appleSTEMs

Science Technology Engineering Math
Software for iOS and OSX

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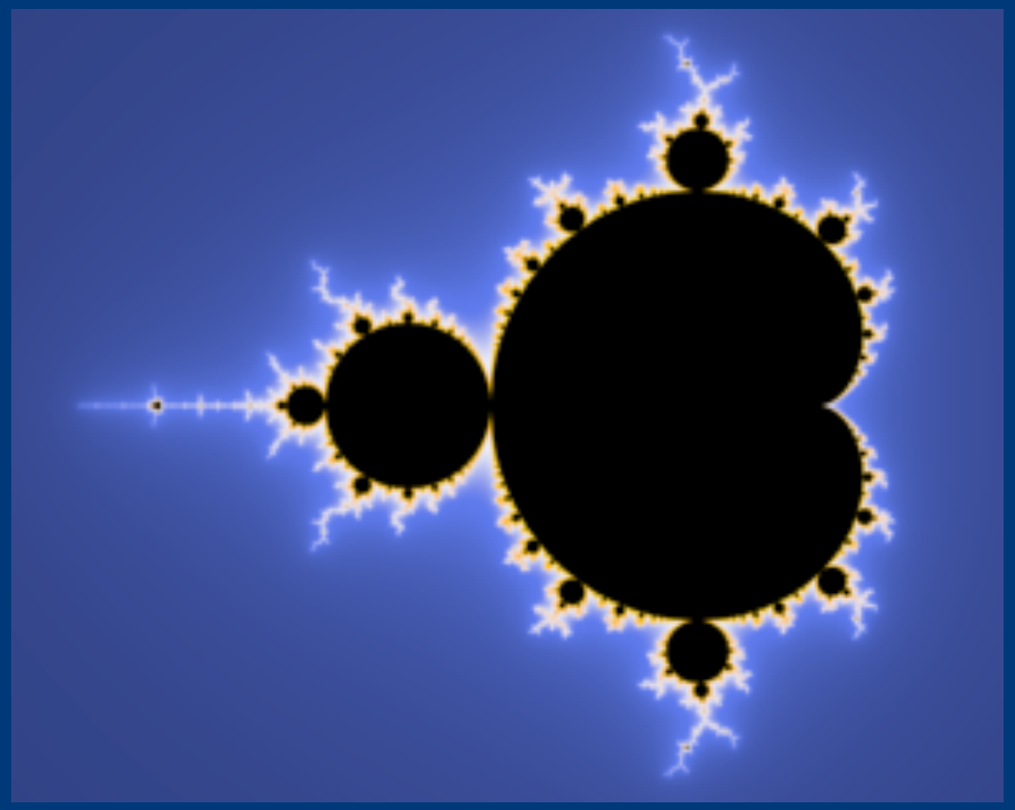
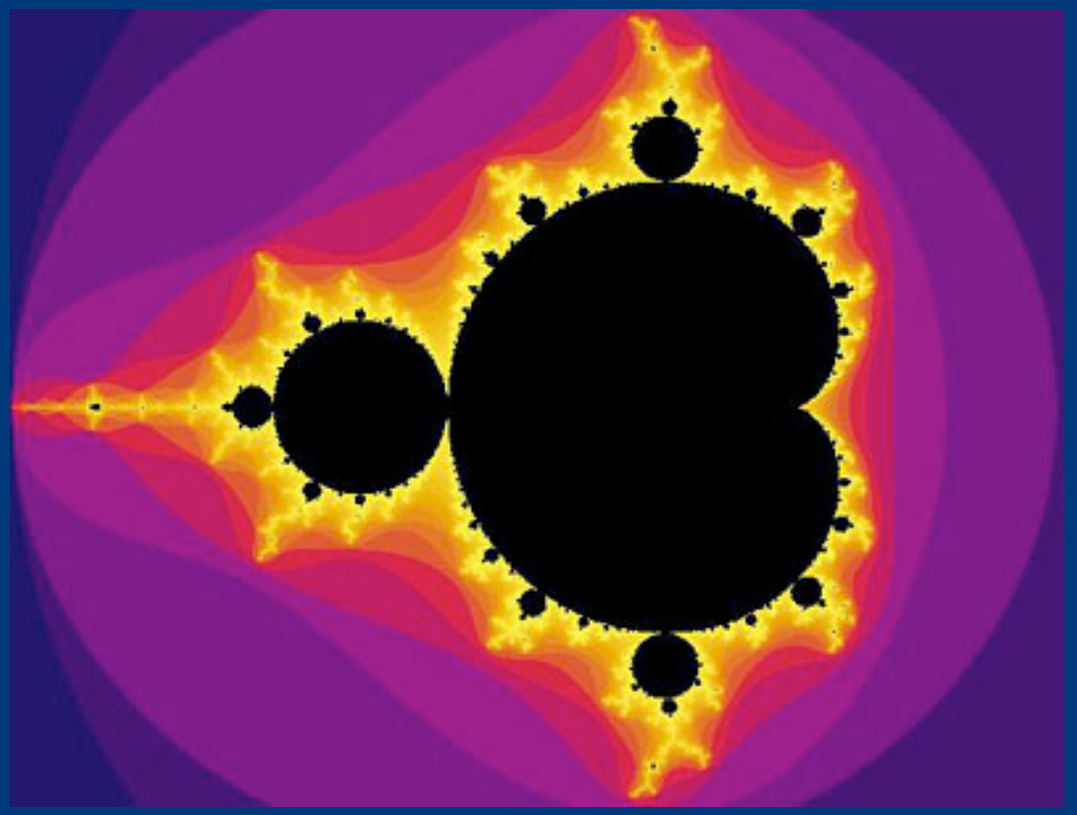
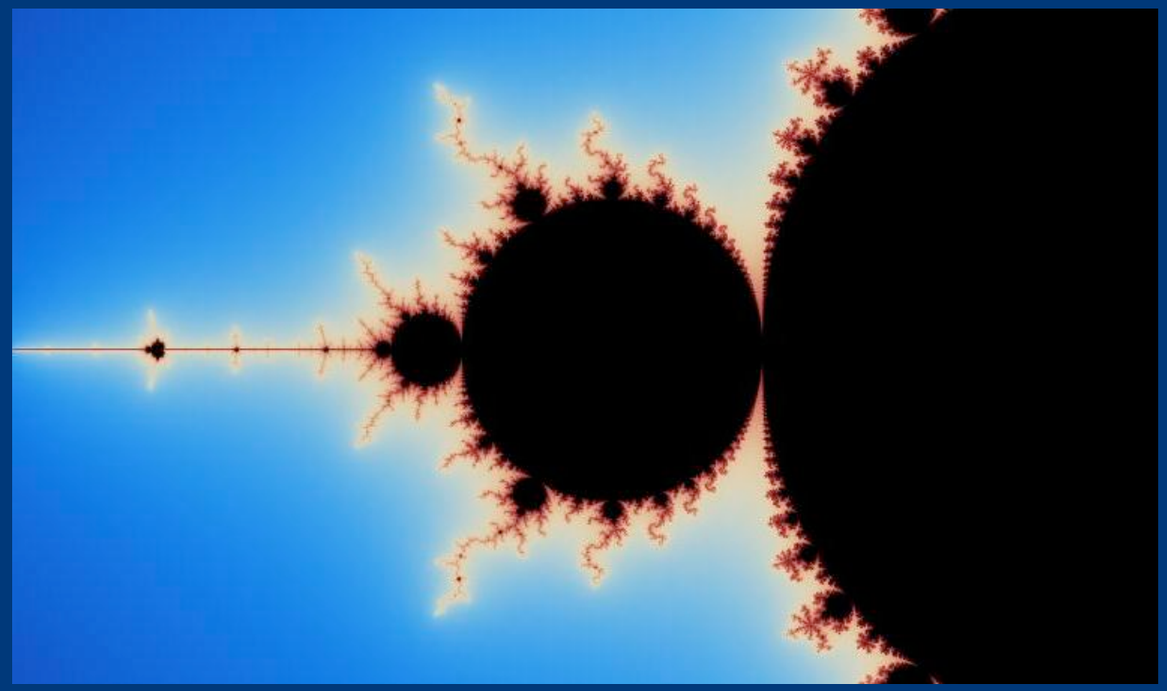
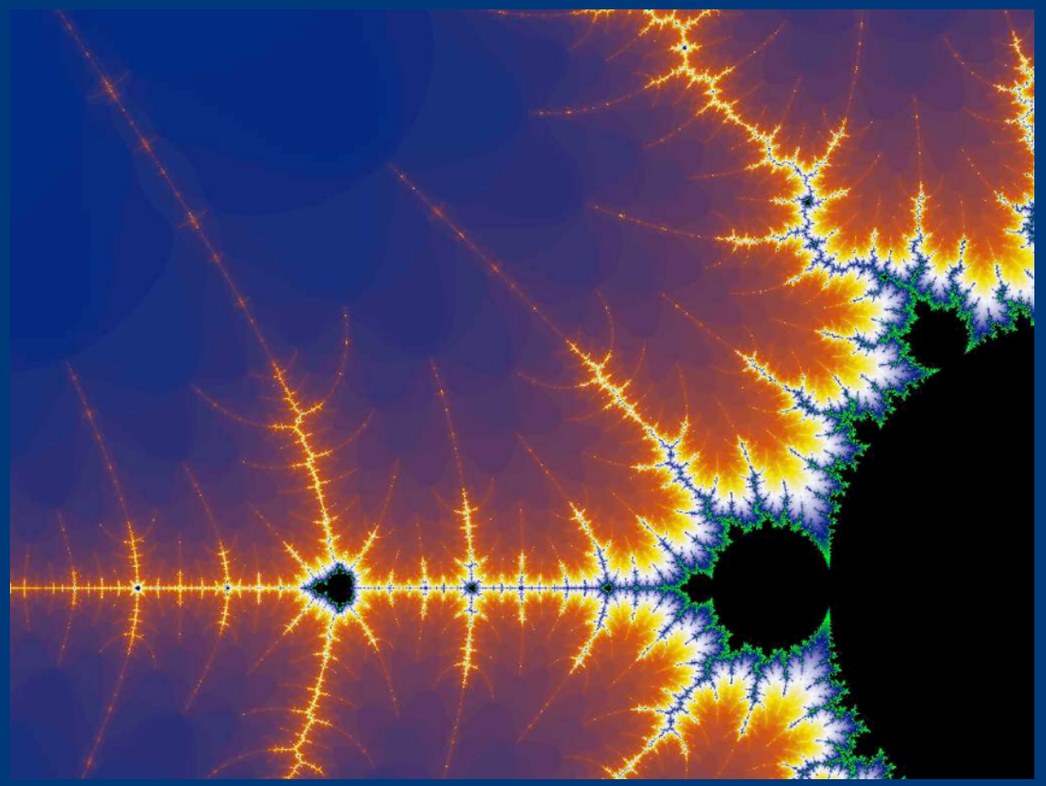
Fractal Images









Fractals

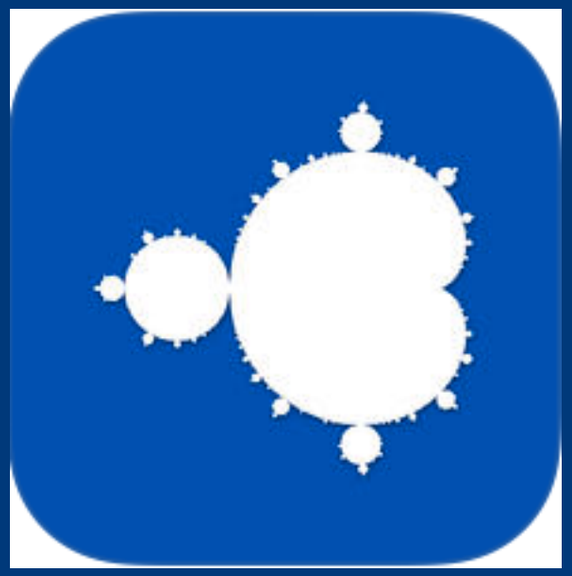
- Self similar - complexity of the image does not change as you zoom in
- Mandelbrot Set, Julia Set and more
  - All based on simple recursive equations using complex numbers
    - Complex numbers use both real and imaginary numbers
      - Imaginary numbers allow -1 to have a square root
    - For any point on the complex plane…
      - If the calculation is bounded then the point is in the set
      - If the calculation is unbounded then that point is not in the set
        - For those points we are interested in how fast they exceed the bounding value
  - Creating the Mandlebrout - or other - set requires doing that iterative calculation for all of the points in the image
- This is simple to describe and calculate but creates infinite complexity
  - And takes mega-boatloads of computations

Fractals in School

- Can serve as a jumping off point for topics in math and computer science
  - Graphing
  - Complex Numbers
  - Recursion
  - Algorithms
  - Programming Structures
  - Computer Graphics
  - Fractals in nature
- Fractal images can create interest in students who might not otherwise be interested in math
- But you need a way to easily create fractal images.....

Fractals on iOS

Fractals



Fast Fractal

- Fractals and Fast Fractal both allow you to explore the Fractal universe in real time on iPhones, iPads and iPod

A Supercomputer in Your Pocket

- Fractal programs for iOS let you do in a fraction of a second something that previously took a supercomputer hours

- Thank you Apple and Steve Jobs

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If you have a favorite STEM app then tell me about it via email
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San Gabriel Valley Apple Users Group

V Infinity Research, LLC