Visual Effects Bootcamp: Rapid Talks

Agenda

- Alim Chaarani
- Andy Lomerson
- Fred Hooper
- Matt Radford
- Nadab Göksu
- Sarah Grisson

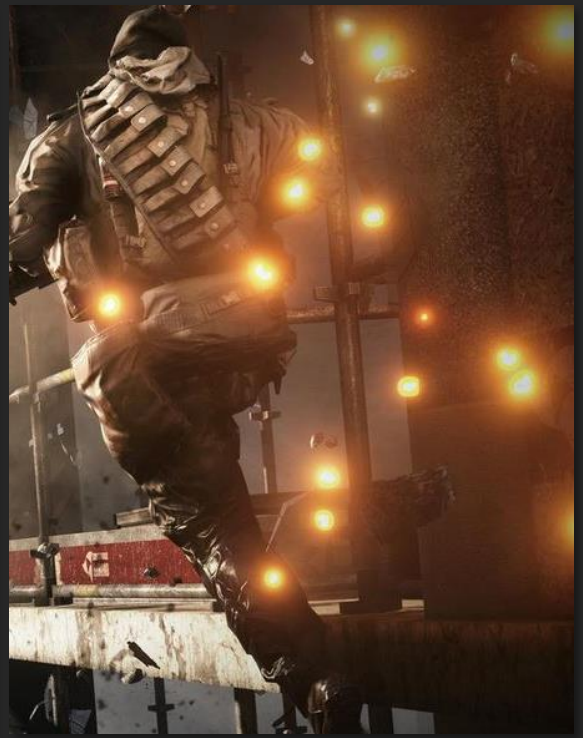
GDC

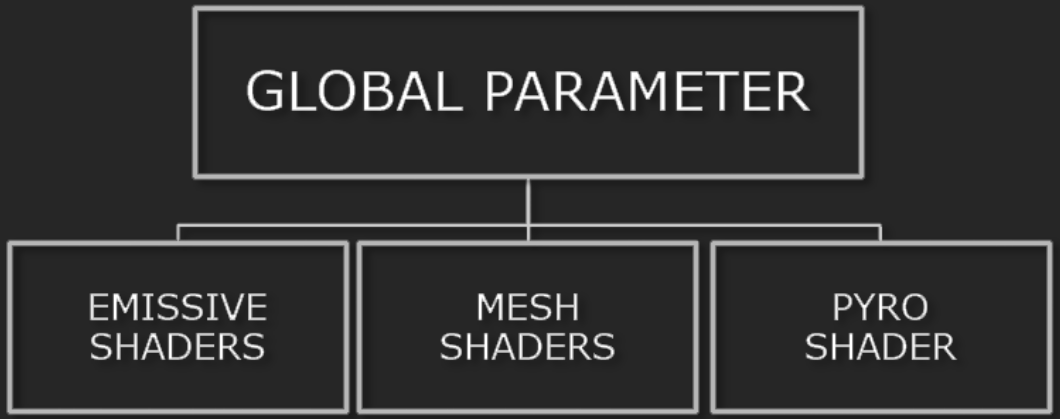
It said boom!, but the intensity wasn’t right.

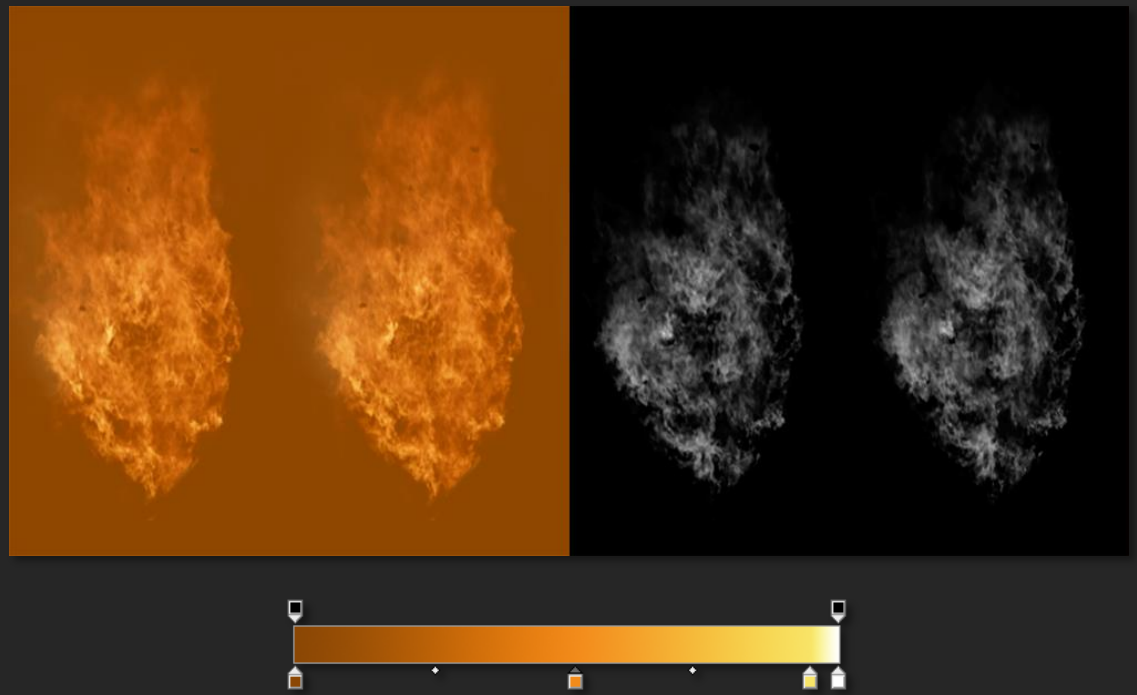
Nadab Göksu
Senior Visual Effects Artist, EA DICE

BATTLEFIELD 1™

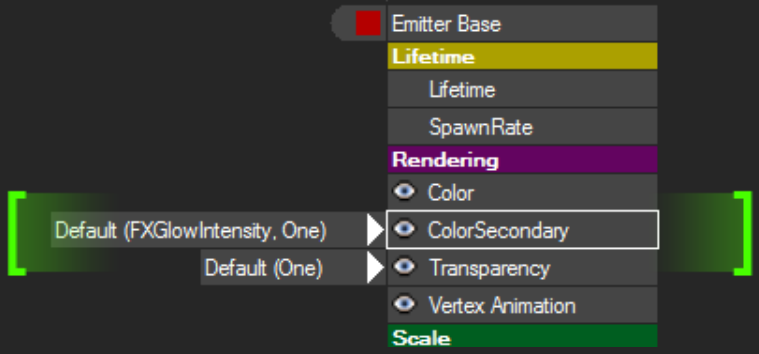
BATTLEFIELD 2
BATTLEFIELD heroes
2142 BATTLEFIELD
BAD COMPANY BATTLEFIELD
BATTLEFIELD BAD COMPANY 2
BATTLEFIELD 3
BATTLEFIELD 4
STAR WARS BATTLEFRONT
RALLISPORT 2 CHALLENGE
NEED FOR SPEED HOT PURSUIT
BATTLEFIELD HARDLINE
MEDAL OF HONOR WARFIGHTER

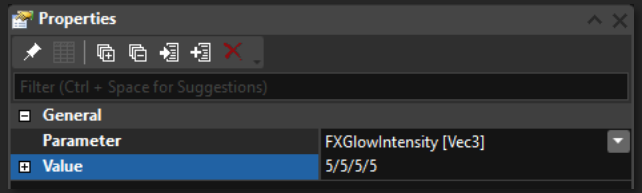



GLOBAL PARAMETER
EMISSIVE SHADERS
MESH SHADERS
PYRO SHADER



Polynomial (EmitterNormWindSpeed)	Lifetime
Polynomial (EmitterNormTime)	SpawnRate
	Physics
Polynomial (NormTime)	Air Resistance
	Gravity
Polynomial Operator (EmitterNormTime)	Local force
	World wind
	Rendering
Polynomial (NormTime)	AlphaLevelMin
Polynomial (NormTime)	AlphaLevelScale
Polynomial Color Interpolator (NormTime)	Color
Default (FXGlowIntensity, NormTime)	ColorSecondary
	SpawnAnimationFrame
	SpawnAnimationSpeed
	Texture
Polynomial Operator (NormTime)	Transparency
	Rotation
	Rotation
Random (One)	SpawnRotation
	SpawnRotationSpeed
	Scale
Polynomial (NormTime)	Size
Random (EmitterParameterDistance, One)	SpawnSize


Emitter Base
Lifetime
Lifetime
SpawnRate
Rendering
Color
Default (FXGlowIntensity, One)
ColorSecondary
Default (One)
Transparency
Vertex Animation
Scale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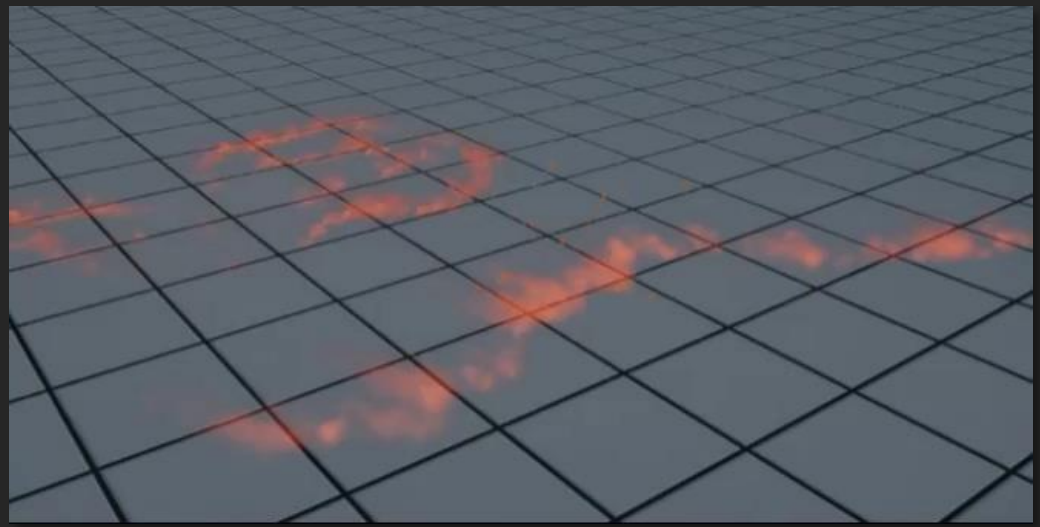
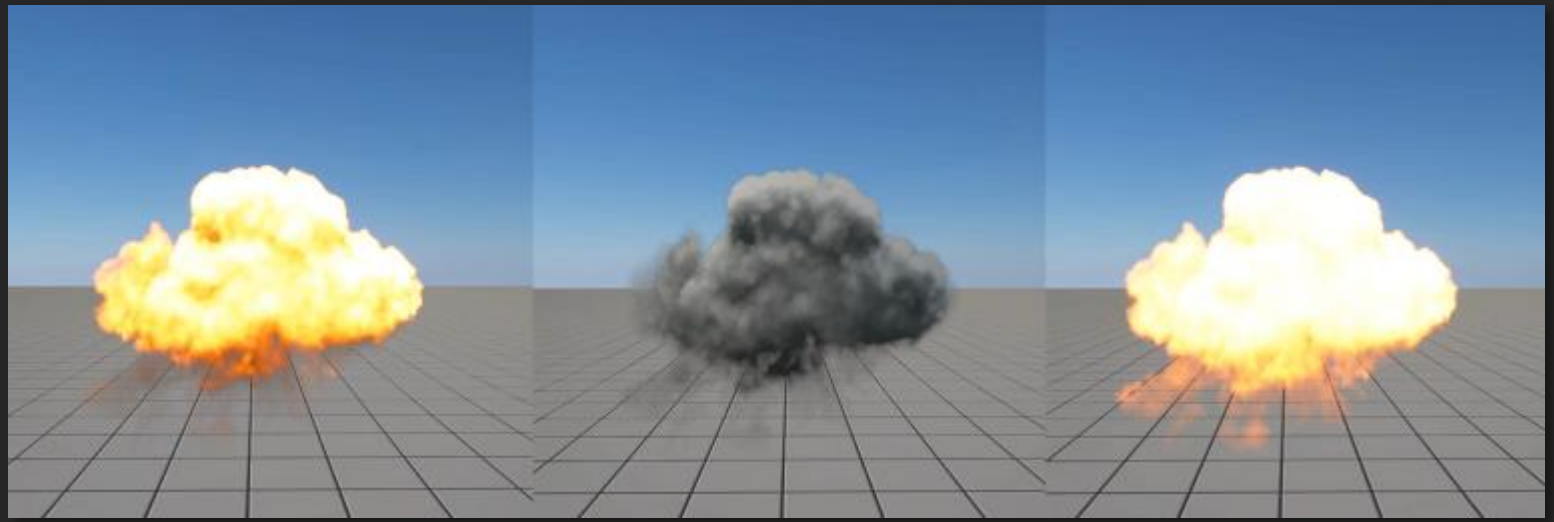
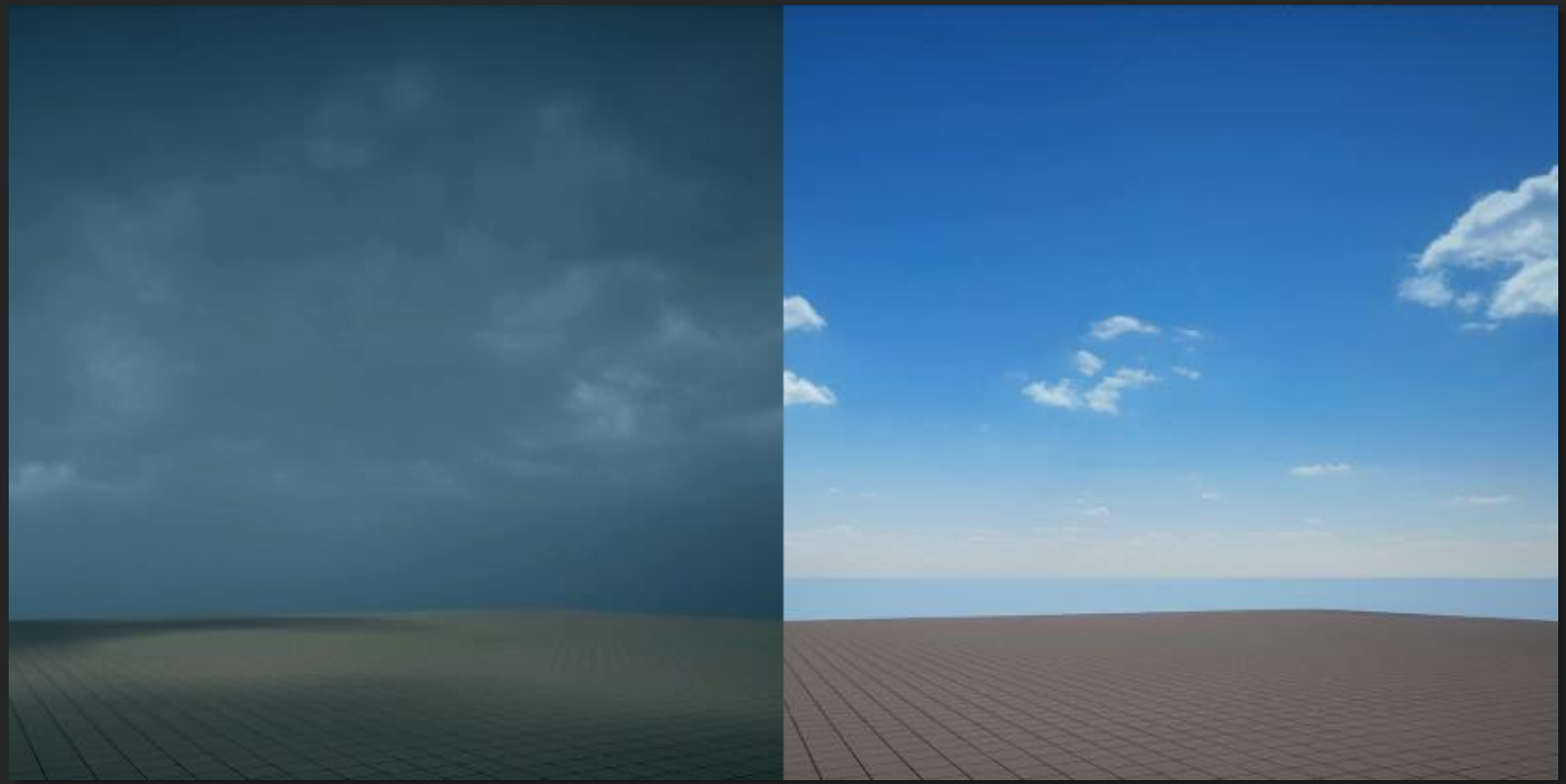
5/5/5/5







303 BALL
Mk7 BLT

- Summery
  - Easy to Art Direct.
  - Consistent Style.
  - Saved us alot of work.

Thank you!

Building A Better Explosion

Fred Hooper
Lead VFX Artist, Nvidia

Overview

- Explosions = hard!
  - Lots of stuff in an explosion
    - Miss one and might you break it!
  - You think you know what you want
  - So does everyone else
- Planning process!
  - Time
  - Rework

Tip#1: Talk Talk Talk

- Talk to:
  - Art
  - Design
  - Sound
- Common language
- The game is most important

STOP: Make a Visual Target

- Make a Concept

Tip#2: Make a Visual Target

- Answer these questions BEFORE concept:
  - Theme
    - Are you making Real/hyperreal/cartoony
      - Does the whole game follow this theme?
    - Are you making an X type of explosion
      - Grenade
      - Fuel
      - non real sci fi/magic type of explosion
    - How is it viewed?
      - From all angles
      - Hero shot

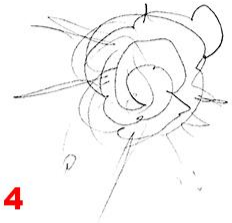
Tip#2: Make a Visual Target

Tip#2: Make a Visual Target

1

2

3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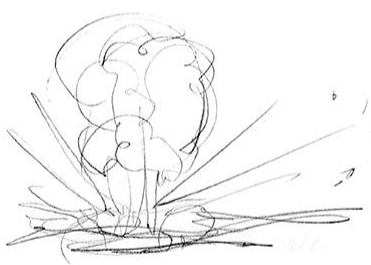
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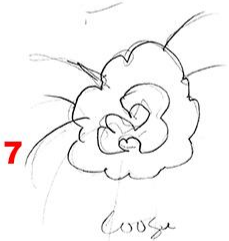
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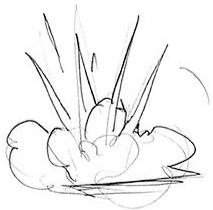
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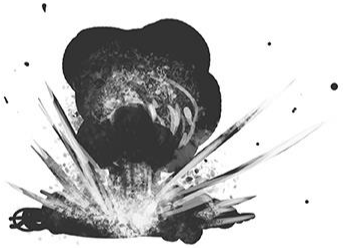
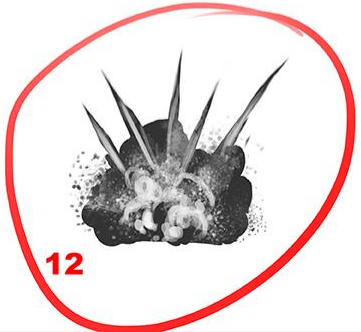
12

Tip#2: Make a Visual Target

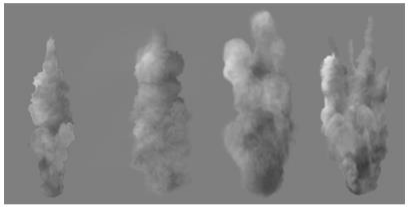


Tip#2: Make a Visual Target



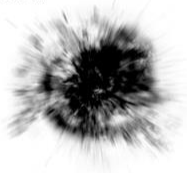
Tip#2: Make a Visual Target

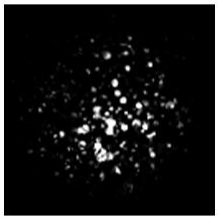
Directional Smoke



Debris

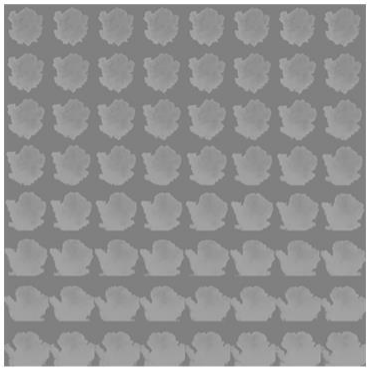
Scorch



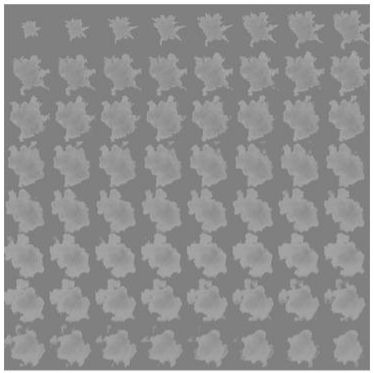


Grit

Slow Smoke

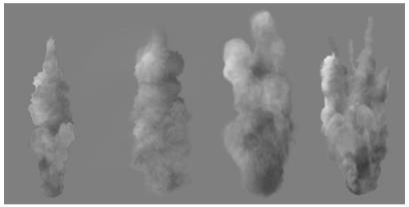


Quick Smoke



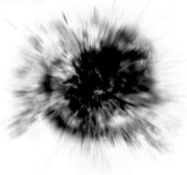
Tip#2: Make a Visual Target

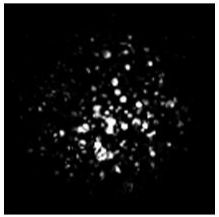
Directional Smoke



Debris

Scorch





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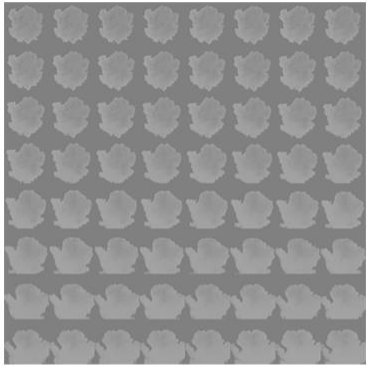
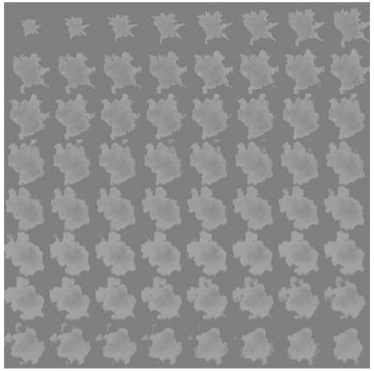
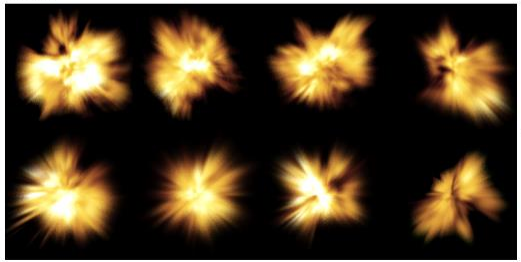


Quick Smoke



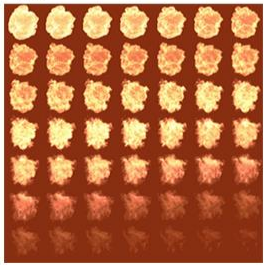
Flash



Ember

Spark

Fire



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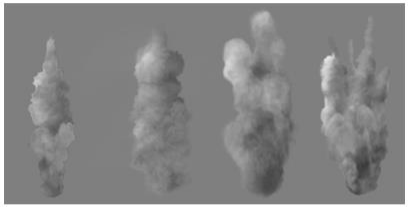
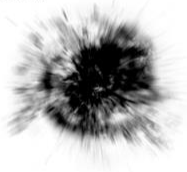
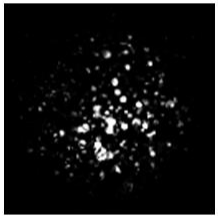


Debris

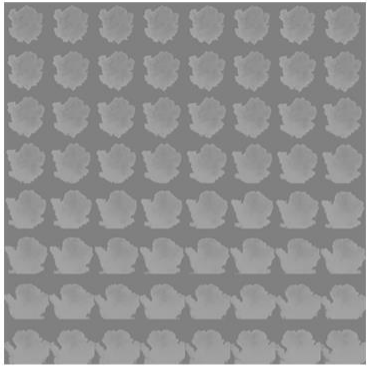
Scorch



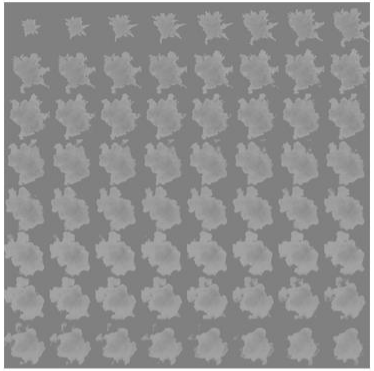


Grit

Slow Smoke



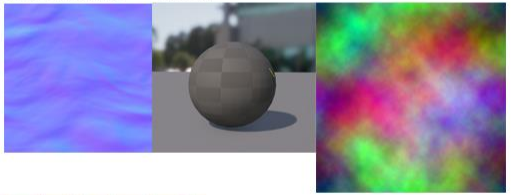
Quick Smoke



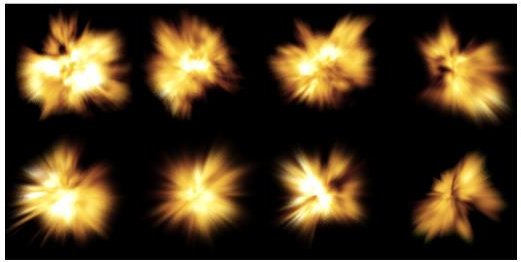
Heat Normal

Mesh

Noise Pack



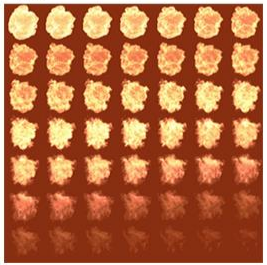
Flash



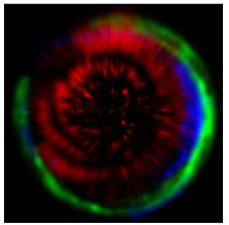
Ember

Spark

Fire



Concussion Pack



Tip#2: Make a Visual Target

- Here are your assets for the explosion.
  - Production types love this:

Non Emissive
- Material/Shader
  - Lit shader
  - GPU shader
- Textures
- Smoke render
  - Slow render
  - Quick render
- Debris texture (GPU)
- Grit/Bits texture (GPU)
- Scorch shader
  - Scorch texture

Emissive
- Material/Shader
  - Emissive Base
  - Emissive GPU
- Fire Render
- Flash Shapes
- Embers (GPU)
- Sparks (GPU)

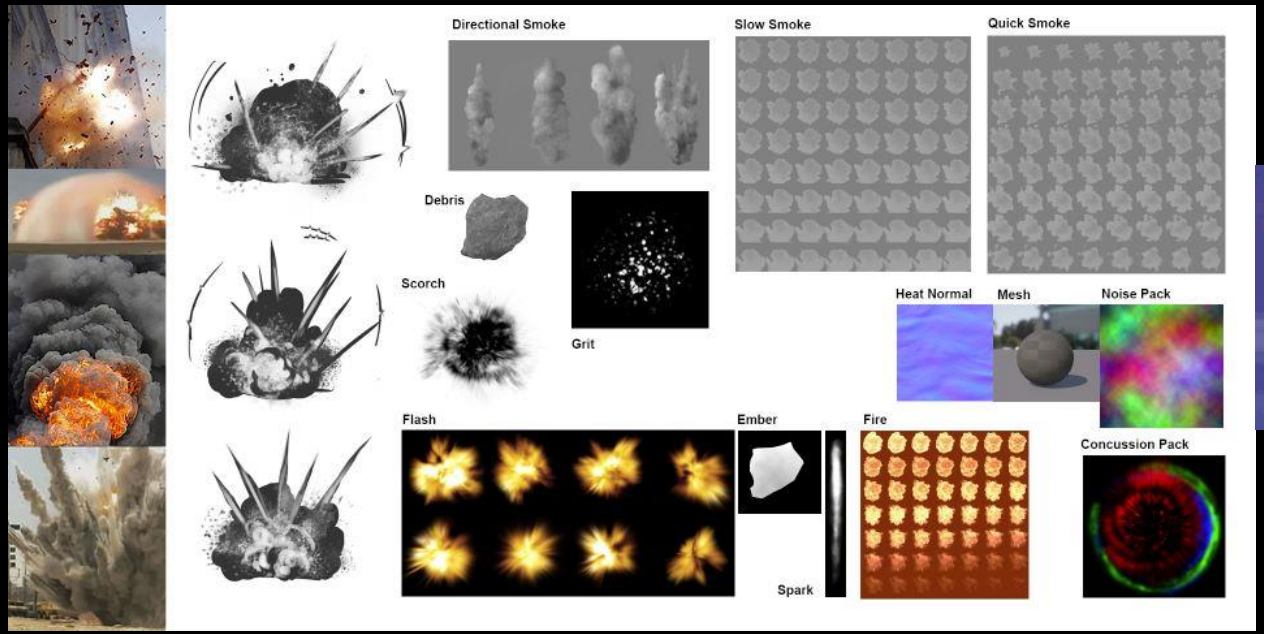
Explosion Effect

Concussive
- Material/Shader
  - Mesh Heat
  - Concussion Shape material
- Sphere Mesh
- Textures
- Packed concussion texture
- Packed Noise texture
- Heat Normal

Game side stuff

Tip#2: Make a Visual Target

- So now you got your target:
  - LETS START BUILDING!!!

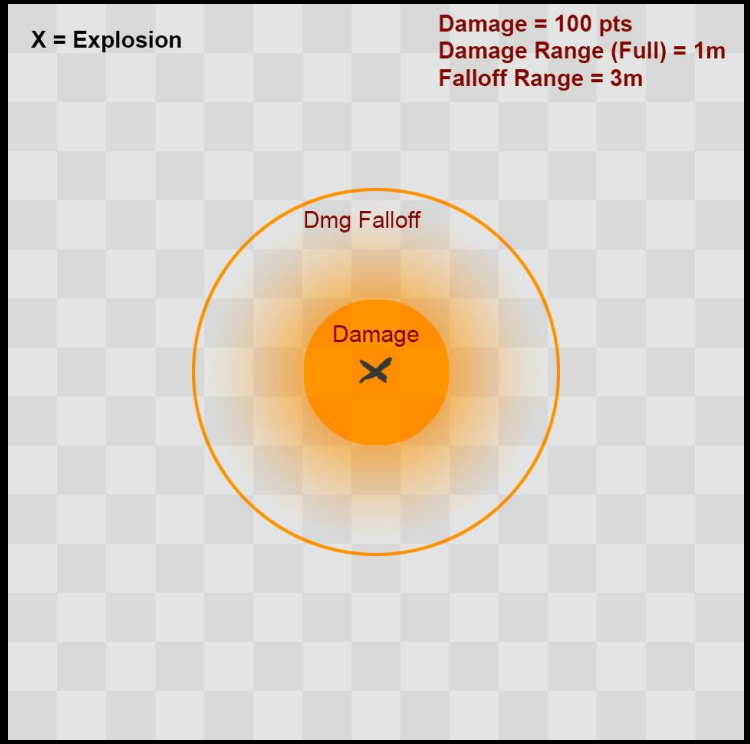


STOP (again): Game Data

- Collect Game side data

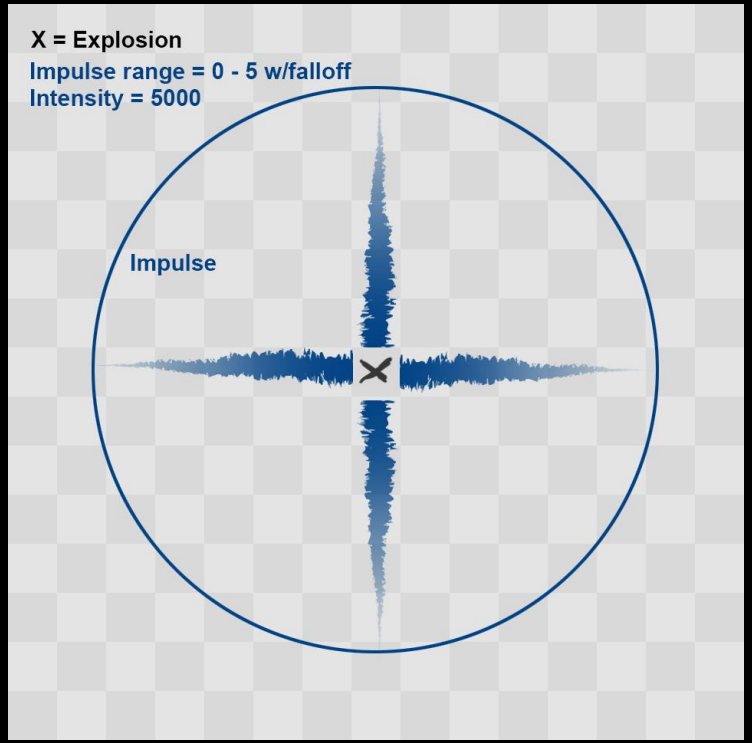
Tip#3: Collect Game Data

- Now you need to answer the game side questions:
  - Damage
    - World amounts (intensities)
    - Range
    - Falloff
      - Post
      - Rumble
      - Camera Shake



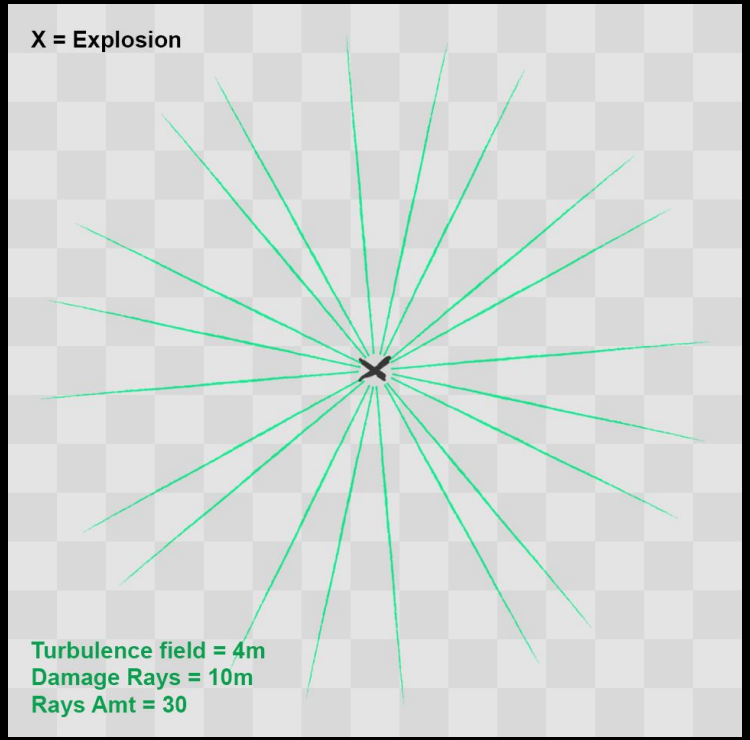
Tip#3: Collect Game Data

- More game side questions:
  - Forces area of effect
    - Impulse/Push/Pull
    - Damaging/Destruction/Physics
    - Falloff

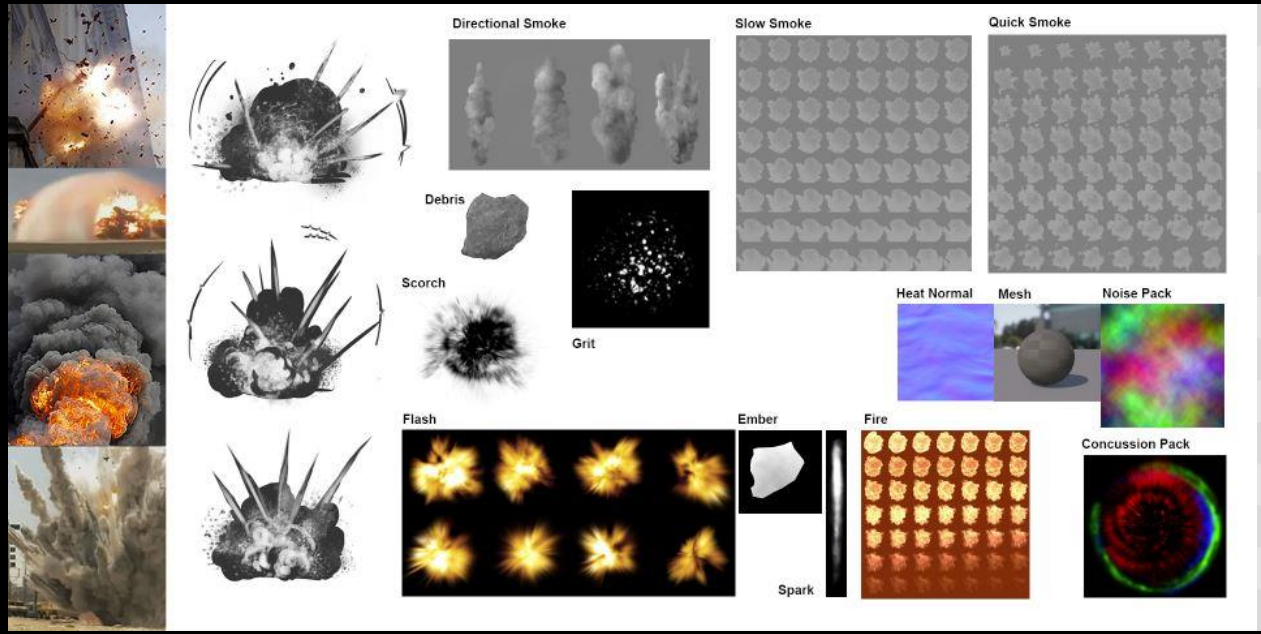


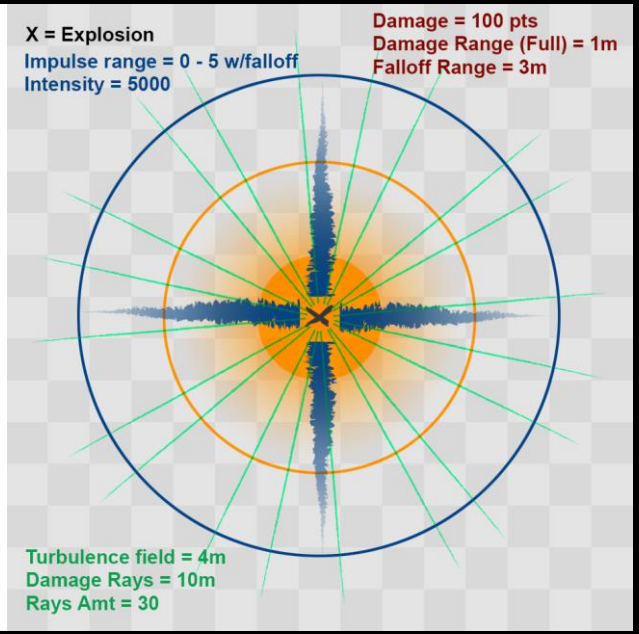
Tip#3: Collect Game Data

- Even MORE questions:
  - Lighting
    - Are the lights a part of the effect or an object in the game?
  - Advantages
    - In House tools/tricks/secret stuff
    - Use in house tools to your benefit



Finally!


Directional Smoke
Slow Smoke
Quick Smoke
Debris
Scorch
Grit
Heat Normal
Mesh
Noise Pack
Flash
Ember
Fire
Concussion Pack
Spark


X = Explosion
Impulse range = 0 - 5 w/falloff
Intensity = 5000
Damage = 100 pts
Damage Range (Full) = 1m
Falloff Range = 3m
Turbulence field = 4m
Damage Rays = 10m
Rays Amt = 30

Go Build

Thank You!

Visual Effects: From Concept to Ship

Alim Chaarani
Lead VFX Artist, Blizzard Entertainment

GAME DEVELOPERS CONFERENCE® | FEB 27–MAR 3, 2017 | EXPO: MAR 1–3, 2017 #GDC17

UBM

MASS EFFECT
BioWare
INTERNET CONNECTION REQUIRED FOR GAMEPLAY.*
DRAGON AGE ORIGINS
BioWare
DRAGON AGE ORIGINS AWAKENING
BioWare
DRAGON AGE II
BioWare
PS3
PlayStation Network
Only On PlayStation.
PLAYSTATION ALL-STARS BATTLE ROYALE
SONY

HEROES
OF THE STORM™

Auto Select
ROLE:
UNIVERSE:
SORT:
A-Z
XP
Filter by name or description
Choose Desired Role
READY
Skins
Mounts
Abilities
Talents
Press / for a list of commands
29

Featured Bundle

Hide Owned | Release Date | Search Featured Items

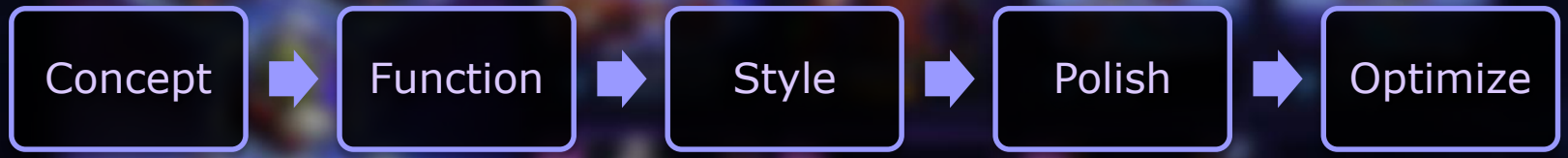
Press / for a list of commands

36

Stages

PLAY
SHOP
WATCH
Featured Bundle
2017 Lunar Festival
Bundle

Stages



Concept

Concept

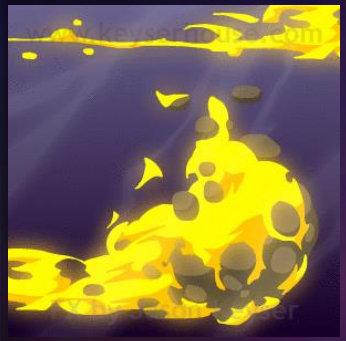
What is the story?

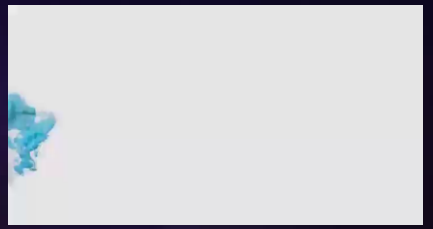
Concept

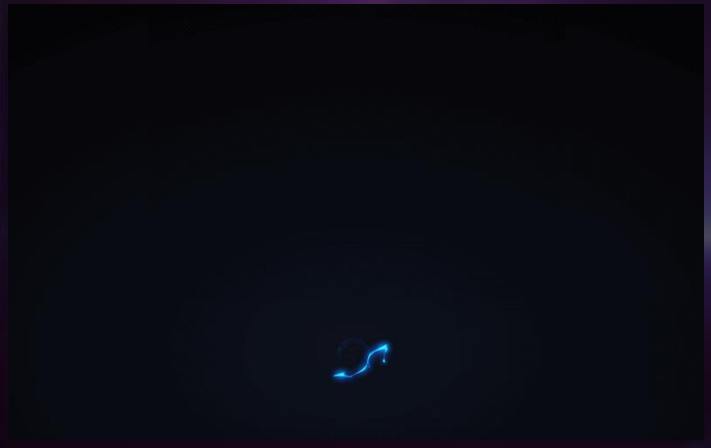
Brainstorm!

- Gather with various disciplines
- Use a moderator
- Every voice matters!
- Compile ideas into a document

Concept







Concept

RESURGENCE
COILS UP
SOME PARTICLES, SOME SMOKE A LA WORMHOLE AT SPAWN
UPWARDS FADE,
AS BODY FADES OUT.
ROTATING HEROES LOGO CENTER,
FURY.
PARTICLE BURST ON IMPACT LESSENS W/ BOUNCE.
LIGHTNING
SPIRAL
PARTICLE BURST
BOLT
SILHOUETTE FADES/POPS QUICKLY?
QUICK PARTICLE BURST.
OR
WIPE UP
FLASH DOWN
OUT
PARTICLE TRAIL
IN
OUT
IN
SWIFT
SHIELD.
ADD PURPLE COLOUR/ STORM COIL TO HEARTH
2 ALLIES HIT BIRTH SHIELD FROM GROUND.
1 QUICK SPIN / EXPAND, MIRROR SHIELD FX STYLE ON GROUND

Concept

Call out Dependencies!

- Art (Model, Rig, Anims, Concept)
- Programming(Feature, Tools)
- The earlier, the better

Function

Function

How will our concept work in game?

Function

Prototype

- Block things in
- Reuse assets
- Establish functionality
- Don’t get attached

Function

Play Testing!

- Clarify stage
- Collect and prioritize feedback
- Adjust and review again
- Repeat for each stage

Style

Style

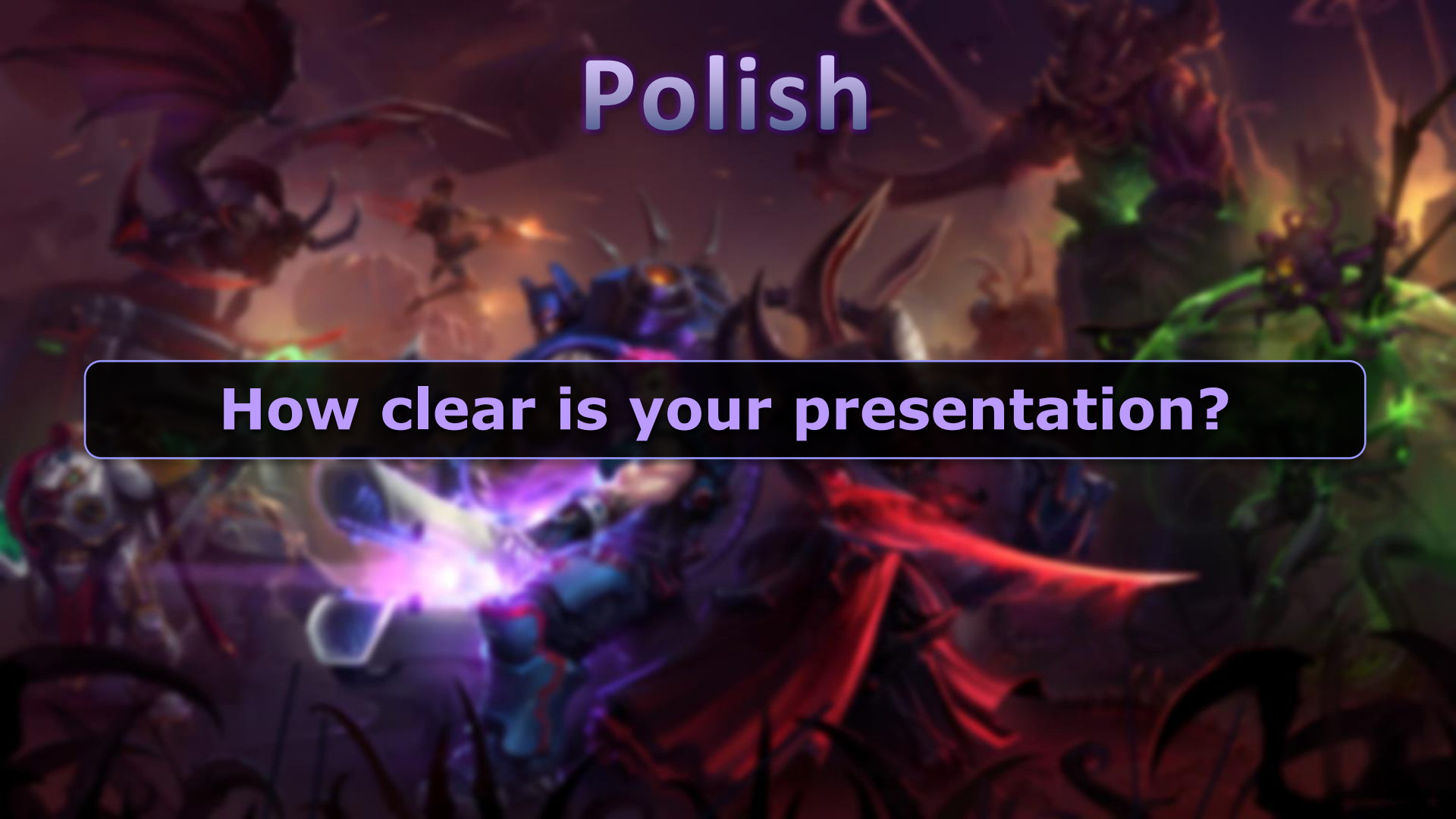
What is our visual identity?

Style

Visual Identity

- Start with one ability
- Define unique elements
- Reinforce game design
- Reuse elements

Polish

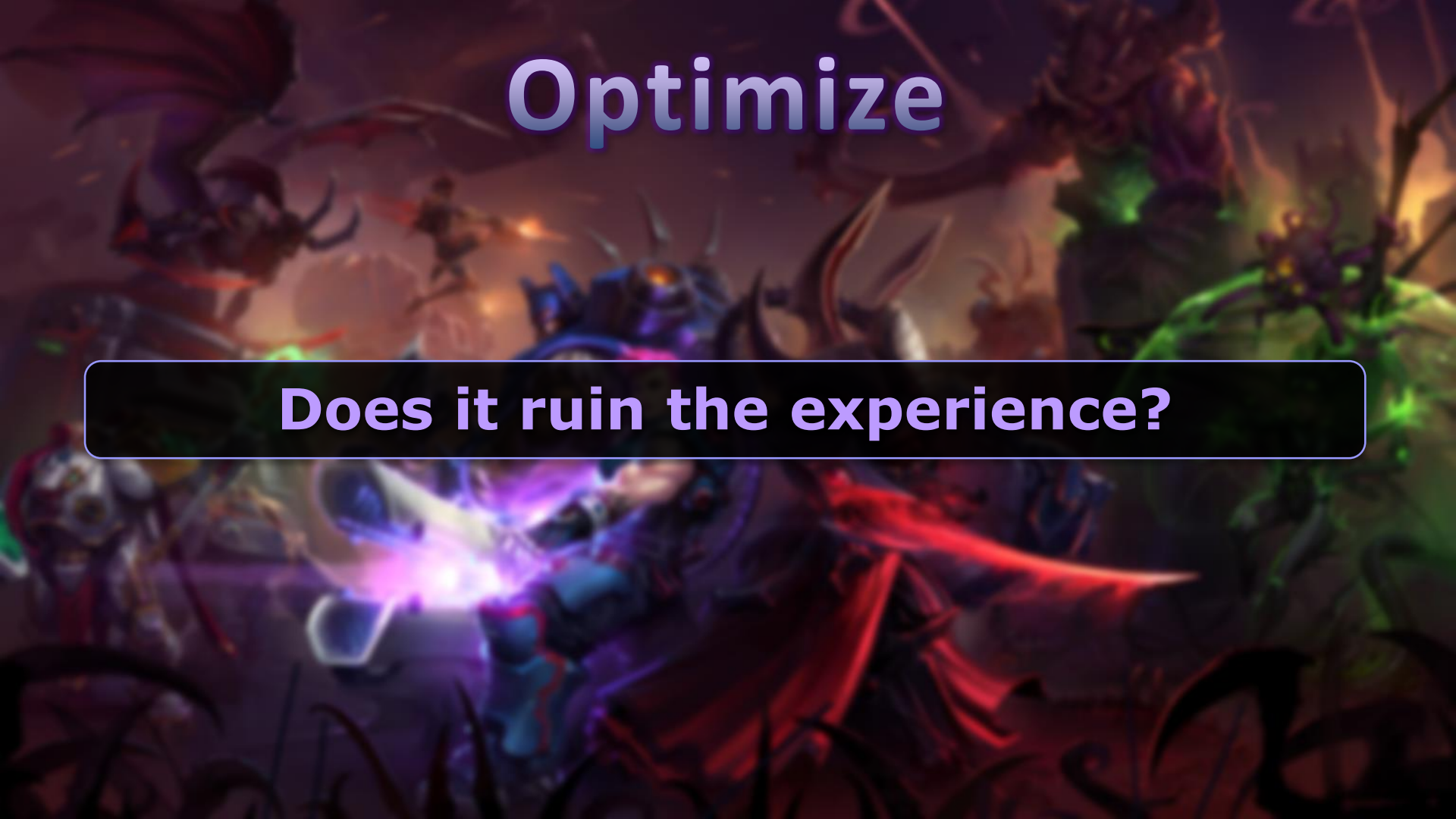

Polish
How clear is your presentation?

Toggle Minions
Toggle Ally
Toggle Cooldowns
Set Level
Reset Talents
Refresh Forts
21
VS
Talent Available
CATCHING MONKEY ELDER:
2664/2664
690/690
New Talent!
Z
Q
W
E
R
B

Toggle Minions
Toggle Ally
Toggle Cooldowns
Set Level
Reset Talents
Refresh Forts
21
VS
Talent Available
Target Dummy
Total Damage: 781
Damage Per Second: 781
2664/2664
690/690
New Talent!
Z
Q
W
E
B

Optimize

Optimize



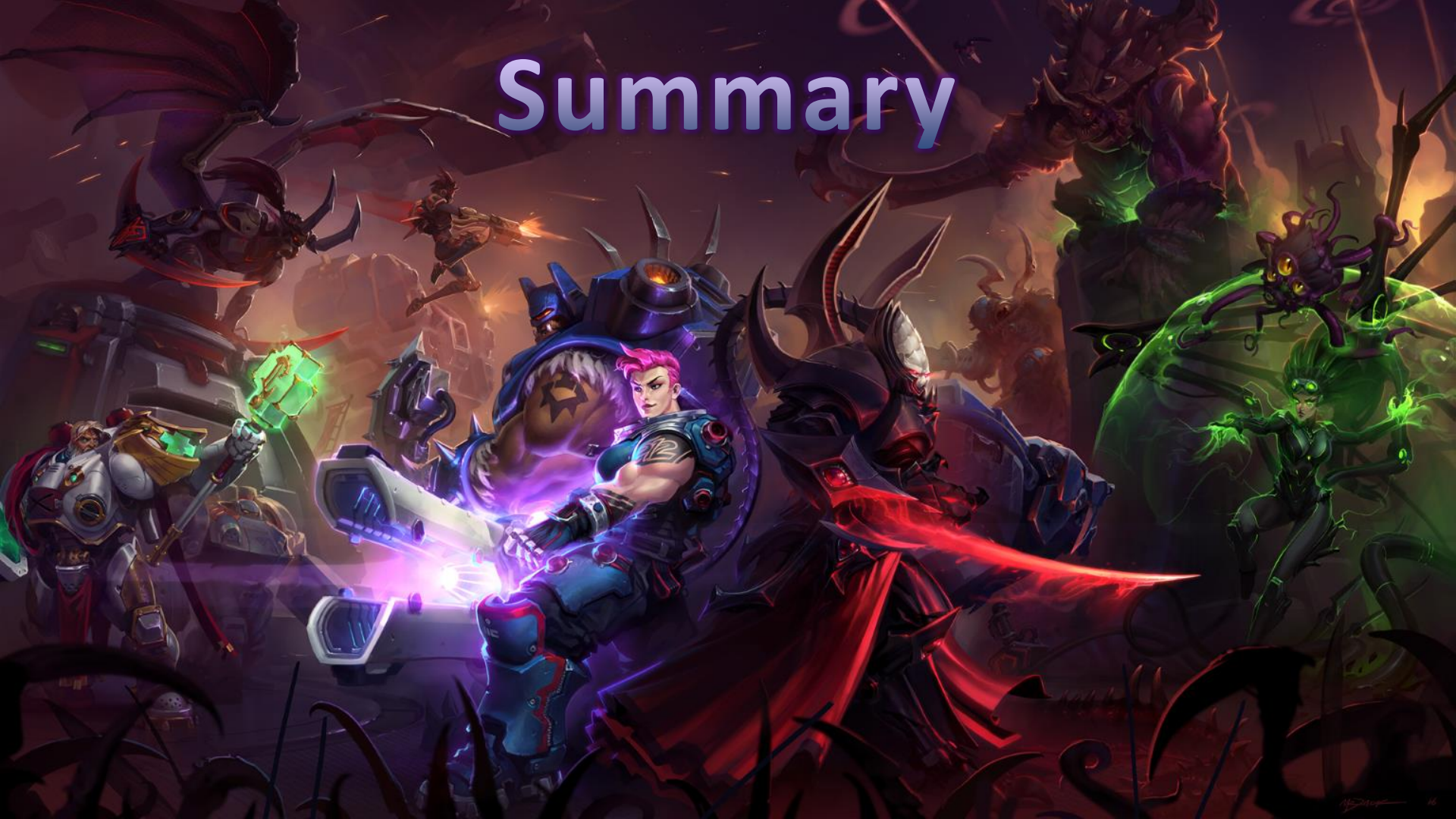
Does it ruin the experience?

Optimize

How we tackle this:

- Know your engine!
- Seek guidance
- Prioritize by importance
- Level of detail (LOD)
- Communicate and compromise
- No expensive features for game play
- Share knowledge with team

Summary



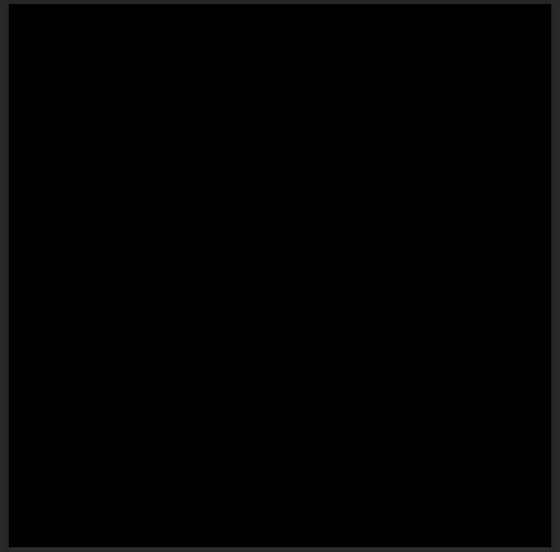
Summary

Concept → [illegible] → [illegible]lish → Optimize

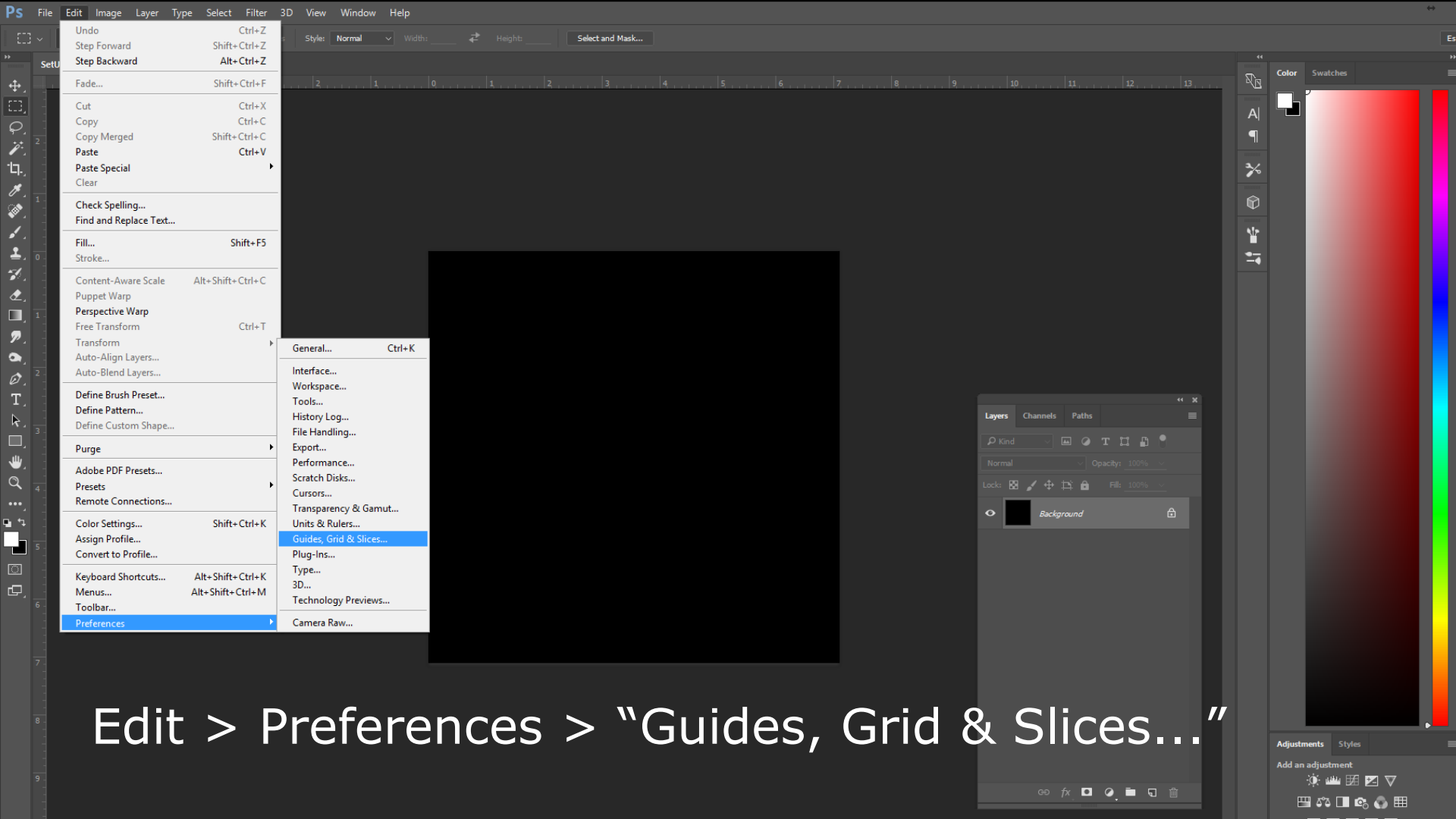
Thank You

GDC
Photoshop Tips & Tricks
Sarah Grissom
Senior VFX Artist, FXVille
GAME DEVELOPERS CONFERENCE® | FEB 27-MAR 3, 2017 | EXPO: MAR 1-3, 2017 #GDC17
UBM

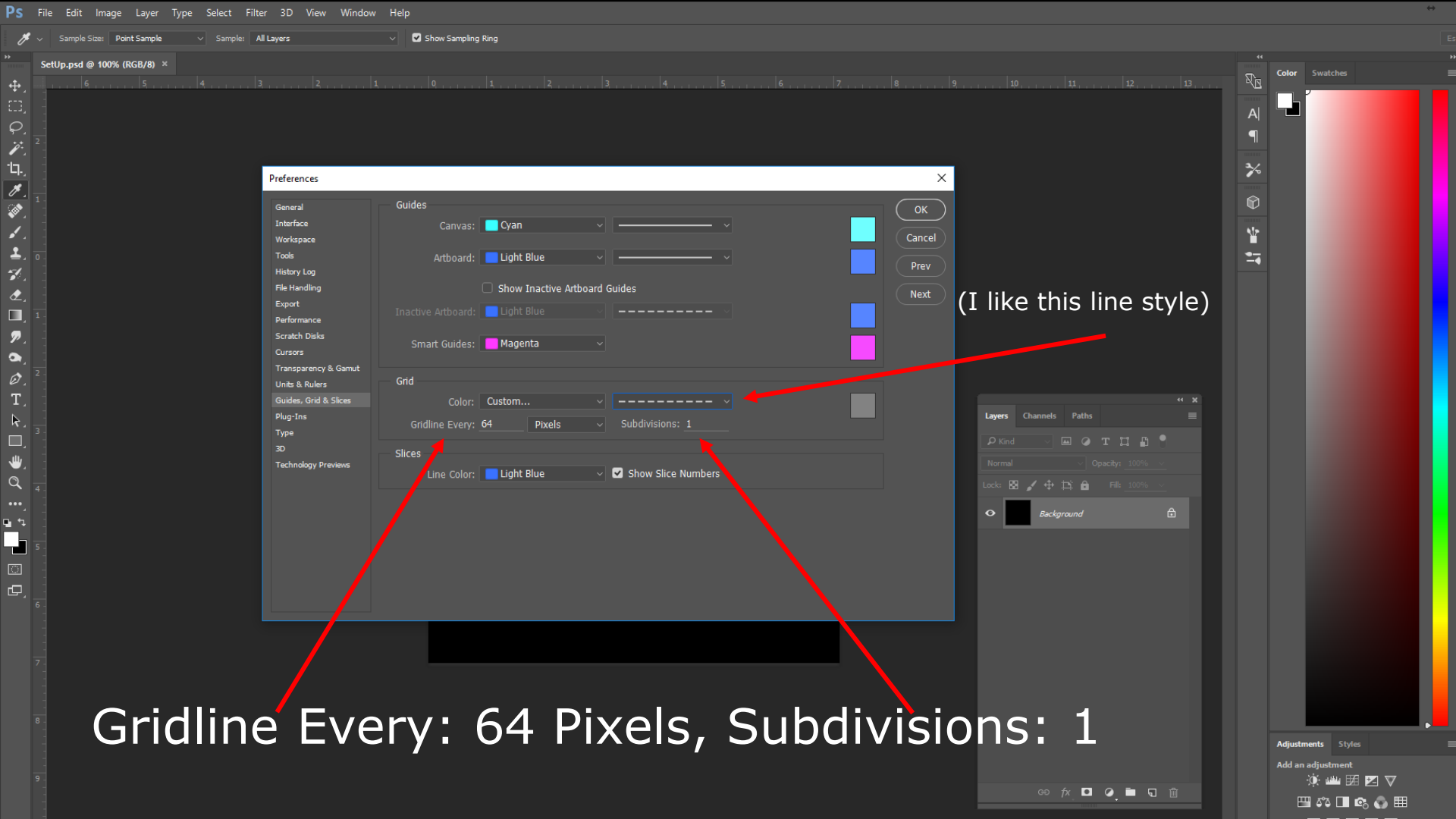
But first: Grids

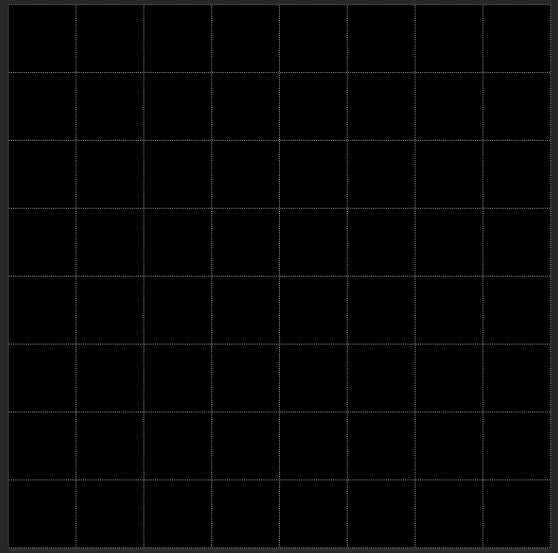


So we’re square!



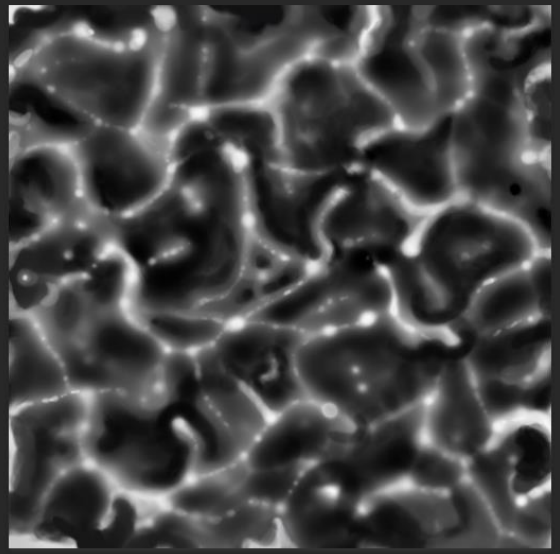
Edit > Preferences > “Guides, Grid & Slices...”


Preferences
General
Interface
Workspace
Tools
History Log
File Handling
Export
Performance
Scratch Disks
Cursors
Transparency & Gamut
Units & Rulers
Guides, Grid & Slices
Plug-Ins
Type
3D
Technology Previews
Guides
Canvas: Cyan
Artboard: Light Blue
Show Inactive Artboard Guides
Inactive Artboard: Light Blue
Smart Guides: Magenta
Grid
Color: Custom...
Gridline Every: 64 Pixels
Subdivisions: 1
Slices
Line Color: Light Blue
Show Slice Numbers
OK
Cancel
Prev
Next
(I like this line style)
Gridline Every: 64 Pixels, Subdivisions: 1

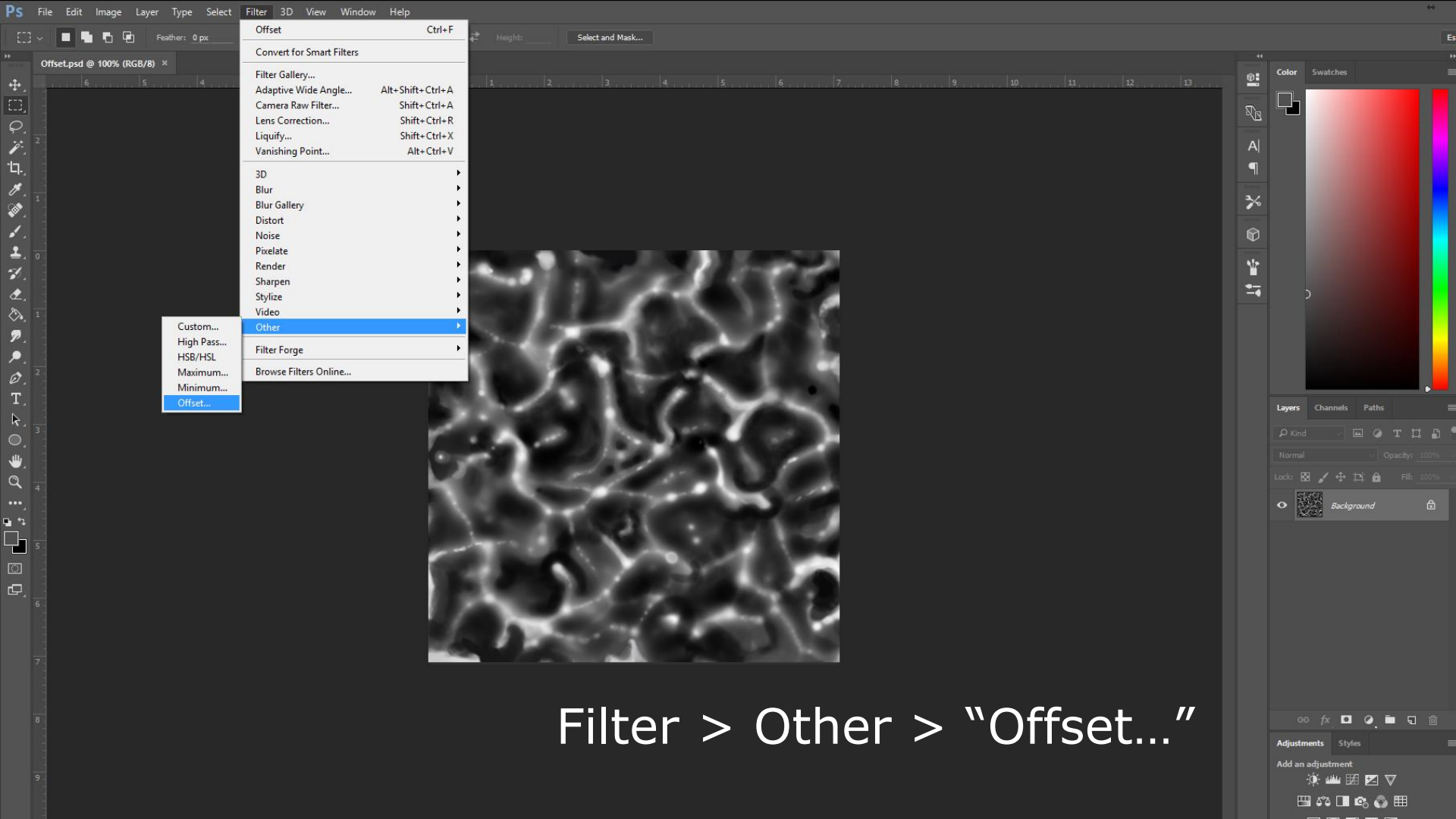


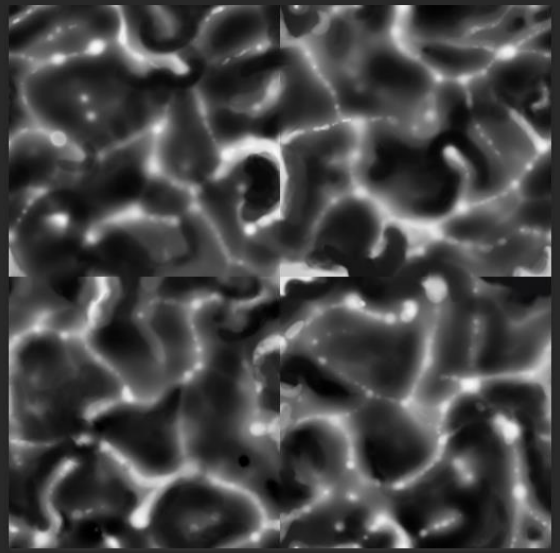
Ctrl + , to toggle

Offset

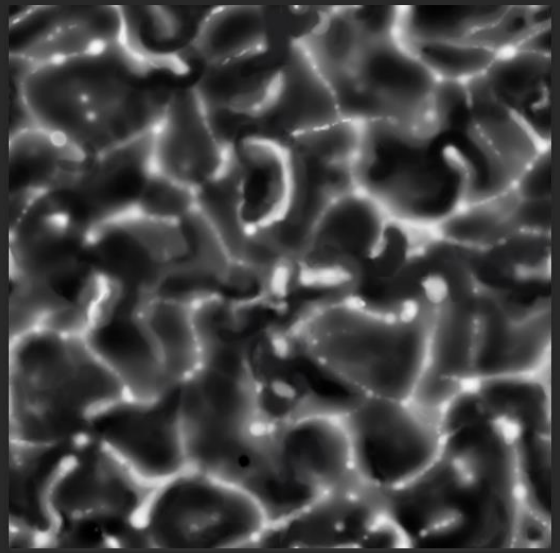


For Tiling Textures!


File Edit Image Layer Type Select Filter 3D View Window Help
Offset Ctrl+F
Convert for Smart Filters
Filter Gallery...
Adaptive Wide Angle... Alt+Shift+Ctrl+A
Camera Raw Filter... Shift+Ctrl+A
Lens Correction... Shift+Ctrl+R
Liquify... Shift+Ctrl+X
Vanishing Point... Alt+Ctrl+V
3D
Blur
Blur Gallery
Distort
Noise
Pixelate
Render
Sharpen
Stylize
Video
Other
Filter Forge
Browse Filters Online...
Custom...
High Pass...
HSB/HSL
Maximum...
Minimum...
Offset...
Offset.psd @ 100% (RGB/8)
Color
Swatches
Layers
Channels
Paths
Background
Adjustments
Styles
Add an adjustment
Filter > Other > “Offset…”

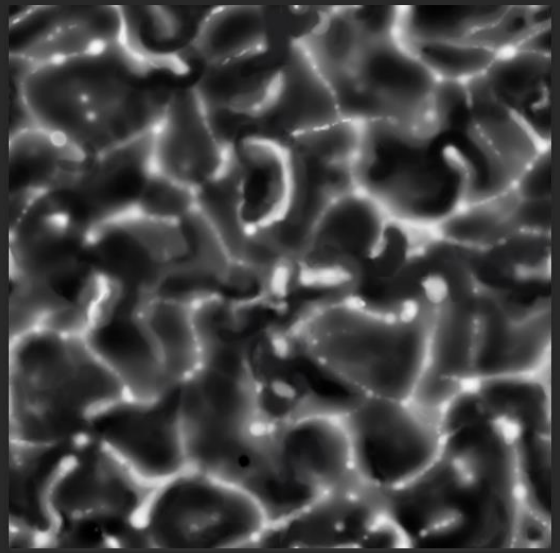

Offset
Horizontal: +256 pixels right
Vertical: +256 pixels down
OK
Cancel
Preview
Undefined Areas
Set to Background
Repeat Edge Pixels
Wrap Around

Ew!

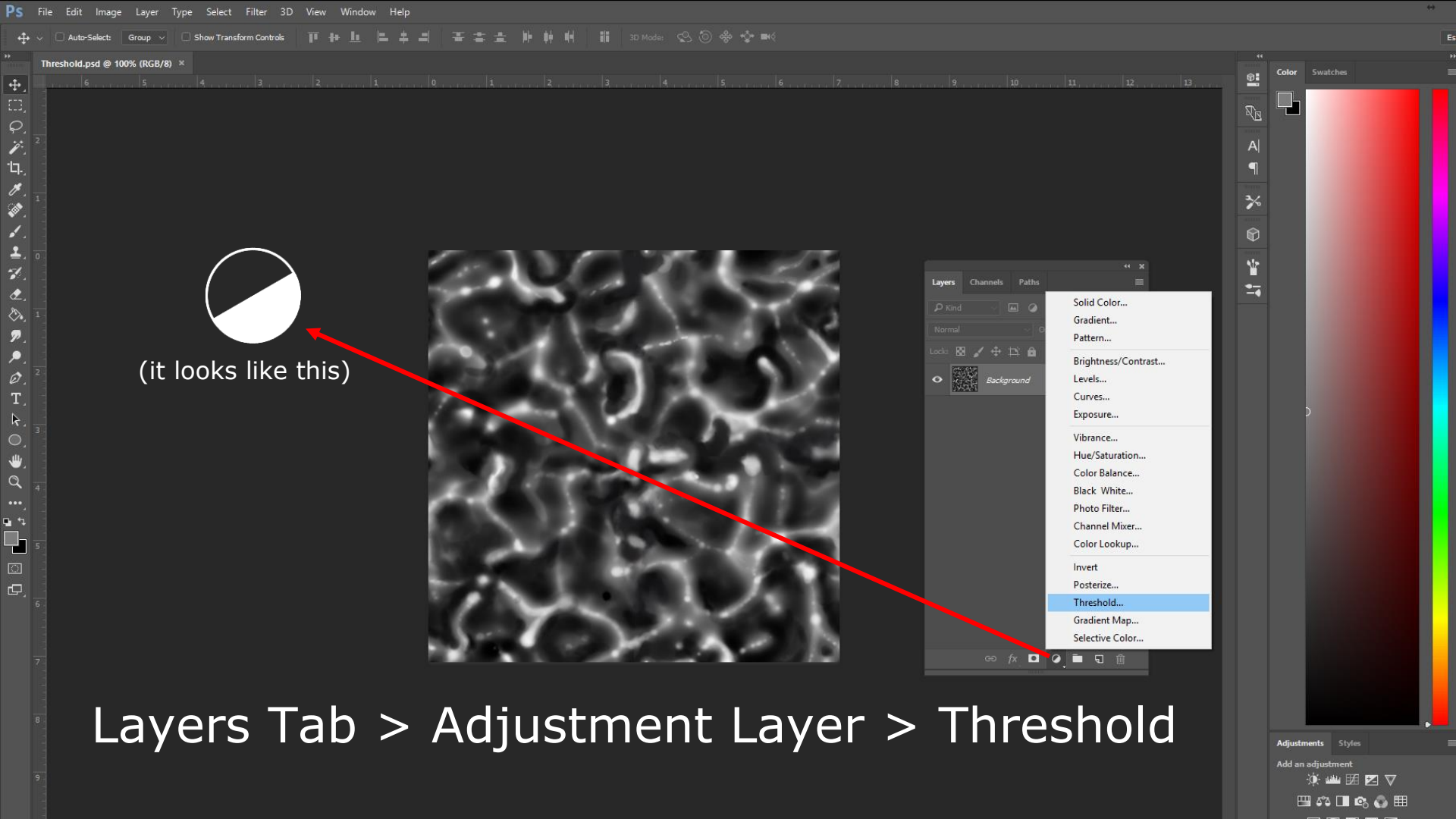


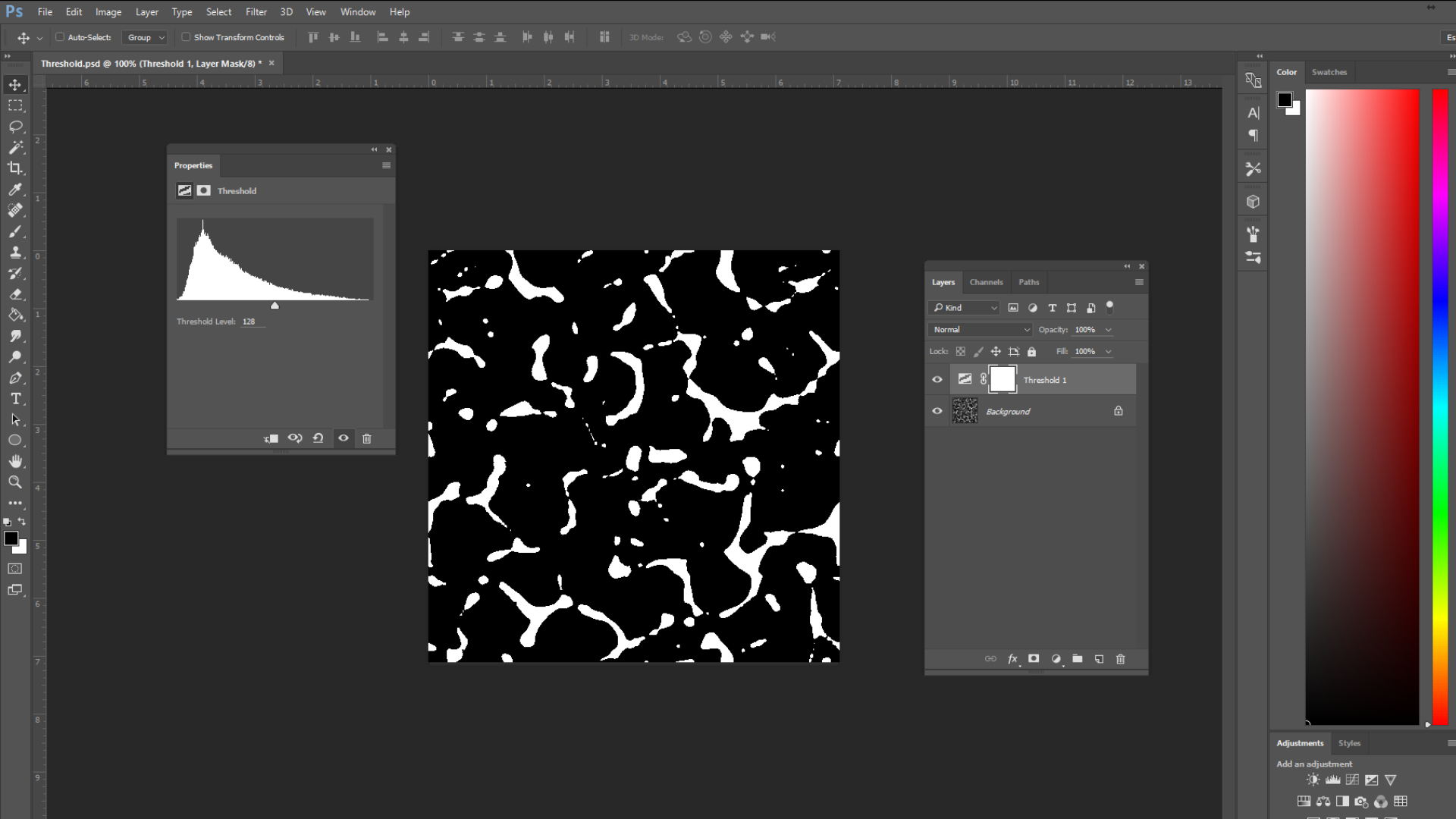
Paint, Blur, Smudge, Stamp into place!

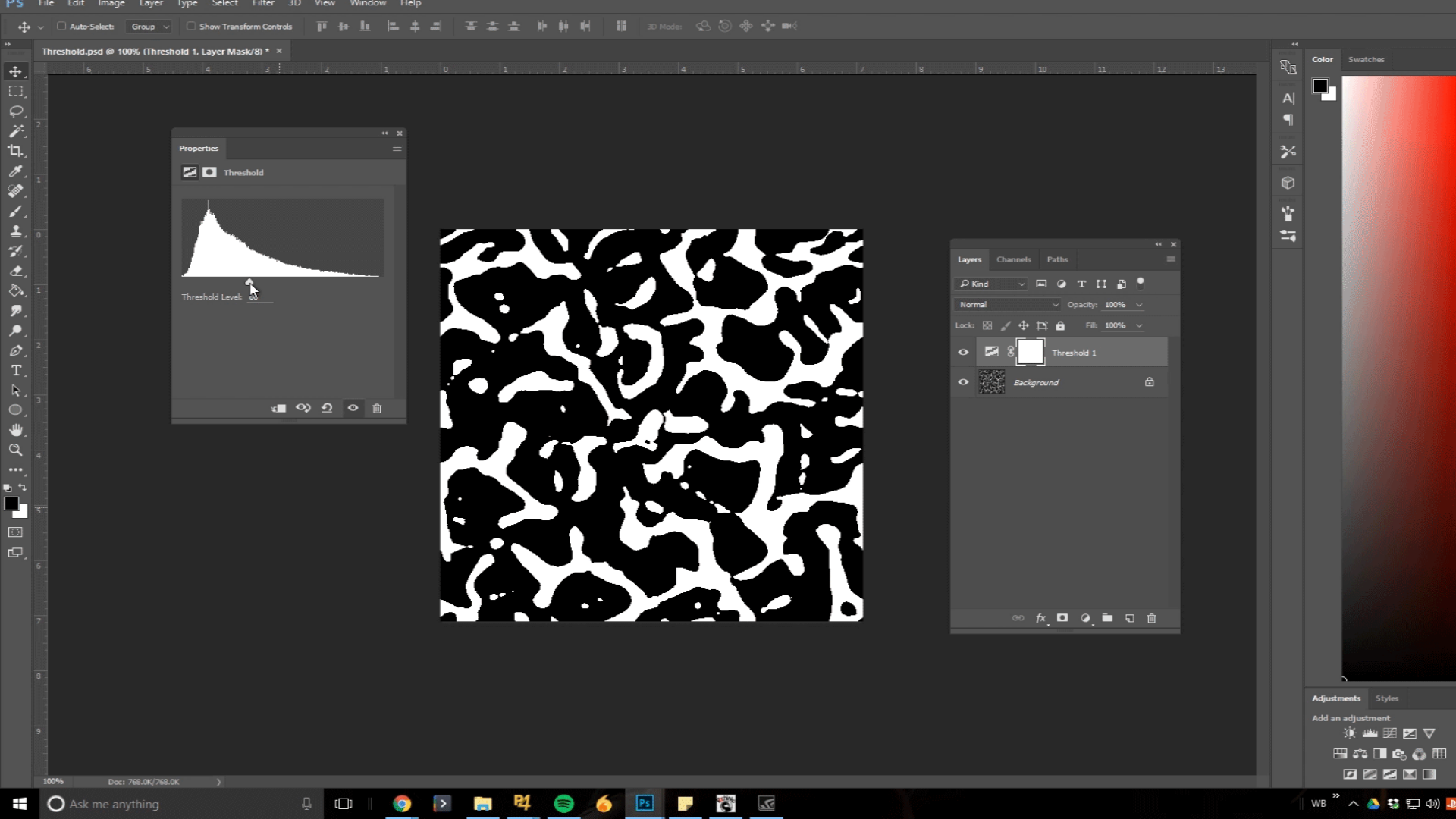
Threshold

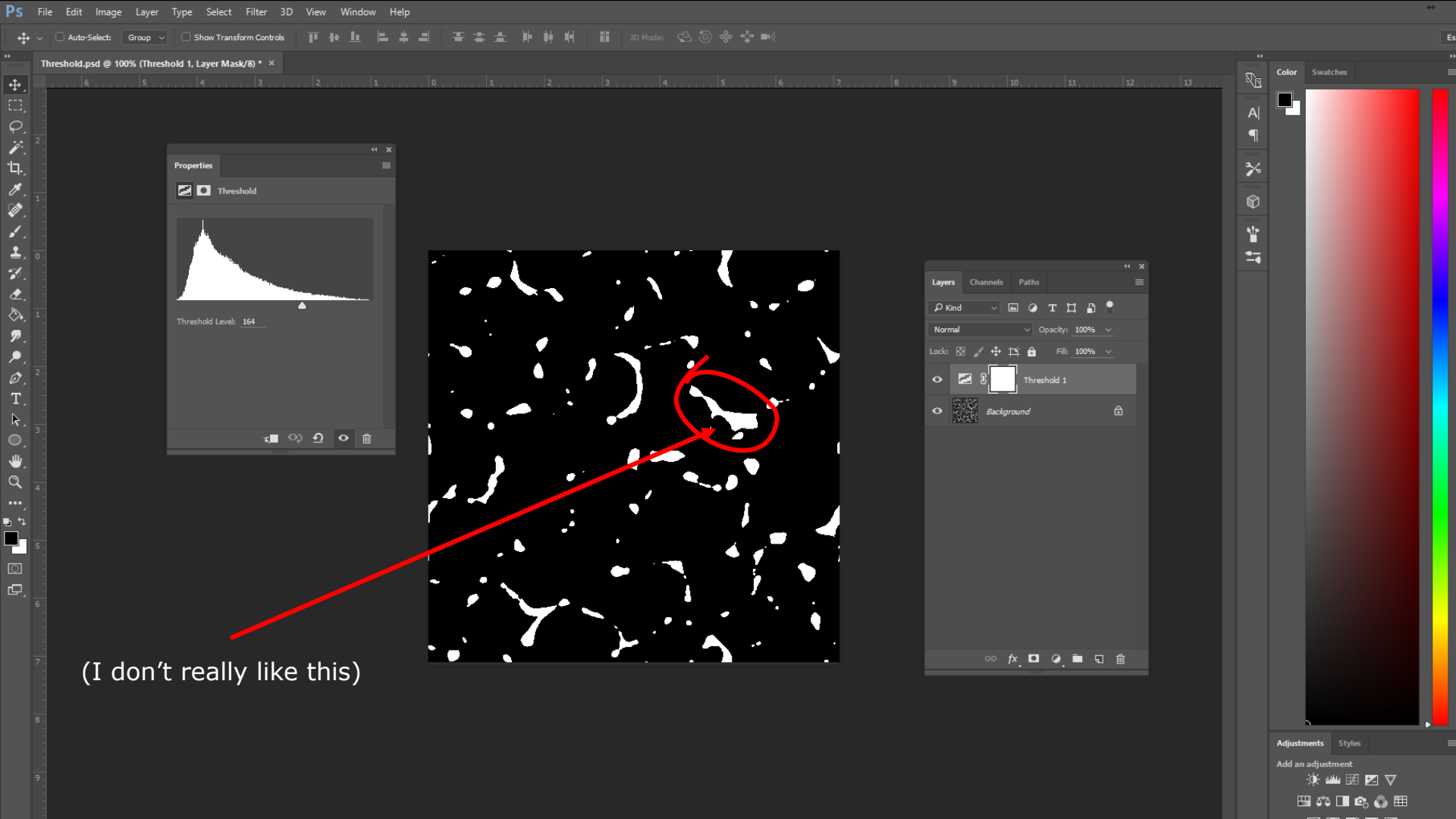


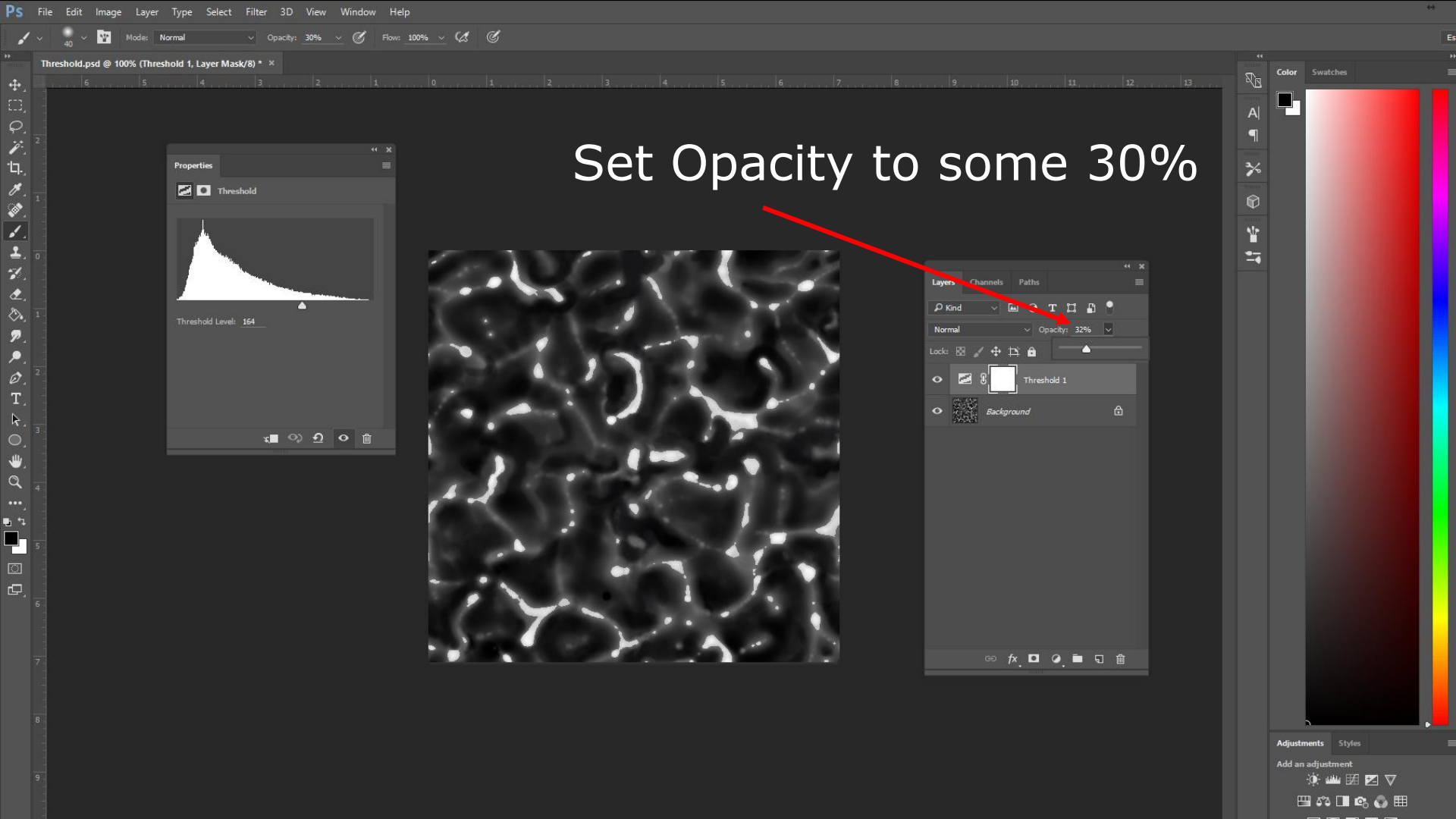
For Clip Masks!

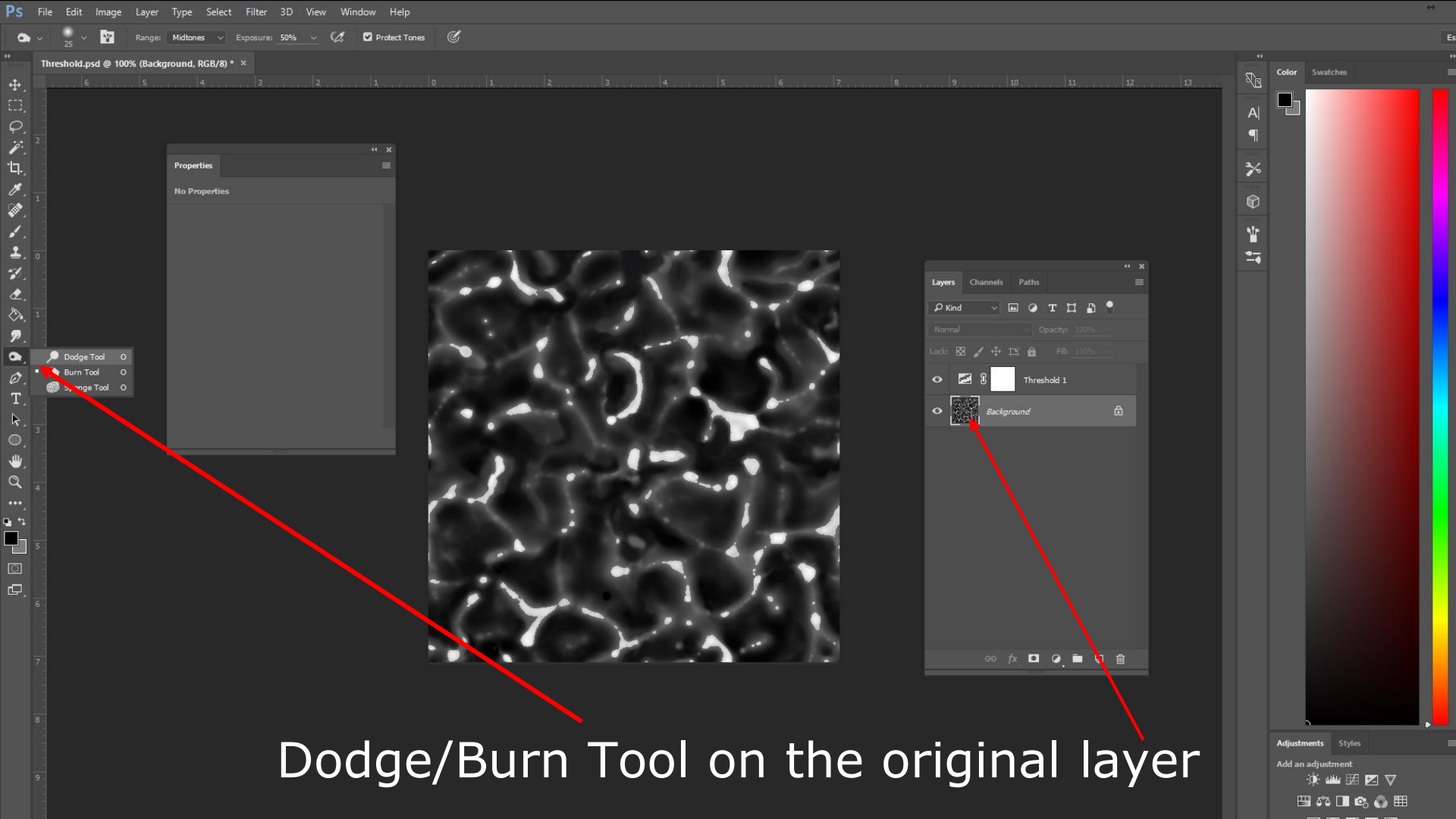

File Edit Image Layer Type Select Filter 3D View Window Help
Threshold.psd @ 100% (RGB/8)
(it looks like this)
Layers
Channels
Paths
Background
Solid Color...
Gradient...
Pattern...
Brightness/Contrast...
Levels...
Curves...
Exposure...
Vibrance...
Hue/Saturation...
Color Balance...
Black White...
Photo Filter...
Channel Mixer...
Color Lookup...
Invert
Posterize...
Threshold...
Gradient Map...
Selective Color...
Color
Swatches
Adjustments
Styles
Add an adjustment
Layers Tab > Adjustment Layer > Threshold

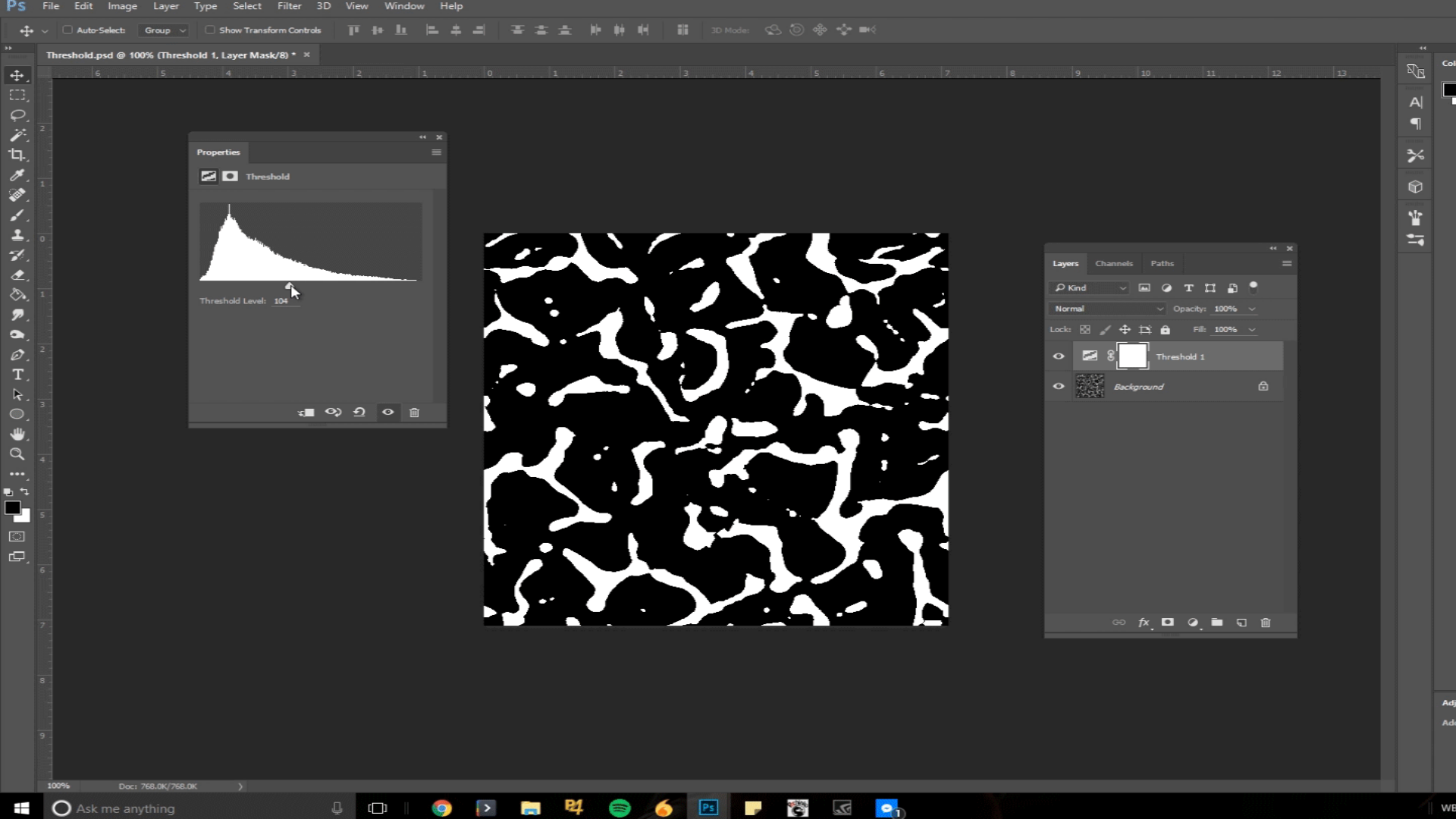

File Edit Image Layer Type Select Filter 3D View Window Help
Auto-Select: Group Show Transform Controls
Threshold.psd @ 100% (Threshold 1, Layer Mask/8) *
Properties
Threshold
Threshold Level: 128
Layers Channels Paths
Kind
Normal Opacity: 100%
Lock: Fill: 100%
Threshold 1
Background
Color Swatches
Adjustments Styles
Add an adjustment


File Edit Image Layer Type Select Filter 3D View Window Help
Auto-Select: Group Show Transform Controls
Threshold.psd @ 100% (Threshold 1, Layer Mask/8) *
Properties
Threshold
Threshold Level: 66
Layers Channels Paths
Kind
Normal Opacity: 100%
Lock: Fill: 100%
Threshold 1
Background
Color Swatches
Adjustments Styles
Add an adjustment
100% Doc: 768.0K/768.0K
Ask me anything

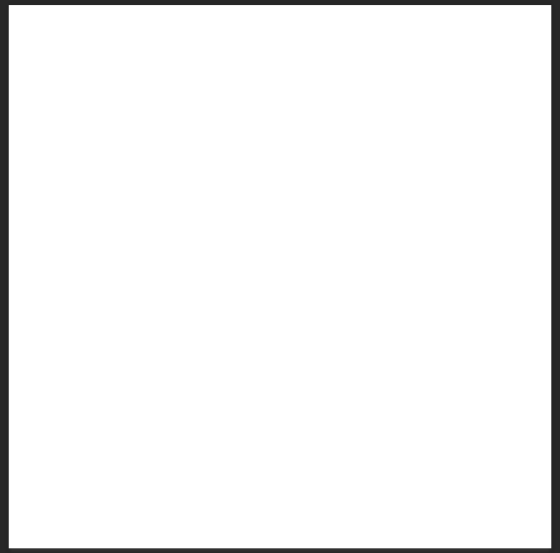

File Edit Image Layer Type Select Filter 3D View Window Help
Threshold.psd @ 100% (Threshold 1, Layer Mask/8) *
Properties
Threshold
Threshold Level: 164
Layers
Channels
Paths
Normal
Opacity: 100%
Fill: 100%
Threshold 1
Background
Color
Swatches
Adjustments
Styles
Add an adjustment
(I don’t really like this)

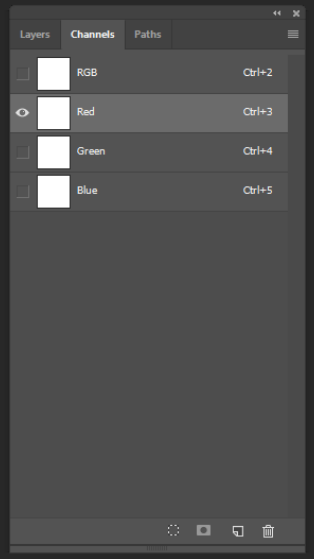

File Edit Image Layer Type Select Filter 3D View Window Help
Threshold.psd @ 100% (Threshold 1, Layer Mask/8) *
Properties
Threshold
Threshold Level: 164
Set Opacity to some 30%
Layers Channels Paths
Kind
Normal
Opacity: 32%
Lock:
Threshold 1
Background
Color Swatches
Adjustments Styles
Add an adjustment


File Edit Image Layer Type Select Filter 3D View Window Help
Range: Midtones
Exposure: 50%
Protect Tones
Threshold.psd @ 100% (Background, RGB/8) *
Properties
No Properties
Dodge Tool O
Burn Tool O
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Fill: 100%
Threshold 1
Background
Color
Swatches
Adjustments
Styles
Add an adjustment
Dodge/Burn Tool on the original layer


File Edit Image Layer Type Select Filter 3D View Window Help
Threshold.psd @ 100% (Threshold 1, Layer Mask/8) *
Properties
Threshold
Threshold Level: 104
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Threshold 1
Background
100%
Doc: 768.0K/768.0K
Ask me anything

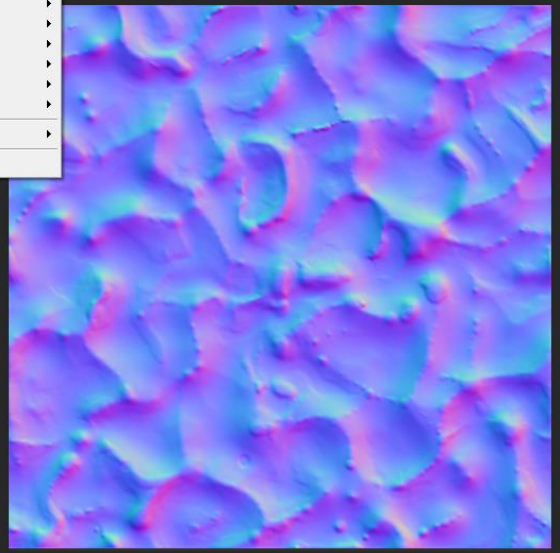
Emboss and Find Edges





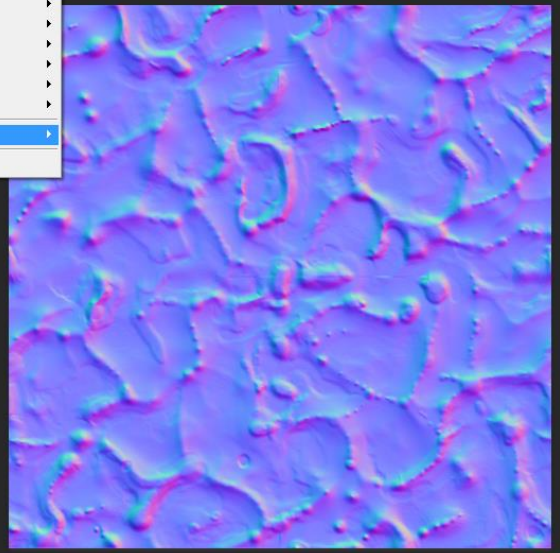
For Normal Maps!

Photoshop

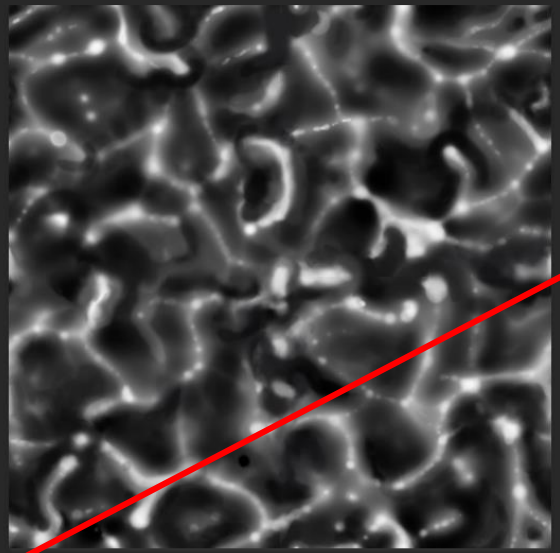


Filter > 3D > “Generate Normal Map…”

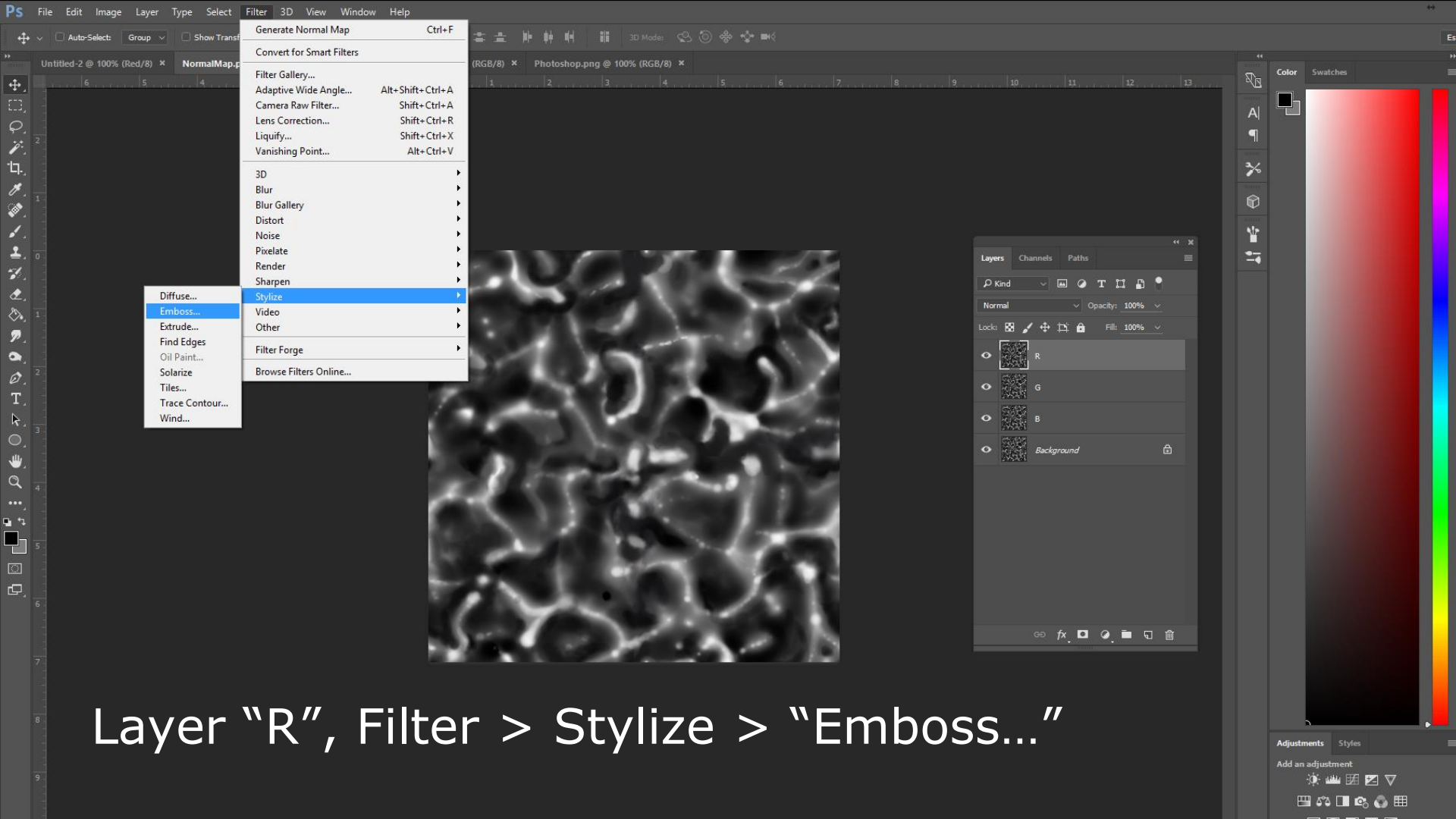
Filter Forge

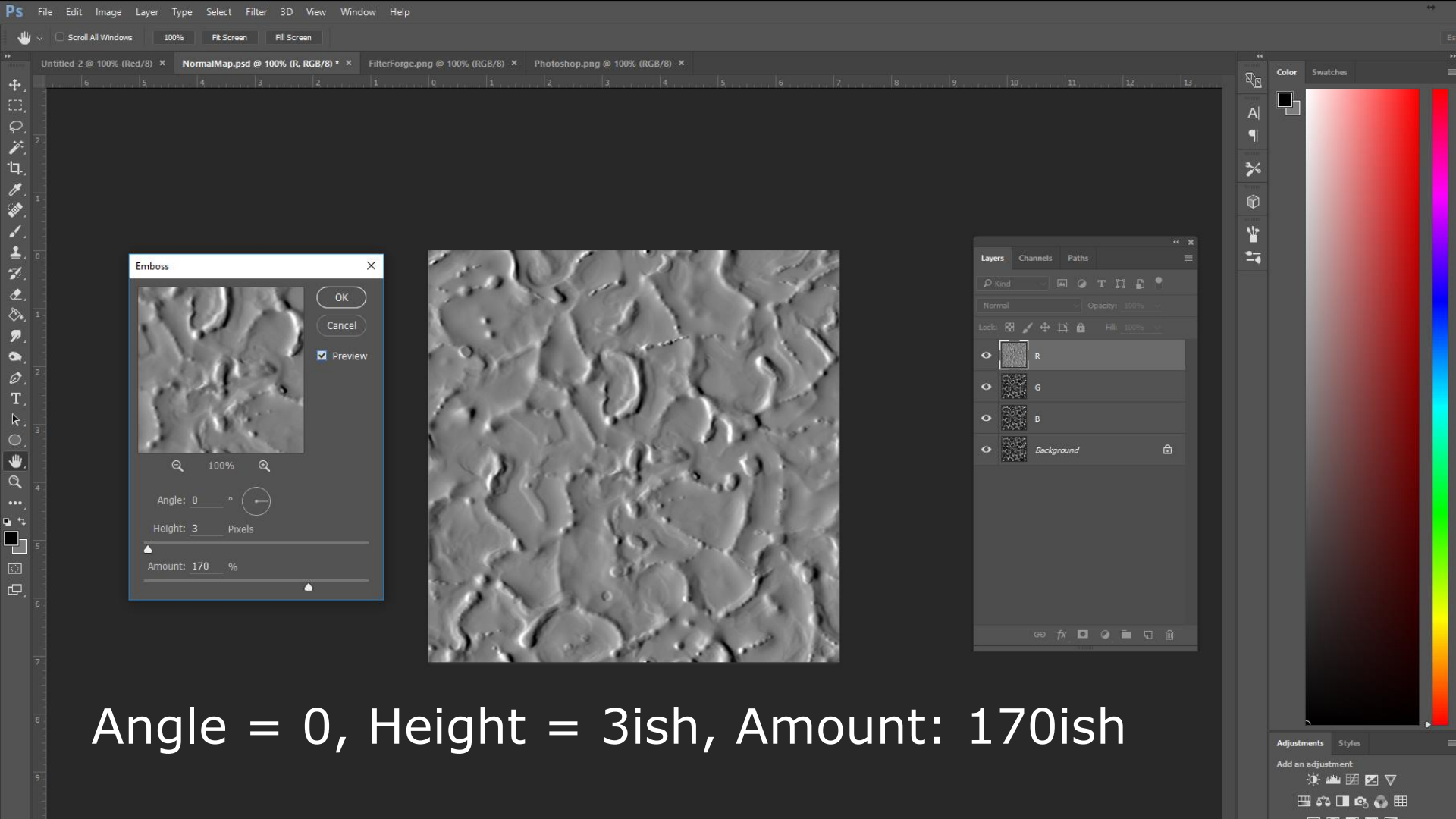


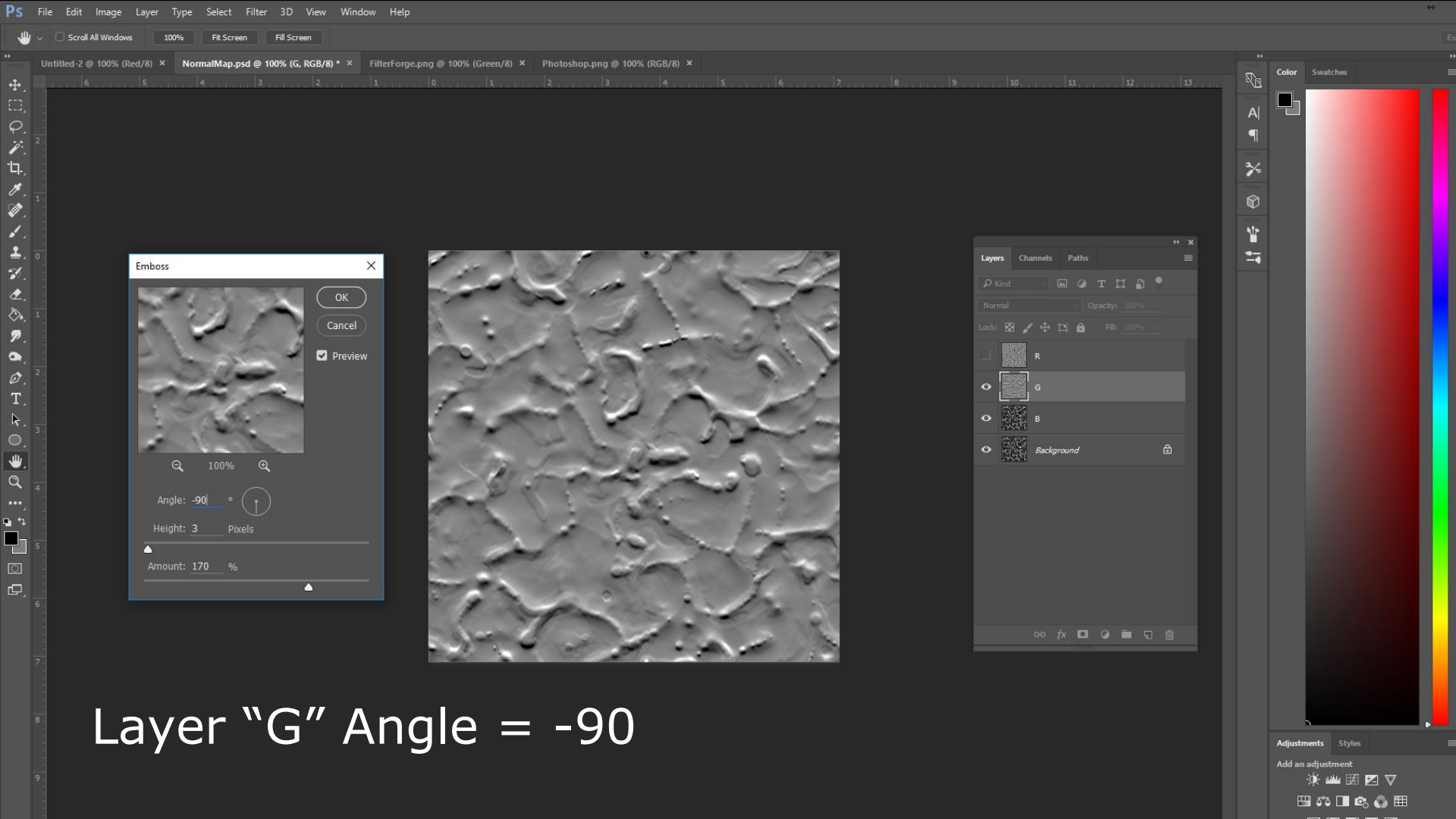
Filter > Filter Forge > “Filter Forge 5…”



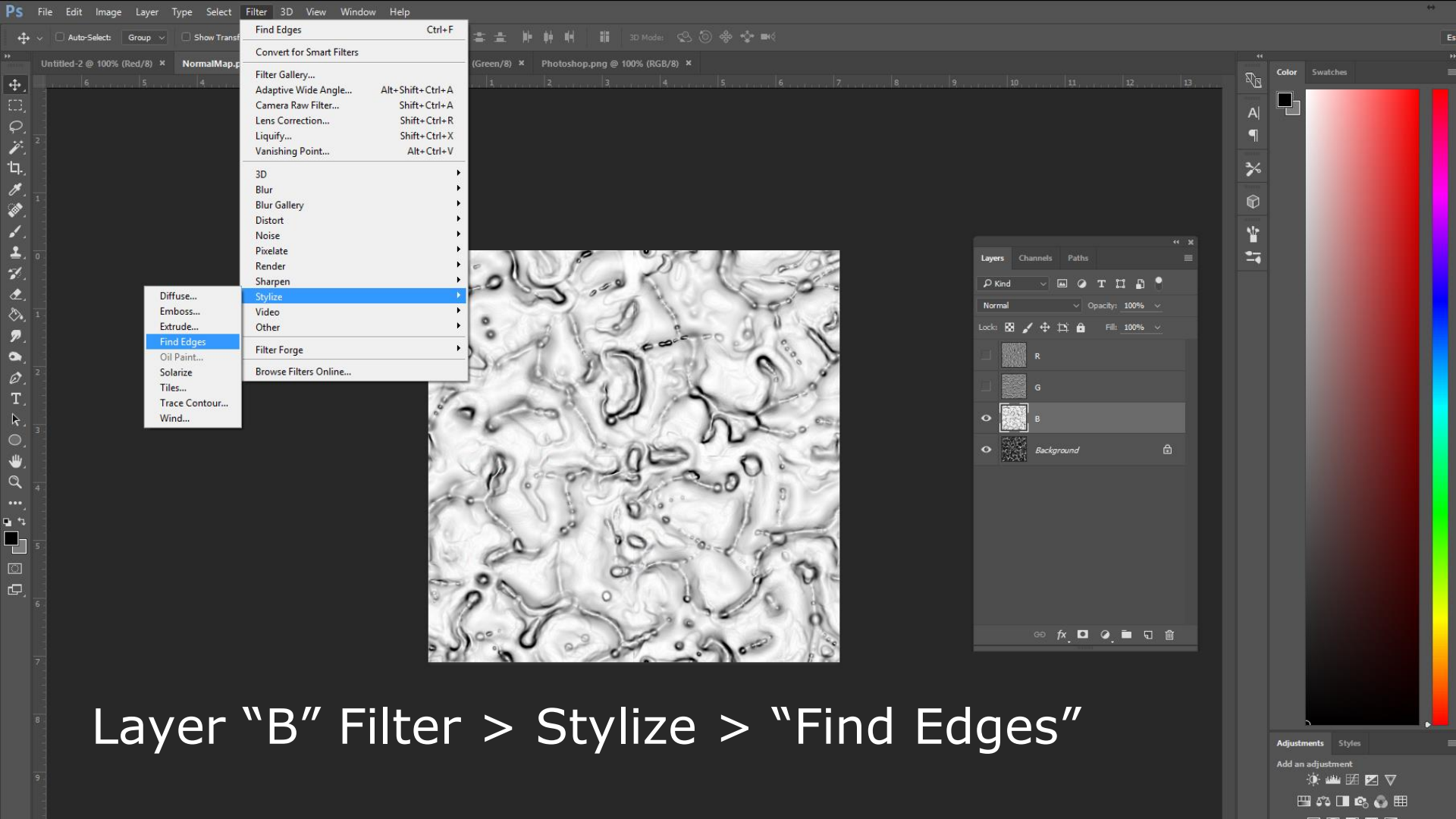
Make Three Layers: “R” “G” and “B”


File Edit Image Layer Type Select Filter 3D View Window Help
Generate Normal Map Ctrl+F
Convert for Smart Filters
Filter Gallery...
Adaptive Wide Angle... Alt+Shift+Ctrl+A
Camera Raw Filter... Shift+Ctrl+A
Lens Correction... Shift+Ctrl+R
Liquify... Shift+Ctrl+X
Vanishing Point... Alt+Ctrl+V
3D
Blur
Blur Gallery
Distort
Noise
Pixelate
Render
Sharpen
Stylize
Video
Other
Filter Forge
Browse Filters Online...
Diffuse...
Emboss...
Extrude...
Find Edges
Oil Paint...
Solarize
Tiles...
Trace Contour...
Wind...
Layers
Channels
Paths
R
G
B
Background
Color
Swatches
Adjustments
Styles
Add an adjustment
Layer “R”, Filter > Stylize > “Emboss...”


File Edit Image Layer Type Select Filter 3D View Window Help
Scroll All Windows
100%
Fit Screen
Fill Screen
Untitled-2 @ 100% (Red/8)
NormalMap.psd @ 100% (R, RGB/8) *
FilterForge.png @ 100% (RGB/8)
Photoshop.png @ 100% (RGB/8)
Emboss
OK
Cancel
Preview
100%
Angle: 0 °
Height: 3 Pixels
Amount: 170 %
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
R
G
B
Background
Color
Swatches
Adjustments
Styles
Add an adjustment
Angle = 0, Height = 3ish, Amount: 170ish



Layer “G” Angle = -90



Layer “B” Filter > Stylize > “Find Edges”

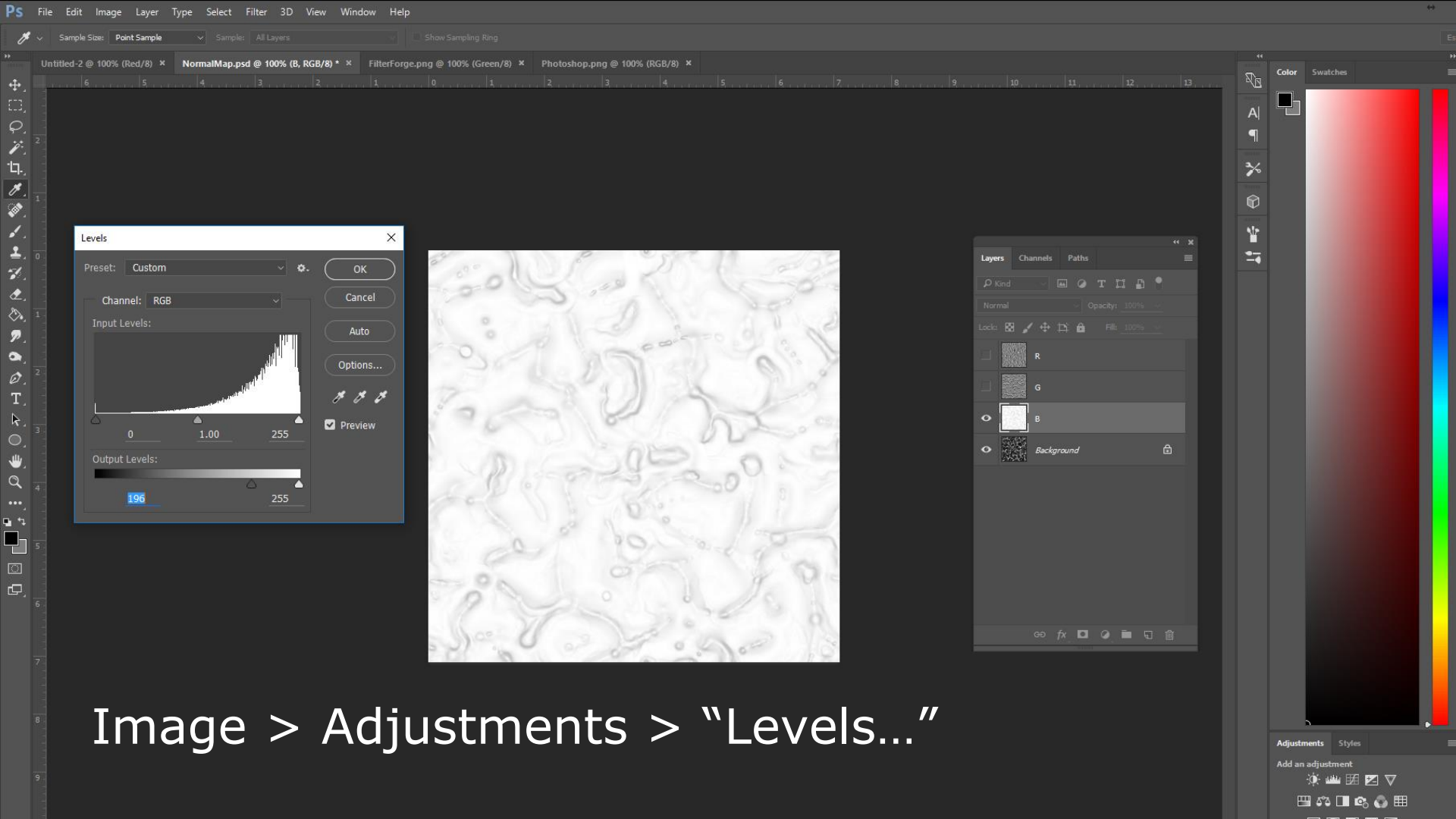
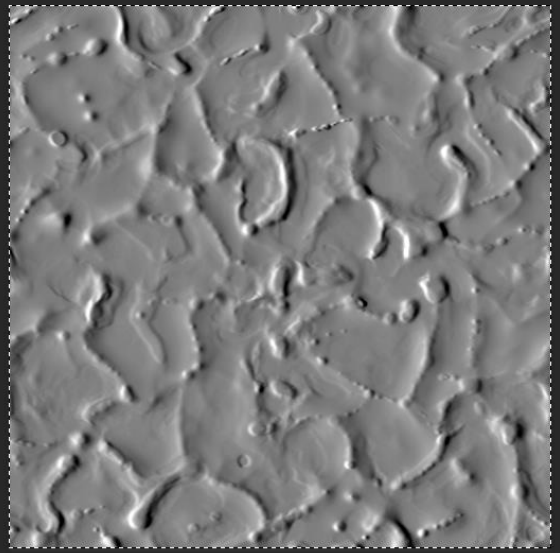


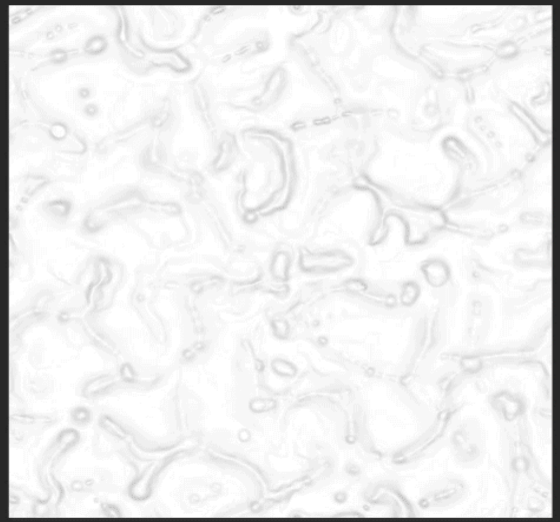
Image > Adjustments > “Levels…”

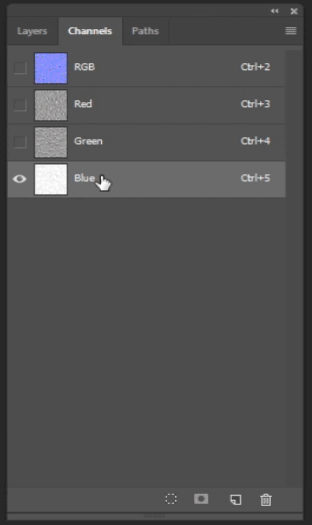


Copy “R” Layer and Paste in *Red CHANNEL

(*of the new, empty document)

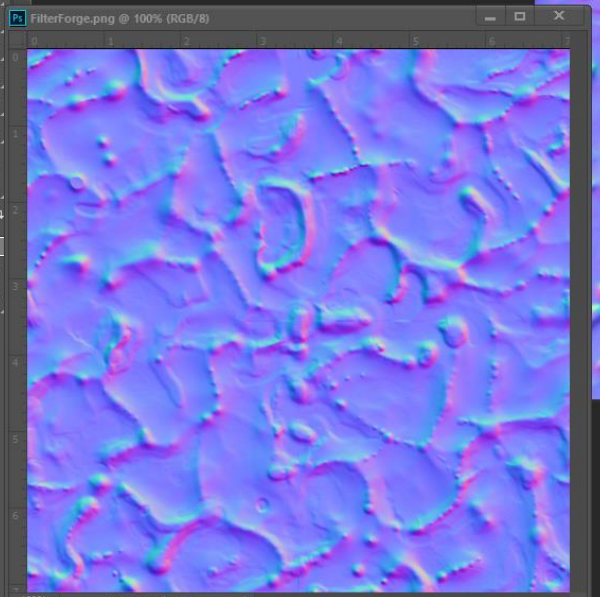
Do the same for “G” Layer and G Channel

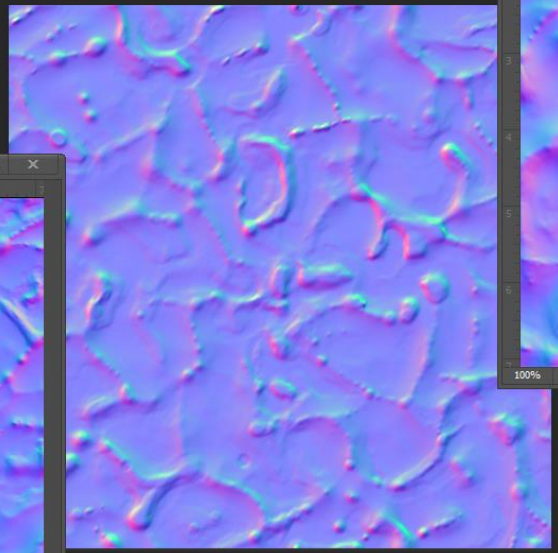


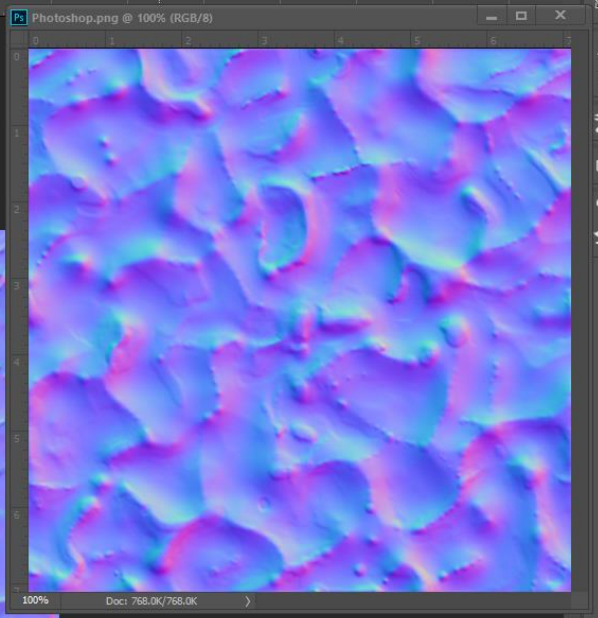


… and for “B” Layer and B Channel

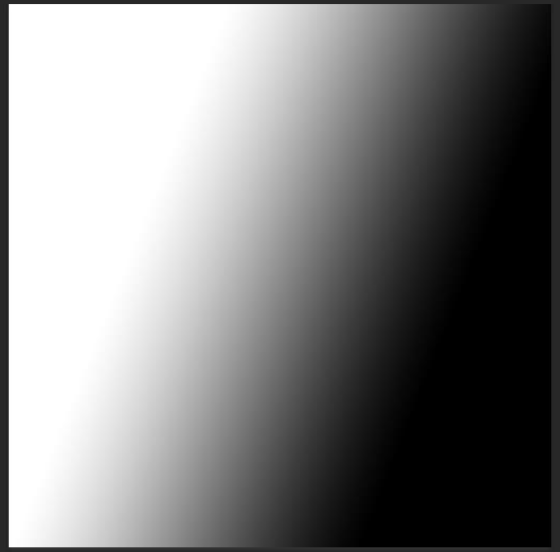
For comparison:

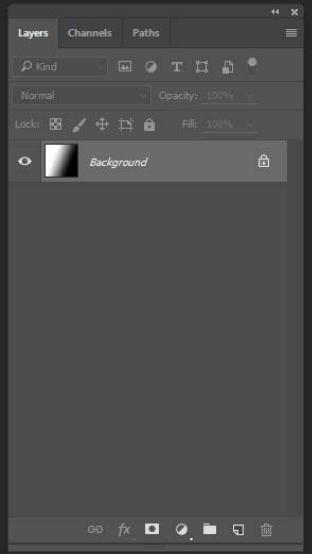




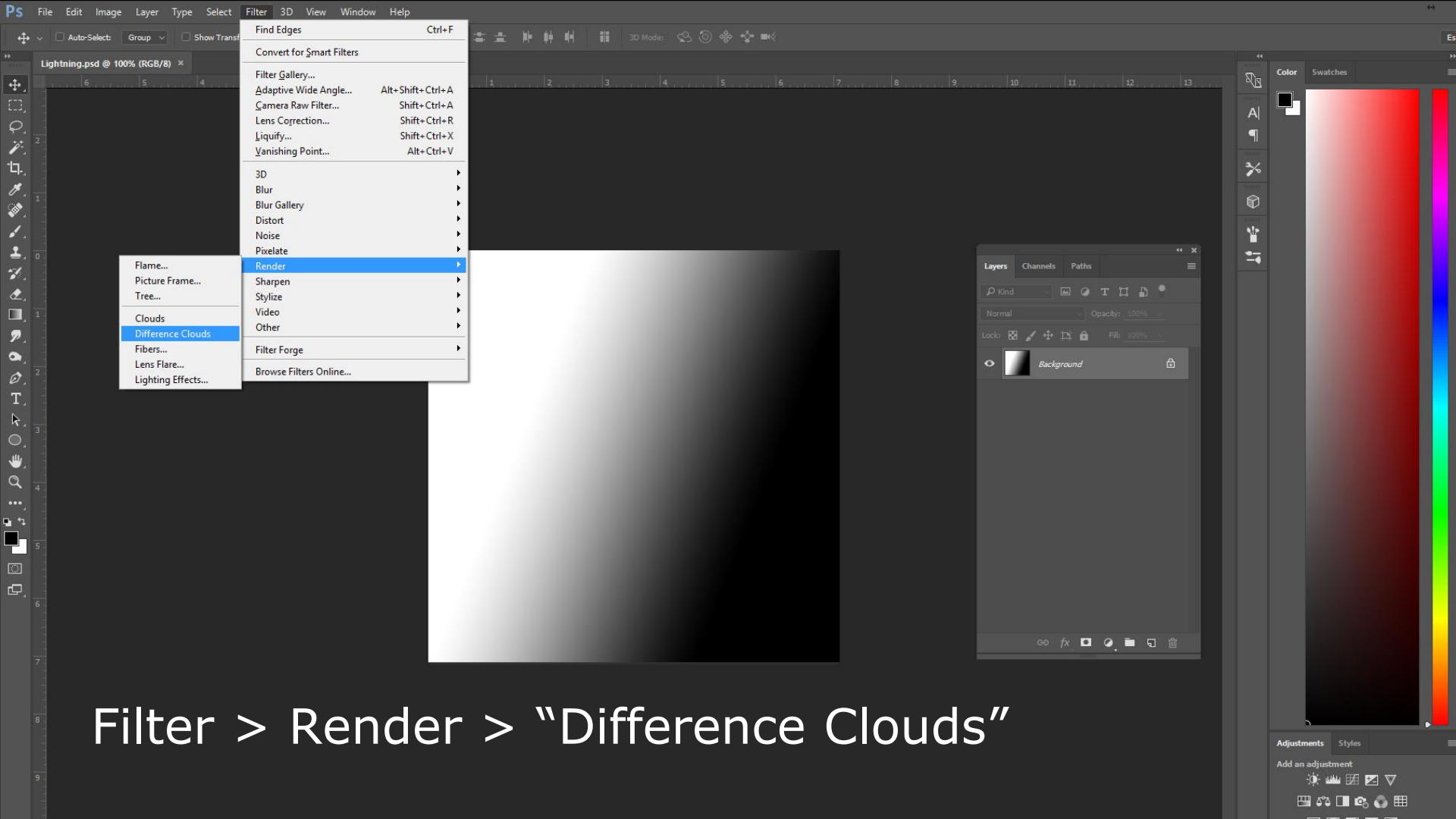


Difference Clouds

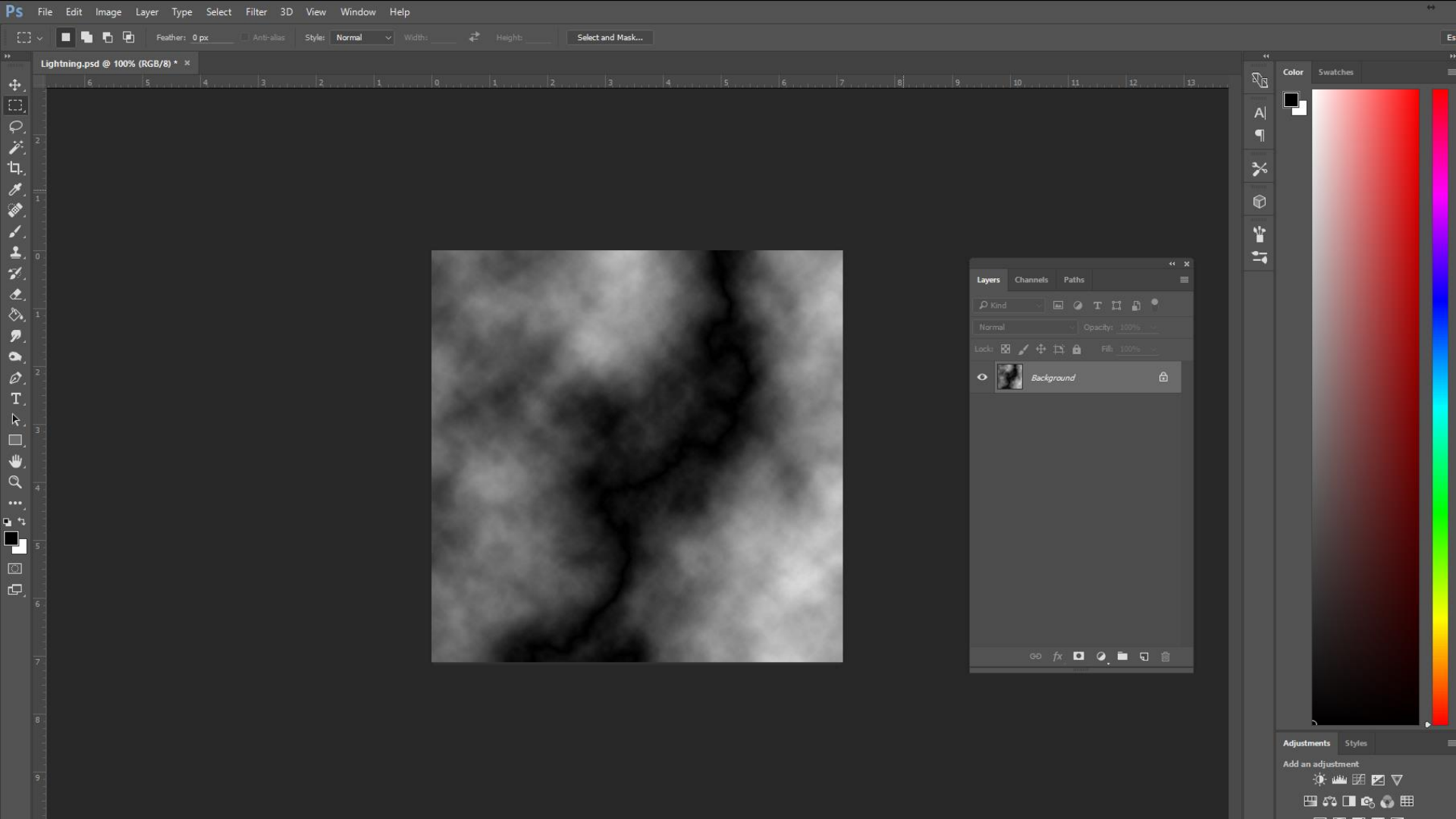




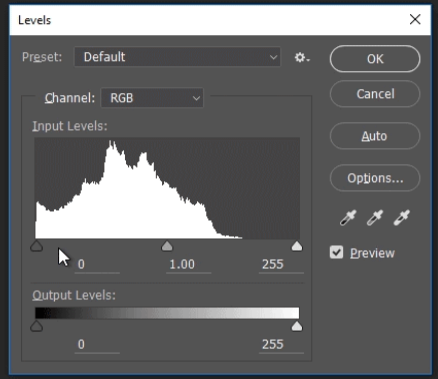
For Easy Lightning!

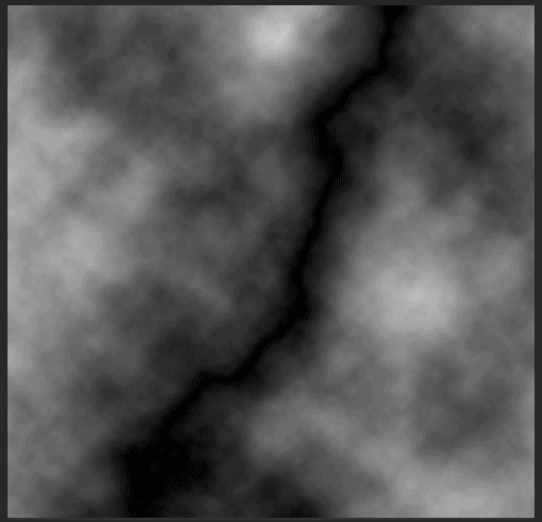


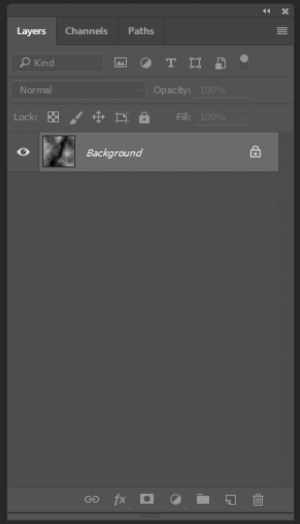
Filter > Render > “Difference Clouds”


File Edit Image Layer Type Select Filter 3D View Window Help
Feather: 0 px
Anti-alias
Style: Normal
Width:
Height:
Select and Mask...
Lightning.psd @ 100% (RGB/8) *
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Background
Color
Swatches
Adjustments
Styles
Add an adjustment

Levels Adjustment

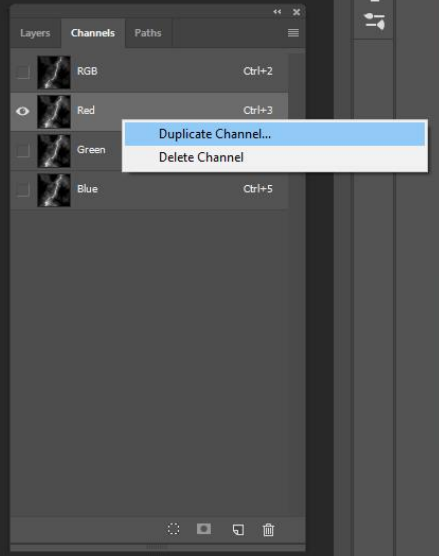




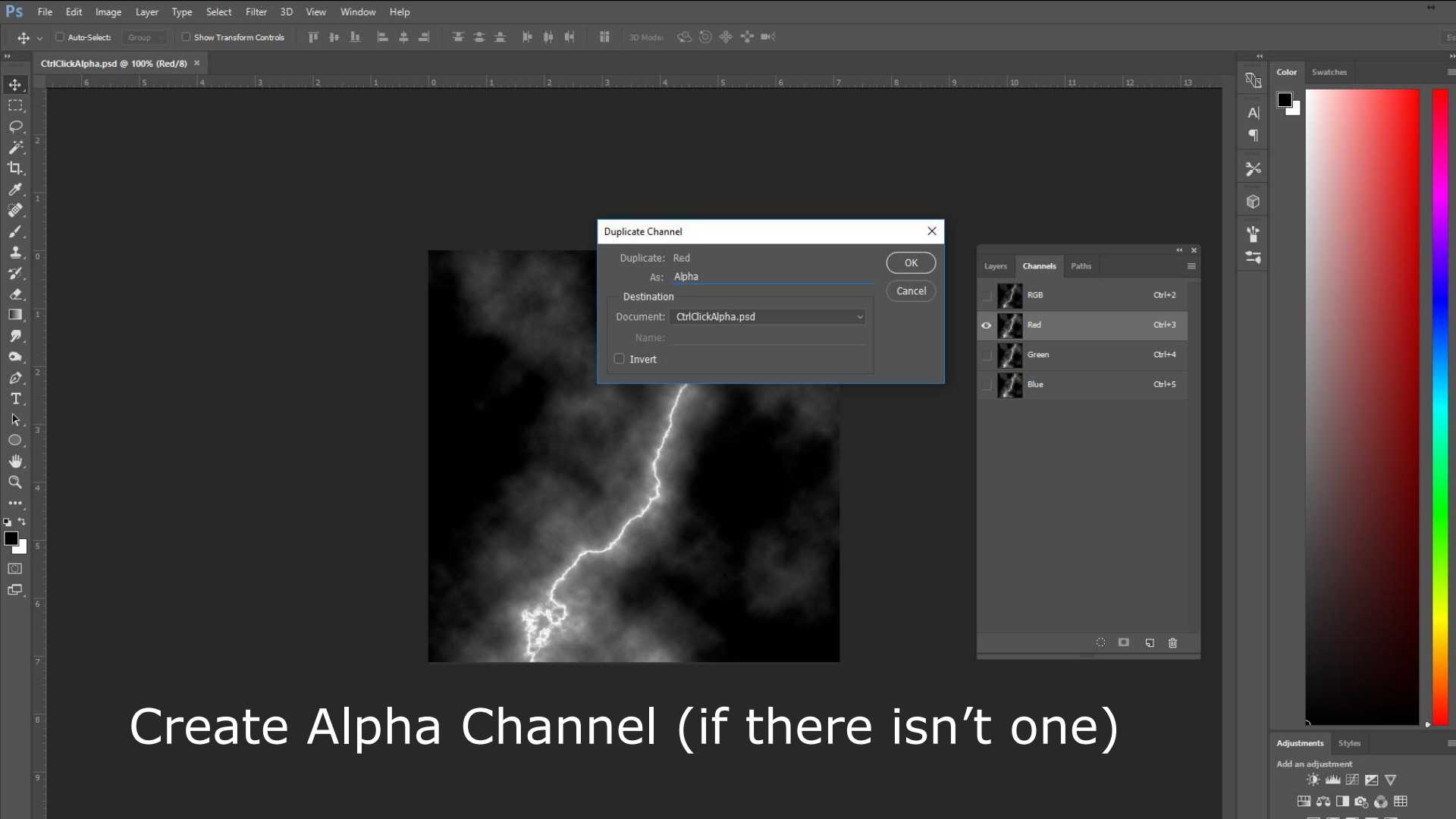


Done

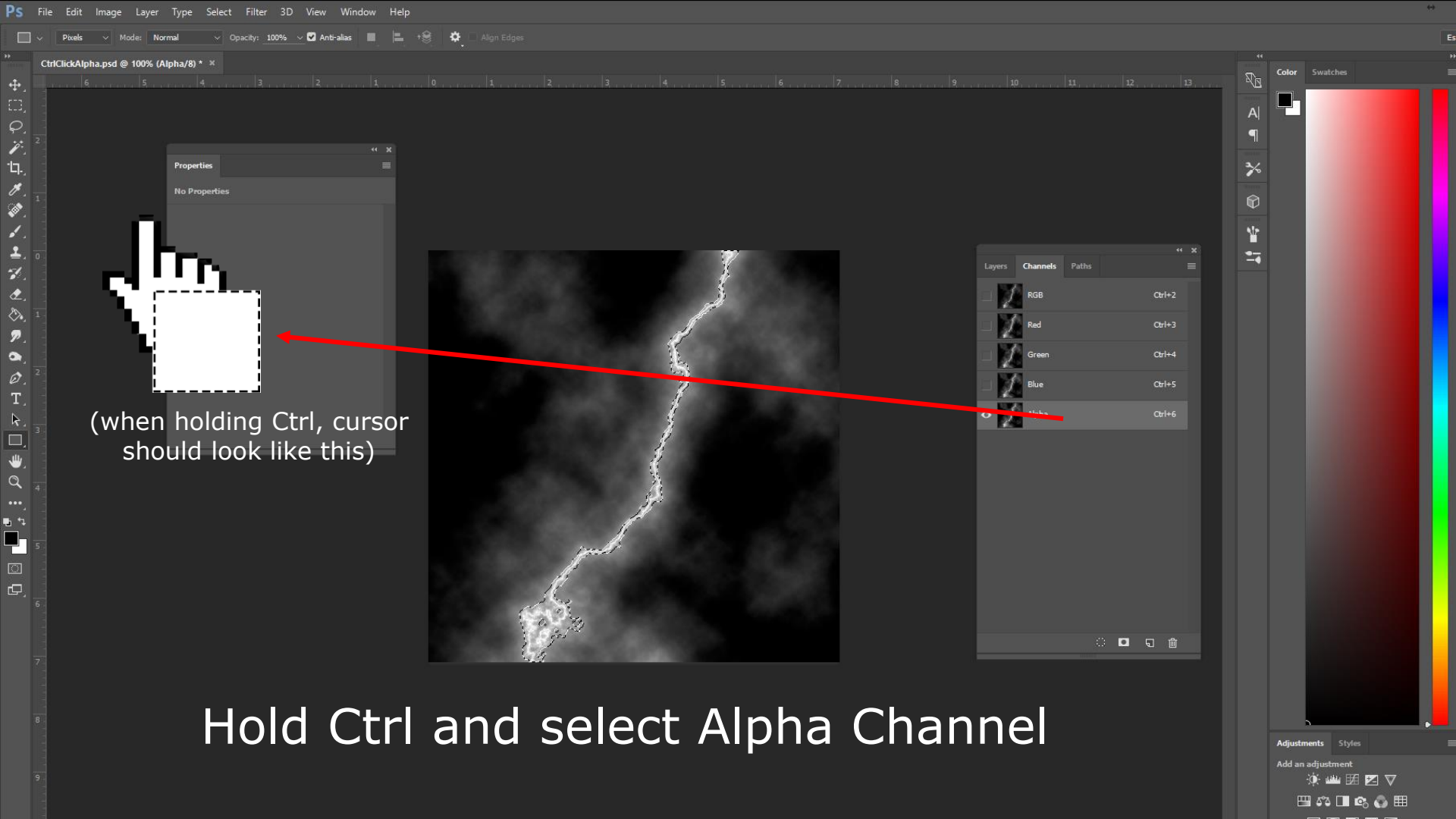
Ctrl + Click Alpha



For Extracting Whites from Flattened Image!

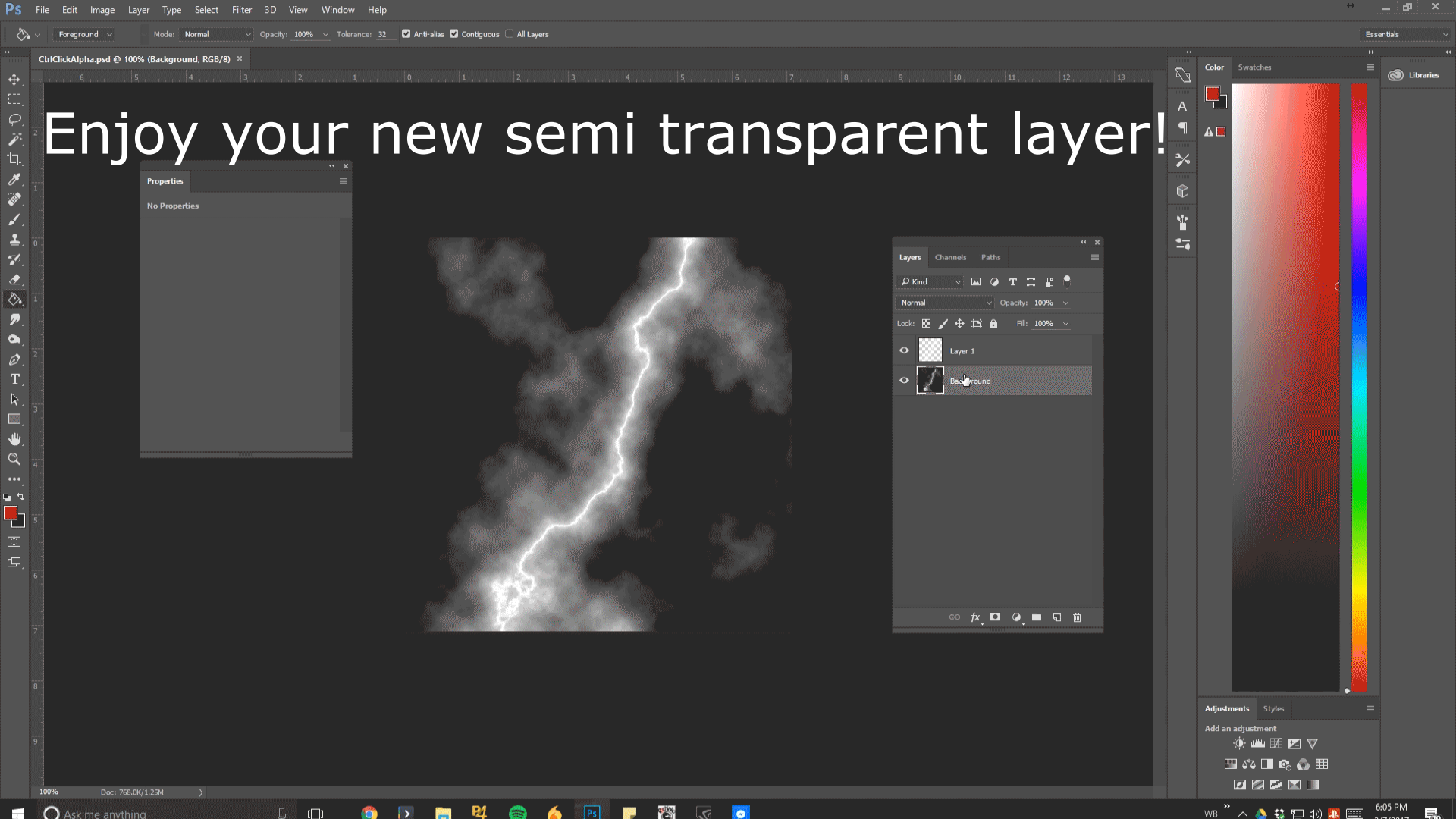


Create Alpha Channel (if there isn’t one)

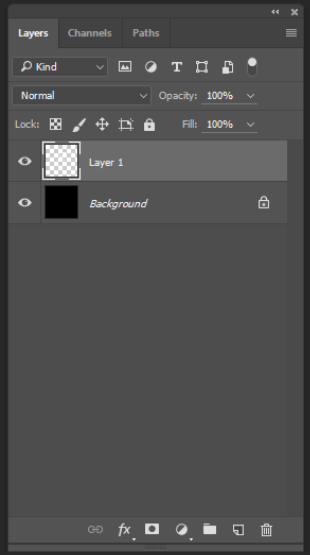

File Edit Image Layer Type Select Filter 3D View Window Help
CtrlClickAlpha.psd @ 100% (Alpha/8) *
Properties
No Properties
(when holding Ctrl, cursor should look like this)
Layers Channels Paths
RGB Ctrl+2
Red Ctrl+3
Green Ctrl+4
Blue Ctrl+5
Ctrl+6
Color Swatches
Adjustments Styles
Add an adjustment
Hold Ctrl and select Alpha Channel

Click on RGB, then Create a New Layer

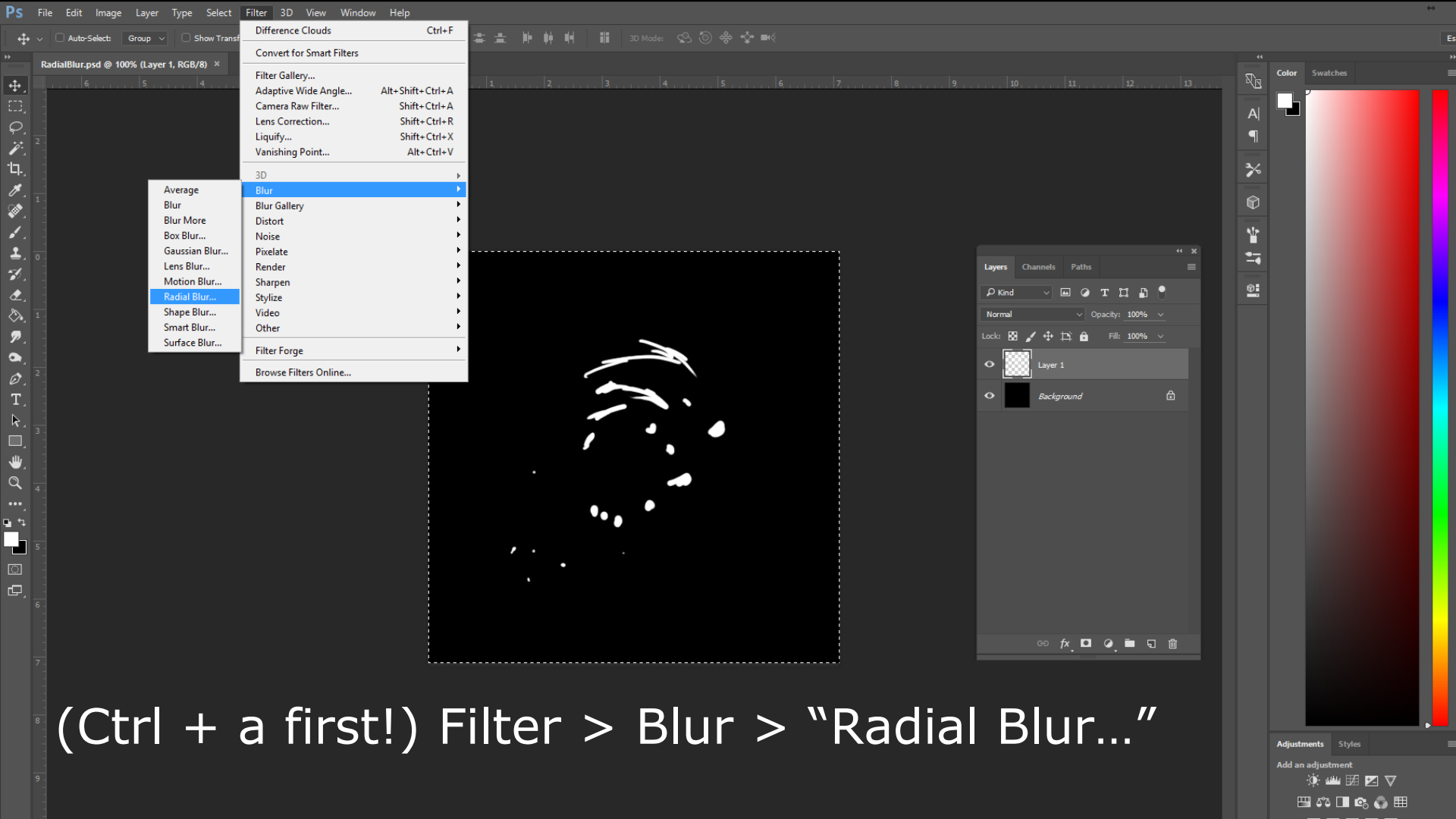
Fill Selection with the Paint Bucket Tool

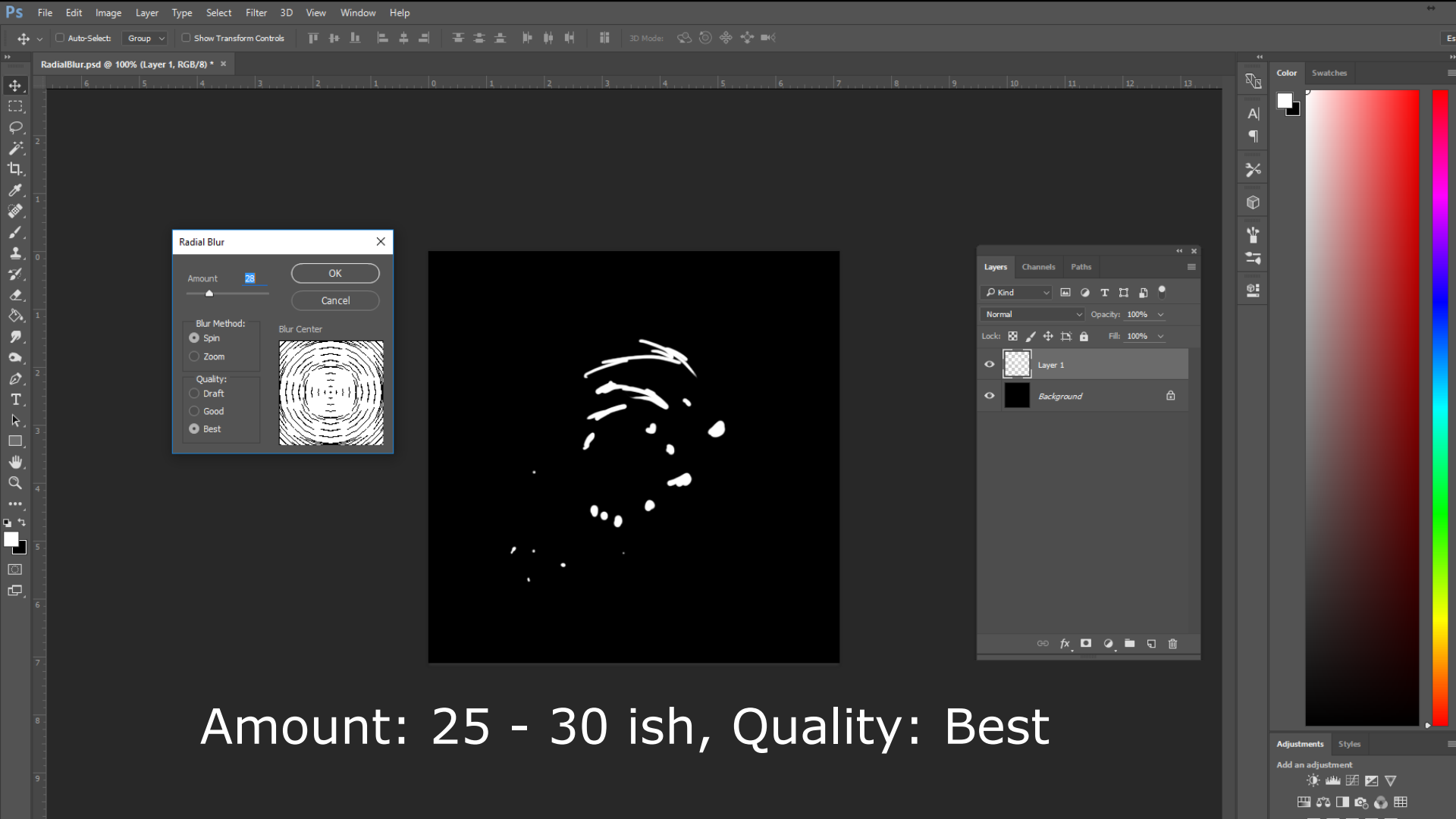

Enjoy your new semi transparent layer!
File Edit Image Layer Type Select Filter 3D View Window Help
Foreground
Mode: Normal
Opacity: 100%
Tolerance: 32
Anti-alias
Contiguous
All Layers
Essentials
CtrlClickAlpha.psd @ 100% (Background, RGB/8)
Properties
No Properties
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Layer 1
Background
Color
Swatches
Libraries
Adjustments
Styles
Add an adjustment
100%
Doc: 768.0K/1.25M
Ask me anything
WB
6:05 PM

Radial Blur



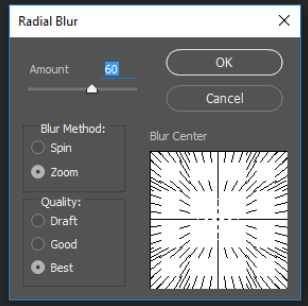
For ripples and scorch marks!

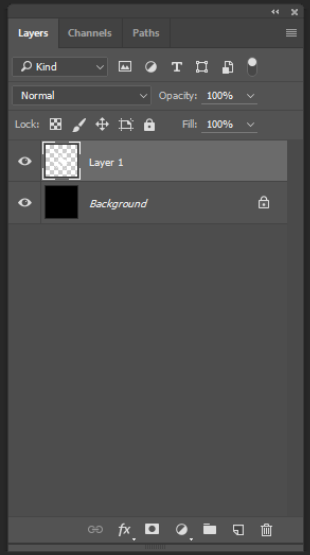

File Edit Image Layer Type Select Filter 3D View Window Help
Difference Clouds Ctrl+F
Convert for Smart Filters
Filter Gallery...
Adaptive Wide Angle... Alt+Shift+Ctrl+A
Camera Raw Filter... Shift+Ctrl+A
Lens Correction... Shift+Ctrl+R
Liquify... Shift+Ctrl+X
Vanishing Point... Alt+Ctrl+V
3D
Blur
Blur Gallery
Distort
Noise
Pixelate
Render
Sharpen
Stylize
Video
Other
Filter Forge
Browse Filters Online...
Average
Blur
Blur More
Box Blur...
Gaussian Blur...
Lens Blur...
Motion Blur...
Radial Blur...
Shape Blur...
Smart Blur...
Surface Blur...
RadialBlur.psd @ 100% (Layer 1, RGB/8)
Layers
Channels
Paths
Layer 1
Background
Color
Swatches
Adjustments
Styles
(Ctrl + a first!) Filter > Blur > “Radial Blur...”


File Edit Image Layer Type Select Filter 3D View Window Help
RadialBlur.psd @ 100% (Layer 1, RGB/8) *
Radial Blur
Amount 28
OK
Cancel
Blur Method:
Spin
Zoom
Quality:
Draft
Good
Best
Blur Center
Layers
Channels
Paths
Normal
Opacity: 100%
Fill: 100%
Layer 1
Background
Color
Swatches
Adjustments
Styles
Add an adjustment
Amount: 25 - 30 ish, Quality: Best

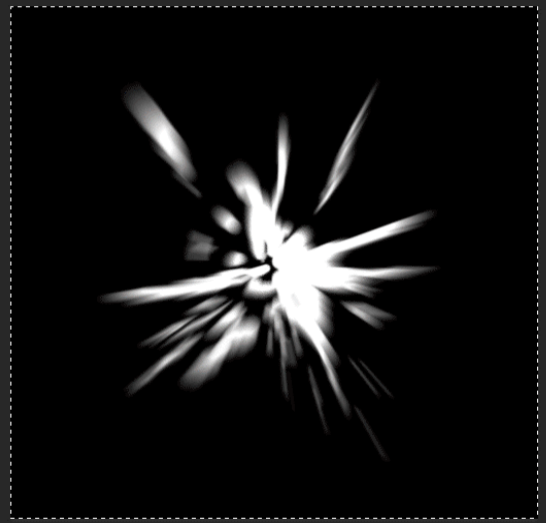
Ctrl + f, Ctrl + f, Ctrl + f

Same technique for scorches except:



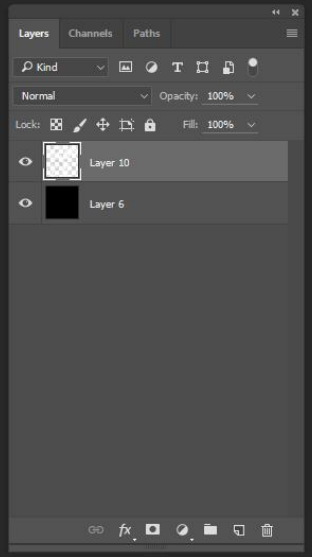


Amount: 60ish, Blur Method: Zoom

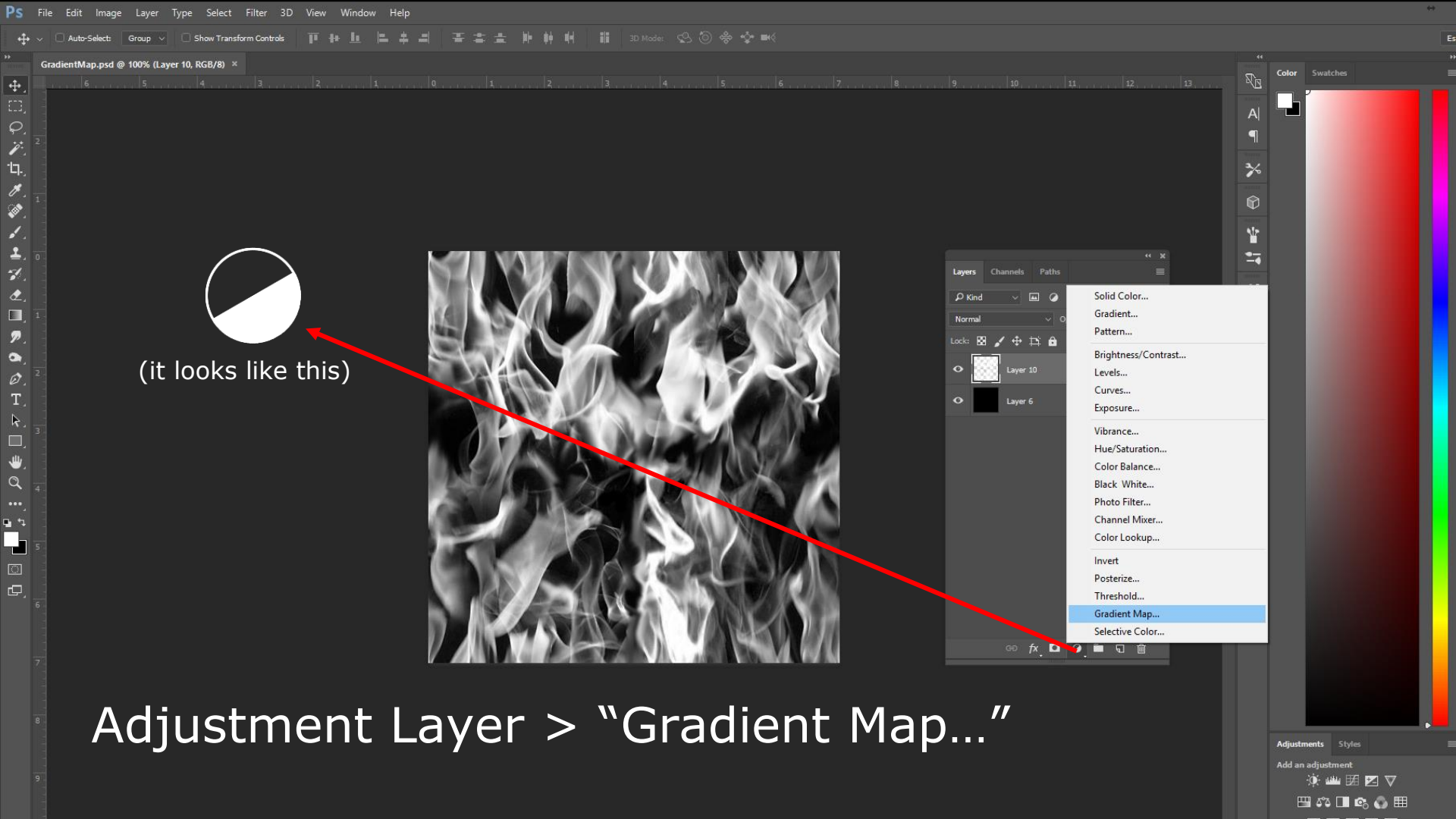


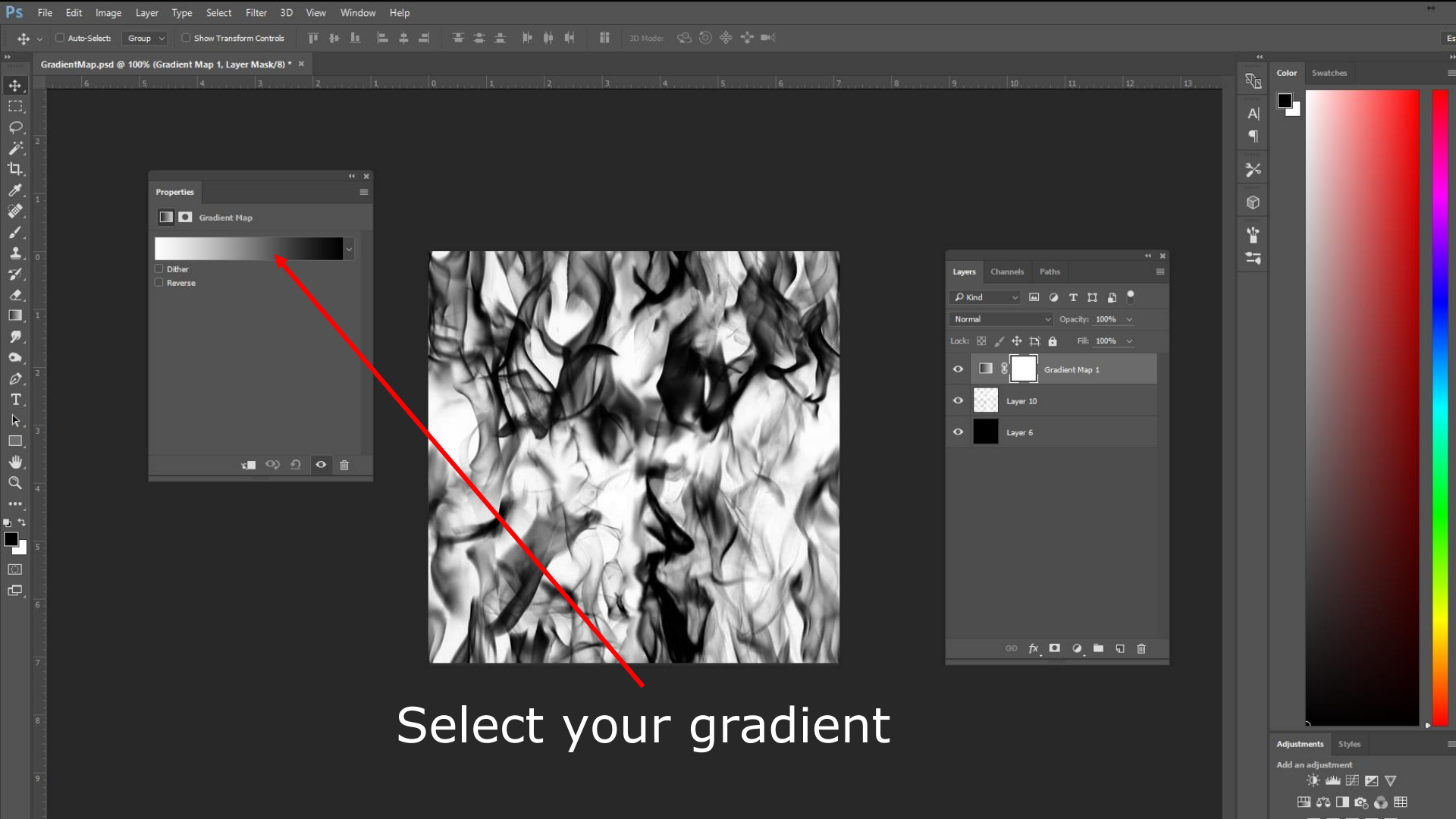
Ctrl + f, Ctrl + f, Ctrl + f

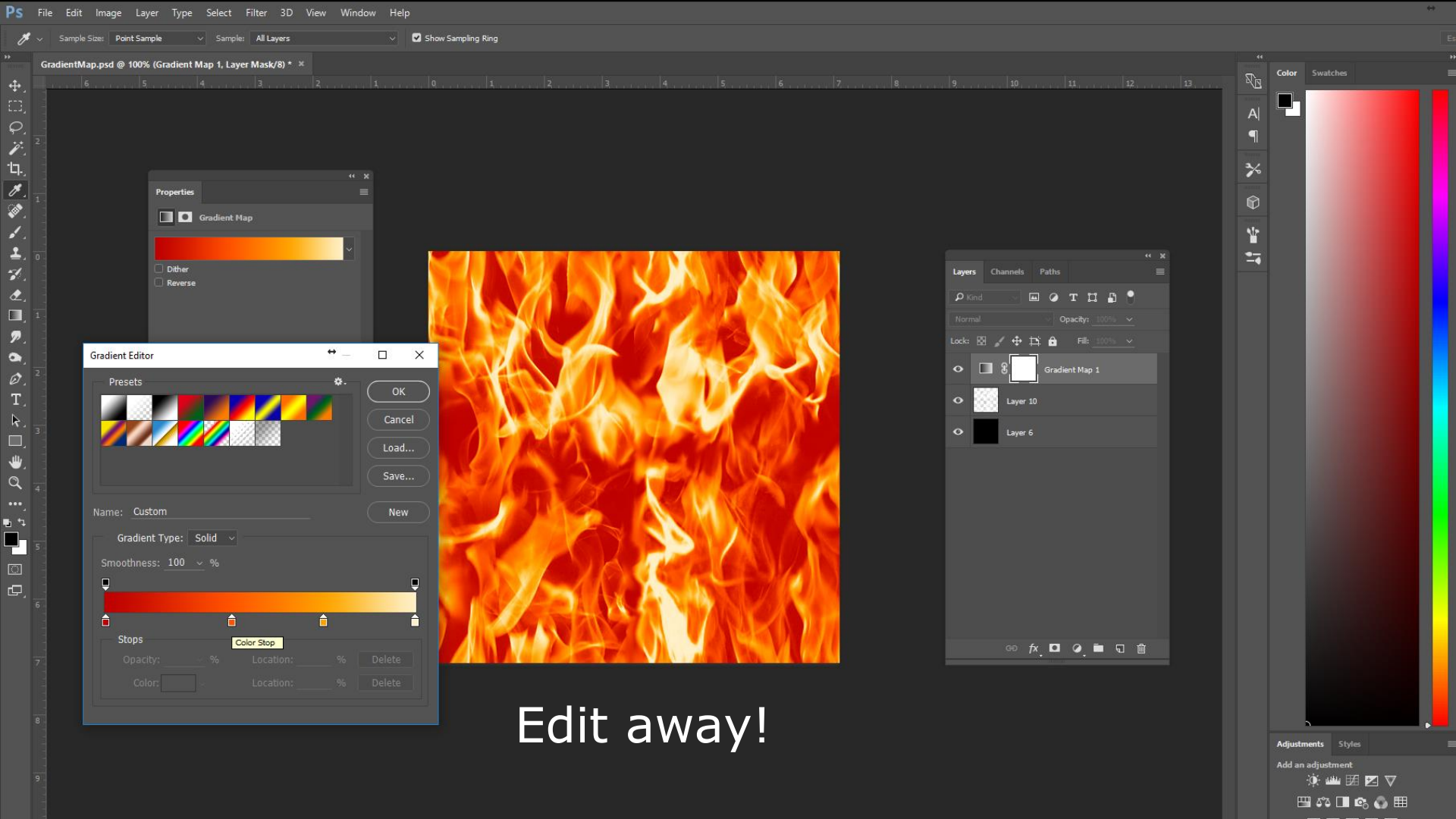
Gradient Map

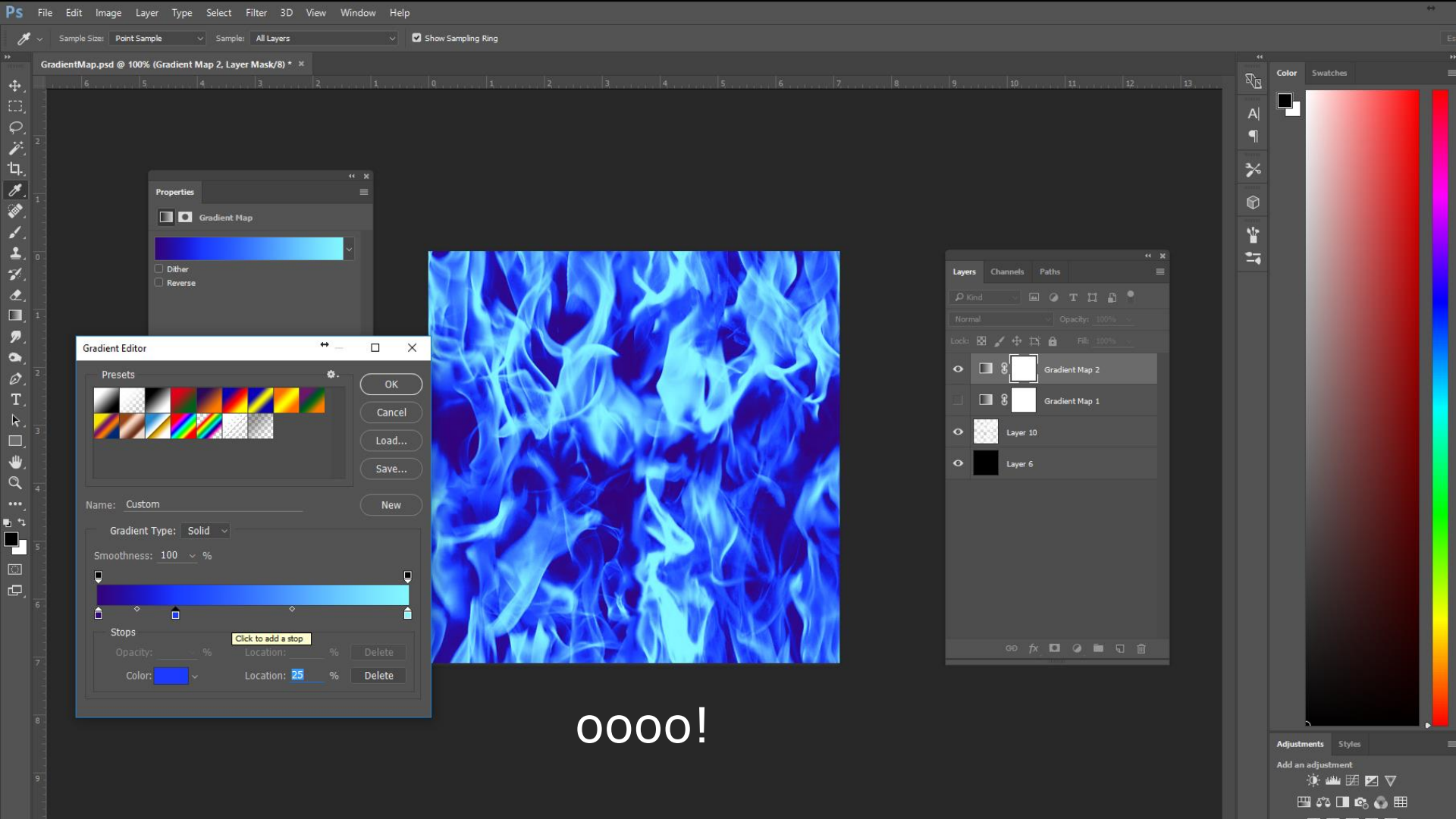


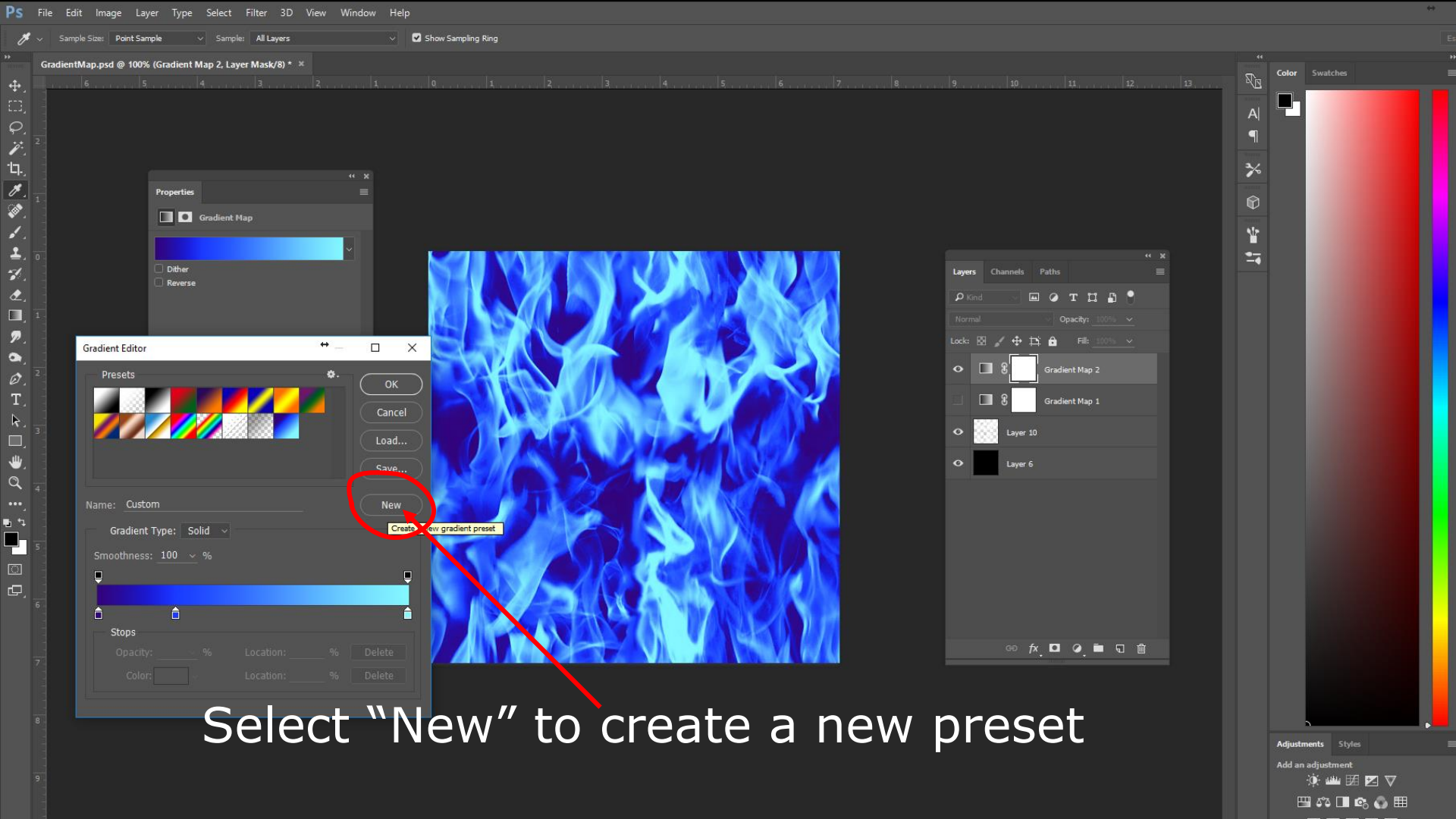
For look-up tables!

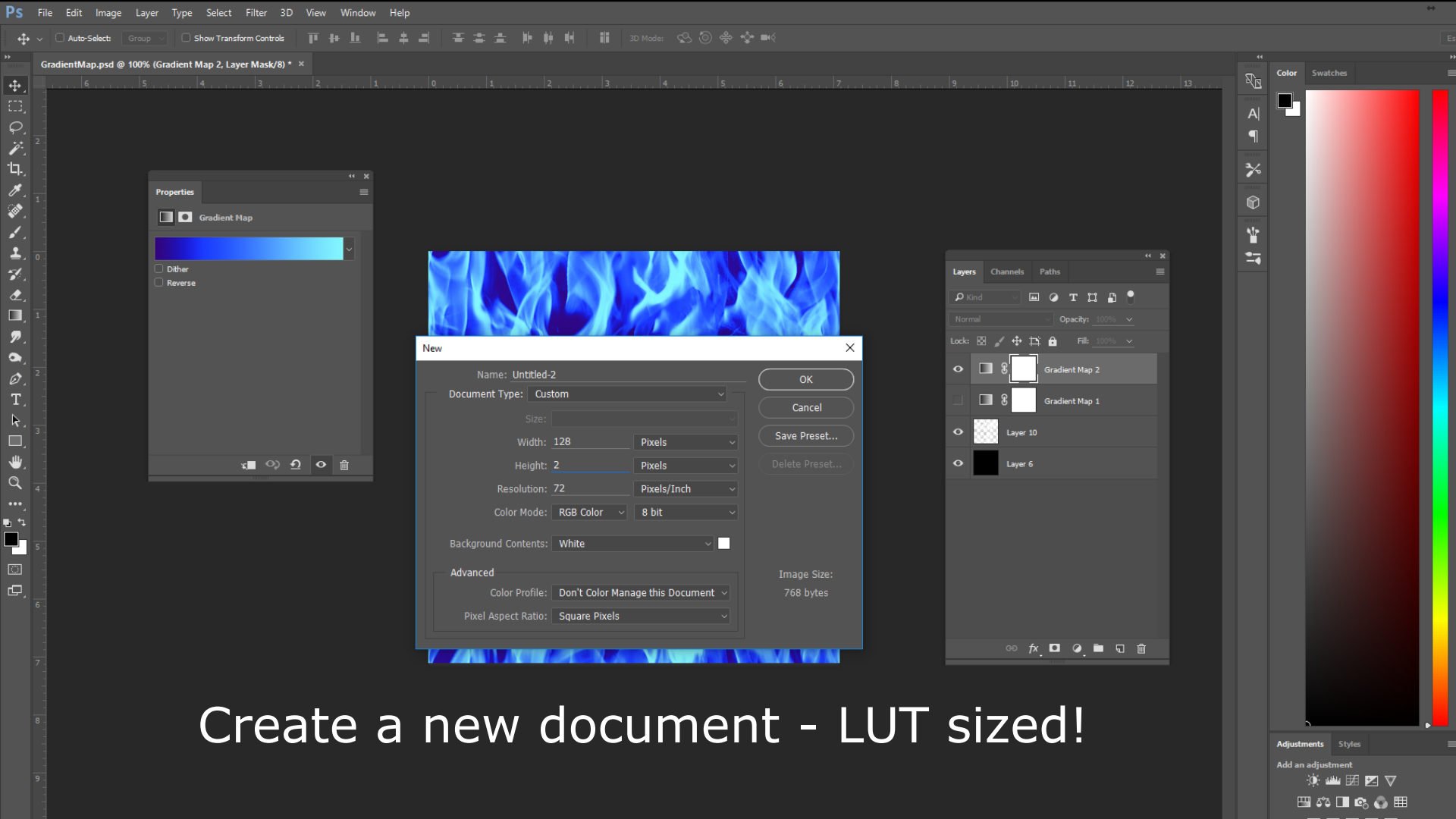

File Edit Image Layer Type Select Filter 3D View Window Help
GradientMap.psd @ 100% (Layer 10, RGB/8)
(it looks like this)
Layers
Channels
Paths
Layer 10
Layer 6
Solid Color...
Gradient...
Pattern...
Brightness/Contrast...
Levels...
Curves...
Exposure...
Vibrance...
Hue/Saturation...
Color Balance...
Black White...
Photo Filter...
Channel Mixer...
Color Lookup...
Invert
Posterize...
Threshold...
Gradient Map...
Selective Color...
Color
Swatches
Adjustments
Styles
Add an adjustment
Adjustment Layer > “Gradient Map…”


File Edit Image Layer Type Select Filter 3D View Window Help
GradientMap.psd @ 100% (Gradient Map 1, Layer Mask/8) *
Properties
Gradient Map
Dither
Reverse
Layers
Channels
Paths
Normal
Opacity: 100%
Fill: 100%
Gradient Map 1
Layer 10
Layer 6
Color
Swatches
Adjustments
Styles
Add an adjustment
Select your gradient

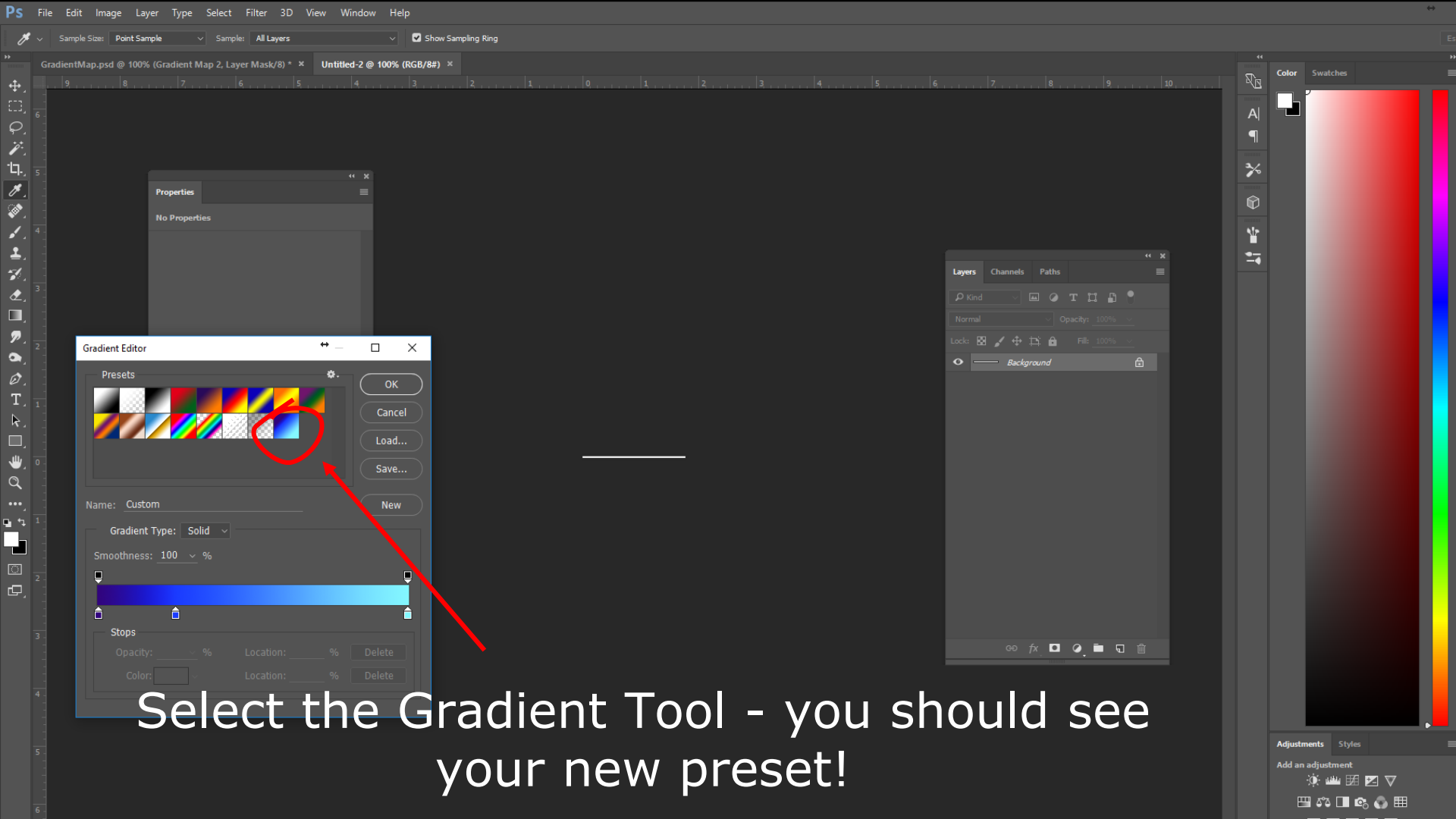

File Edit Image Layer Type Select Filter 3D View Window Help
Sample Size: Point Sample
Sample: All Layers
Show Sampling Ring
GradientMap.psd @ 100% (Gradient Map 1, Layer Mask/8) *
Properties
Gradient Map
Dither
Reverse
Gradient Editor
Presets
OK
Cancel
Load...
Save...
Name: Custom
New
Gradient Type: Solid
Smoothness: 100 %
Stops
Color Stop
Opacity: % Location: % Delete
Color: Location: % Delete
Layers
Channels
Paths
Kind
Normal
Opacity:
Lock:
Fill:
Gradient Map 1
Layer 10
Layer 6
Color
Swatches
Adjustments
Styles
Add an adjustment
Edit away!

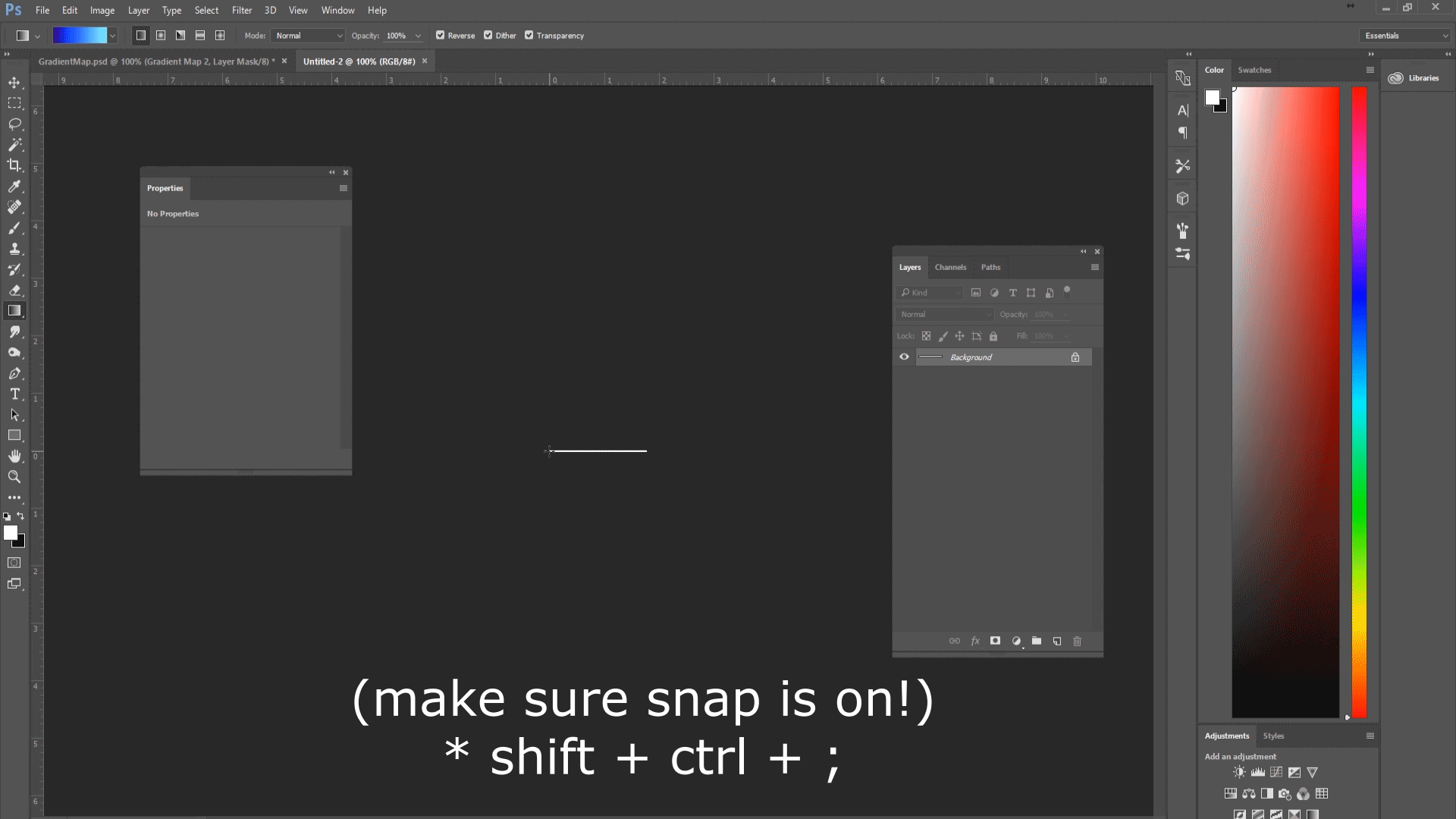

File Edit Image Layer Type Select Filter 3D View Window Help
Sample Size: Point Sample
Sample: All Layers
Show Sampling Ring
GradientMap.psd @ 100% (Gradient Map 2, Layer Mask/8) *
Properties
Gradient Map
Dither
Reverse
Gradient Editor
Presets
OK
Cancel
Load...
Save...
Name: Custom
New
Gradient Type: Solid
Smoothness: 100 %
Stops
Click to add a stop
Opacity: % Location: % Delete
Color: Location: 25 % Delete
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Gradient Map 2
Gradient Map 1
Layer 10
Layer 6
Color
Swatches
Adjustments
Styles
Add an adjustment
oooo!

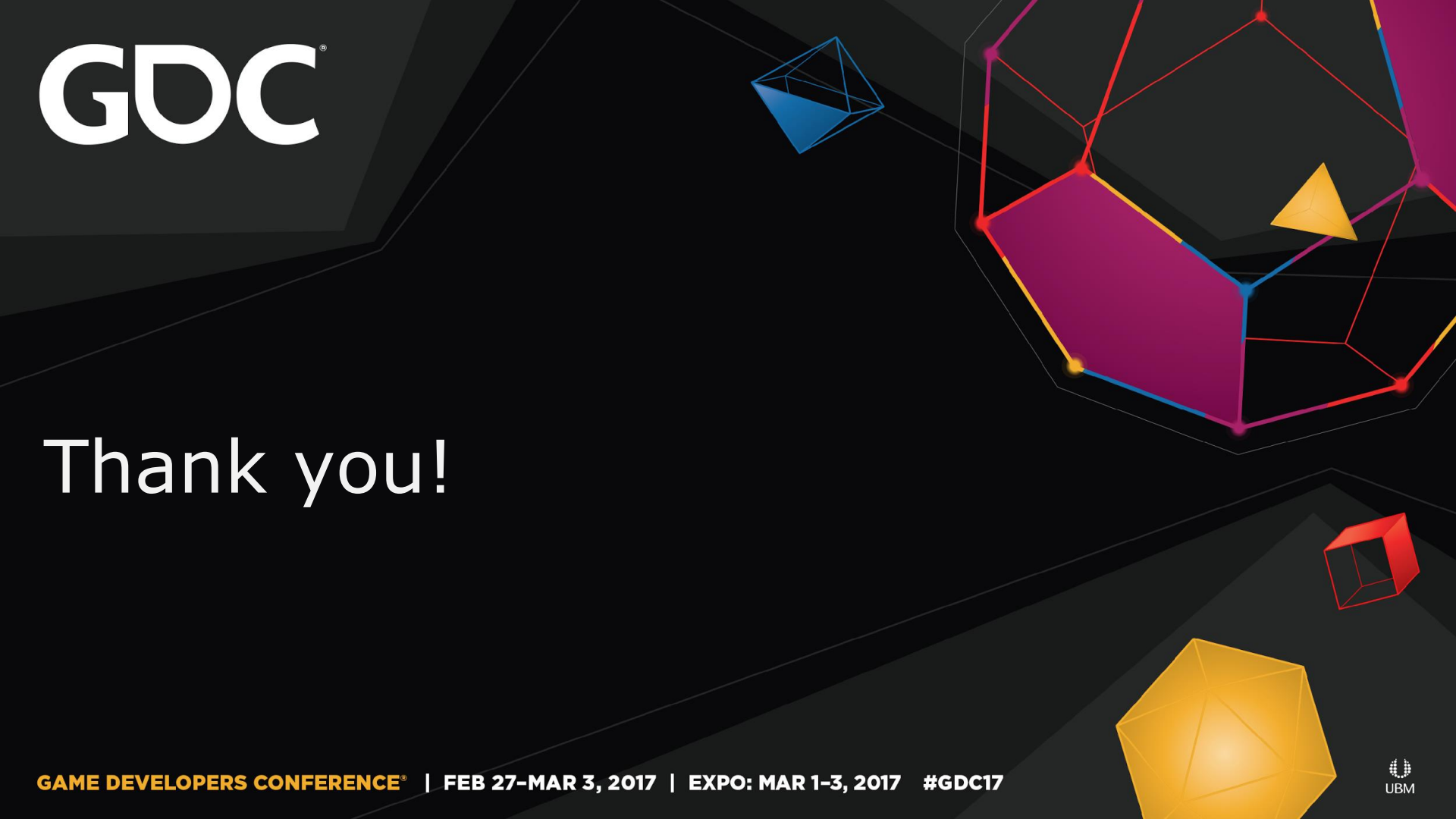

File Edit Image Layer Type Select Filter 3D View Window Help
GradientMap.psd @ 100% (Gradient Map 2, Layer Mask/8) *
Properties
Gradient Map
Dither
Reverse
Gradient Editor
Presets
OK
Cancel
Load...
Save...
Name: Custom
New
Create new gradient preset
Gradient Type: Solid
Smoothness: 100 %
Stops
Opacity: % Location: % Delete
Color: Location: % Delete
Layers
Channels
Paths
Normal
Opacity:
Lock:
Fill:
Gradient Map 2
Gradient Map 1
Layer 10
Layer 6
Color
Swatches
Adjustments
Styles
Add an adjustment
Select “New” to create a new preset



Create a new document - LUT sized!


Ps
File Edit Image Layer Type Select Filter 3D View Window Help
Sample Size: Point Sample
Sample: All Layers
Show Sampling Ring
GradientMap.psd @ 100% (Gradient Map 2, Layer Mask/8) *
Untitled-2 @ 100% (RGB/8#)
Properties
No Properties
Gradient Editor
Presets
OK
Cancel
Load...
Save...
Name: Custom
New
Gradient Type: Solid
Smoothness: 100 %
Stops
Opacity: % Location: % Delete
Color: Location: % Delete
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Background
Color
Swatches
Adjustments
Styles
Add an adjustment
Select the Gradient Tool - you should see your new preset!


File Edit Image Layer Type Select Filter 3D View Window Help
Mode: Normal
Opacity: 100%
Reverse
Dither
Transparency
Essentials
GradientMap.psd @ 100% (Gradient Map 2, Layer Mask/8) *
Untitled-2 @ 100% (RGB/8#)
Properties
No Properties
Layers
Channels
Paths
Kind
Normal
Opacity: 100%
Lock:
Fill: 100%
Background
Color
Swatches
Libraries
Adjustments
Styles
Add an adjustment
(make sure snap is on!)
* shift + ctrl + ;


GDC
Thank you!
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UBM

Something's Burning!
FX Fundamentals of Flames from a Moving Object

Andy Lomerson

Effects Artist, Vicarious Visions

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what?

- FX for flaming moving objects!
- Behaves realistically
- Robust without being too expensive
- Doesn’t fall apart when animators and designers do unexpected things to it

reference

breakdown

breakdown > at rest

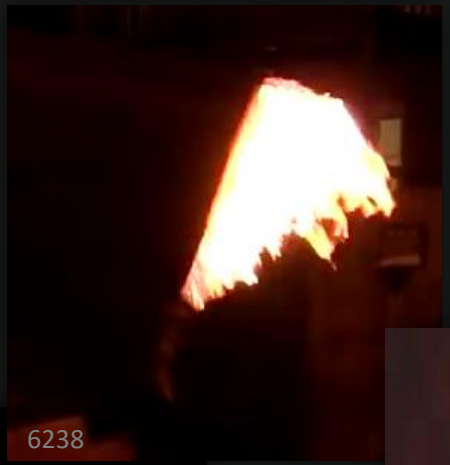
breakdown > transition to moving

breakdown > movement > slow

breakdown > movement > slow to fast transition

Breakdown > movement > slow to fast transition

breakdown > movement > fast



breakdown > inherited velocity?

breakdown > movement > changing directions

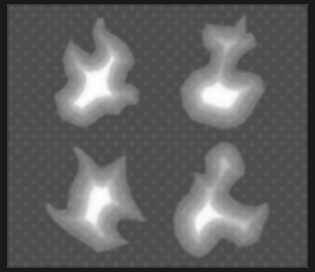
breakdown > movement > transition to rest

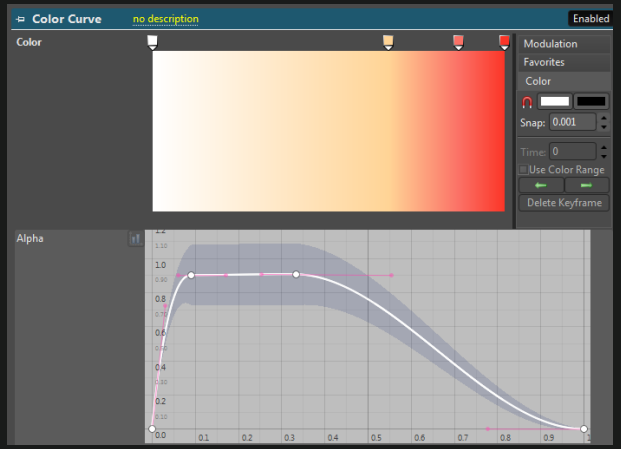
Fundamentals Checklist

- Speed of moving object affects flame life
  - Slowly moving > longer life
  - Faster moving > shorter life
- Short living flames don't have the opportunity to rise
- Flame life decreases rapidly when object is moving fast
- Lifetime of already living flames is not affect by object's speed
- Flames quickly build back up when the object comes to a rest
- Flames spawn across object’s surface no matter the speed

in engine

In engine > simple fire material





in engine > particle lifetimes

- Speed of moving object affects flame life
  - Slowly moving > longer life
  - Faster moving > shorter life
- Life of already spawned flames is not affect by object's speed
  - This leads to longer living flames "tearing off"
- Flame life decreases rapidly when object is moving fast
- Adjust spawn rates to compensate for lifetimes

in engine > two emitter solution

- spawn by rate
- focus on stationary
- lifetime 0.5-0.55 sec

in engine > two emitter solution

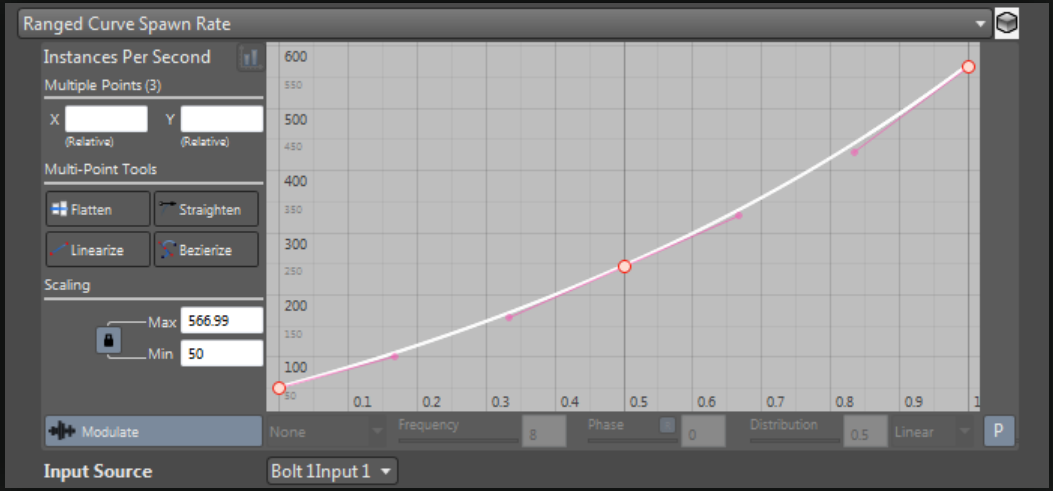
- spawn by distance
- focus on moving
- lifetime 0.2 sec

in engine > two emitter solution

in engine > lifetimes based on velocity

in engine > lifetimes based on velocity

in engine > one emitter solution

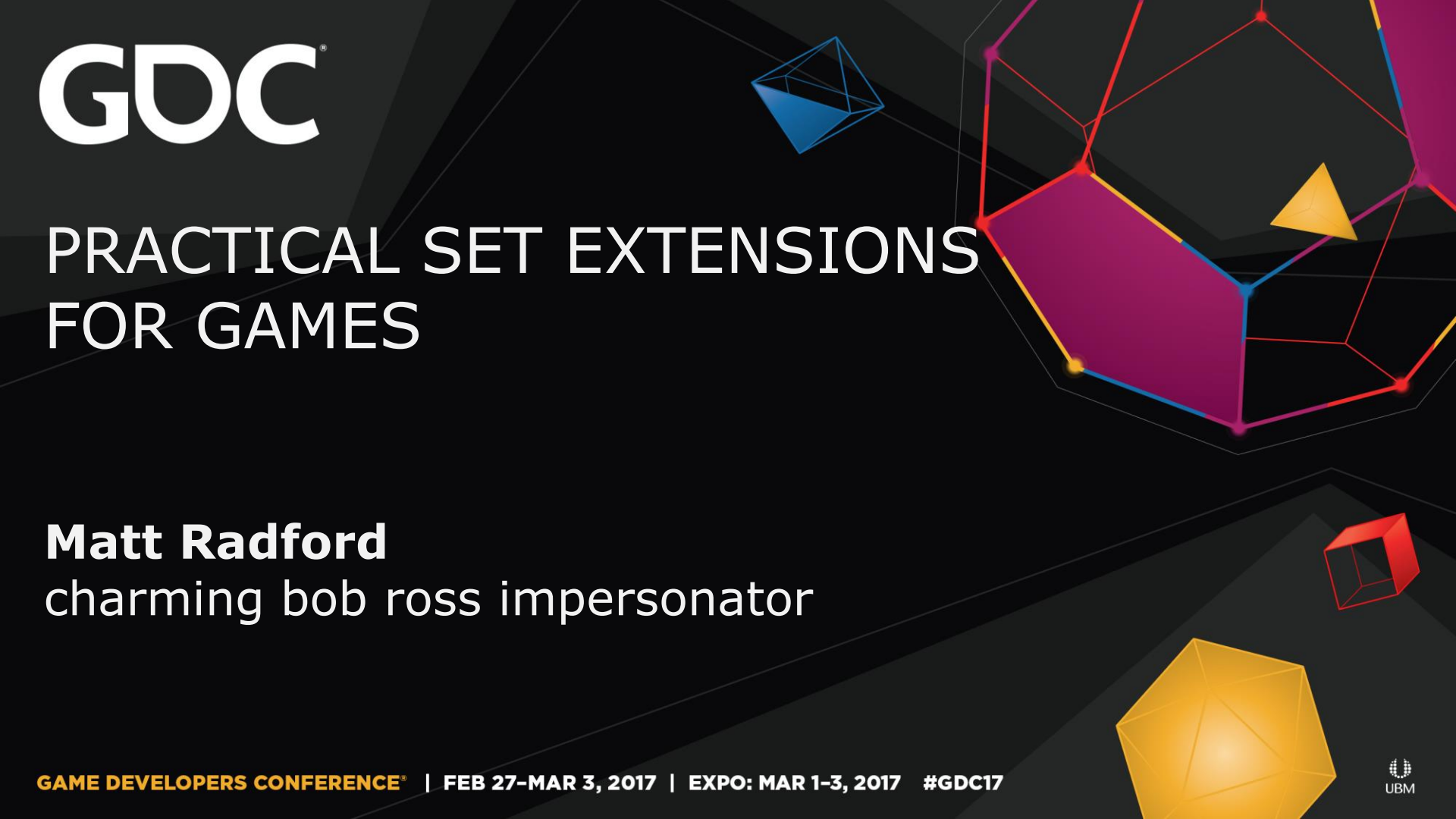


in engine > one emitter solution

in engine > perf

references

- First test of the fire sword – Jim Nelson, Nov 27, 2011
  - https://www.youtube.com/watch?v=mHRQex-BlPU&t=2s
- Flame Throwing – The Slow Mo Guys – 2500Fps, Dec 14,2012
  - https://www.youtube.com/watch?v=g1Lxmjidfmw
- Slow motion fire: homemade torch Part 1 – 1953kwbullnose, Sep 2, 2013
  - https://www.youtube.com/watch?v=MOrb3FFNGSE
- Fire Tennis - The Slow Mo Guys, Aug 3, 2012
  - https://www.youtube.com/watch?v=2NS1umhAAeg
- Simon's doublestaff demo - Jim Nelson, Dec 24, 2013
  - https://www.youtube.com/watch?v=JdvjCmvcViY&t=2s
- Wax “California” – Directed by Spike Jonez, 1995
  - https://www.youtube.com/watch?v=RPOqcqJqeCo



PRACTICAL SET EXTENSIONS FOR GAMES

Matt Radford
charming bob ross impersonator

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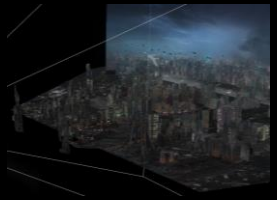
UBM

ALIEN CLOUDSC
MATTE BREAKD



EXTEND THE FOREGROUND

PROCEDURAL

EXPENSIVE.

displacement mapping / sophisticated terrain system

nested loop of atmosphere simulation

ART DRIVEN

INEXPENSIVE.

low number of polygons

can depth test for terrain

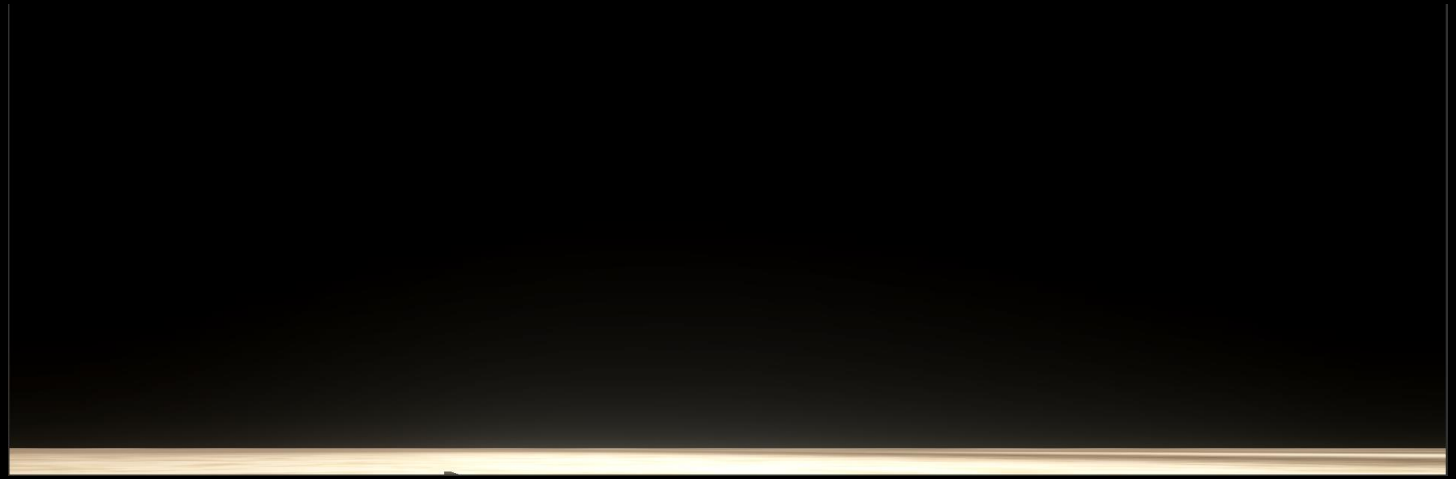
single texture fetch per element

HOW DO WE MAKE THIS?

SHADERS

Scene
Game
Asset Store
Inspector
Target Texture
None (Render Texture)
Occlusion Culling
HDR
Target Display
Display 1
GUI Layer
Flare Layer
Audio Listener
Cloudscape (Script)
Distance Color
Height Color
Sky Distance Color
Sky Height Color
Sky Shadow Color
Terrain_blend
Terrain_fog Distance
Terrain_fog Height
Sky_blend
Sky_fog Distance
Sky_fog Height
Sky_cloud Scale
Sky_speed
Sky_hdr
Time Mult
Camera Controls (Script)
Cam
None (Camera)
Vertical Speed
Horizontal Speed
Mouse X
Mouse Y
Tonemapping Color Grading
Eye Adaptation
Middle Grey
Min
Max
Speed
Show Debug
Tonemapping
Tonemapper
ACES
Exposure
Color Grading
Precision
High
Shadows
Midtones
Highlights
Basics
Temperature Shift
Tint
Hue
Saturation
Vibrance
Value
Contrast
Gain
Histogram

build up layers



build up layers

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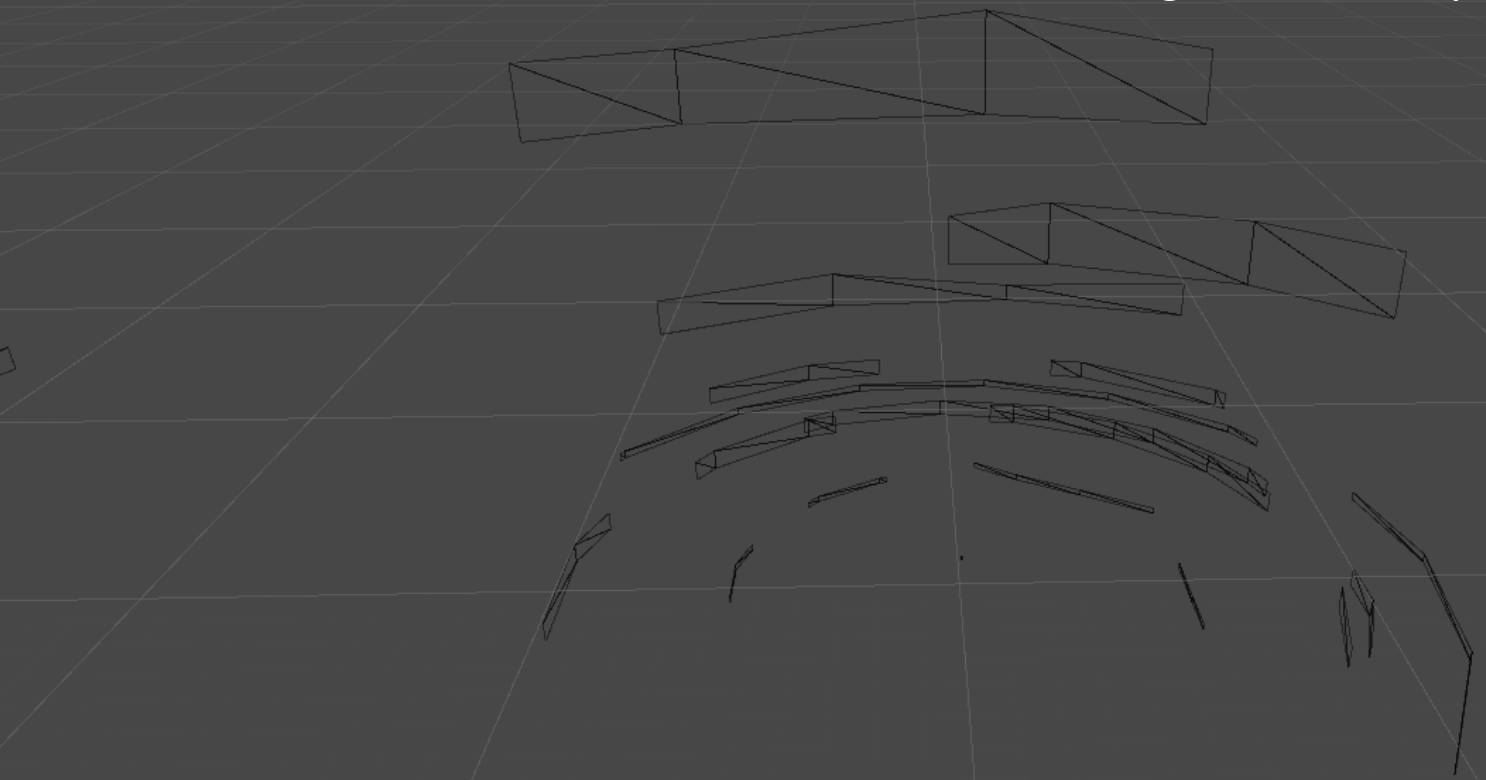
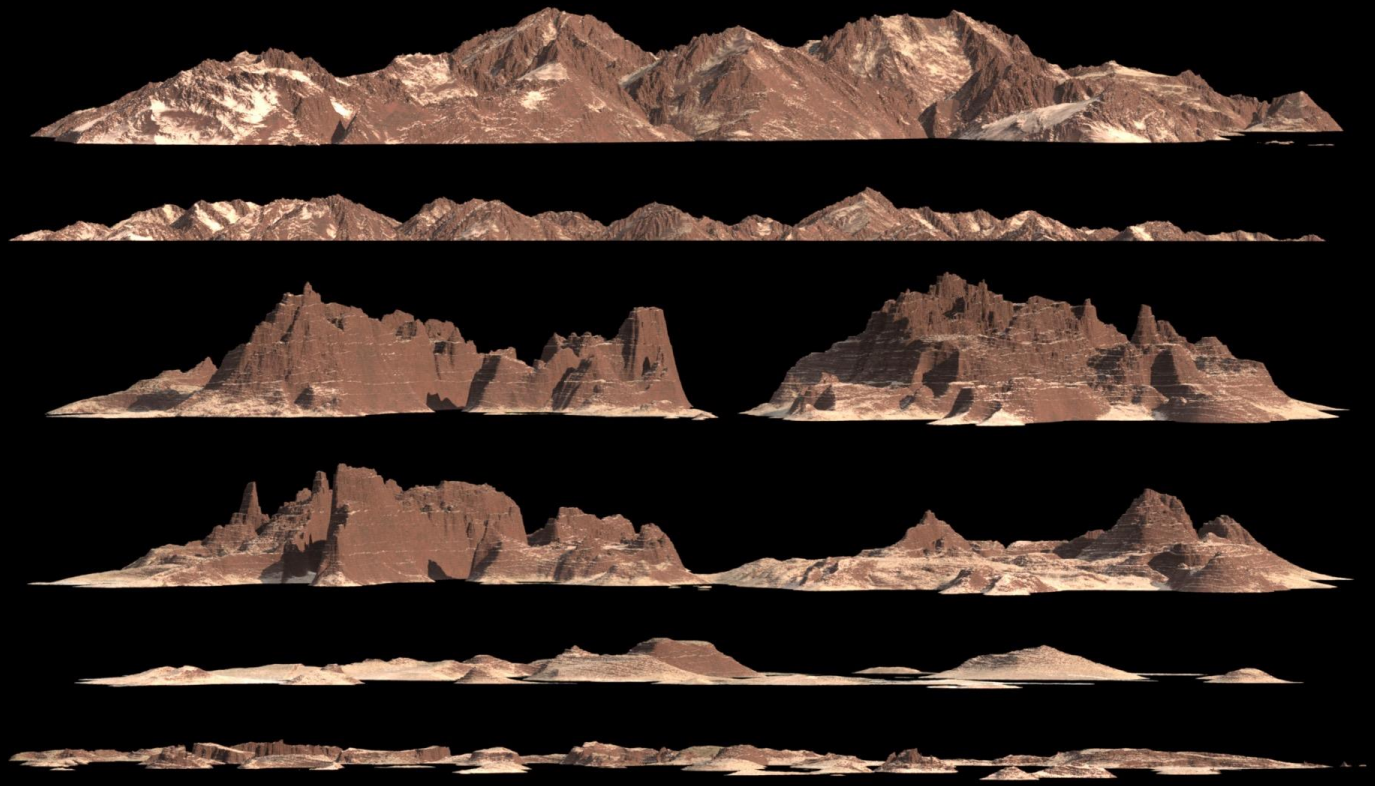
TERRAIN

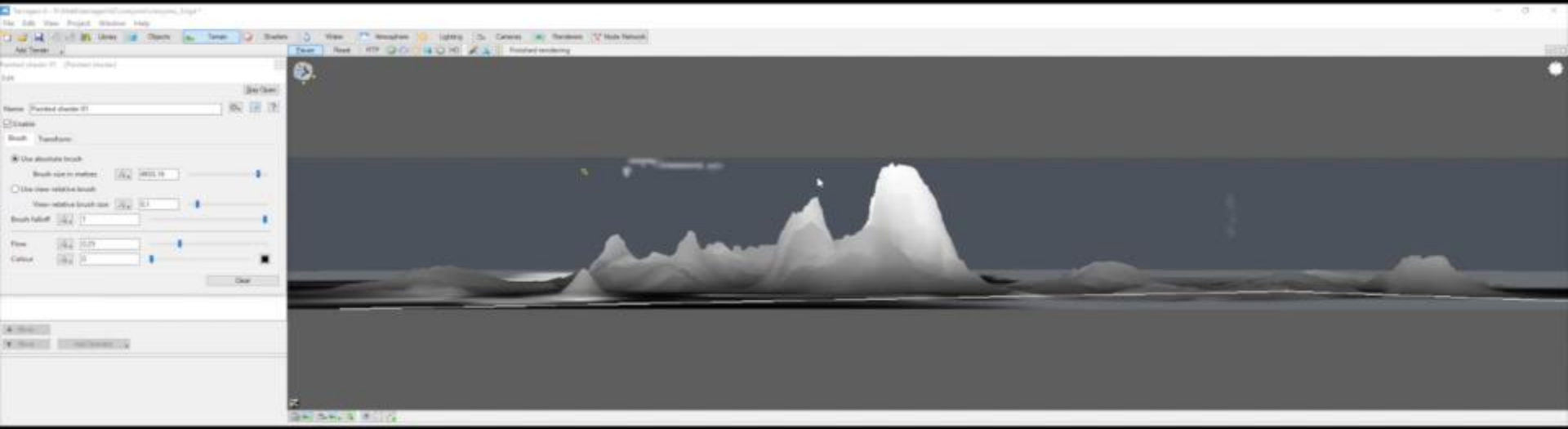
tiling textures on cylinders



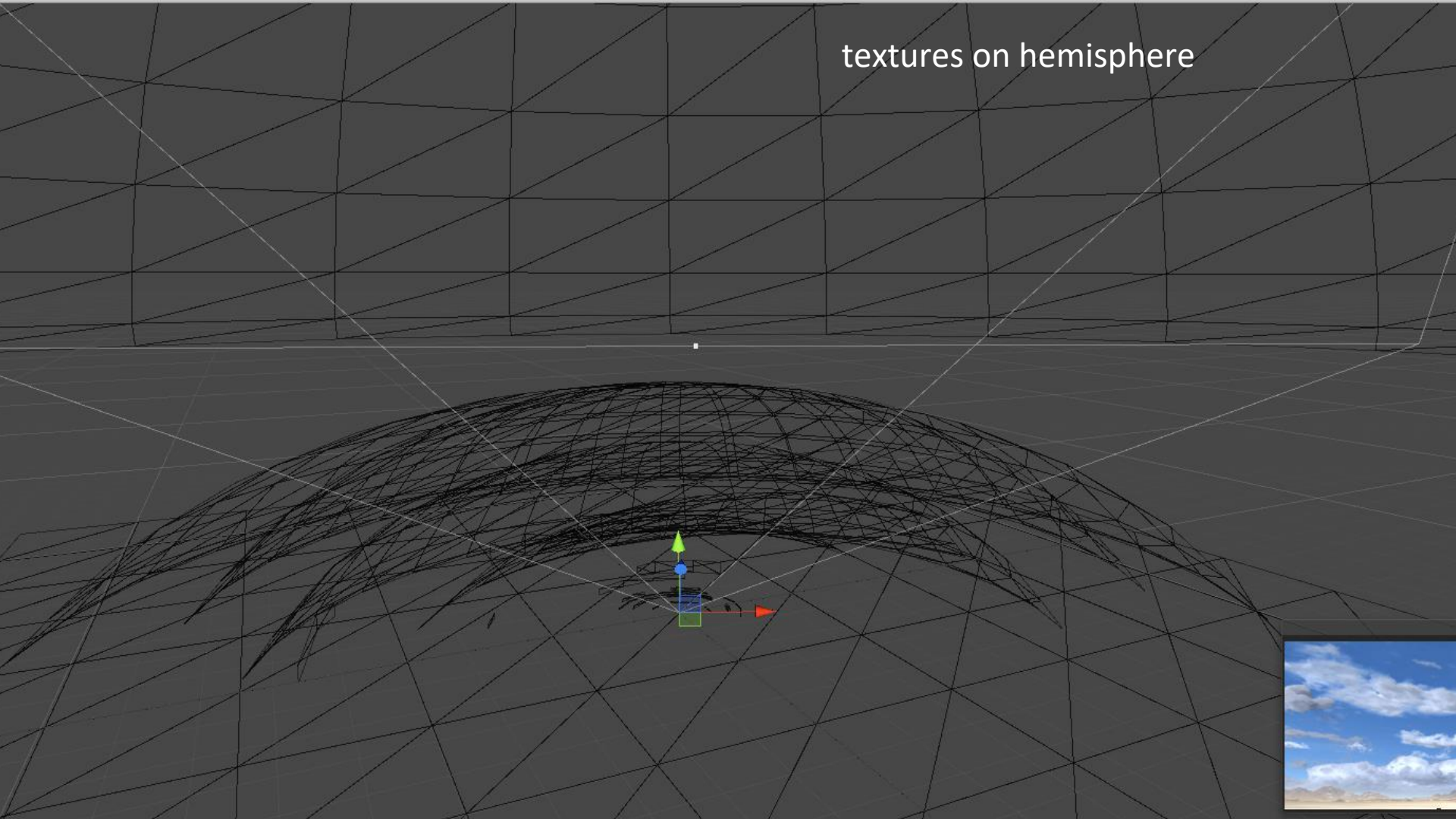
tiling textures on cylinders



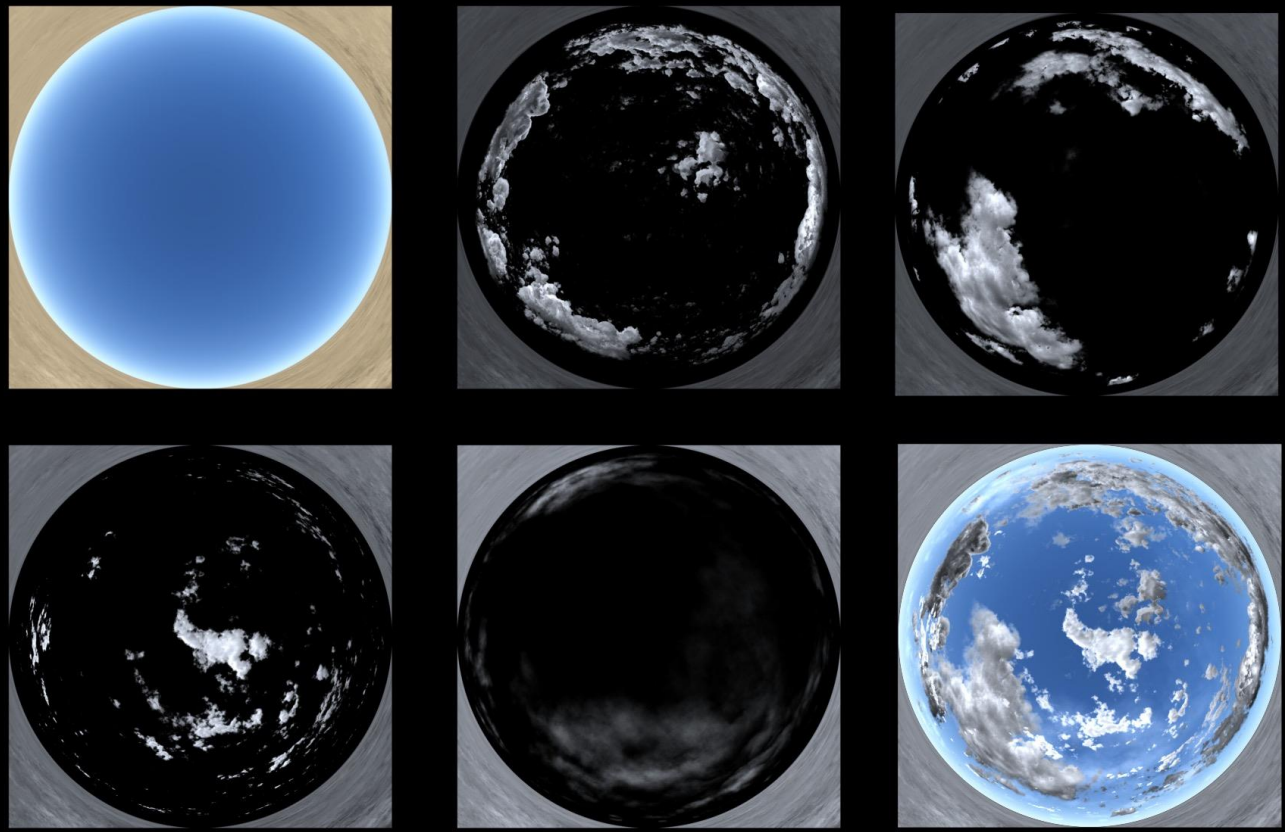
tiling textures on cylinders



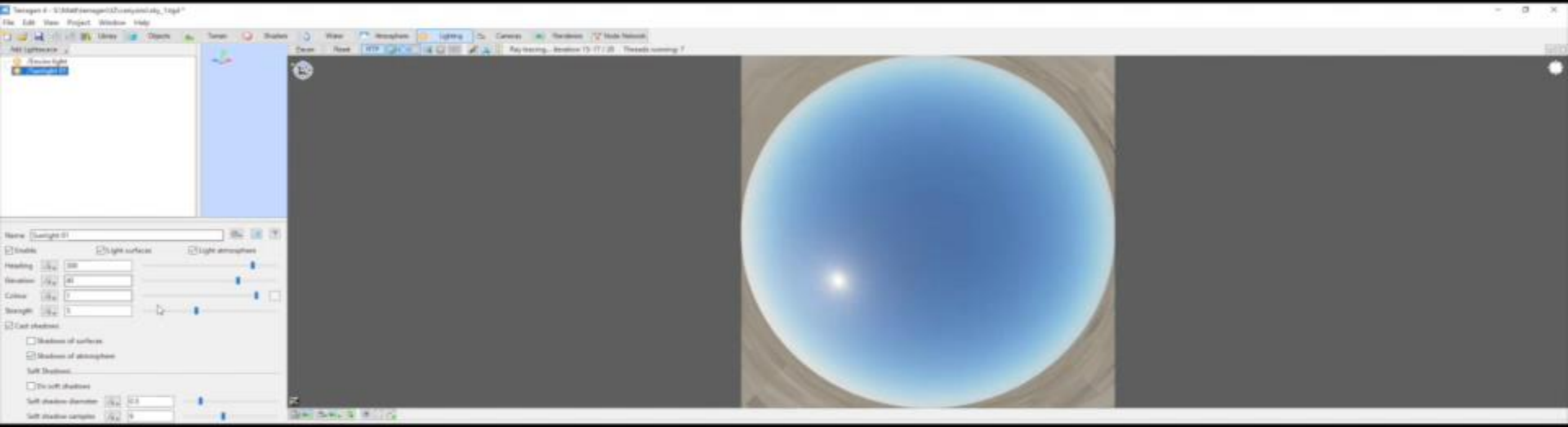
SKY


textures on hemisphere

textures on hemisphere



textures on hemisphere



THANKS!

MATT RADFORD
GDC 2017
BEYOND-FX

Thank you! Questions?

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  - Matt Radford – matthewpierreradford@gmail.com

- A special thanks to Drew Skillman and the GDC crew for arranging it all.

VFX Roundtables & Parties

Roundtables

- VFX Roundtable - Wed 11am-12pm
- VFX Roundtable - Thurs 4pm-5pm
- VFX Roundtable – Fri 1:30pm–2:30pm

Parties!

- Tech Art & VFX Gathering – Tuesday
  Jillian’s - 7:30pm-9:30pm
- Realtime VFX Mixer - Thursday
  St Regis Hotel - 6pm-8pm