

# Julia Set

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Generates Julia sets from the unit circle using backward transformation in the complex plane.

Sources:

[1] [Karl Sims, Understanding Julia and Mandelbrot Sets](#)

[2] [Steven Wittens, How to Fold a Julia Fractal](#)

[3] [Julia set, Wikipedia, the free encyclopedia](#)

```
> restart :
#c := 0.274 - 0.008 I:
c := -0.8 + 0.156 I:
N := 10 : #total number of iterations
myby := 3 : #number of initial circles

> ptlist := [ ] : j := 1 :
  for r from 0 to 1 by  $\frac{1}{myby}$  do
    ptlist := [ ] :
    for phi from 0 to 2*3.14 by  $\frac{3.14}{30}$  do
      ptlist := [ r*(cos(phi) + I*sin(phi)), op(ptlist) ] :
    end do

    for i from 1 to N do
      p[j] := plots[complexplot](ptlist, x=-2..2, y=-2..2, style=point, axes=box, scaling
        =constrained, color=ColorTools:-Color([1-r, 0.2, r]));
      ptlist := ptlist +~ (-c) :
      ptlistnew := ptlist^~( $\frac{1}{2}$ ) : ptlist := [op(ptlistnew), op(-ptlistnew)] :
      j := j + 1 :
    end do:

  end do:

> plots:-animate(plots:-display, [seq(p[round(k*N + n)], k=0..myby), title
  =cat("Julia set - iteration ", round(n))], n=1..N, frames=N, paraminfo=false);
```

Julia set - iteration 10

