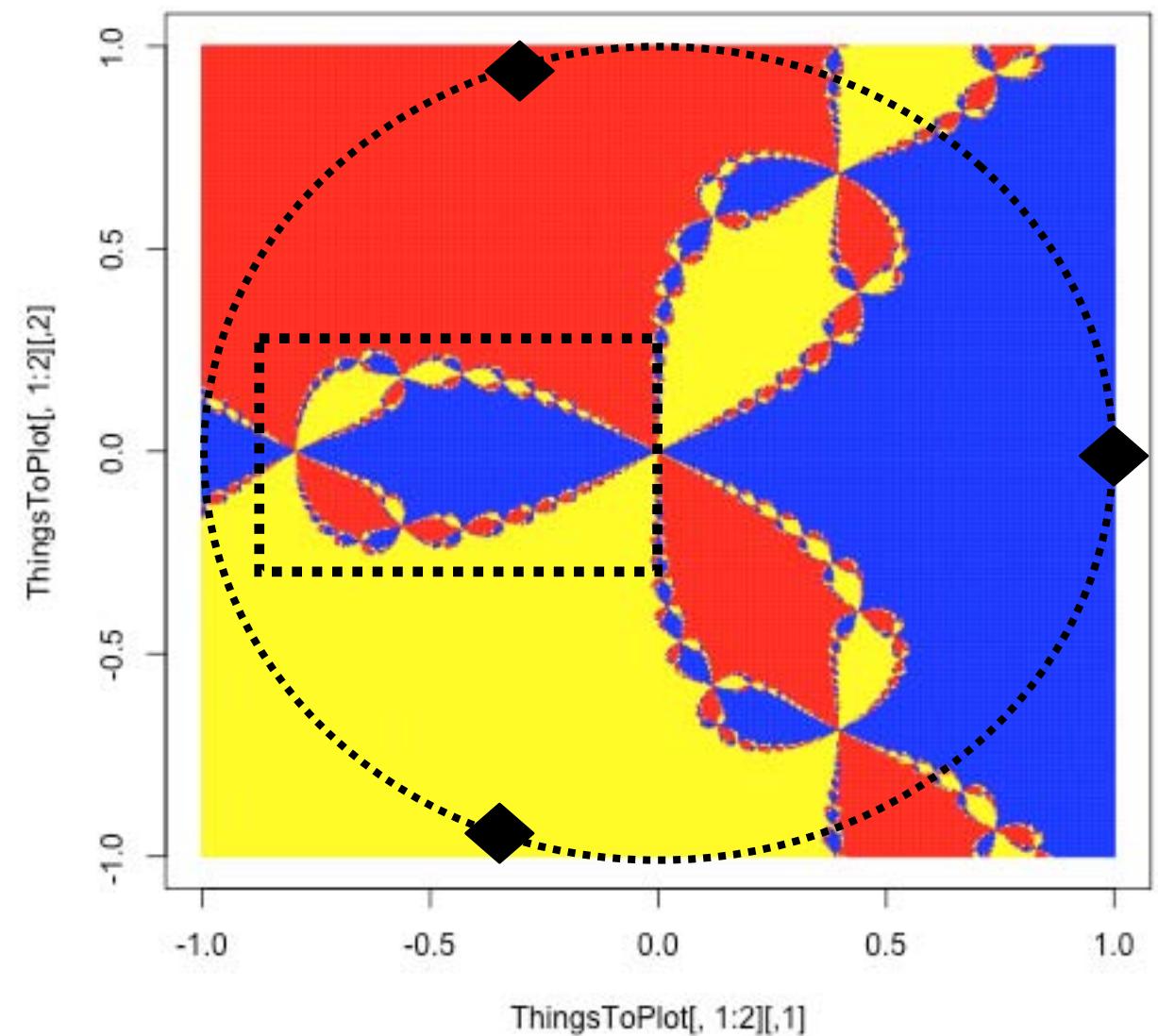
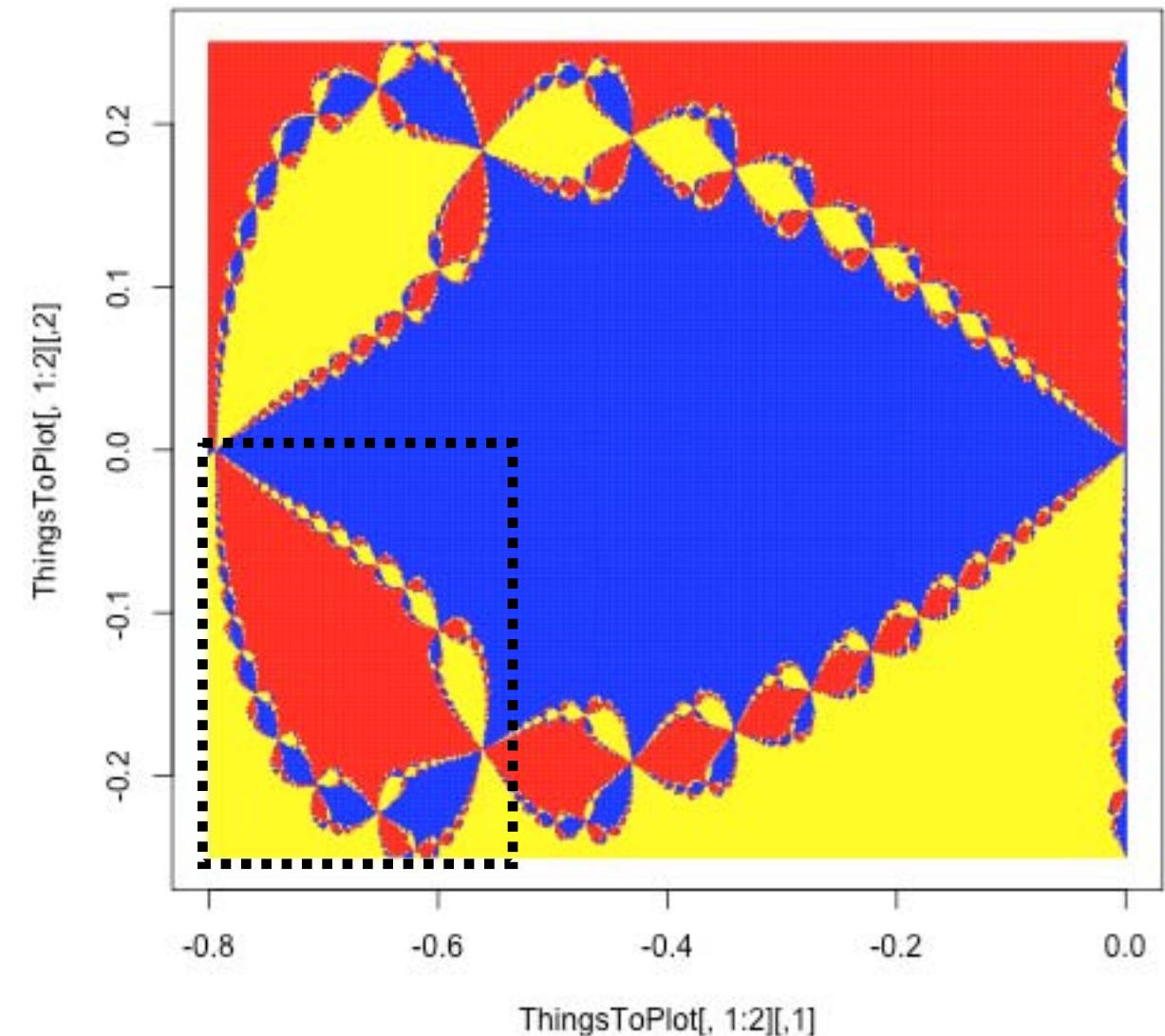


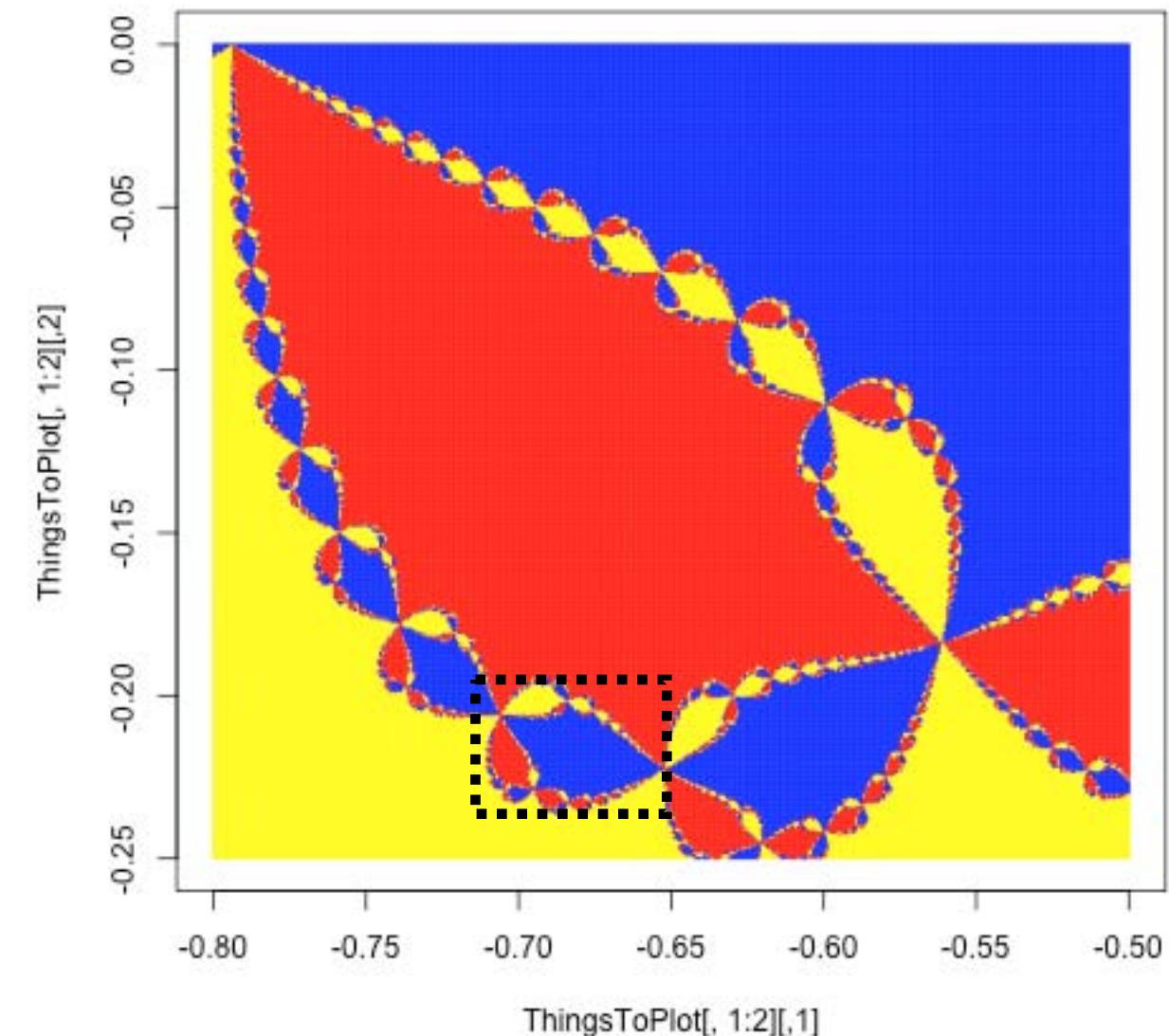
$$F(z) = z^3 - 1$$



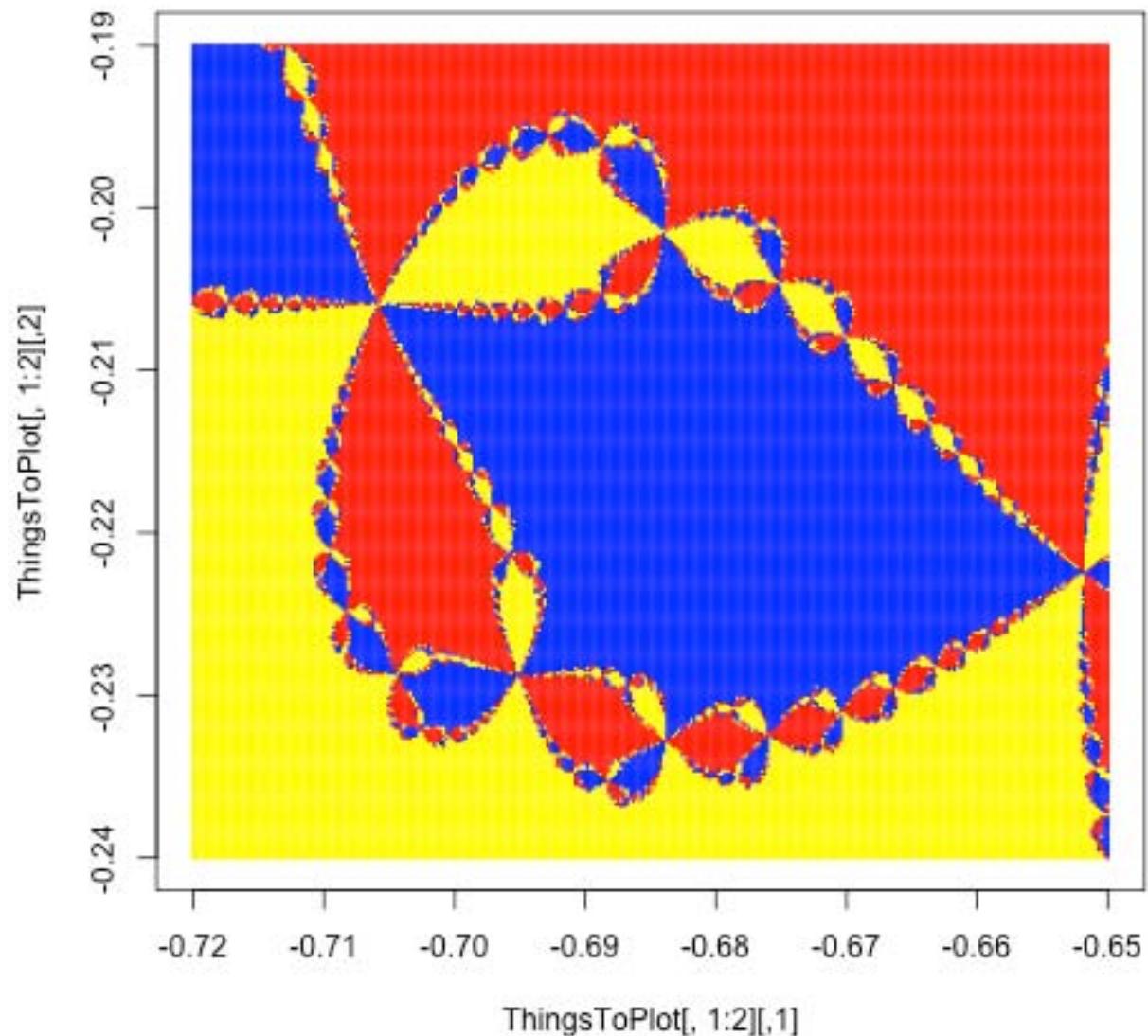
```
png("FigFrac1.png")
A<-RootPlotter(F6,-1,1,500,-1,1,500,0.2)
dev.off()
```



```
png("FigFrac2b.png")
A<-RootPlotter(F6,-0.8,0,500,-0.25,0.25,500,0.2)
dev.off()
```



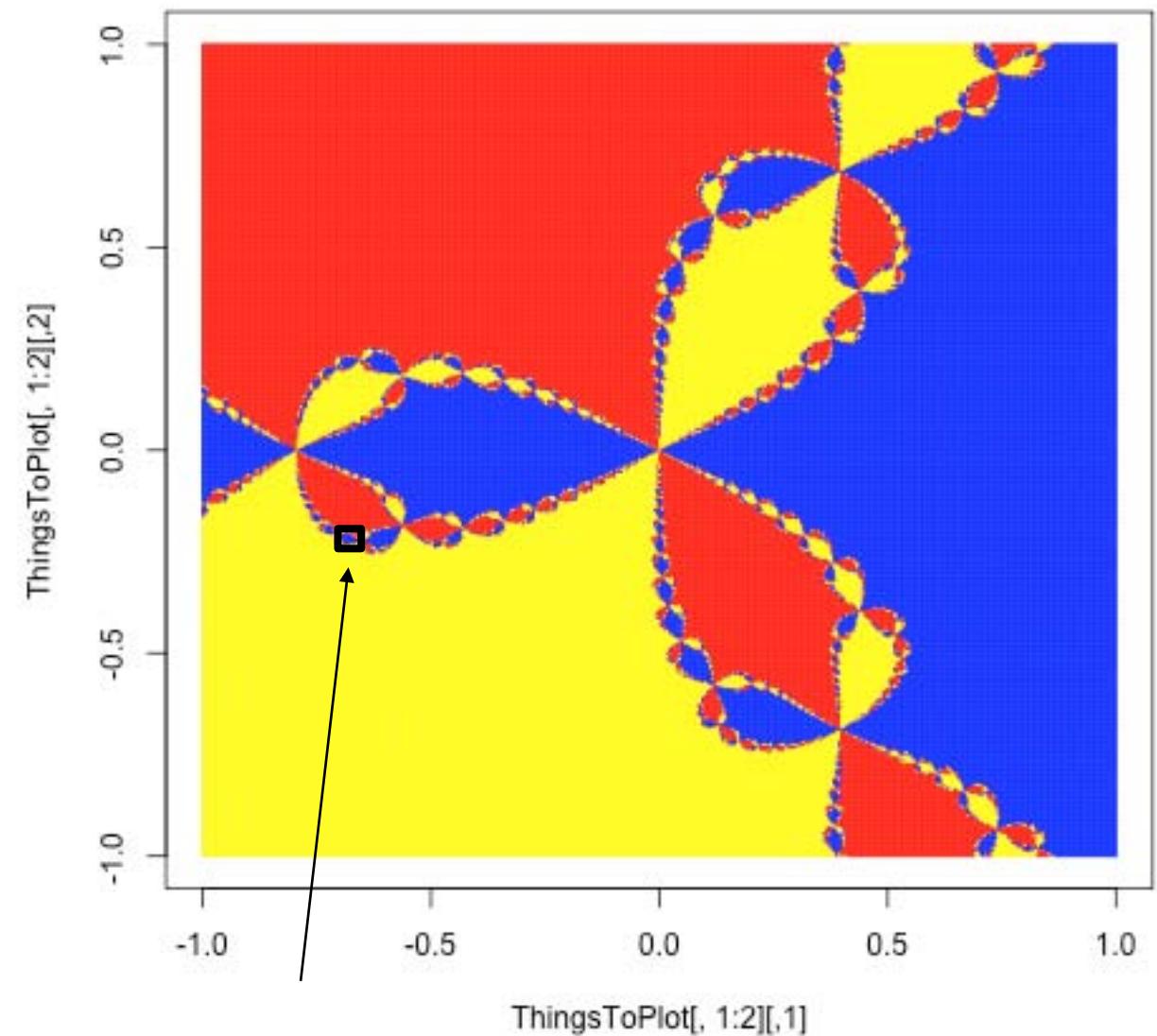
```
png("FigFrac3.png")
A<-RootPlotter(F6,-0.8,-0.5,500,-0.25,0,500,0.2)
dev.off()
```



```
png("FigFrac5.png")
```

```
A<-RootPlotter(F6,-0.72,-0.65,300,-0.24,-0.19,300,0.3)  
dev.off()
```

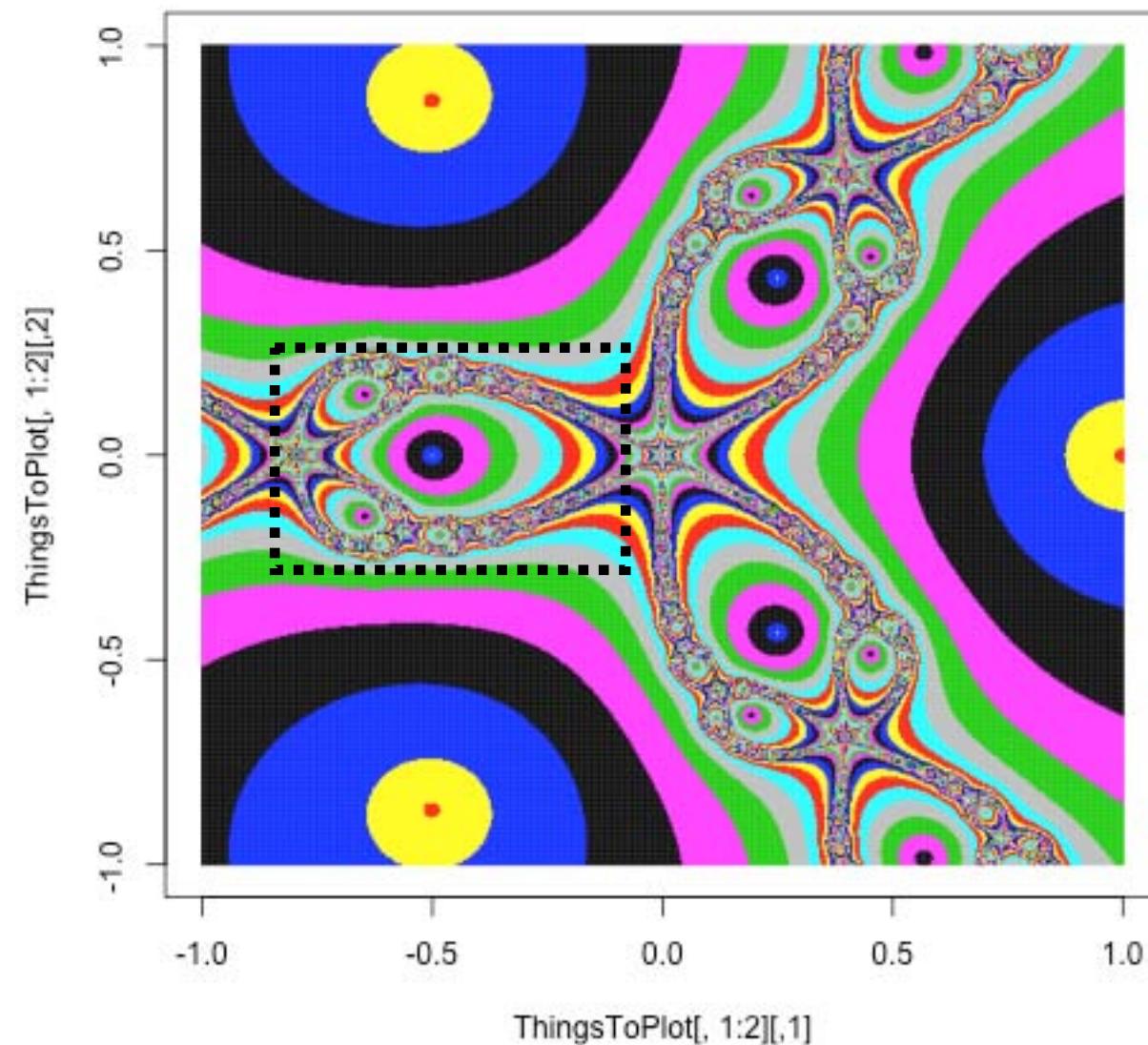
$$F(z) = z^3 - 1$$

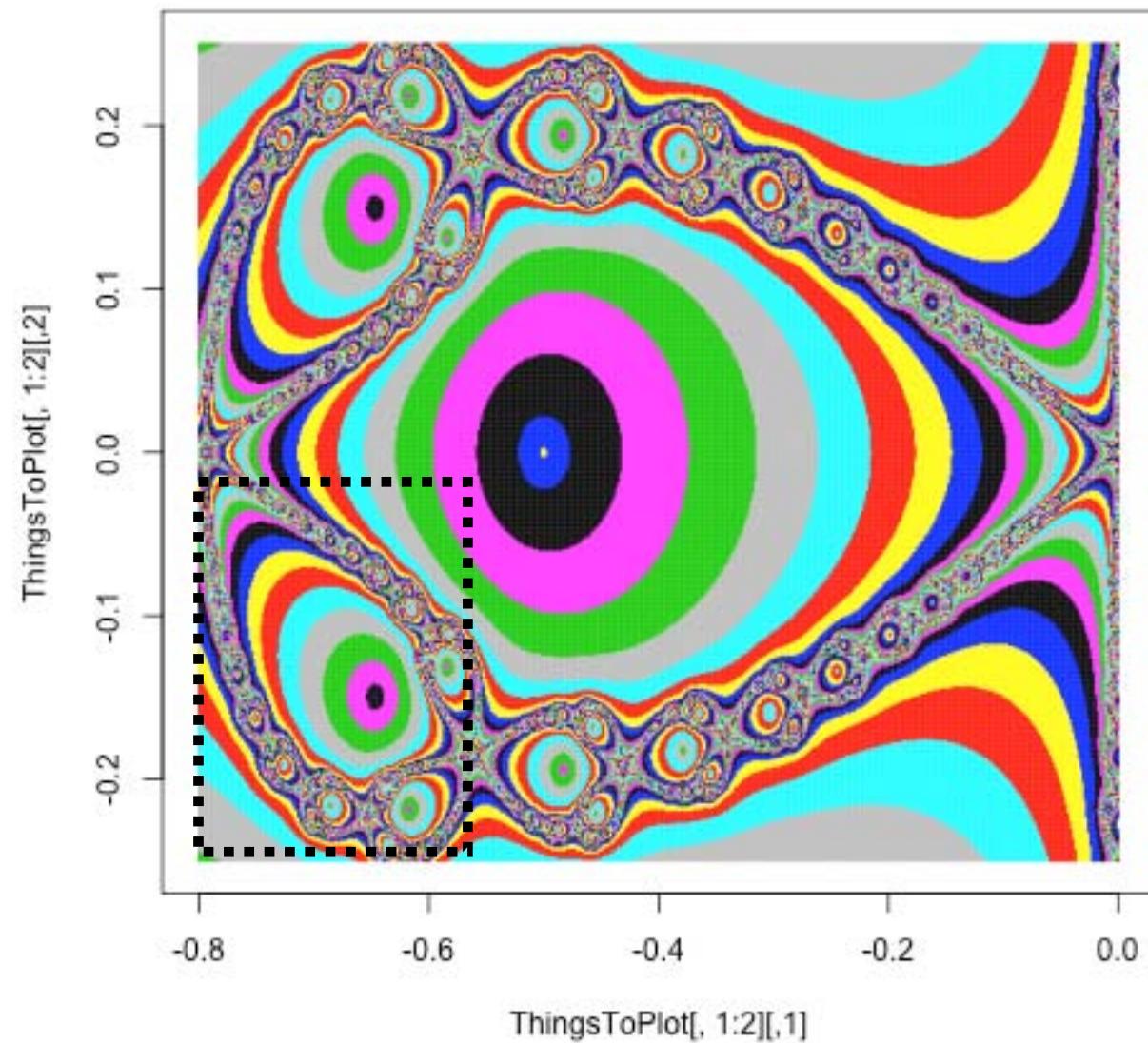


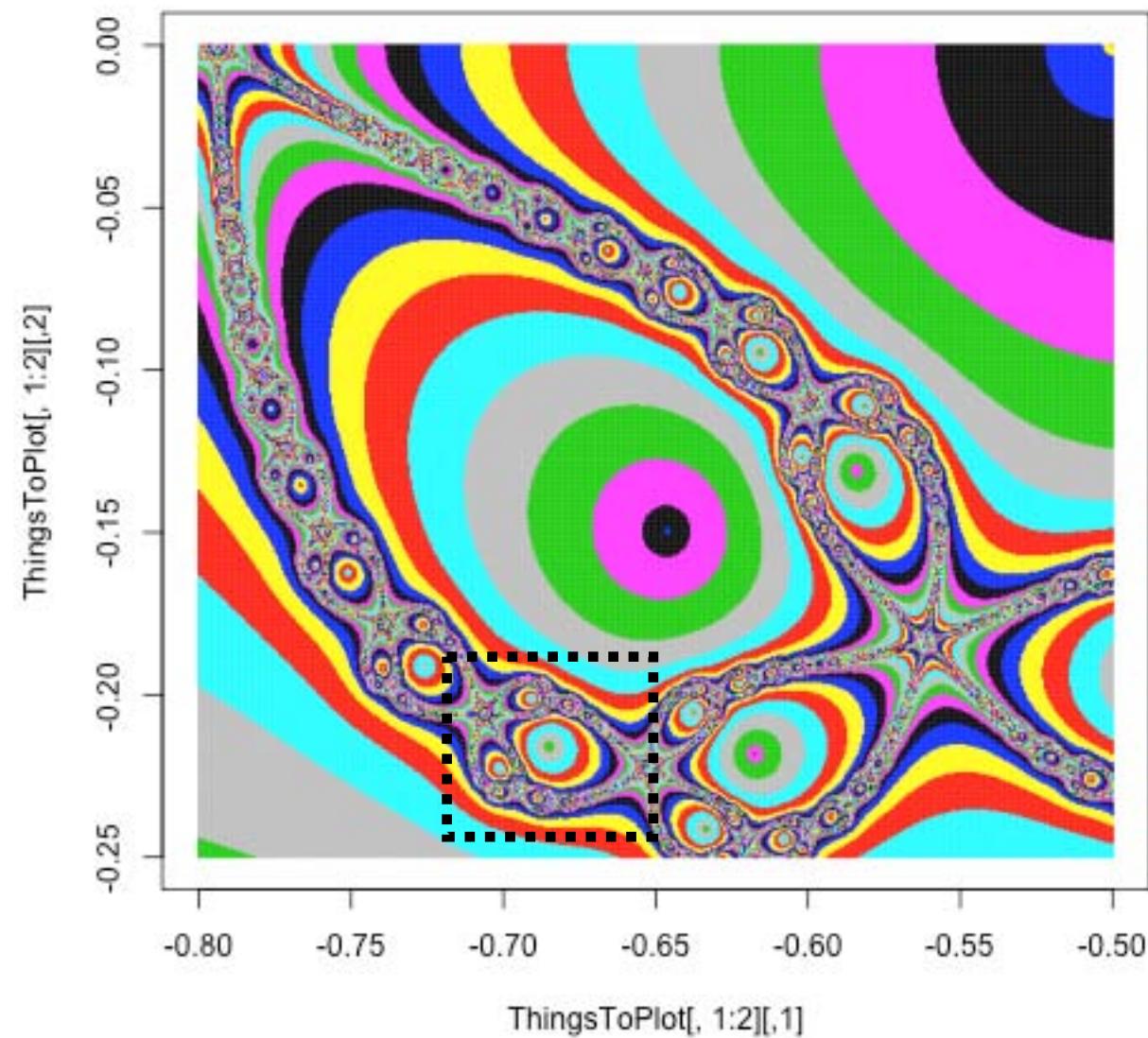
```
png("FigFrac1.png")
A<-RootPlotter(F6,-1,1,500,-1,1,500,0.2)
dev.off()
```

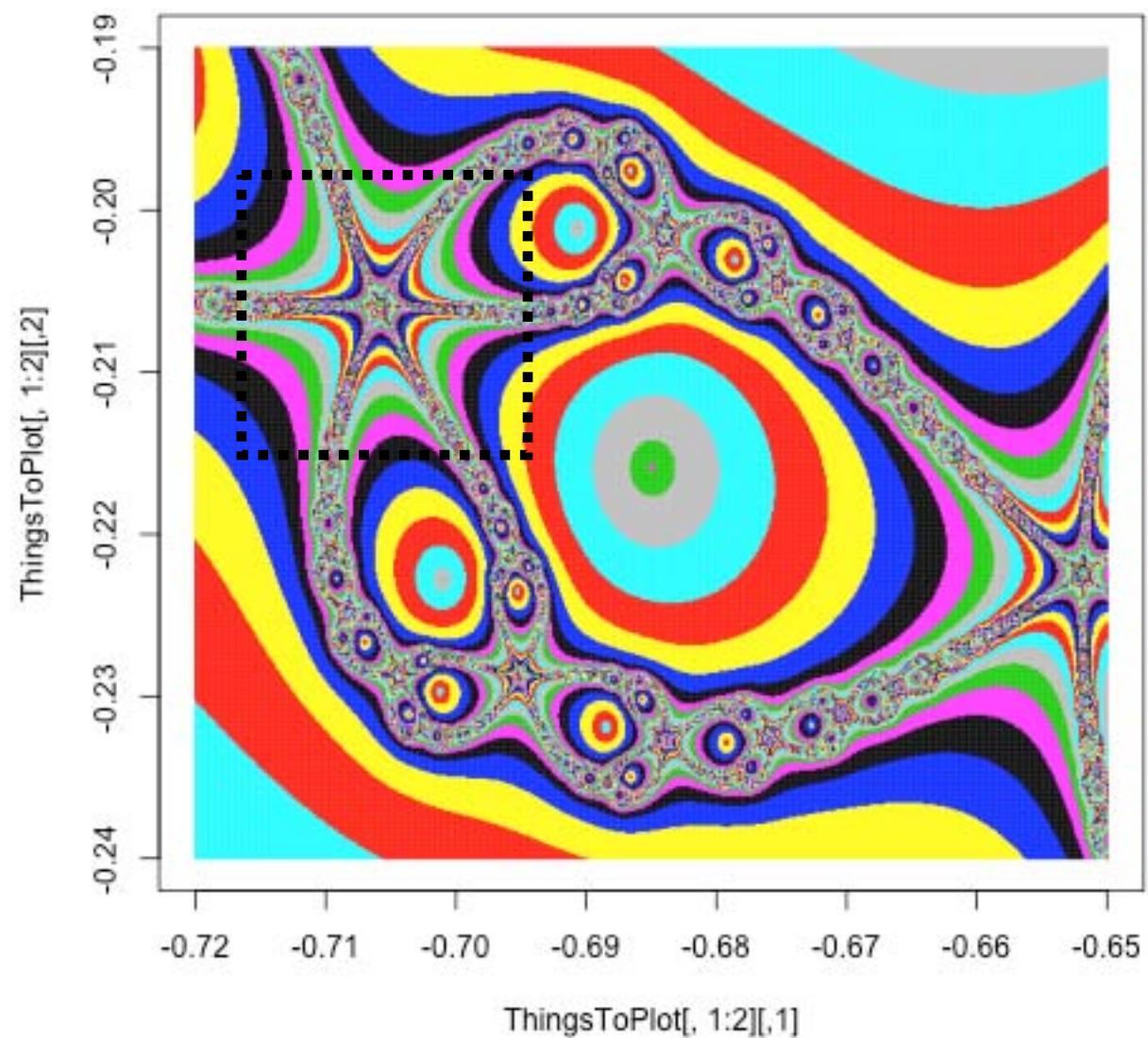
Example: Color by “number of iterations needed”

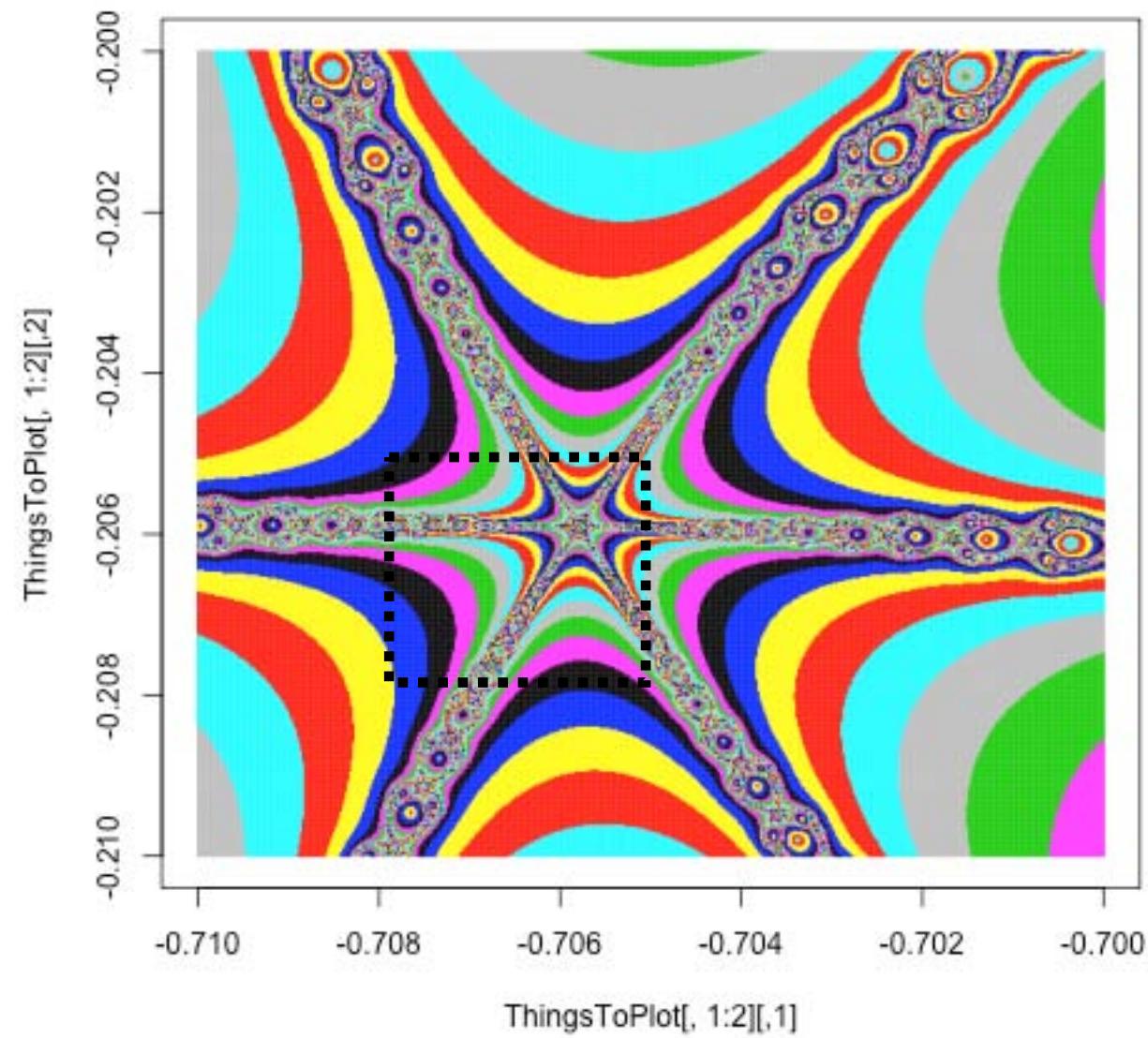
$$F(z) = z^3 - 1$$

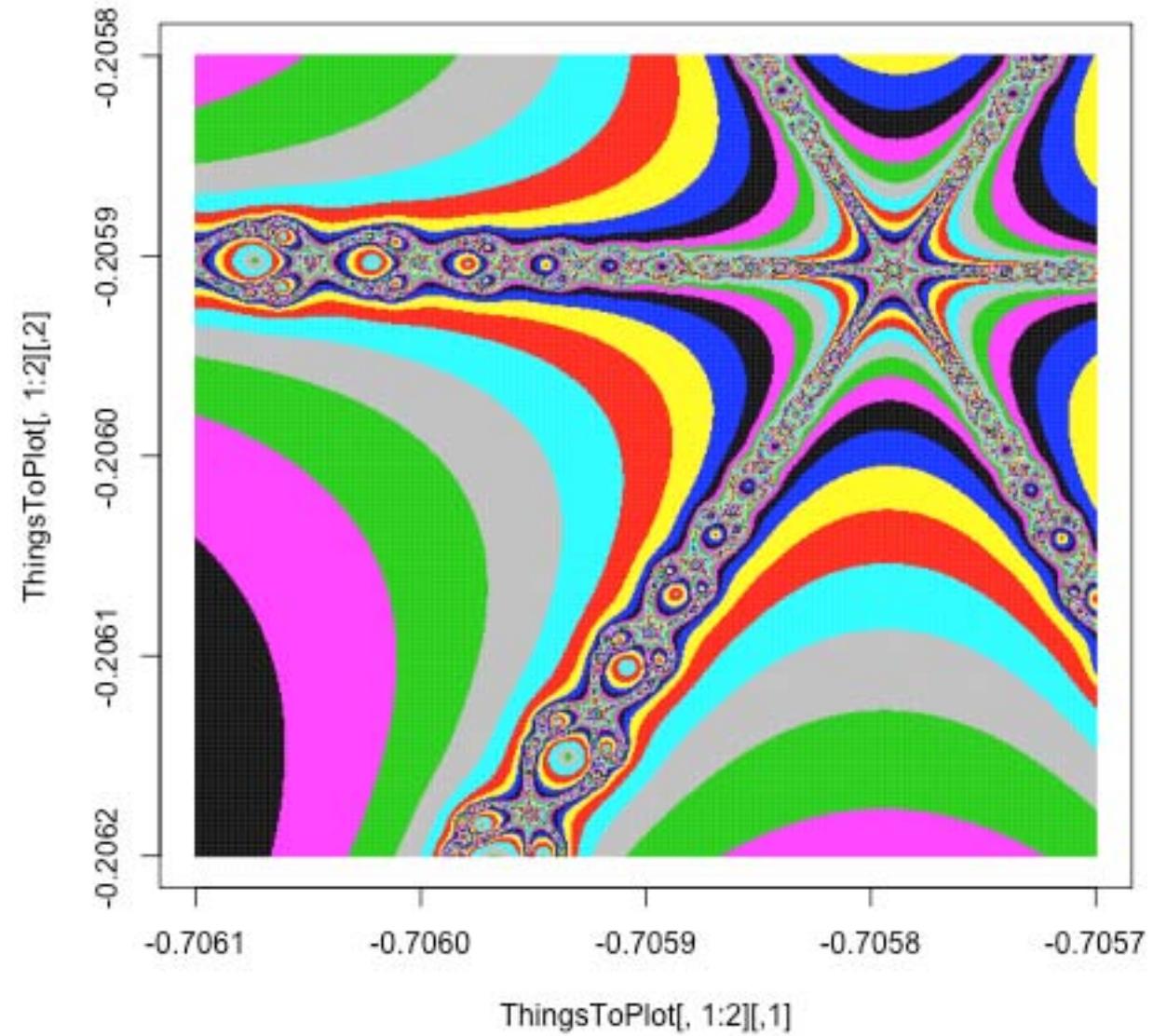




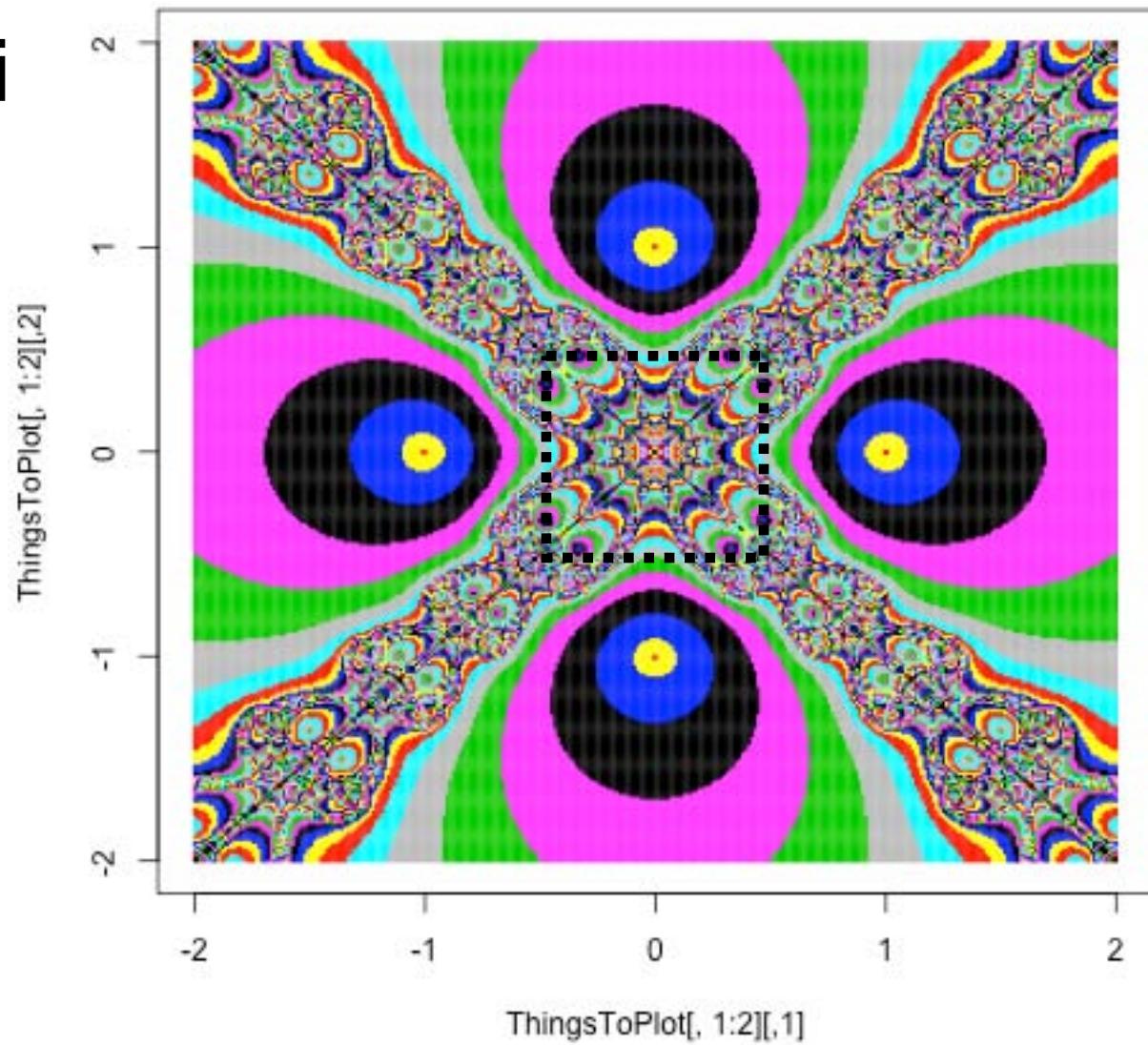






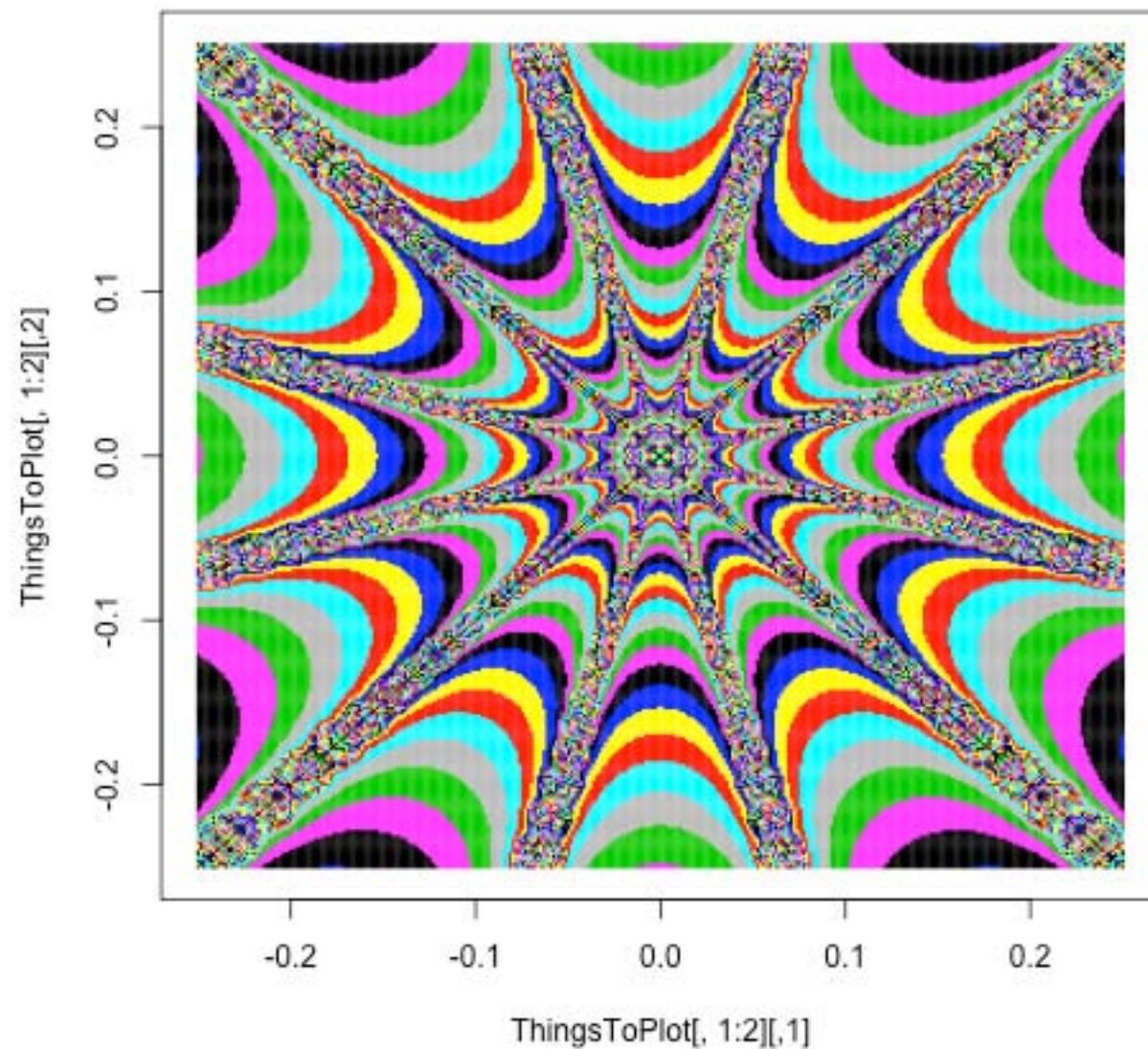


- F_i

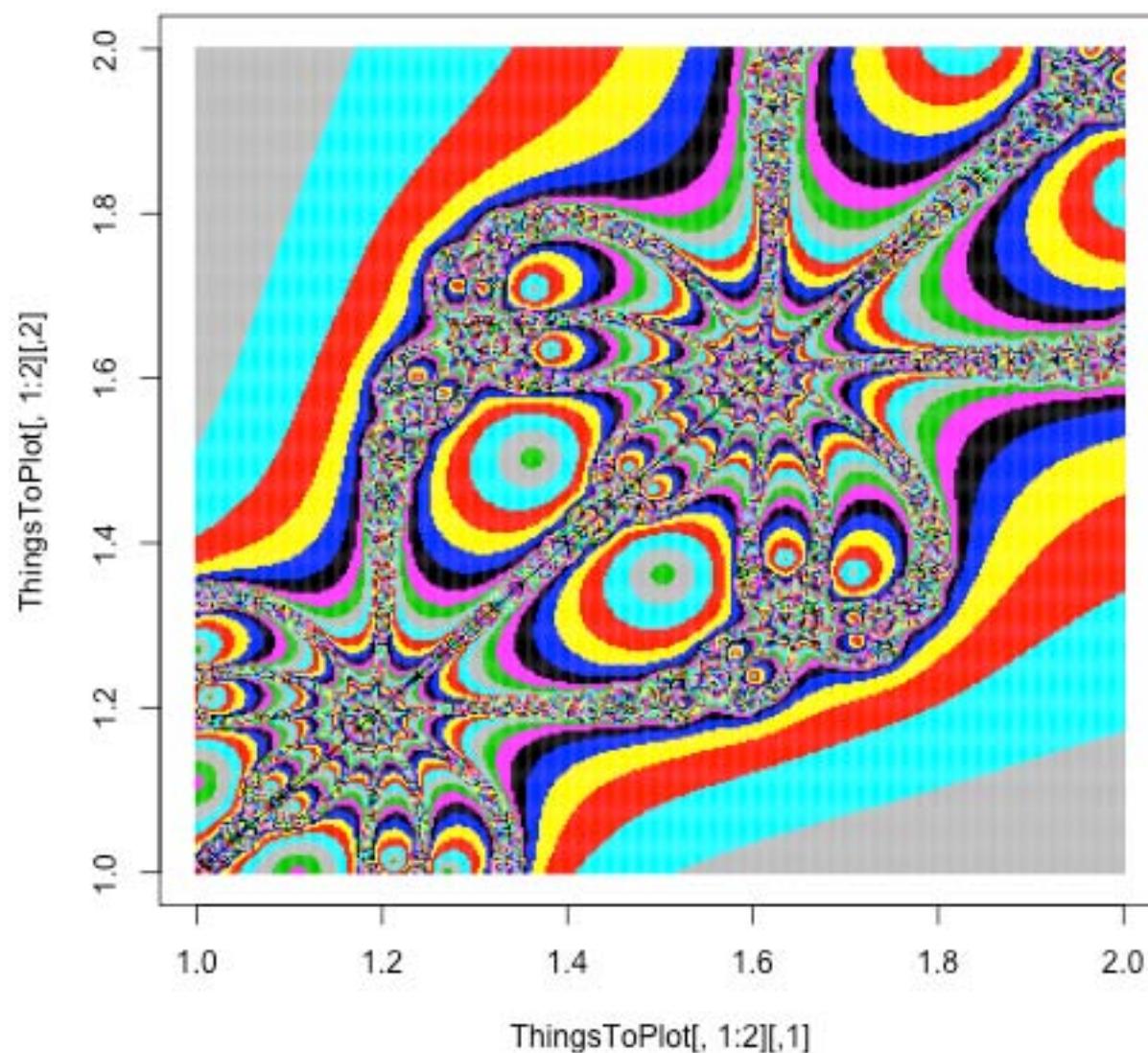


$$F(z) = z^4 - 1$$

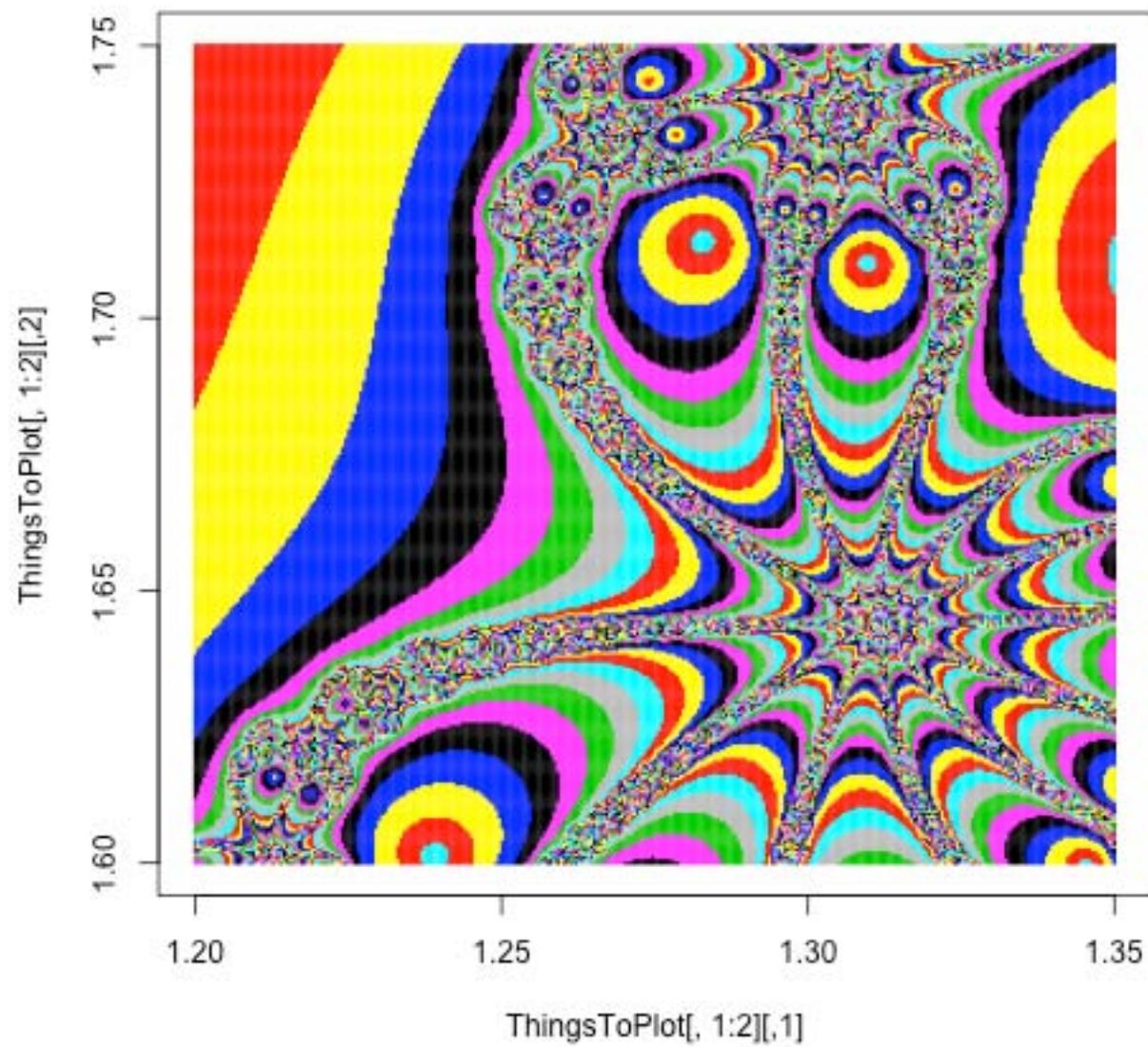
$$F(z) = z^4 - 1$$



$$F(z) = z^4 - 1$$



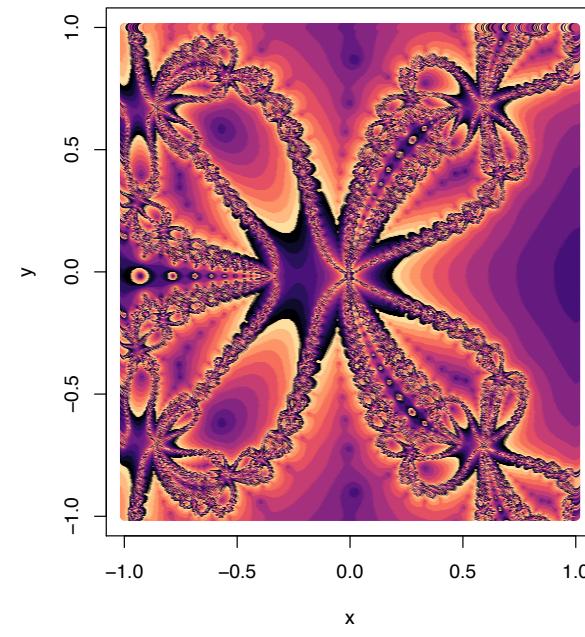
$$F(z) = z^4 - 1$$



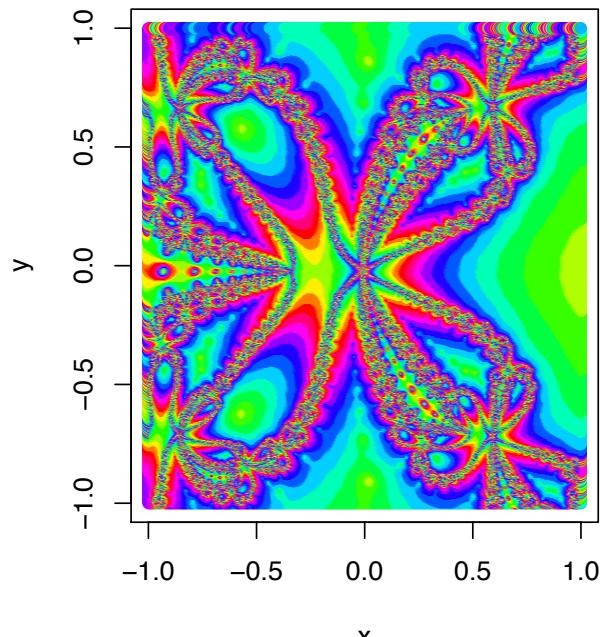
Color palettes

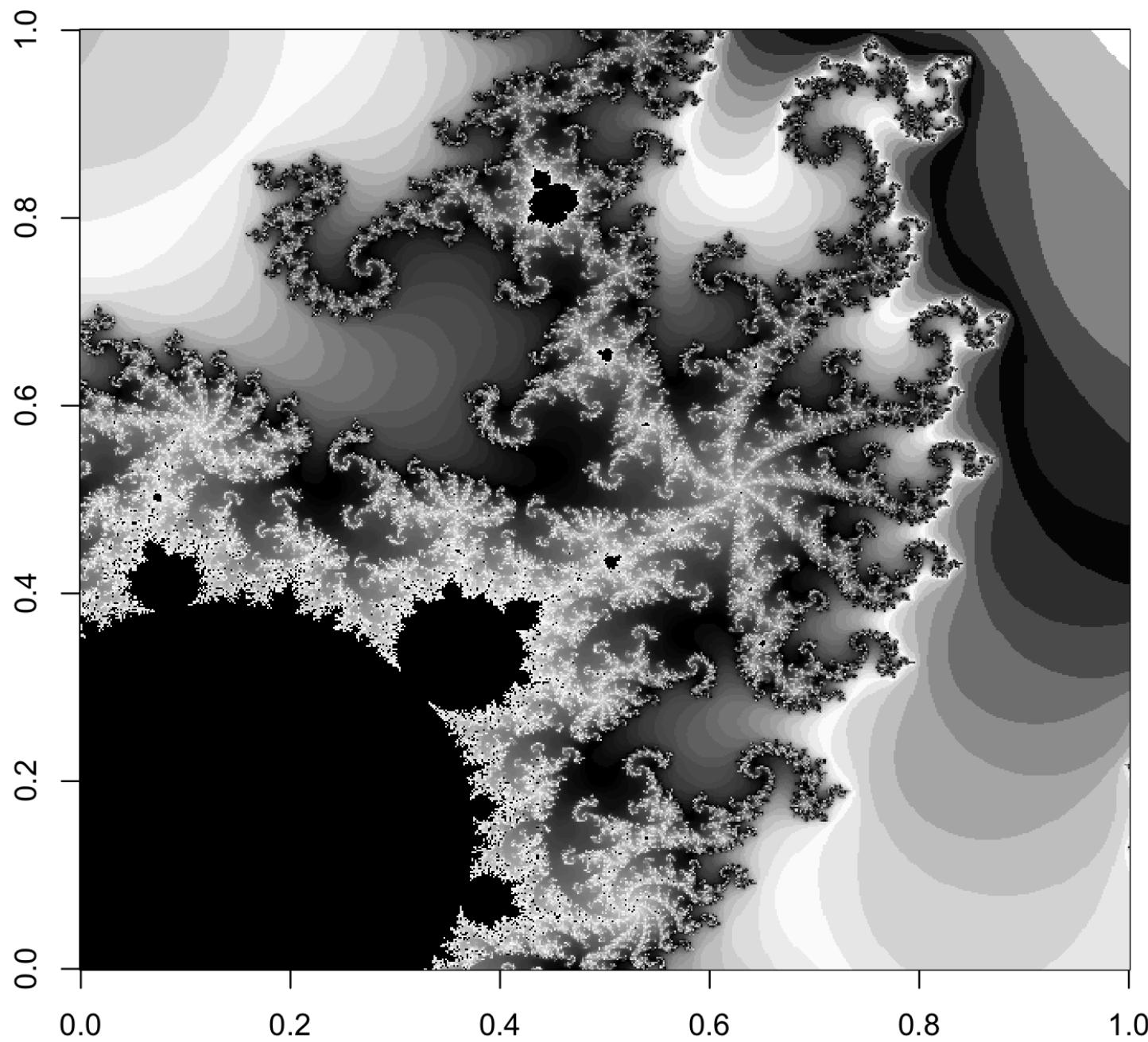
- For better pictures, use something other than R's default color palette. See examples in the FasterFractal repo (versions 6 and 7 of the code)
- E.g. using `library("viridis")` on $z^4 - 2$, plotting "number of iterations".

`palette(magma(64))`



`palette(rainbow(64))`

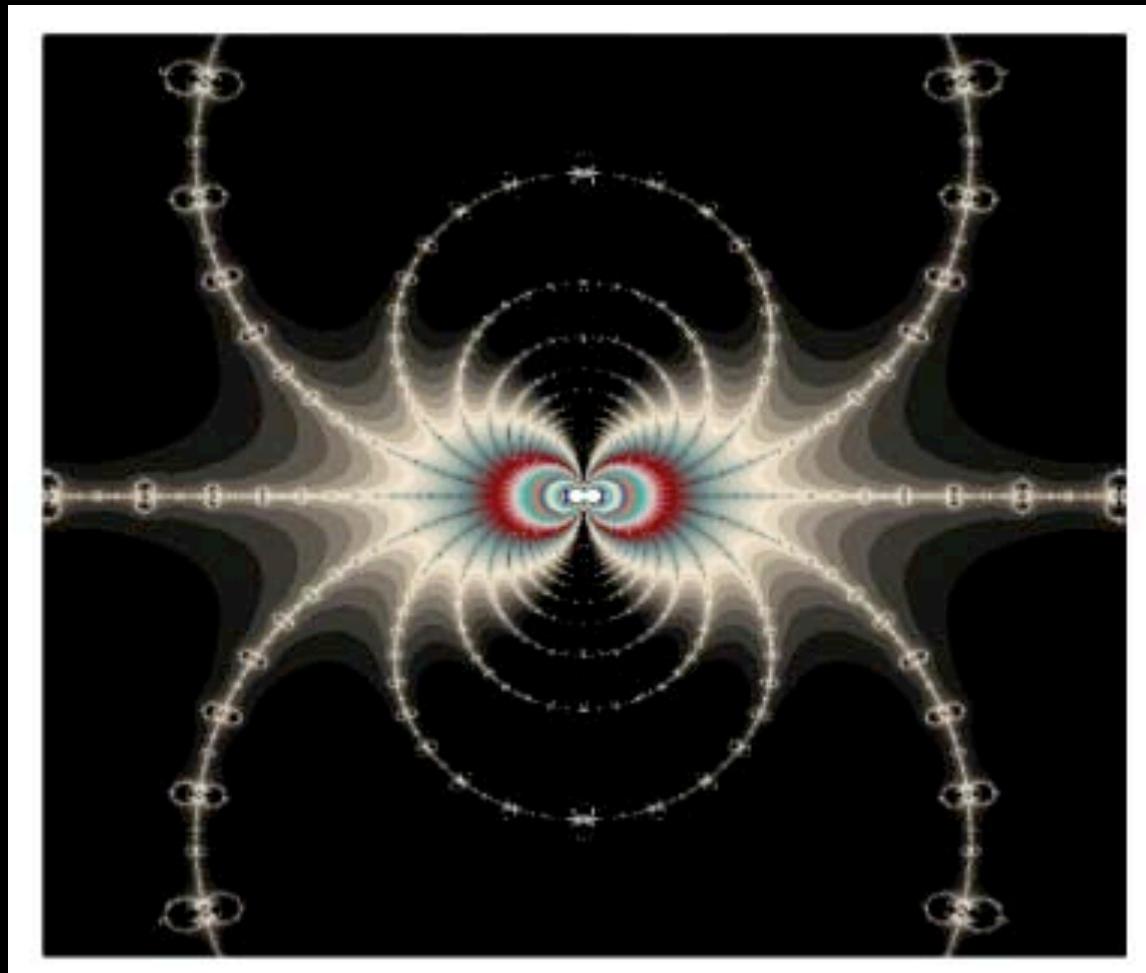




Examinable assignment 2a: The Art Show

- Take the code for Newton-Raphson on the complex plain from Github:
 - Basic [slow] code: <https://github.com/PM520-Spring-2020/Week3-NewtonRaphsonFractals>. [has pretty graphics].
 - Better [faster] code: <https://github.com/PM520-Spring-2020/Week3-FasterFractals> [**I will walk you through this in a minute - use this version for your pictures**]
- Use it to draw some fractals for some functions **other than those we saw in today's class**. [Alternatively, Google “Julia Sets”]
- Write a report in Rmarkdown including your R code, and describing the functions you tried, but also including some pretty pictures for display at the start of class in three week's time. **They must be drawn by your R code rather than found on the web (and it is ok to just run the code I gave you here)**.
- Each person should also commit one picture. You are strongly encouraged to give it a pretentious/artsy name.
- There will be a prize for the best work of art.
- **Deadline: 11am Monday March 1st..**

For examples from previous years, see:
[https://github.com/PM520-Spring-2021/Week3-
ArtShowPreviousYears](https://github.com/PM520-Spring-2021/Week3-ArtShowPreviousYears)



The One Who Bit Spiderman

Making code more efficient

- For a problem like this, it is worth investing some time to make your code run more efficiently.
- See example in “FasterFractals” repo.

END