# Arctic Ice Images analysis

## Python -

### Calculating the range for white pixels in an image

* After loading in an image, we use Matplotlib’s color picker tool to decide the lower bound of the range for white pixels. The upper bound is (255,255,255).
* The lower bound comes to be (153,161,165), approximately.
* So the [ lower, upper ] range is → [ (153,161,165), (255,255,255) ]

### Reading an image to calculate ice percentage

* Image is loaded in with the OpenCV library. (In BGR mode)
* As some of the image pixels represent the space part, they are subtracted from the total number of pixels to get the no of pixels for the Earth.
* Then the OpenCV method inRange helps us to decide which pixels in the image fall between the [lower, upper] range.
* We make use of the range we’ve found out to calculate the no of white pixels representing ice in the image.
* Then the ratio of the number of white pixels to the number of Earth pixels gives us the percentage of ice.
* The ice percentage is added to the list of percentages.

## Spreadsheet -

### Ice percentages.

* For every year, the Ice Percent decreases by about 0.0612
* The values seem to be decreasing faster in the last 20 years than first 20 years.
* After the year 1996, the value started dropping more rapidly, on average.
* There are more peaks and dips in the last 20 years than the first 20 years.
* Years 2007 to 2012 show the lowest sum of ice percentages for any 6 years.
* The year 1983 had maximum Ice percentage value = 8.8294
* Average values = 7.6325
* 2012 and 2016 were the years with the least ice percentages with values of 5.77 and 5.93 respectively.
* Percent change relative to last year: lowest was -0.0118 in 2007, and the highest was +0.0160 in 2013.

### Global average temperatures.

* 2016 and 2020 show the highest global average temperatures with values of 1.02 each.
* All the years 2015-2020 show some of the highest global average temperatures.
* With the last value 0.95 being significantly the most.
* Average of all values = 0.5138
* In 1985, global avg temperature was lowest = 0.12

For every increase of 1.0 in Ice Percentage, Global Avg Temp decreases by about 0.25.