



Color Perception



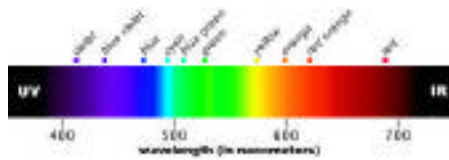
Ware – Chapter 4



<http://www.efg2.com/Lab/Library/Color/Science.htm>

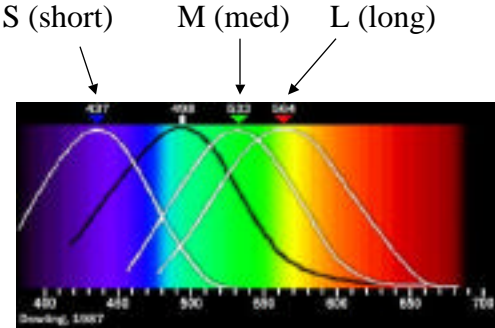


The Visible Spectrum

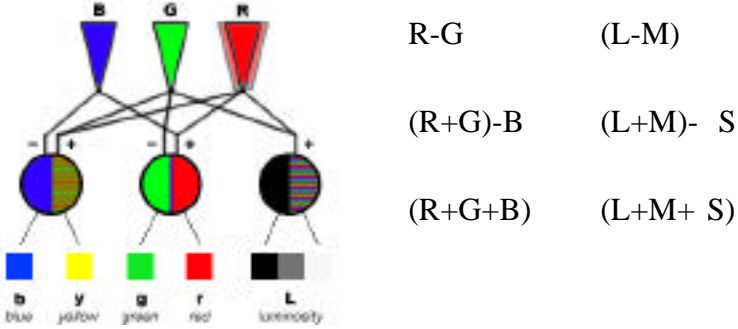




Three Cones Types



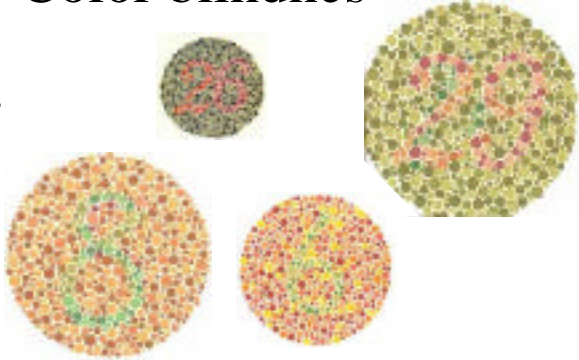
Opponent Processing



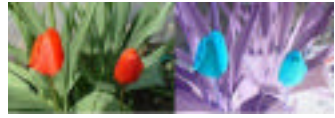


Color blindness

Ishihara Plates



Most Common –
no distinction between
R and G

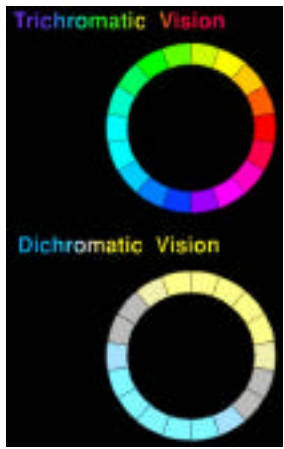


Considering Color Blindness

Trichromatic Vision **Dichromatic Vision**

The red and background colors as left are invisible to this observer as they might appear to a colorblind person.

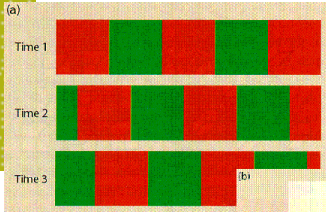
Blueish-Reds and Blueish-Greens	
This Would Not Be Very Visible to a Person with Red-Green Color Vision Deficiency	This Would Not Be Very Visible to a Person with Red-Green Color Vision Deficiency



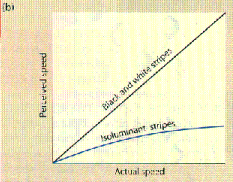
Neitz Lab



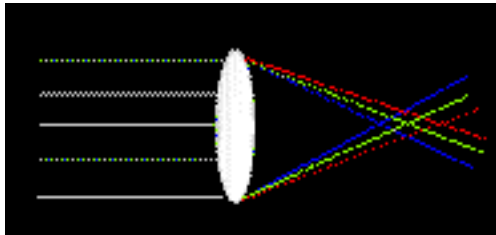
Color in Context of Color

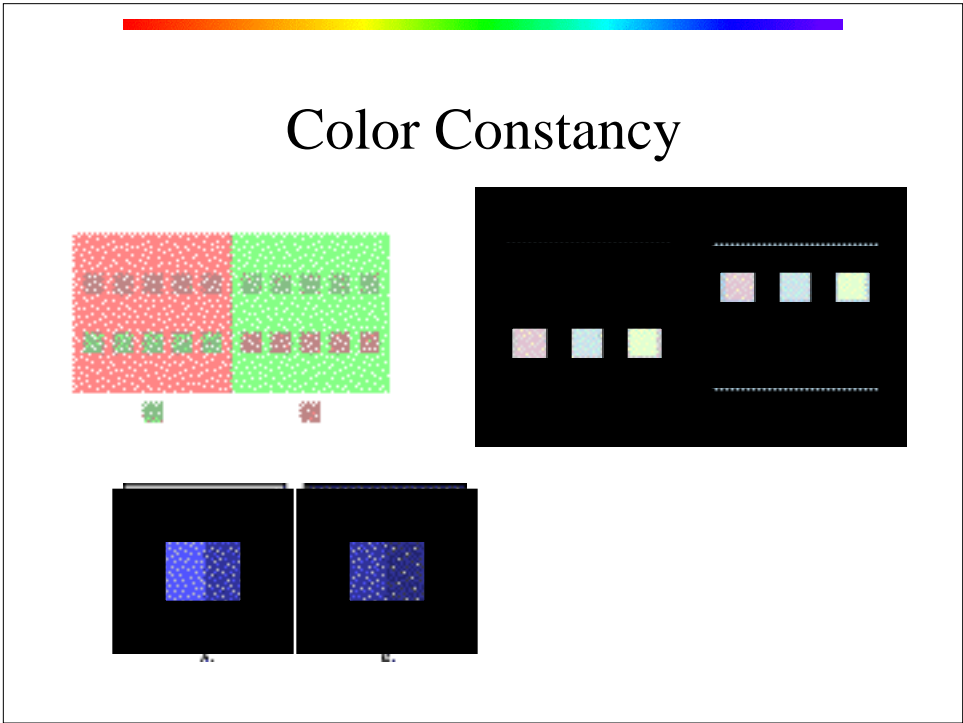
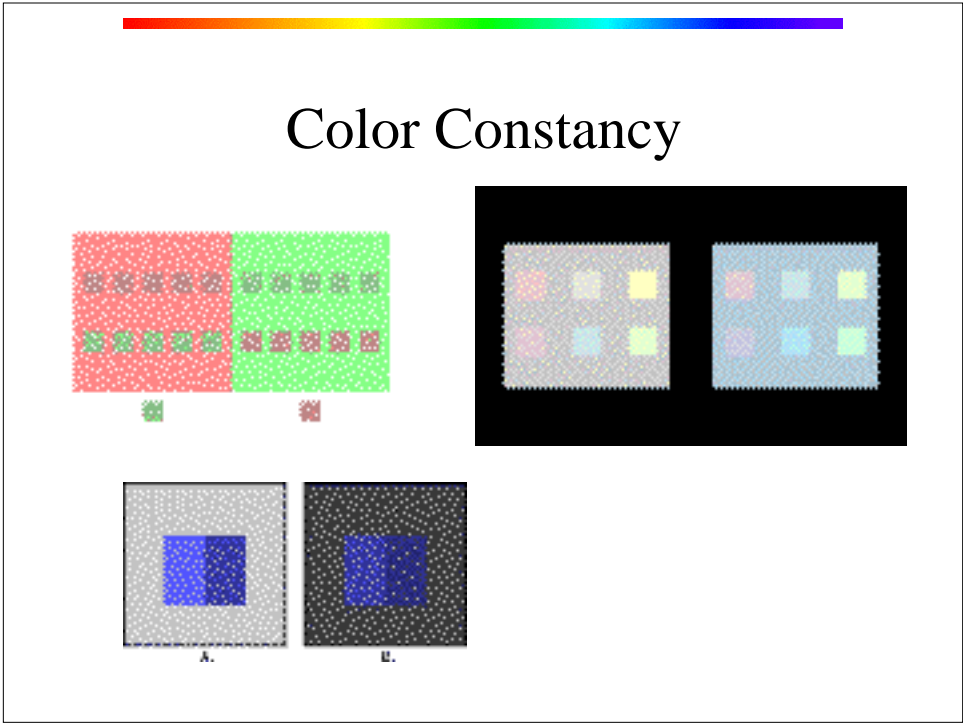


- Isoluminance reduces motion perception, which is most effective for high-contrast stimuli.



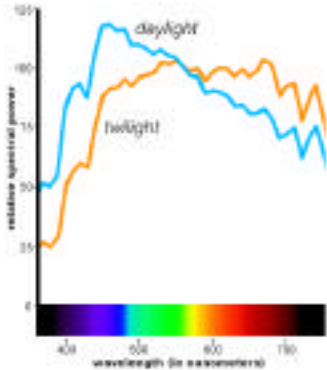
Chromatic Aberration



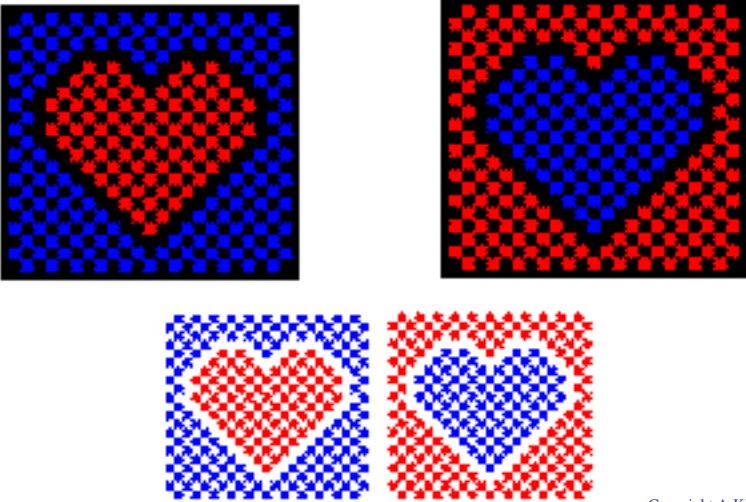




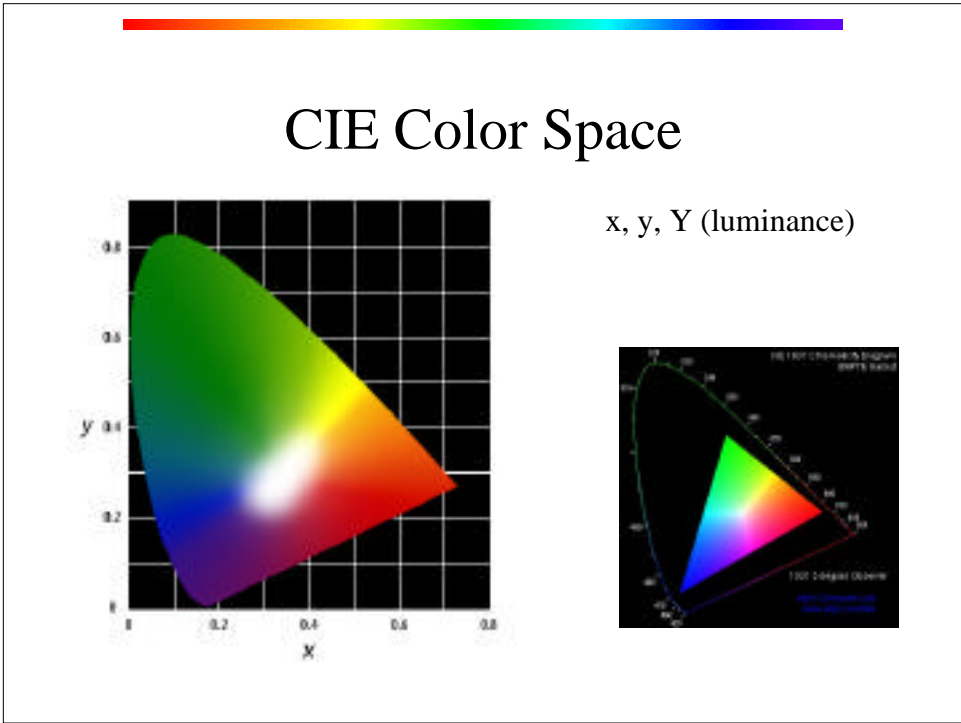
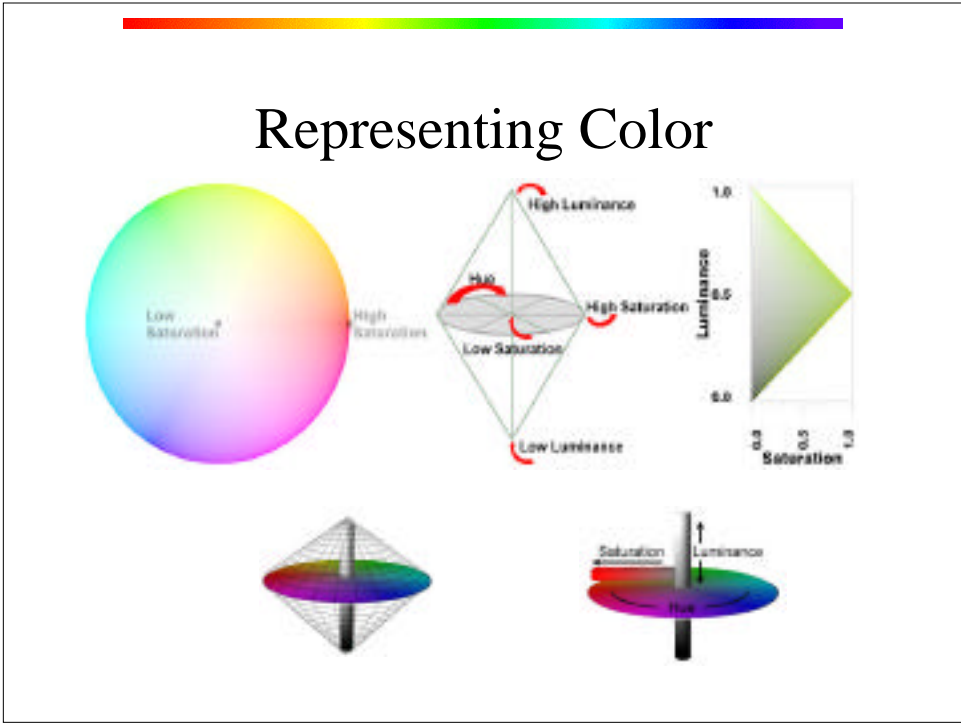
Differential Sensitivity during the day and twilight



Chromostereopsis

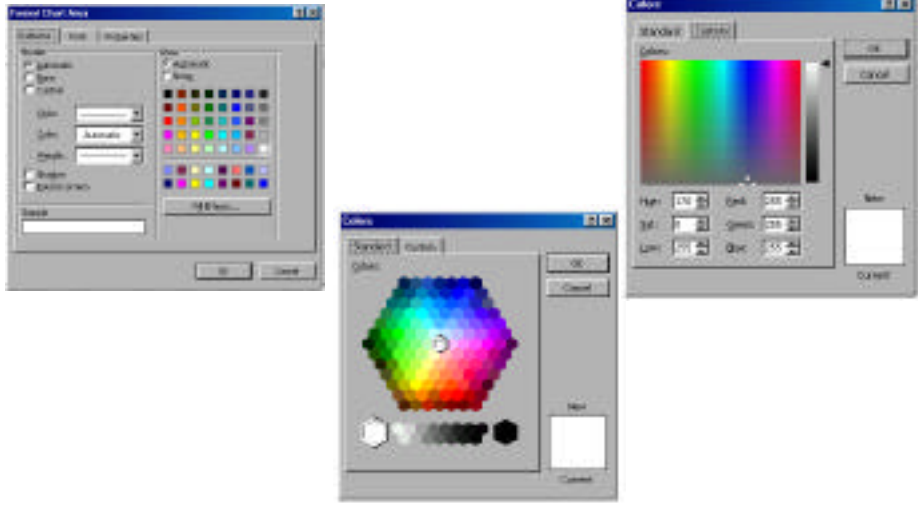


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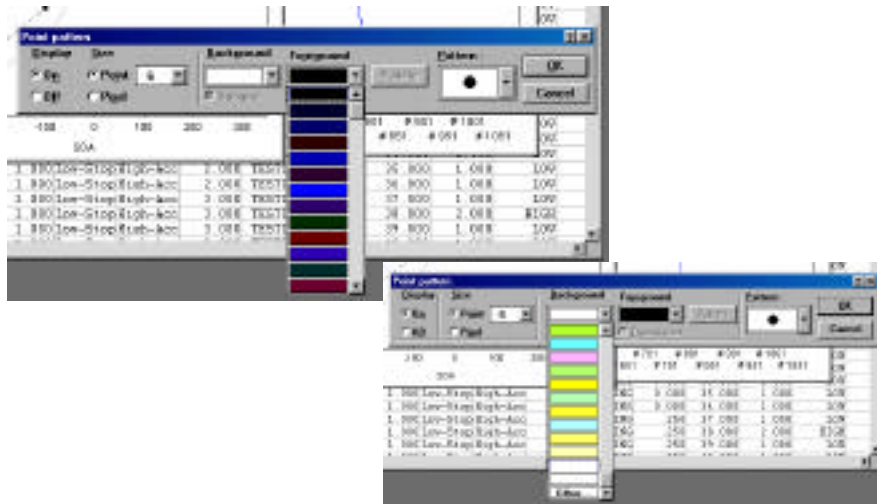


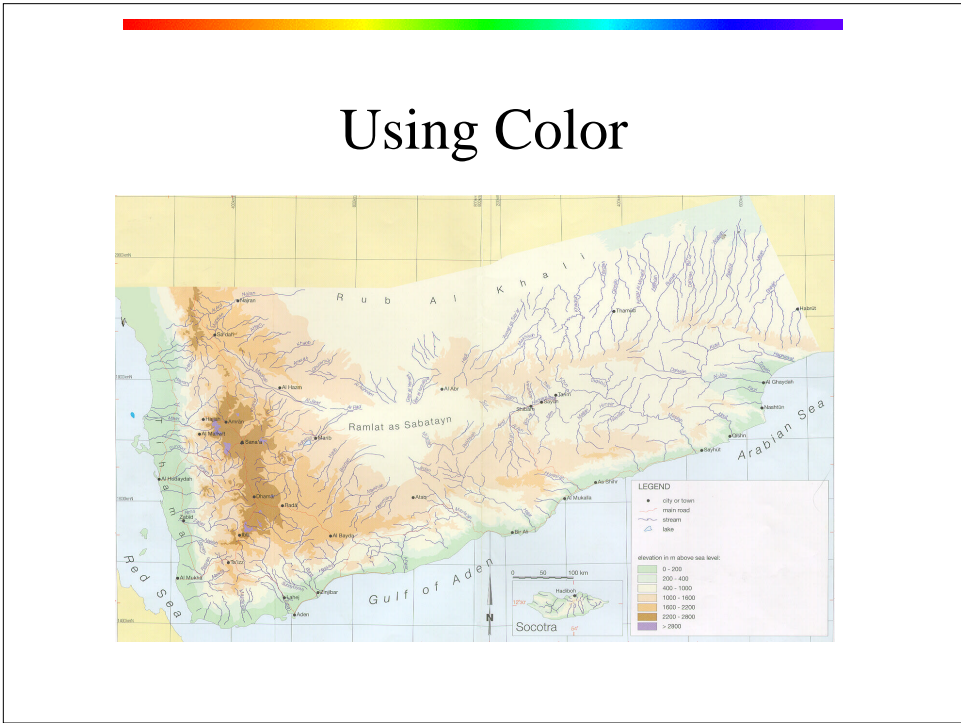
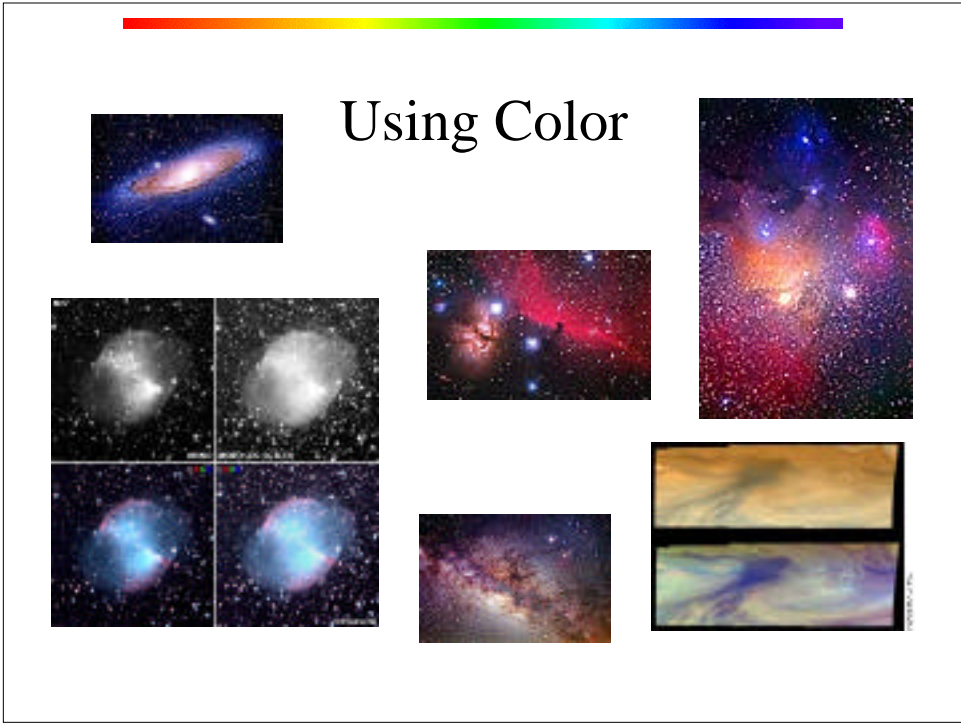


Color Selection Interfaces



Fitting the Options for the Task


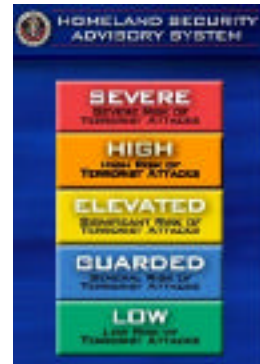






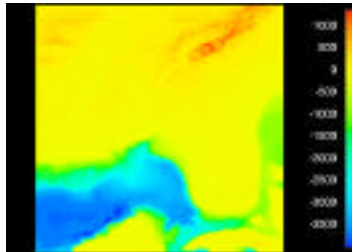
Using Color


- 5 Values
- Different Labels
- Cultural Issues?



Why should engineers and scientists be worried about color?

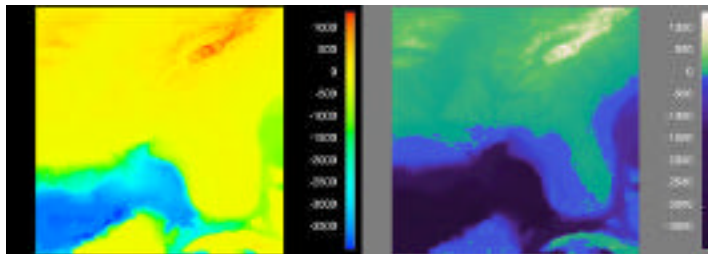
Rogowitz and Treinish





Why should engineers and scientists be worried about color?

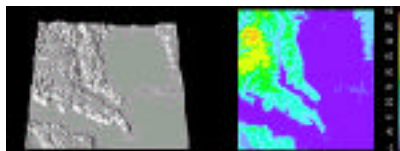
Rogowitz and Treinish



The color maps are mathematically equivalent

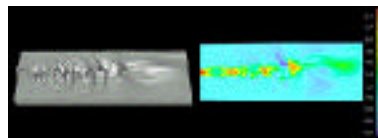
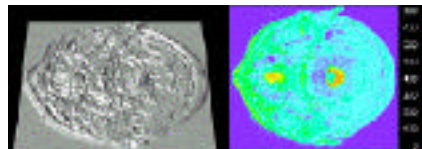


Color Can Be Bad



Topographic Map

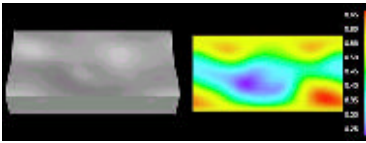
T2 Weighted MRI slice



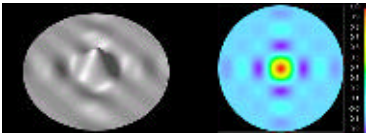
Jet Noise Simulation



Color Can Be Bad



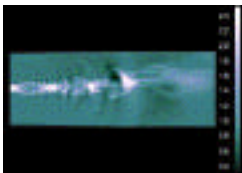
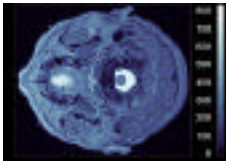
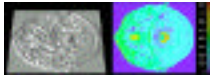
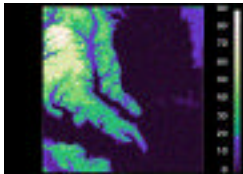
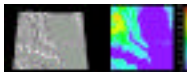
Earth's Magnetic Field



Two-dimensional sinc function

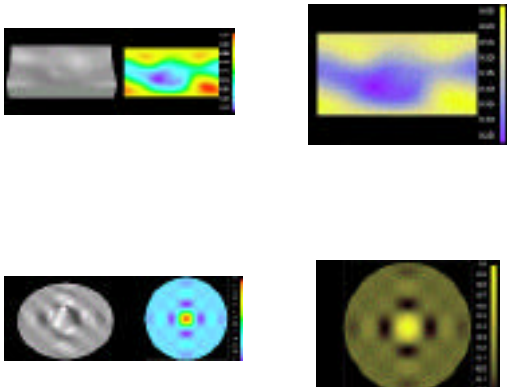


Color Can Be Good





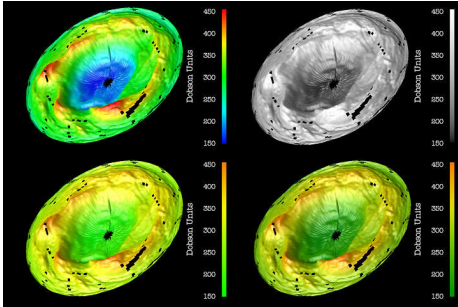
Color Can Be Good



Color Can Be Good

Ozone density in the atmosphere

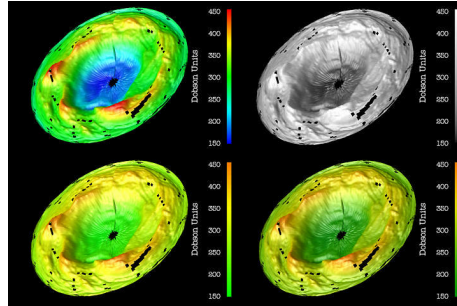
Luminance for hi-spatial freq data/ small details





Color and Luminance

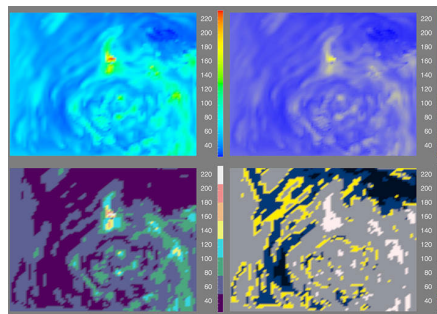
- Saturation for low spatial frequency interval data
- Combination of both



Different Colors For Different Tasks

Air pollution distribution:

Isomorphic map

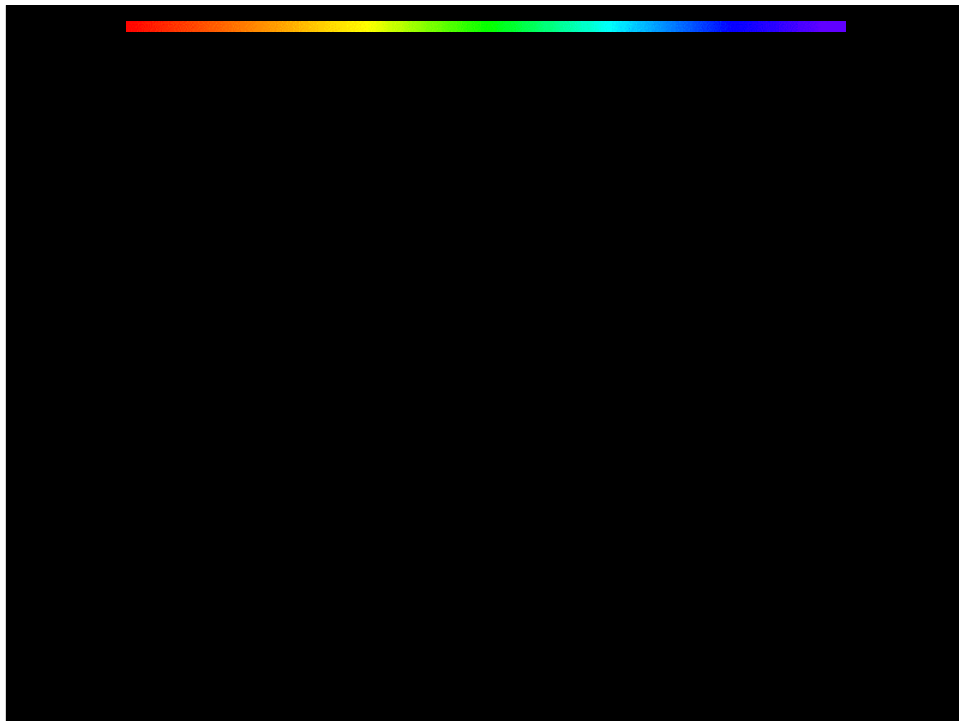
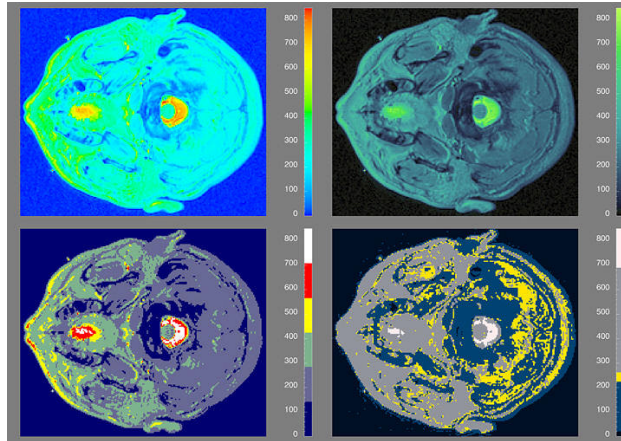


Segmented map

Segmented map



Different Colors For Different Tasks



It's All Relative...

It's All Relative...

It's All Relative...

It's All Relative...

It's All Relative...

It's All Relative...

It's All Relative...

It's All Relative...

