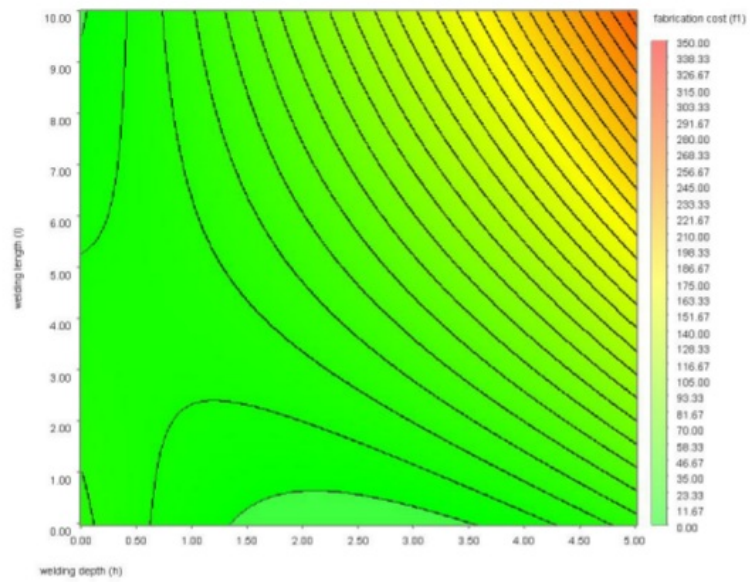
Graphical representation of data in which the data is represented by symbols, such as bars in a bar chart, lines in a line chart, or slices in a pie chart.



Plots

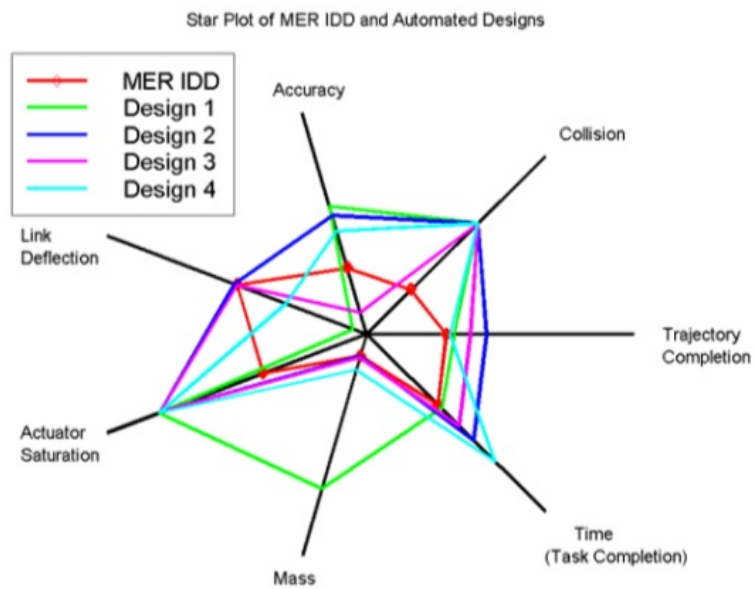
A plot is a graphical technique for representing a data set, usually as a graph showing the relationship between two or more variables.

Contour Plot

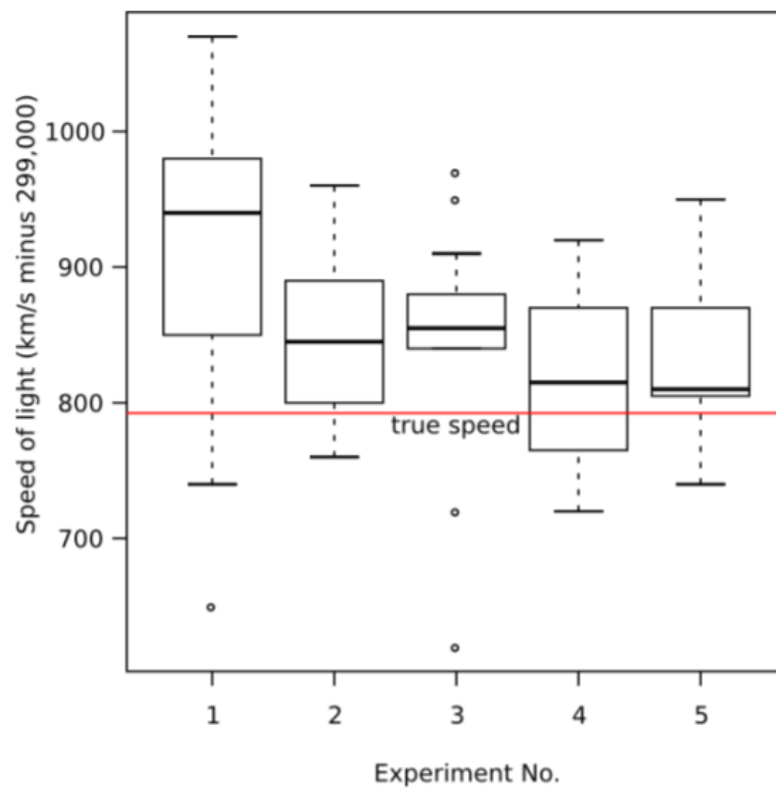


<http://knovel.com/>

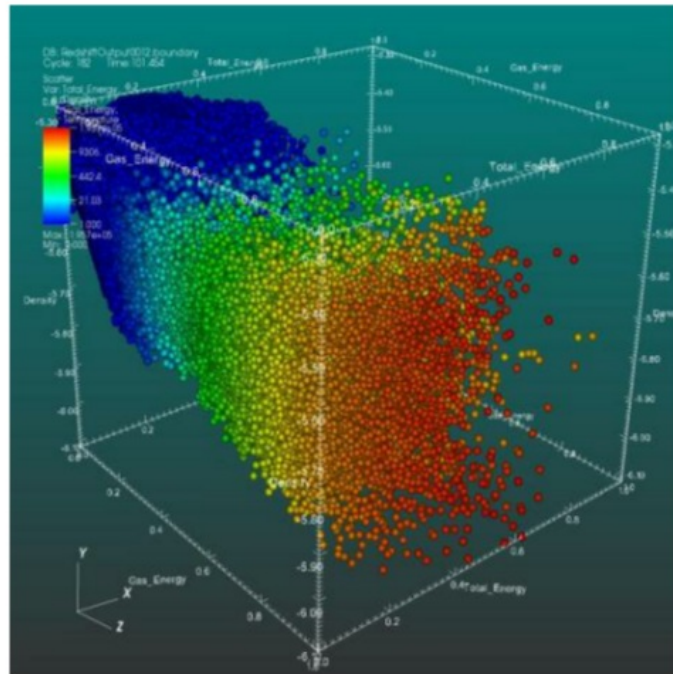
Star Plot



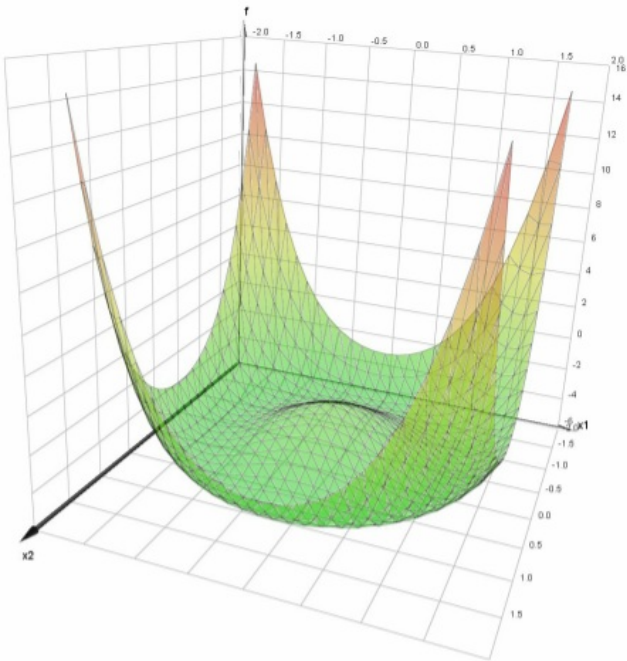
Box Plot



Scatter Plot



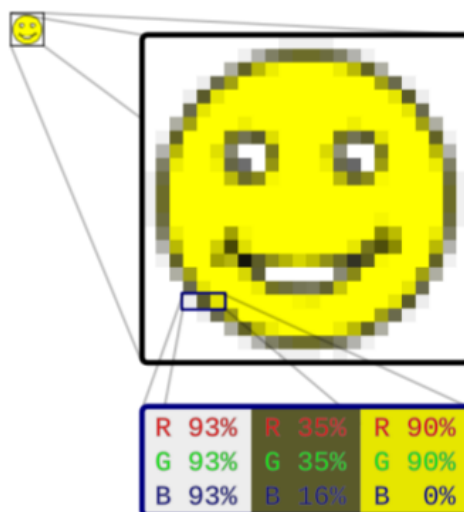
Surface Plot



Raster/Bitmap Image

A **raster, or bitmap, graphic** is a dot matrix data structure representing a generally rectangular grid of pixels, or points of color, viewable via a monitor, paper, or other display medium.

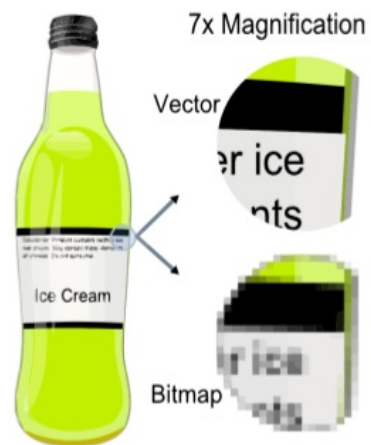
Filetypes: .gif, .png, .jpg, .bmp



Vector Image

is the use of geometrical primitives such as points, lines, curves, and shapes or polygon(s), which are all based on mathematical expressions, to represent images in computer graphics.

Filetypes: .svg, .ps, .eps, .pdf, (.doc, .odt)



Units

Units are pretty straightforward except for the notation of a pixel. Most units are physical distances in our reality, but a pixel isn't. It can change from display to display. There are some compatibility issues that you should be aware of between printed media and video images for that reason.

Standard units

m+m, cm, inch, etc. These are straight forward and are used in many computer aided drafting/design programs.

Typography Units

Points

Traditionally used to measure fonts on printed pages and typography. Nowadays 72 points equals 1 inch (1 pt = 0.0139 in = 0.3528 mm).

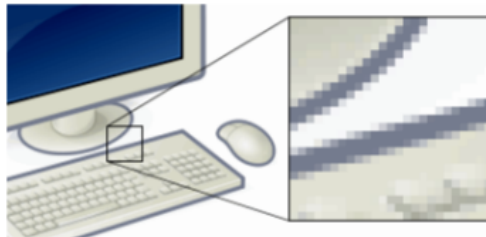
EM

A relative measurement with respect to the point size of the type face. Used in typography and in html/css.

Units - Pixels

Pixel

The smallest single element of a digital image. The word resolution is often used for the amount of pixels in an image. The higher the resolution the better the ability to reproduce the actual image digitally. **A pixel does not equal a standard physical dimension, it depends on the screen the image is being displayed on.**



Dots

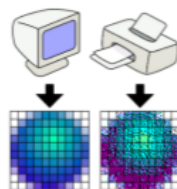
Dots per inch

A measure of spatial printing or video dot density, the number of individual dots that can be placed in a line within the span of 1 inch (2.54 cm). Correlates with image resolution, but is related only indirectly (from Wikipedia).

Pixels per inch

Can describe the resolution, in pixels, of an image to be printed within a specified space. For instance, a 100 x 100 pixel image that is printed in a 1-inch square could be said to have 100 dots per inch (DPI). Good quality photographs usually require 300 dpi. (from Wikipedia)

Modern computer-monitors typically display about 72 to 130 pixels per inch (PPI) some modern consumer printers can resolve 2400 dots per inch (DPI) or more



Typesetting Equations

\(\TeX\): Donald Knuth's computer based typesetting system released in 1978

\(\LaTeX\): Leslie Lamport's document markup language and document preparation based on `\(\TeX\)`

Rendering the Quadratic Formula

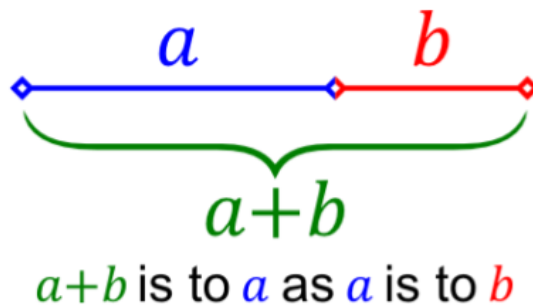
TeX input: `-$-b \pm \sqrt{b^2 - 4ac} \over 2a$`

Tex output: `$$-b \pm \sqrt{b^2 - 4ac} \over 2a$$`

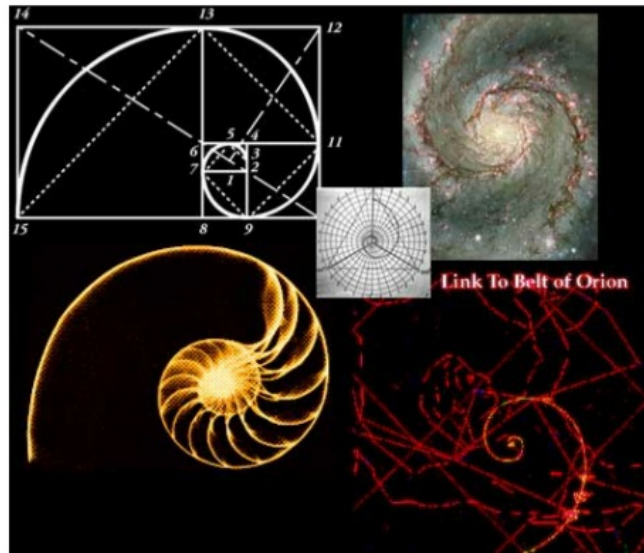
Golden Ratio

$$\frac{a+b}{a} = \frac{a}{b} = \varphi$$

$$\varphi = \frac{1+\sqrt{5}}{2} = 1.618\dots$$



Golden Ratio In Nature



Plotting with Matplotlib

[Matplotlib website](#)

[Matplotlib gallery](#)

[Example plots done in class](#)