An Overview of the Demoscene

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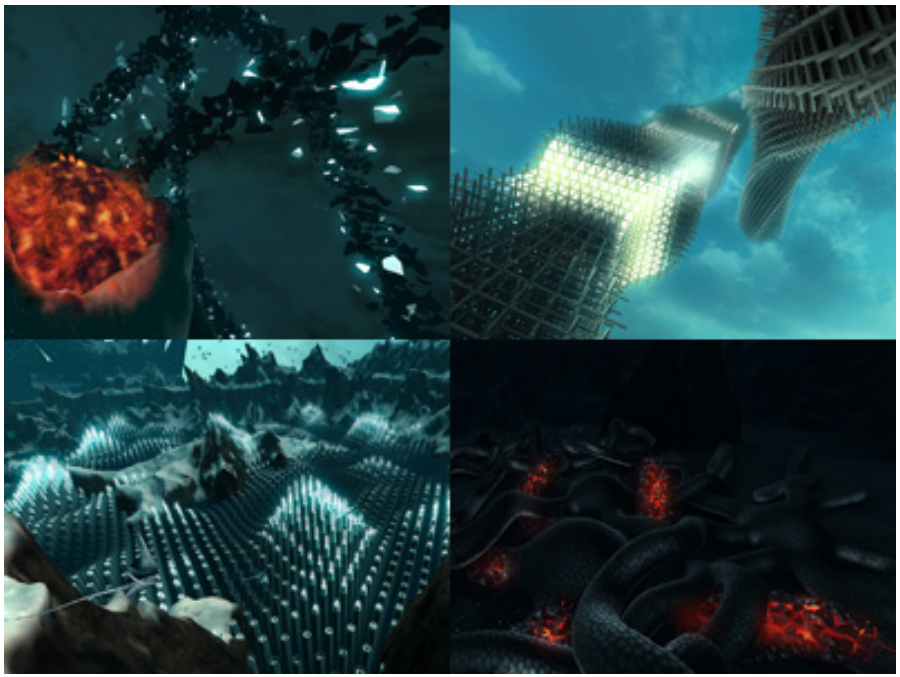
Image from Stargazer, by Orb & Andomeda

What is demoscene?



Agenda Circling Forth, by Fairlight (2010)

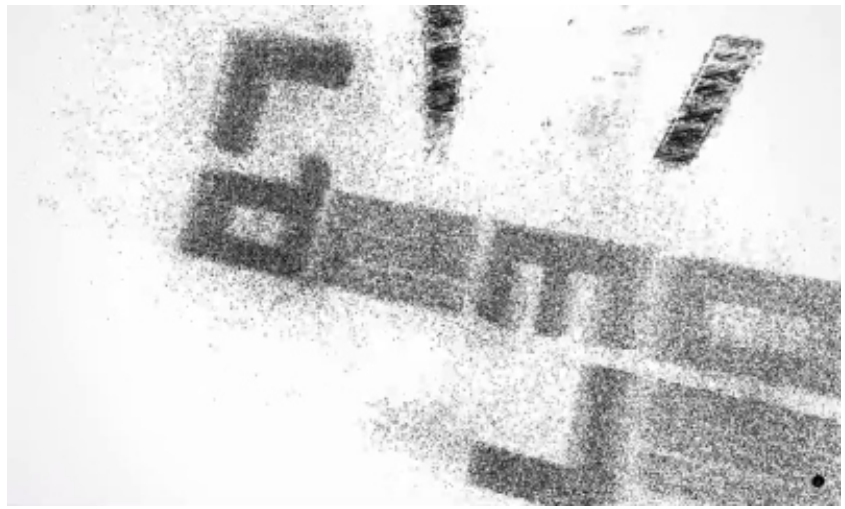
Platforms

C64

An ATM (running Windows)

Playstation 3

Javascript (WebGL)



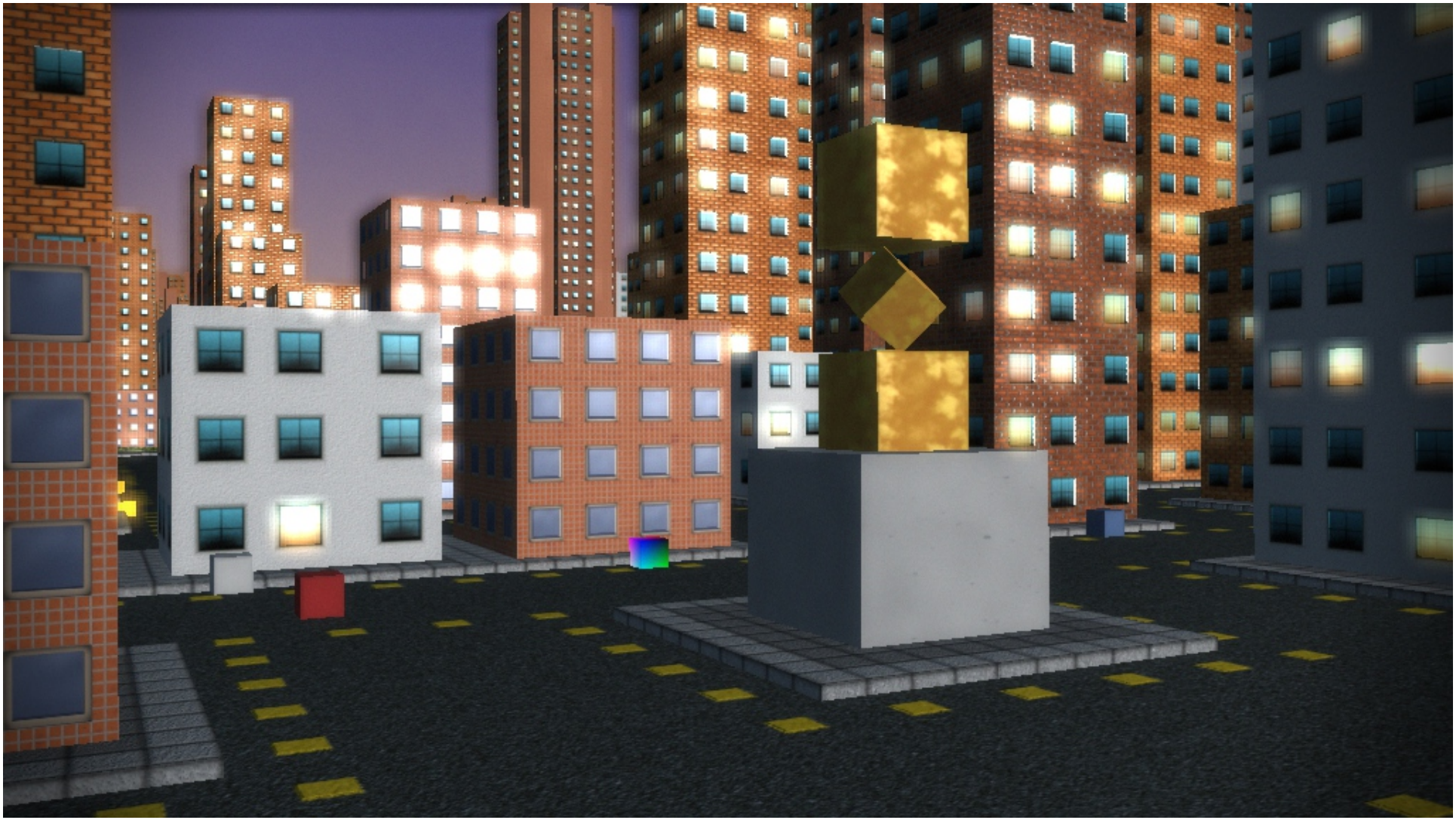
Size-coding

- Demo
- 64kb intro
- 4kb intro
- 1kb intro
- etc.

What can I get for 64kb?

- a 200x100 pixels BMP image, or
- a 640x480 Jpeg image with low quality, or
- 400ms of Wave sound, or
- 3 seconds of MP3 (at 192kbps)

Or this demo



Incubation, by Ctrl-Alt-Test (2010)

How does it work?

- Write compact code
- Use compression
- Procedurally generate data
  - curves
  - textures
  - 3D models
  - animations

A few coding tricks

64k intros are almost always written in C or C++,
but to save more bytes:

- no STL!
- compile without standard library
- properly configure your compiler
- disable exception handling
- avoid virtual methods
- be clever

Floating point numbers

- Double = 8 bytes
- Float = 4 bytes

But we don't need that precision.

Instead of using:

1.42 (in hexadecimal: 0x3fb5c28f)

Use:

1.421875 (in hexadecimal: 0x3fb60000)

which takes only 2 bytes (after compression)

Make the data more compressible

Use delta encoding

Instead of storing:

1, 2, 3, 3, 3, 4, 5, 5, 6

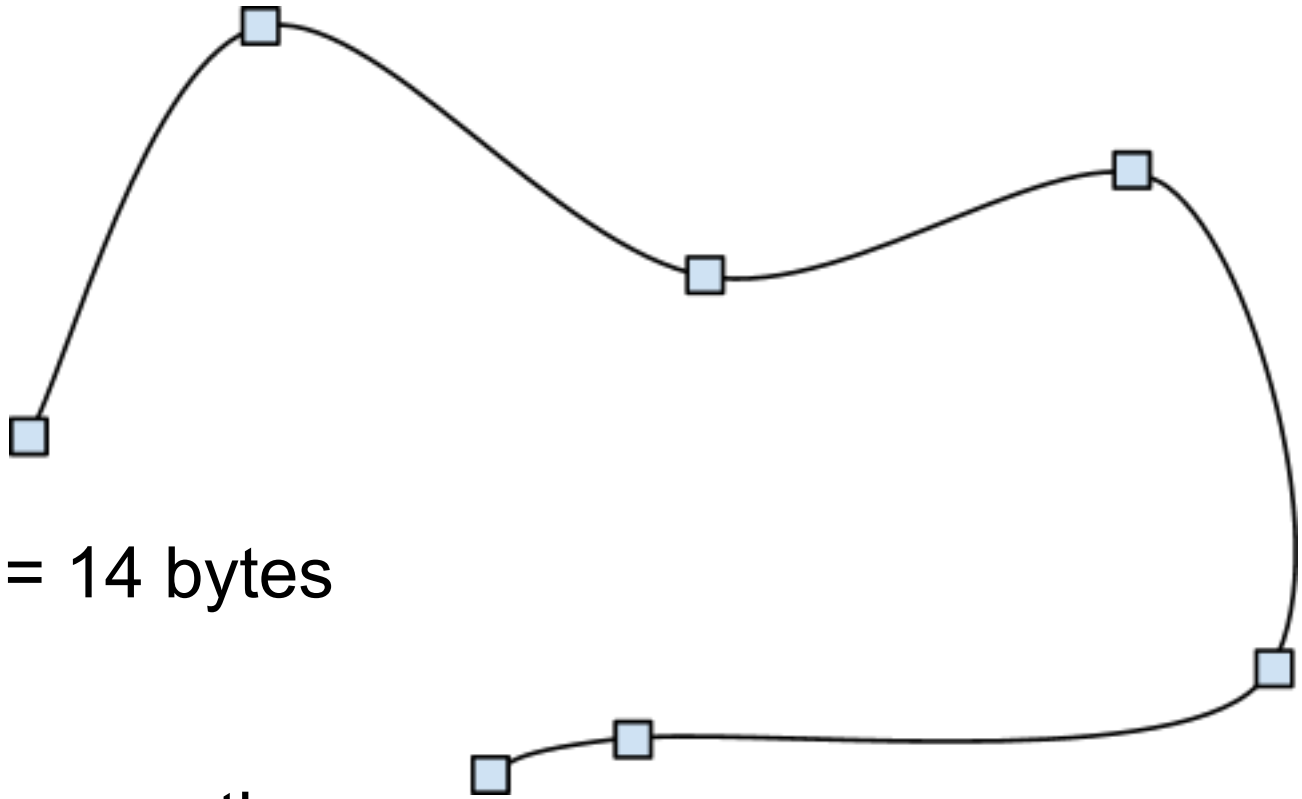
Store:

1, 1, 1, 0, 0, 1, 1, 0, 0, 1

The compressor will make it super small

Curves

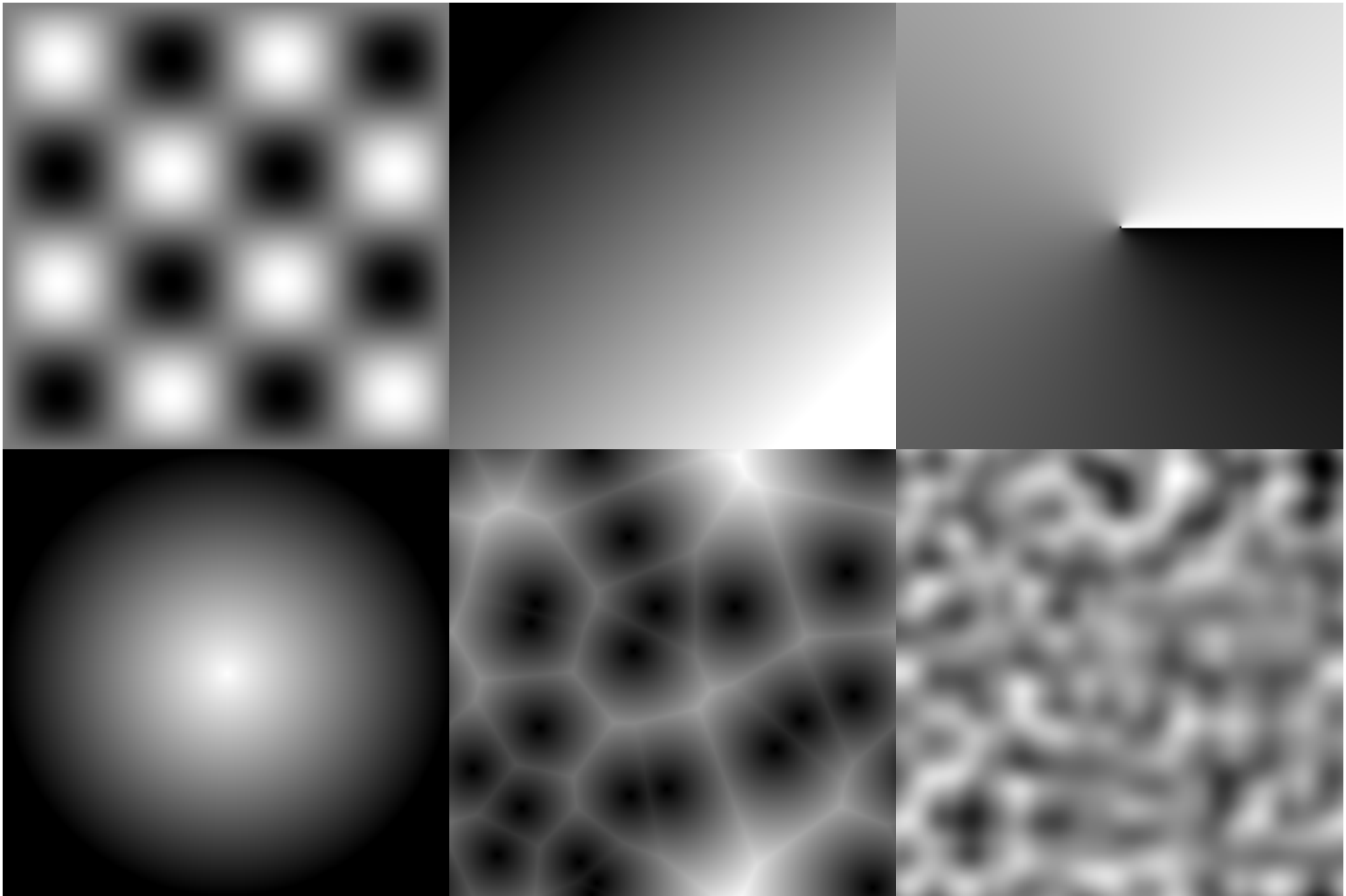
Curves are easy to generate and are quite small.



Seven 2D points = 14 bytes

Useful for smooth camera paths

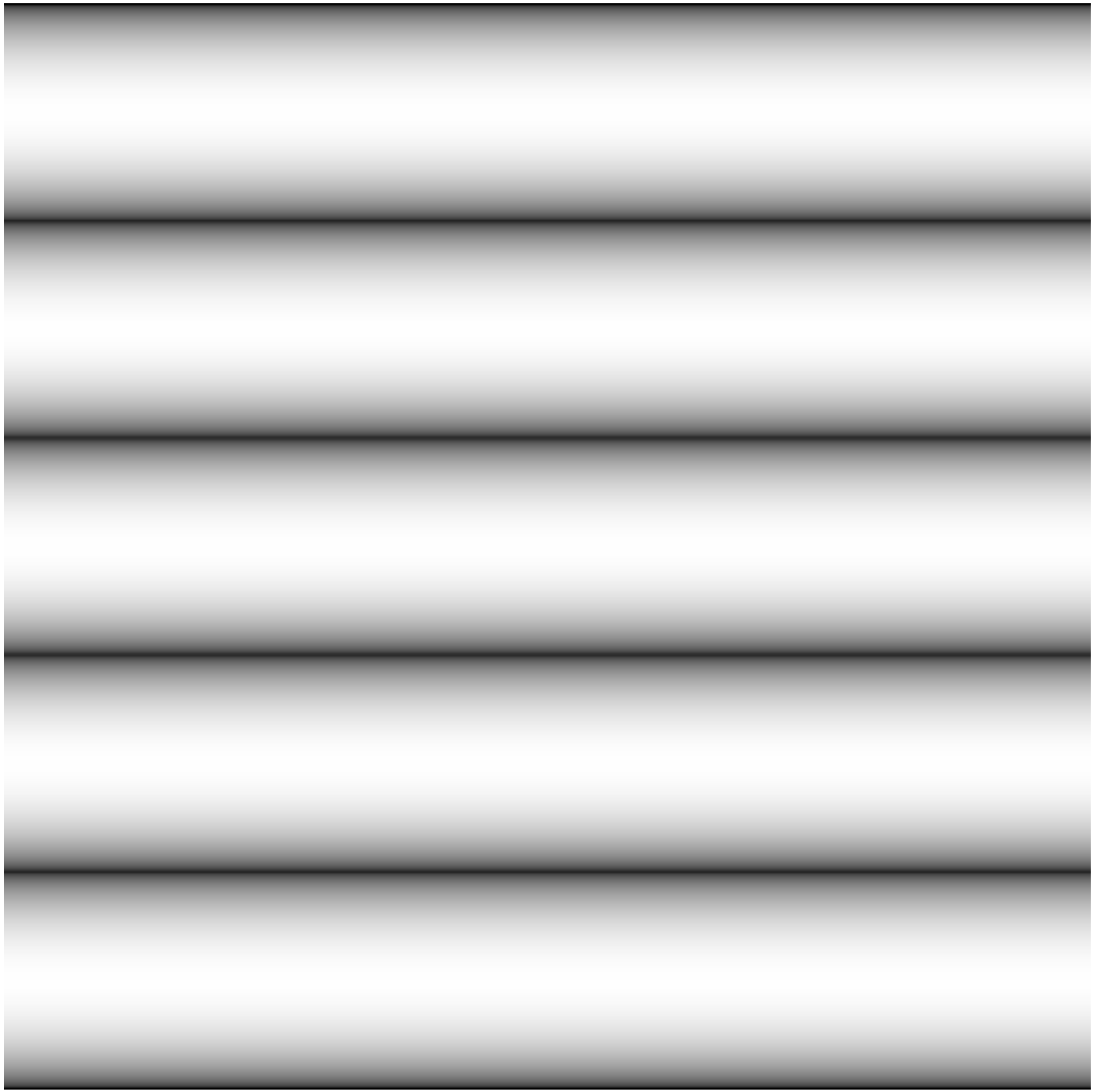
Texture generation



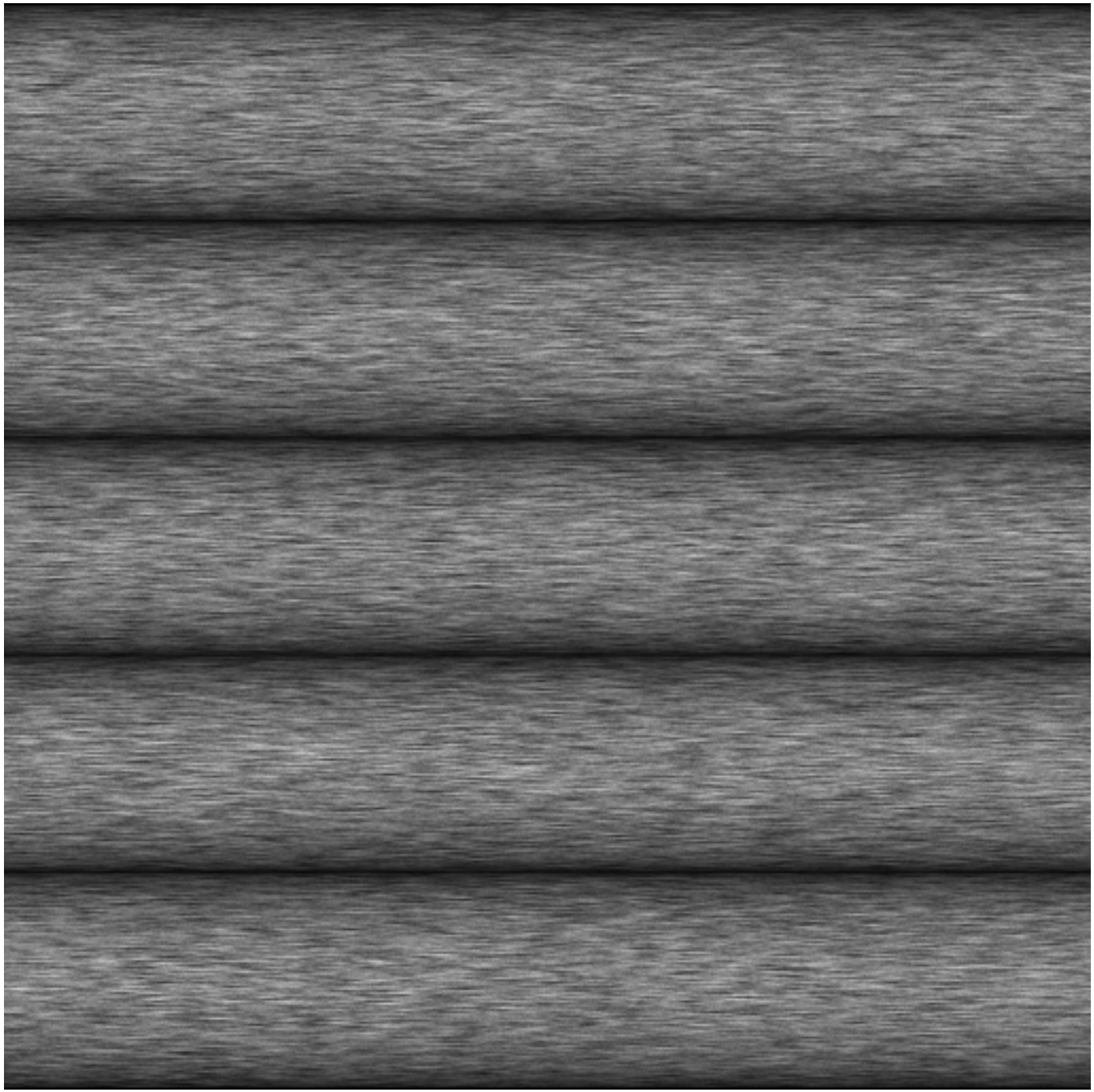
Modify and combine textures

- blur
- translate
- zoom
- rotate
- deform
- etc.

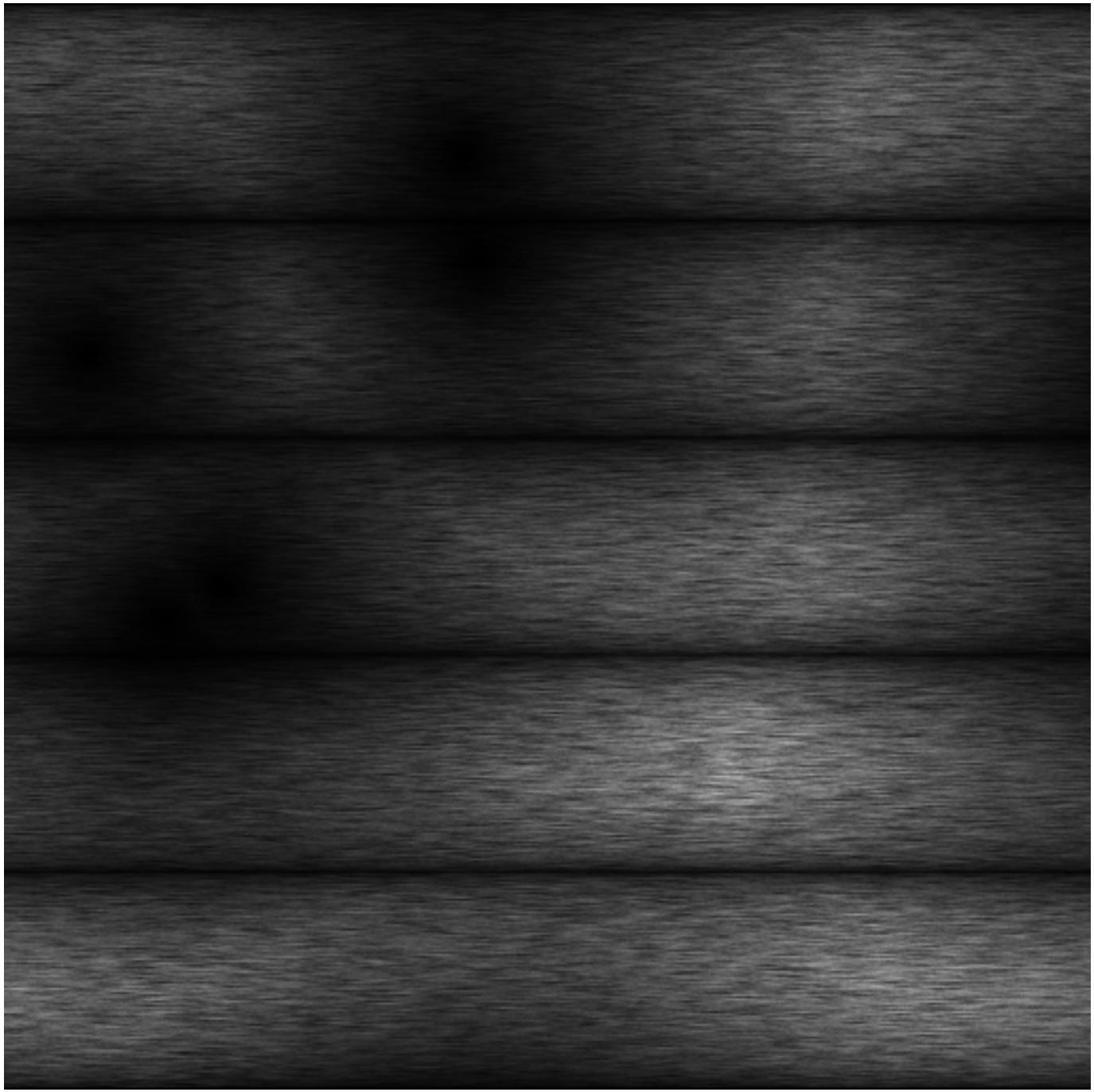
- add
- multiply
- min, max
- mix
- etc.



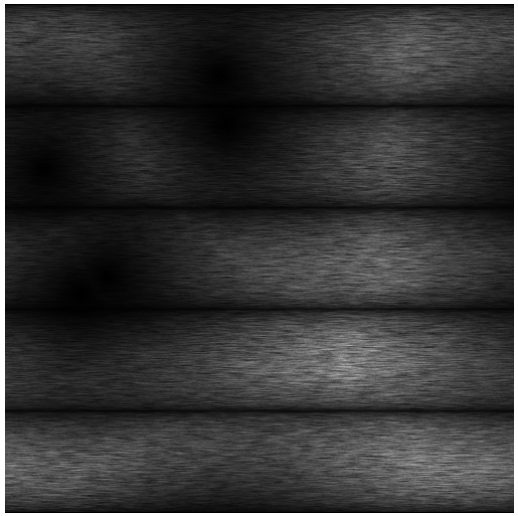
$col = abs(sin(y))^{0.2}$

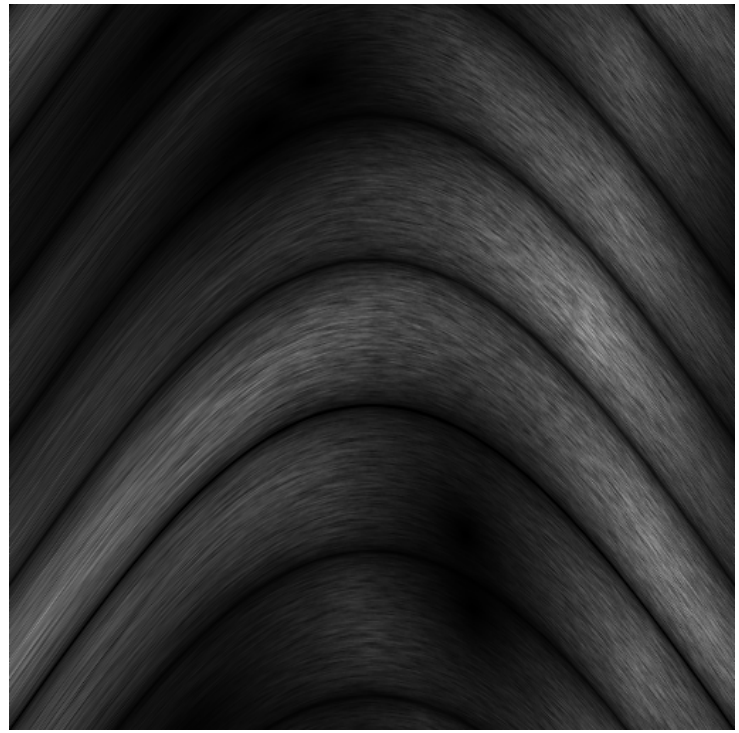


Multiply with noise



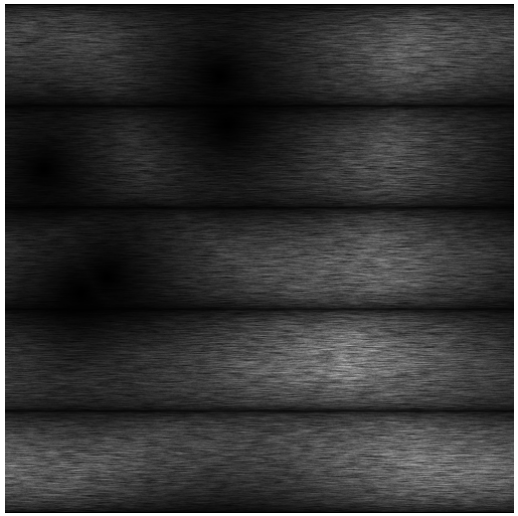
Multiply with low frequency noise

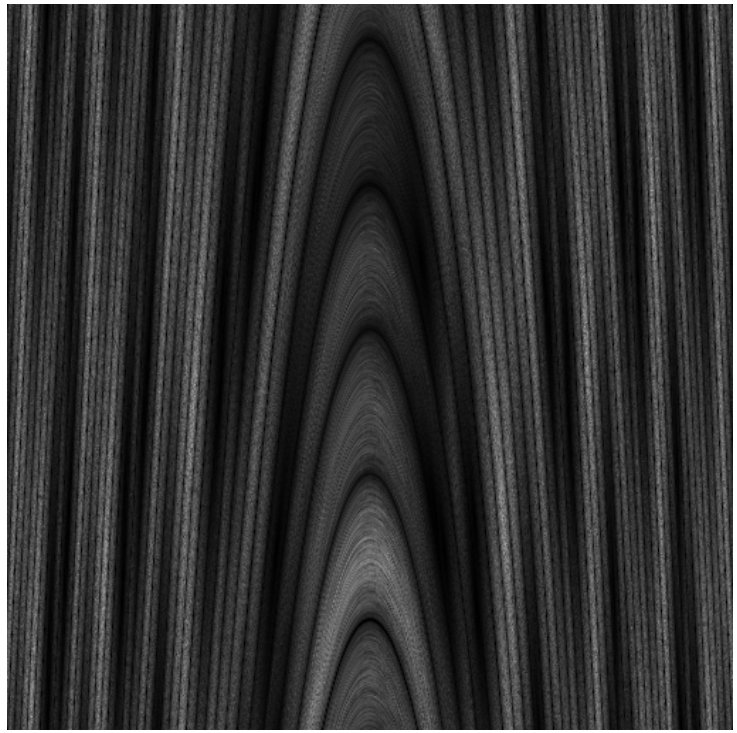




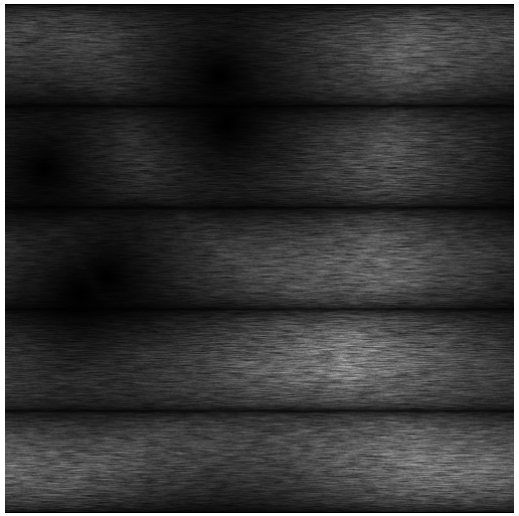
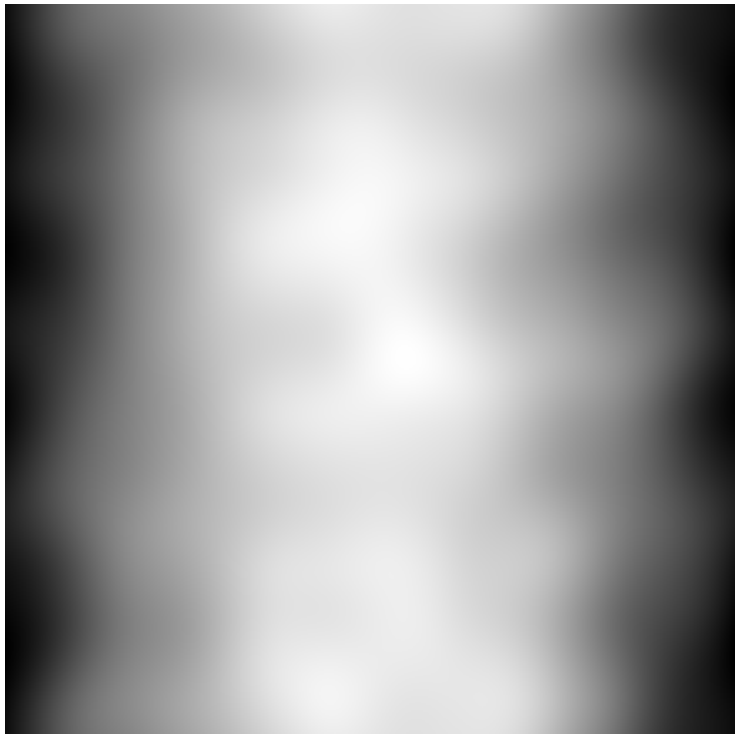
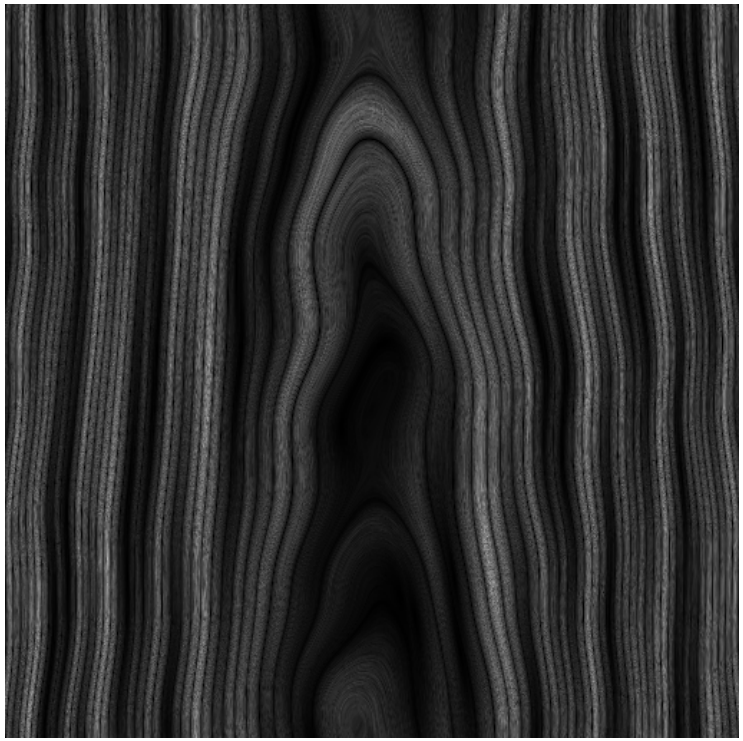
Deform using a texture

(the intensity represents the distance for the translation of each pixel)

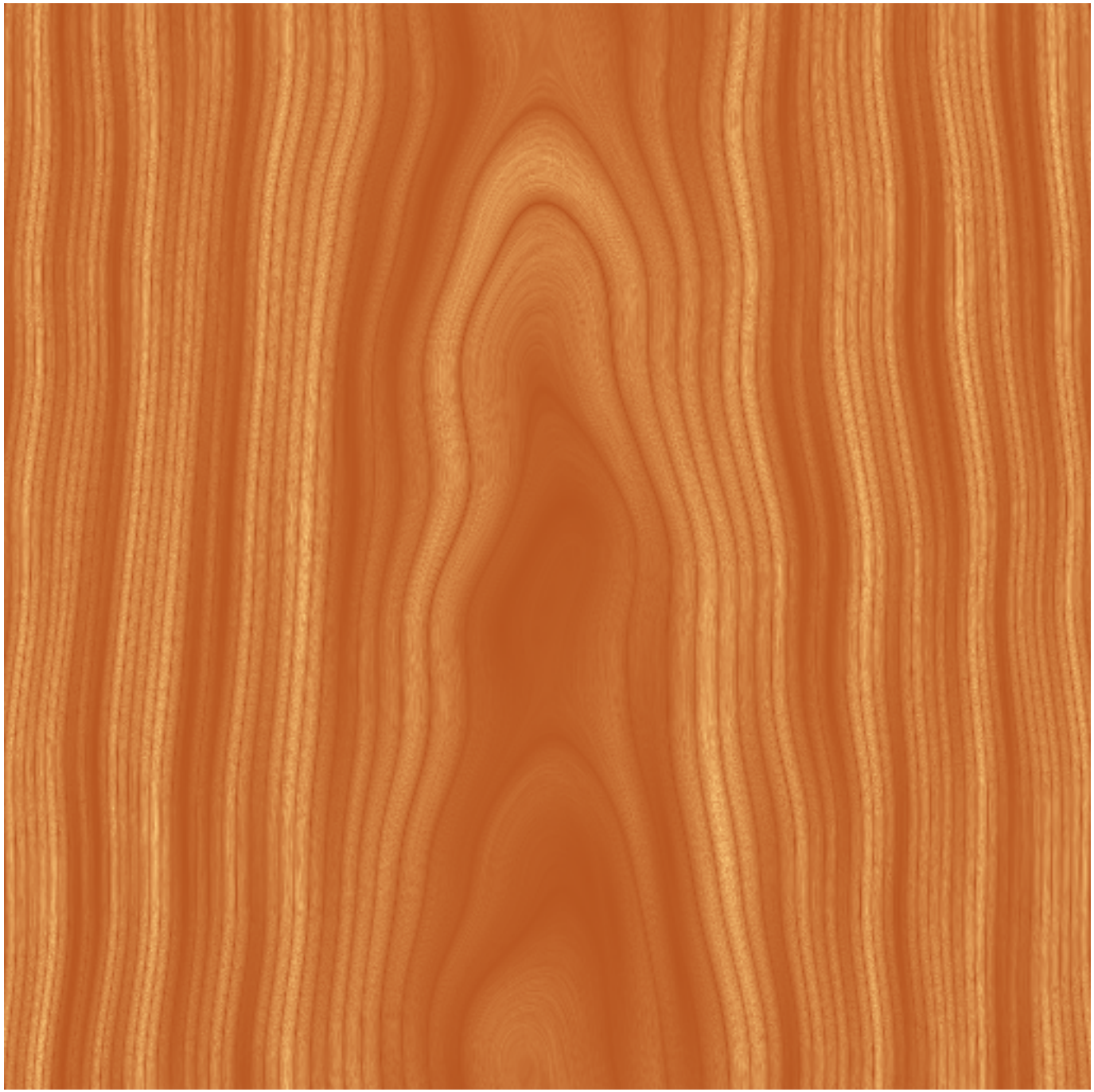




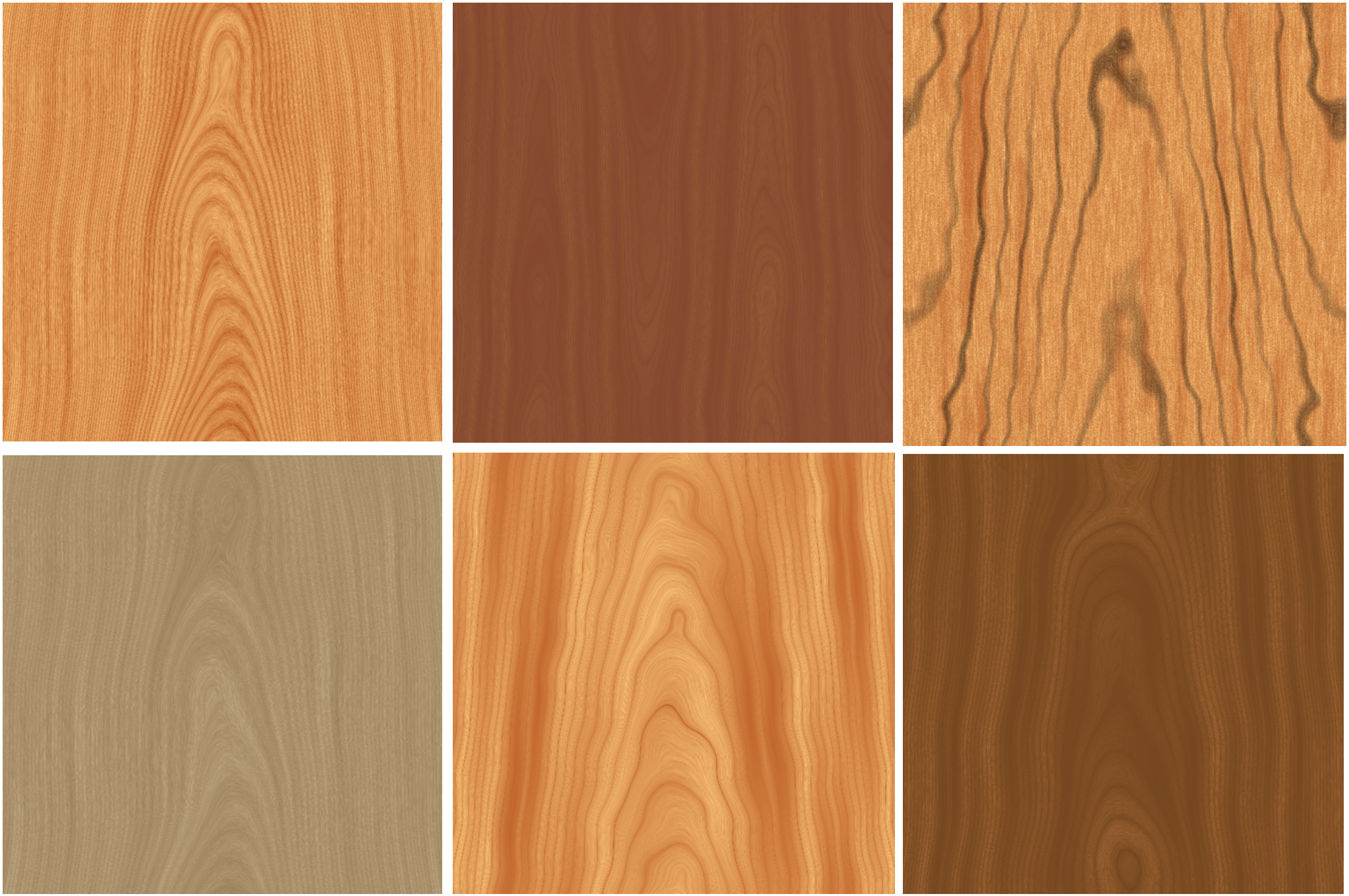
Deform much more

Add noise in the deformation texture



Map intensity with colors

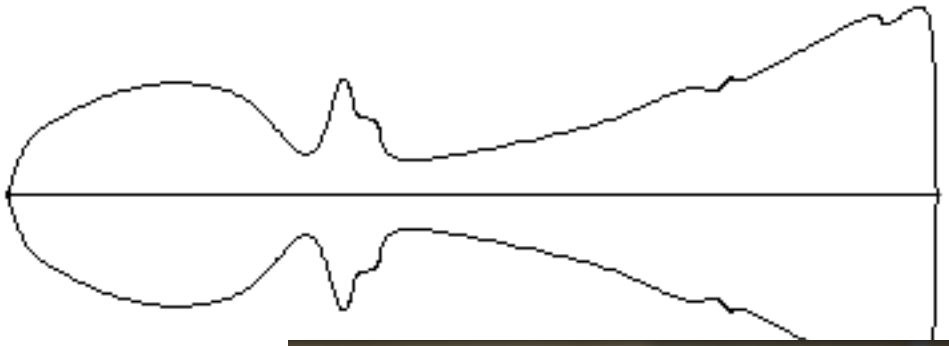


Tweak parameters and colors to generate
many other textures almost for free

Mesh generation

Revolution based on a curve

```
0, 0,
9, 25,
37, 41,
61, 37,
79, 15,
88, 43,
92, 30,
97, 27,
105, 13,
151, 25,
177, 39,
186, 39,
190, 44,
195, 44,
225, 66,
231, 64,
242, 66,
244, 0
```



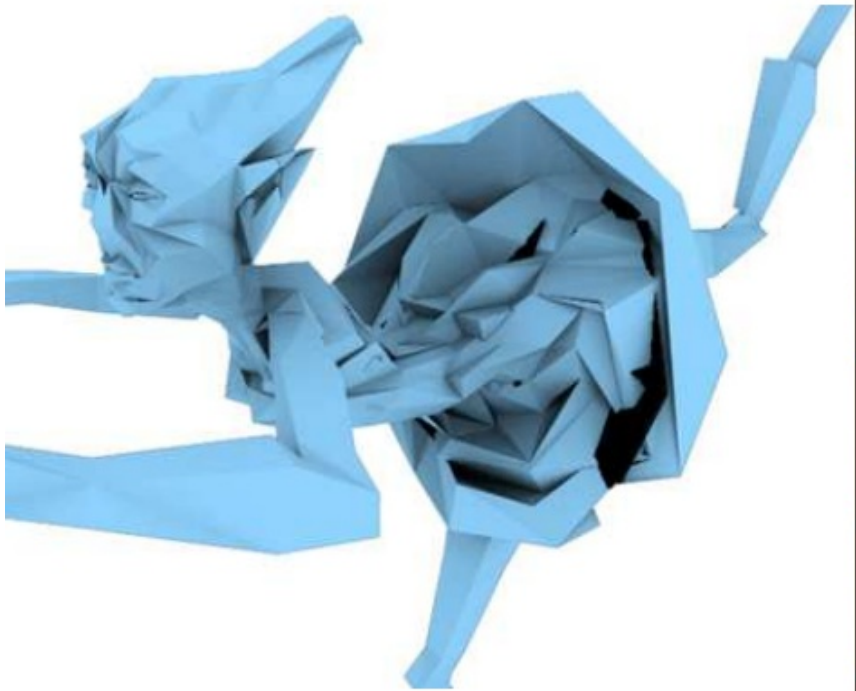
18 points
= 36 bytes

Mesh compression

- Store a low-detailed model

- Smooth it

(eg. Catmull Clark subdivision)



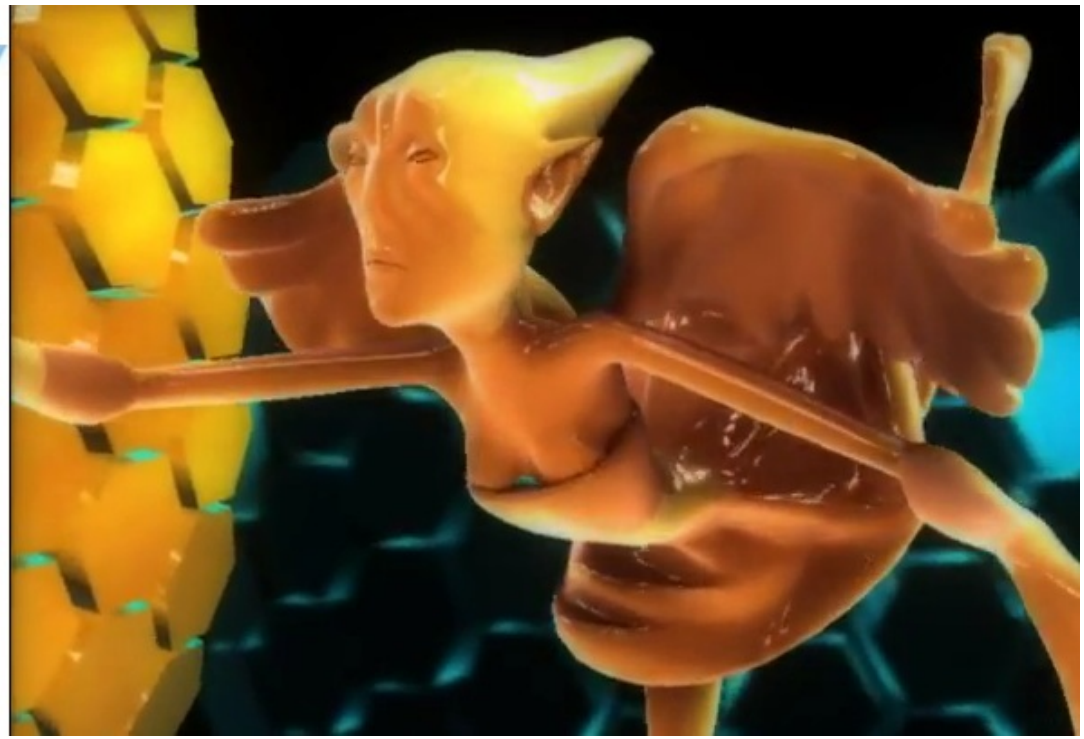
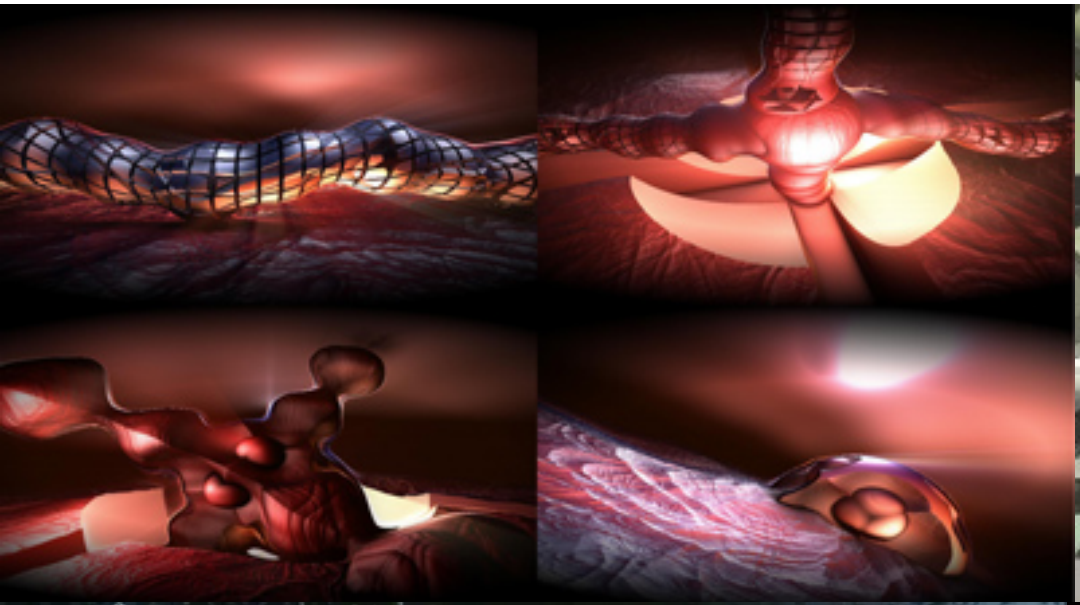
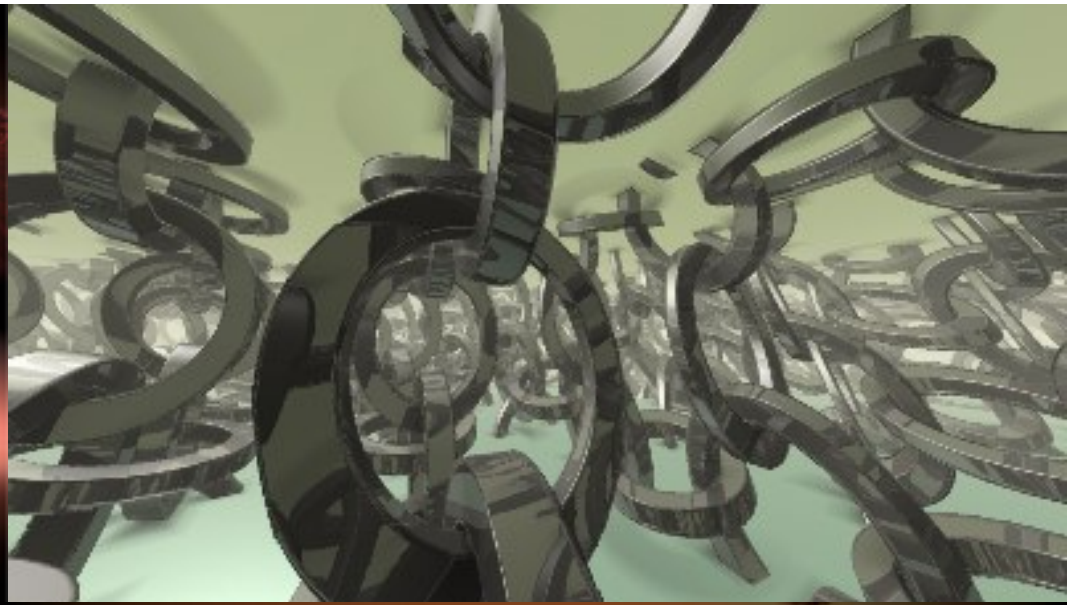
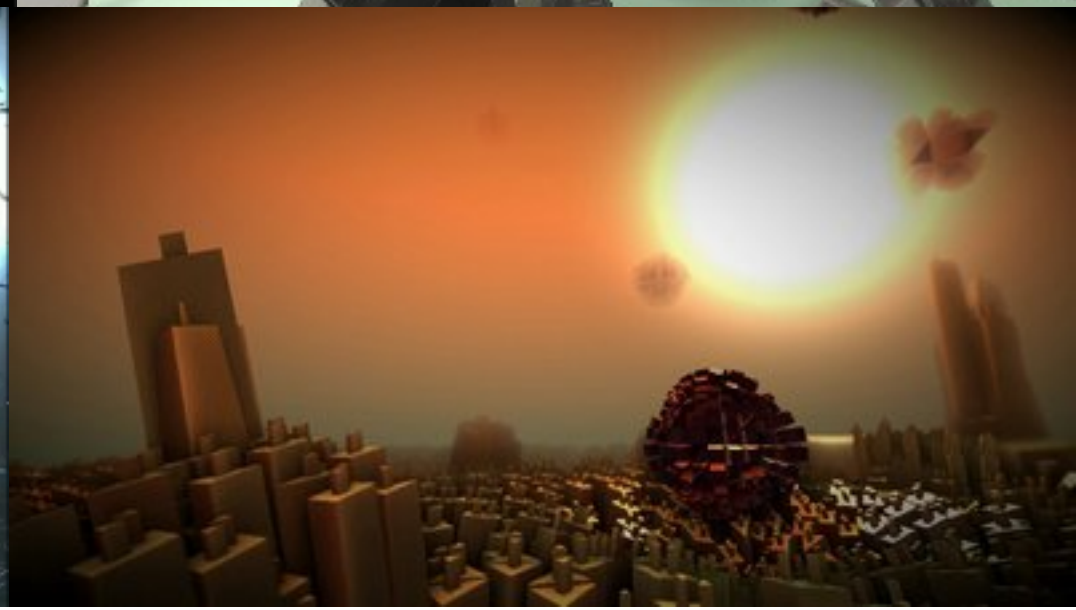


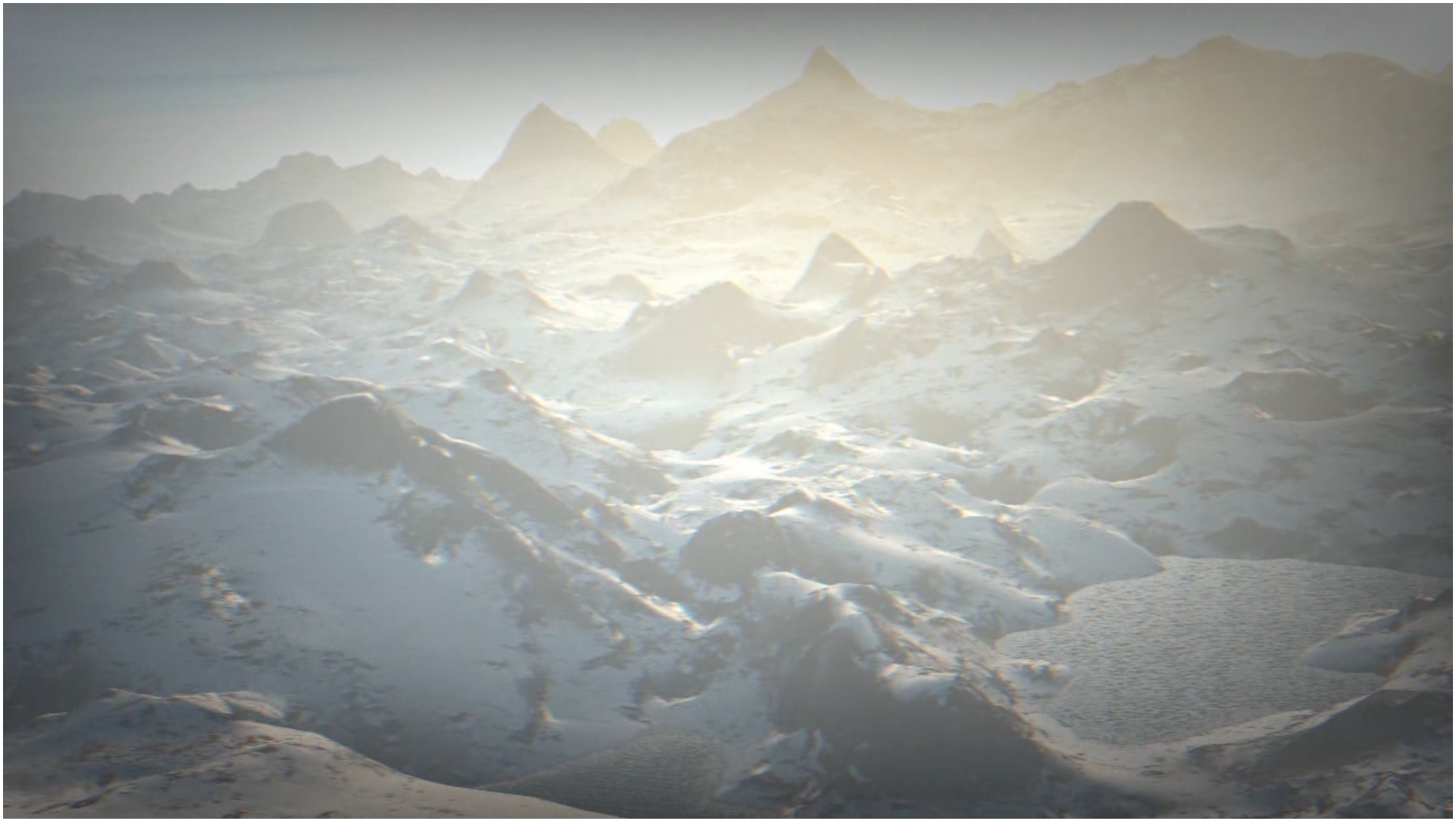
Image from 195/95/256, by RGBA (2005)

4k intros









Elevated, by RGBA (2009)

Questions?

- http://pouet.net
- http://www.iquilezles.org/www/
- http://in4k.northerndragons.ca
- http://www.ctrl-alt-test.fr