

Introduction to Vulkan API (Computer Graphics Programming)

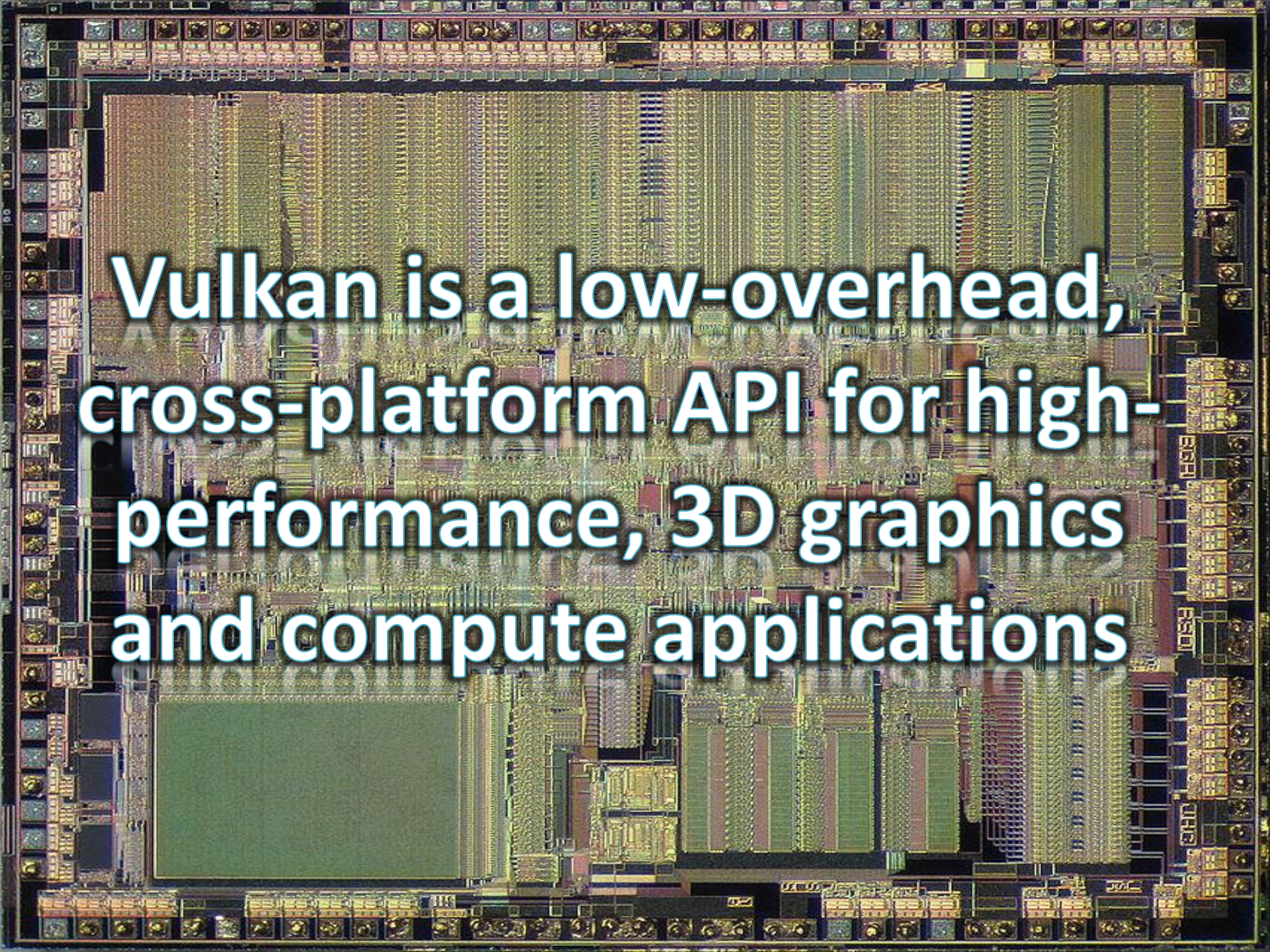
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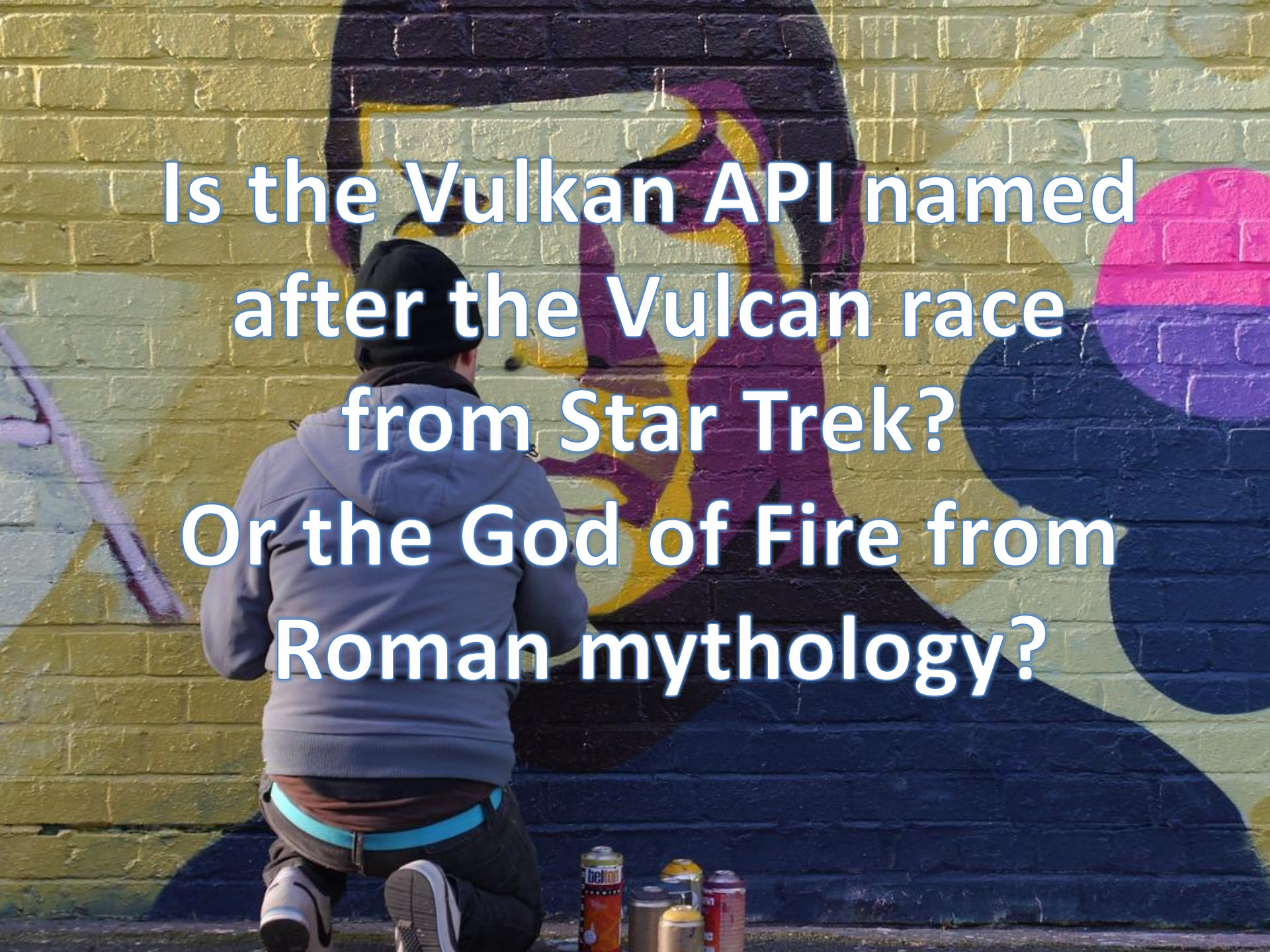
Road Map Course

- What is Vulkan?
- Background (OpenGL vs Vulkan)
- Whats and Whys of Vulkan
- Getting Started Programming Vulkan
- Step-by-Step Introduction
- Examples
 - Hello Triangle to Complex Scenes
- Summary/Conclusion
- Discussion/Questions

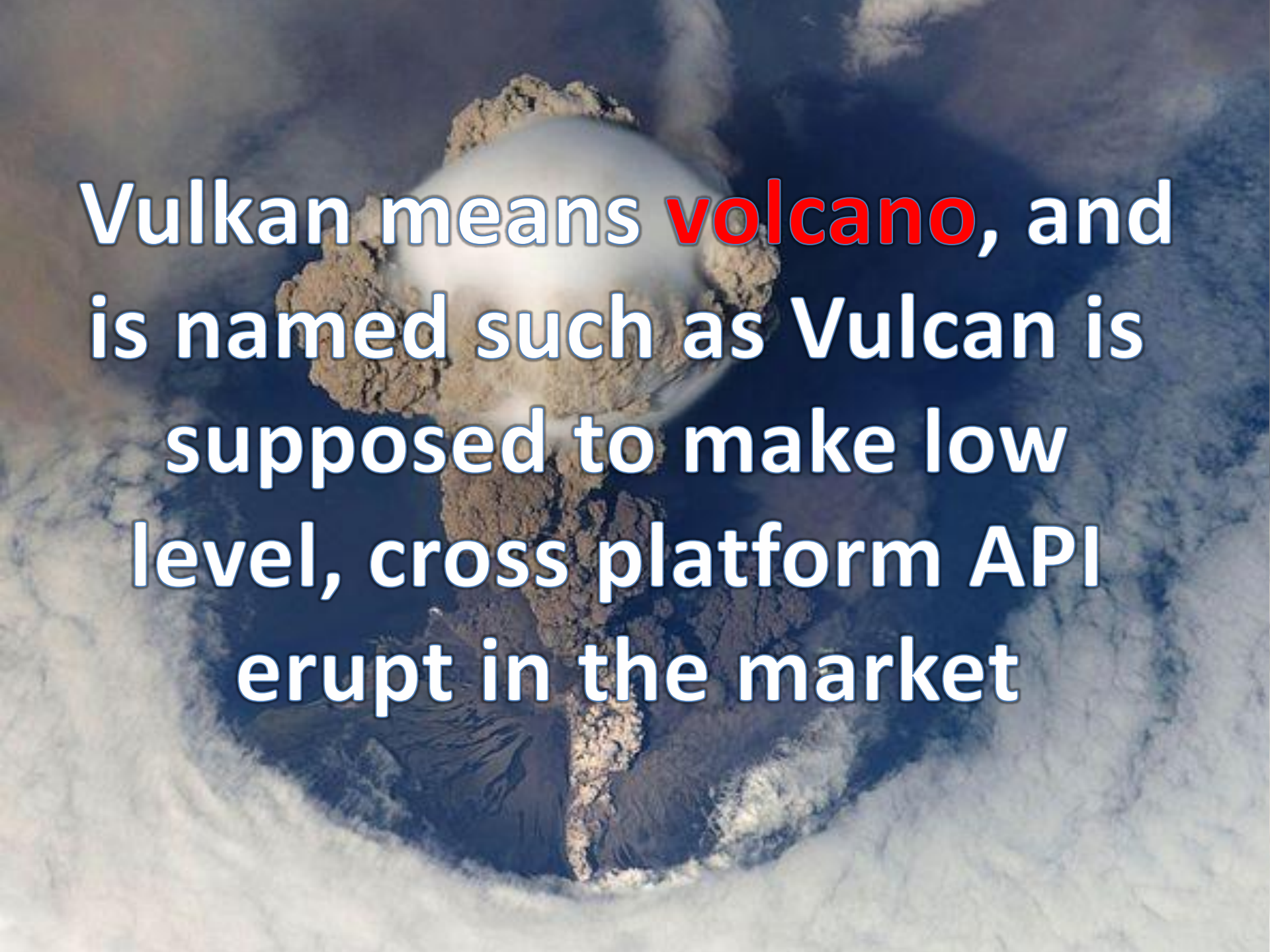




**Vulkan is a low-overhead,
cross-platform API for high-
performance, 3D graphics
and compute applications**

A person wearing a grey hoodie, black beanie, and black pants with a bright blue waistband is kneeling on a sidewalk, painting a large mural on a yellow brick wall. The mural features abstract shapes in purple, yellow, and blue. Several spray paint cans are on the ground next to the person. The text is overlaid in the center of the image.

Is the Vulkan API named
after the Vulcan race
from Star Trek?
Or the God of Fire from
Roman mythology?

A photograph of a volcanic eruption. A large, billowing plume of white smoke and grey ash rises from a dark, rocky crater. The plume is dense and reaches high into the sky. The foreground shows the dark, jagged rim of the crater and some ash-covered ground.

Vulkan means **volcano**, and
is named such as Vulcan is
supposed to make low
level, cross platform API
erupt in the market

Is OpenGL Dead?

A dramatic, low-key photograph of a graveyard. In the foreground, a dark crow stands prominently on top of a large, dark, rectangular tombstone. To the left, the back of a person in a dark suit is visible, standing near another tombstone. The ground is covered in dry, yellowish grass. In the background, several other tombstones of various shapes are scattered across the field. The sky is filled with heavy, dark, and textured clouds, with a bright light source breaking through in the center, creating a strong backlighting effect and silhouettes. The overall mood is somber and ominous.

Is OpenGL Dead?

A dark, atmospheric scene with a full moon, bare trees, and several zombie hands rising from the ground. The scene is set in a graveyard or a desolate landscape. A large, pale, full moon hangs in a dark, cloudy sky. Bare, gnarled trees frame the scene on both sides. In the foreground, several zombie hands are visible, some rising from the ground. The overall mood is eerie and ominous.

OpenGL isn't Dead Yet

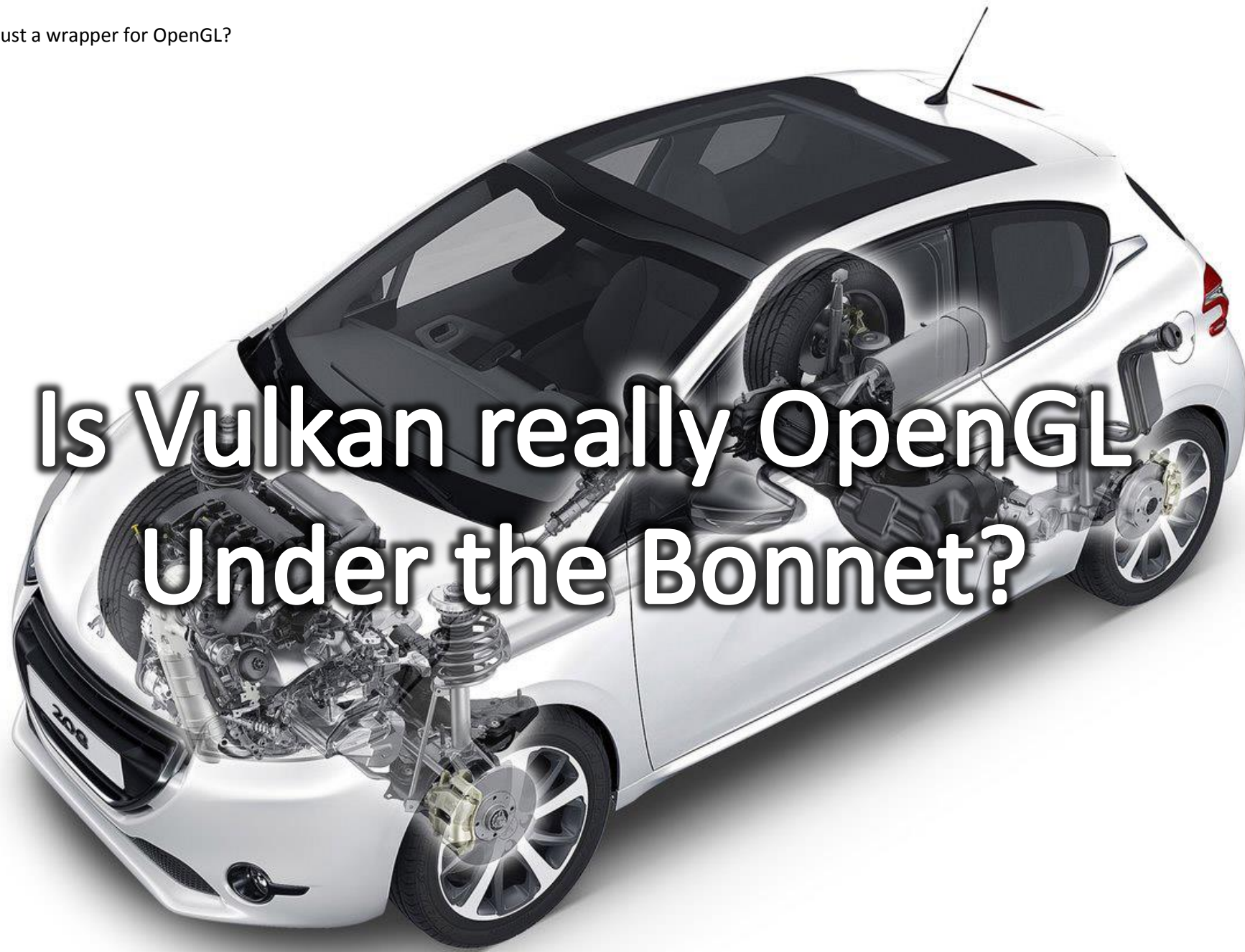
However, a New Era has Arrived

Birth of a new API

 **Vulkan**™



Is Vulkan just a wrapper for OpenGL?



**Is Vulkan really OpenGL
Under the Bonnet?**

Vulkan is a complete redesign

Vulkan is a Complete Redesign from the Ground Up



Do we need another API?



Is this redesign anything special?

Accommodate Next Generation Hardware (Parallelism & Control)

Opens new doors – more freedom and power (great power comes great)

A heavy metal chain is shown breaking apart in the center of the frame. The chain is dark and metallic, with several links visible on either side of the break. At the point of separation, a bright, fiery explosion of sparks and molten metal fragments is occurring, radiating outwards. The background is a textured, light blue-grey surface.

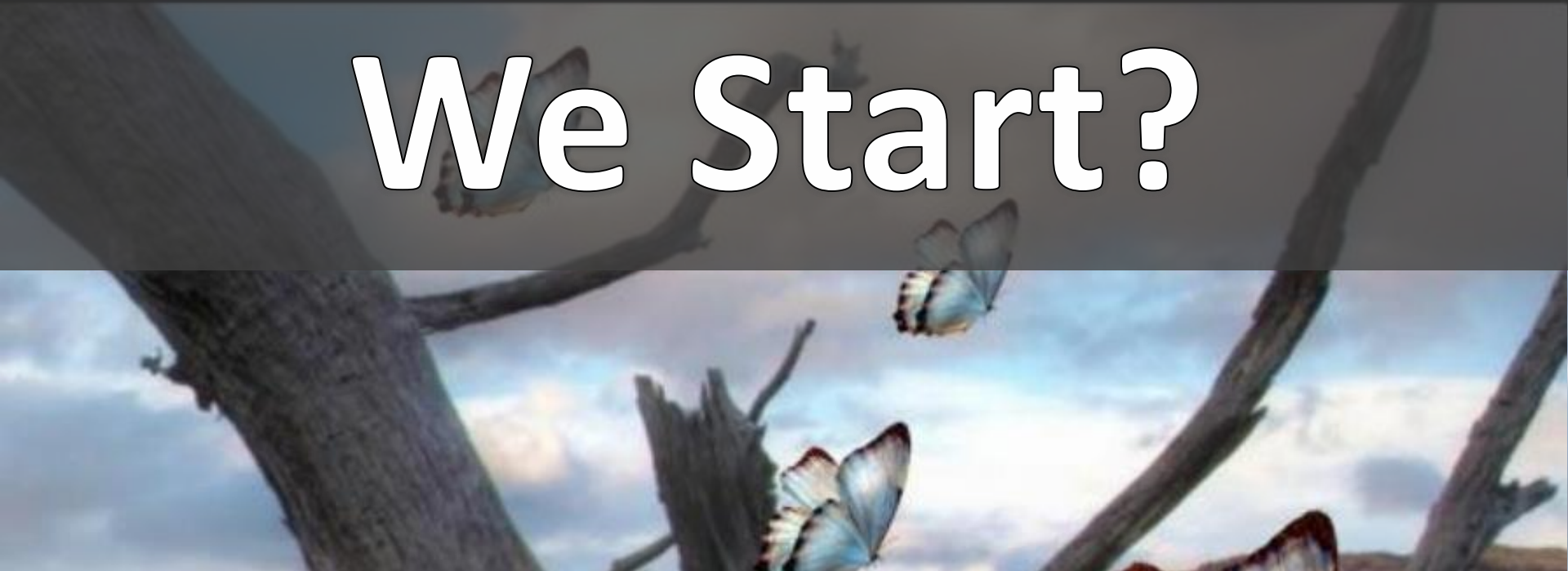
Vulkan Breaks The Chains

Introduction to Computer Graphics and the Vulkan API

From Principles to Practice

Where Do

We Start?



What's Next

- What's inside Vulkan?
- How do all the pieces fit together?
- How many lines of code?
- Breaking it down
- Workshop approach
 - small exercises that focus on different areas
 - up and running from the start
 - ground-up (i.e., write everything)

Today

- Work through Exercises in Workbook
- `Hands-on’
 - YOU have to type in code
 - Helps with learning
 - Master the core principles
- Each Exercise focuses on a particular area
 - e.g., customizing graphical effect, optimising/modifying buffers

Questions/Discussion