GeoMystica-MetaTronStream

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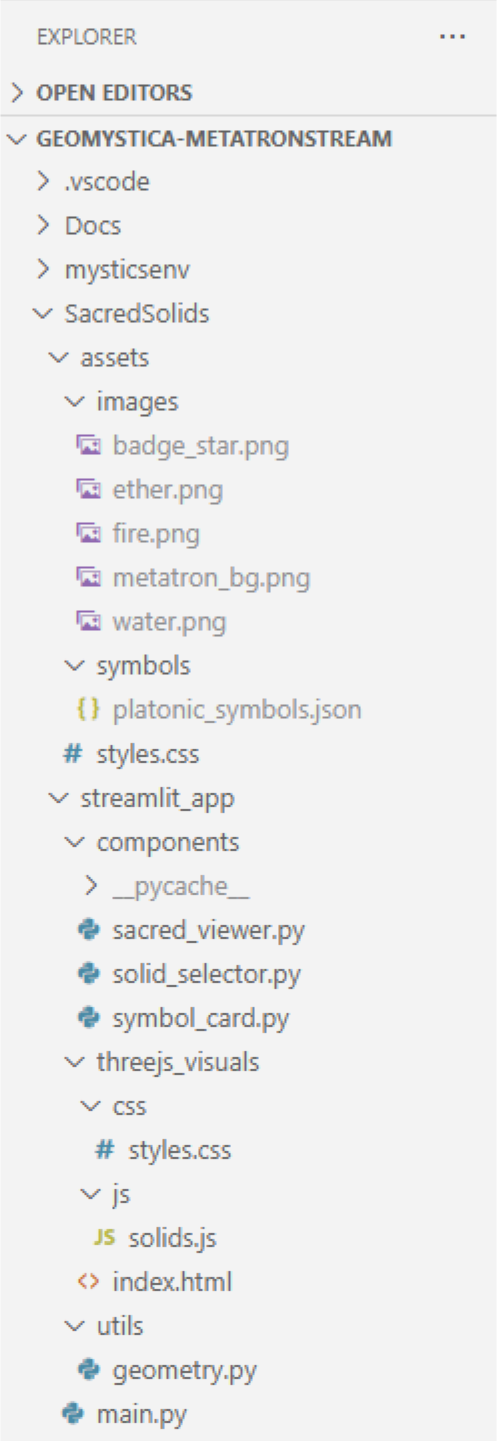
Code Files



```
EXPLORER                                   ···
> OPEN EDITORS
∨ GEOMYSTICA-METATRONSTREAM
  > .vscode
  > Docs
  > mysticsenv
  ∨ SacredSolids
    ∨ assets
      ∨ images
          badge_star.png
          ether.png
          fire.png
          metatron_bg.png
          water.png
      ∨ symbols
        { } platonic_symbols.json
      # styles.css
    ∨ streamlit_app
      ∨ components
        > __pycache__
          sacred_viewer.py
          solid_selector.py
          symbol_card.py
      ∨ threejs_visuals
        ∨ css
          # styles.css
        ∨ js
          JS solids.js
        <> index.html
      ∨ utils
          geometry.py
        main.py
```

requirements.txt

```
streamlit>=1.30.0

numpy>=1.24.0

sympy>=1.12

pillow>=10.0.0

plotly>=5.20.0

watchdog>=3.0.0

streamlit-extras>=0.3.0

scipy

# streamlit-authenticator>=0.2.3     # For login/auth features

# pymongo>=4.6.0                     # If connecting to MongoDB

# streamlit-analytics>=0.1.0         # For tracking user interactions

# matplotlib>=3.8.0                  # For static plots
```

Inside assets directory

styles.css

```
body {
font-family: 'Segoe UI', sans-serif;
background-color: #f4f6f9;
color: #333;
}


/* Title styling */
h1 {
   font-size: 2.5em;
   color: #2c3e50;
   text-align: center;
   margin-bottom: 0.5em;
}

/* Sidebar customization */
[data-testid="stSidebar"] {
   background-color: #ecf0f1;
   border-right: 2px solid #bdc3c7;
}

[data-testid="stSidebar"] .css-1d391kg {
   padding-top: 2em;
}

/* Plotly chart container */
.plot-container {
   border-radius: 12px;
   box-shadow: 0 4px 12px rgba(0,0,0,0.1);
   padding: 1em;
   background-color: #ffffff;
}

/* Latex and symbolic section */
.stMarkdown h2, .stMarkdown h3 {
   color: #34495e;
}

.stMarkdown .latex {
   font-size: 1.2em;
   color: #2c3e50;
}

/* Footer */
footer {
   text-align: center;
   font-size: 0.9em;
   color: #7f8c8d;
   margin-top: 2em;
}
```

```
/* Button hover effect */
button:hover {
   background-color: #3498db !important;
   color: white !important;
   transition: background-color 0.3s ease;
}

/* Smooth fade-in animation */
@keyframes fadeIn {
   from { opacity: 0; transform: translateY(10px); }
   to { opacity: 1; transform: translateY(0); }
}

.stApp {
   animation: fadeIn 0.6s ease-in-out;
}
```

Inside streamlit_app/components Directory

sacred_viewer.py

```
import os
import streamlit.components.v1 as components

def show_3d_viewer(solid_name=None):
   """
   Loads and embeds the Three.js viewer from index.html.
   Optionally injects a script to initialize a specific solid.
   """
   base_dir = os.path.dirname(os.path.abspath(__file__))
   raw_path = os.path.join(base_dir, "..", "threejs_visuals", "index.html")
   viewer_path = os.path.normpath(raw_path)

   if not os.path.exists(viewer_path):
      raise FileNotFoundError(f"Viewer HTML not found at: {viewer_path}")
```

```
    with open(viewer_path, "r", encoding="utf-8") as f:
        html_content = f.read()

    # Optional: Inject solid name into viewer via JS
    if solid_name:
        injection = f"""
        <script>
            if (typeof createSolid === 'function') {{
                createSolid("{solid_name.lower()}");
            }}
        </script>
        """
        html_content += injection

    components.html(html_content, height=600, scrolling=False)
```

solid_selector.py

```
import numpy as np
from sympy import Eq
from sympy.abc import V, E, F

def get_solid(name):
    """
    Returns vertices and faces for the given Platonic solid.
    """
    if name == "Tetrahedron":
        vertices = np.array([
            [1, 1, 1],
            [-1, -1, 1],
            [-1, 1, -1],
            [1, -1, -1]
        ])
        faces = [[0,1,2], [0,1,3], [0,2,3], [1,2,3]]

    elif name == "Cube":
        vertices = np.array([
            [-1, -1, -1], [1, -1, -1],
            [1, 1, -1], [-1, 1, -1],
            [-1, -1, 1], [1, -1, 1],
            [1, 1, 1], [-1, 1, 1]
        ])
        faces = [
            [0,1,2,3], [4,5,6,7],
            [0,1,5,4], [2,3,7,6],
            [1,2,6,5], [0,3,7,4]
        ]

    elif name == "Octahedron":
        vertices = np.array([
            [1,0,0], [-1,0,0],
            [0,1,0], [0,-1,0],
            [0,0,1], [0,0,-1]
        ])
        faces = [
            [0,2,4], [2,1,4], [1,3,4], [3,0,4],
            [0,2,5], [2,1,5], [1,3,5], [3,0,5]
        ]

    elif name == "Dodecahedron":
        from scipy.spatial import ConvexHull
        phi = (1 + np.sqrt(5)) / 2
        a, b = 1, 1 / phi
        points = []
        for i in [-a, a]:
            for j in [-a, a]:
                for k in [-a, a]:
                    points.append([i, j, k])
        for i in [-b, b]:
            for j in [-b, b]:
                points += [[0, i, j], [i, 0, j], [i, j, 0]]
        vertices = np.array(points)
        hull = ConvexHull(vertices)
        faces = hull.simplices.tolist()
    else:
        return None, None

    return vertices, faces

def symbolic_description(name):
    """
    Returns Euler's formula and symbolic counts for the solid.
    """
    if name == "Tetrahedron":
        return Eq(V - E + F, 2), {"V": 4, "E": 6, "F": 4}
    elif name == "Cube":
        return Eq(V - E + F, 2), {"V": 8, "E": 12, "F": 6}
    elif name == "Octahedron":
        return Eq(V - E + F, 2), {"V": 6, "E": 12, "F": 8}
    elif name == "Dodecahedron":
        return Eq(V - E + F, 2), {"V": 20, "E": 30, "F": 12}
    else:
        return None, {}

def get_symbolic_overlay(name):
    """
    Placeholder for symbolic overlays (e.g. Metatron’s Cube, golden spirals).
    """
    overlays = {
        "Tetrahedron": "Fire, initiation, upward motion",
        "Cube": "Earth, stability, foundation",
        "Octahedron": "Air, balance, duality",
        "Dodecahedron": "Ether, cosmos, divine geometry"
    }
    return overlays.get(name, "No symbolic overlay defined.")

# Optional: UI selector (if needed)
def select_solid():
    import streamlit as st
    return st.sidebar.selectbox("Choose a Platonic Solid", ["Tetrahedron", "Cube", "Octahedron", "Dodecahedron"])
```

symbol_card.py

```
import streamlit as st

def show_symbol_card(solid_name, symbol_data):
    st.markdown(f"""
    <div style="text-align:center; padding:10px; border-radius:10px; background-color:{symbol_data['color']}; color:white;">
        <h2>{symbol_data['symbol']} {solid_name.capitalize()}</h2>
        <h4>Element: {symbol_data['element']}</h4>
        <p><em>{symbol_data['meaning']}</em></p>
    </div>
    """, unsafe_allow_html=True)
```

Inside streamlit_app/threejs_visuals Directory

css subdirectory

styles.css

```
/* SacredSolids: Three.js Canvas Styling */

body {
margin: 0;
    padding: 0;
    background-color: #f0f4f8;
    font-family: 'Segoe UI', sans-serif;
    overflow: hidden;
}

/* Canvas container */
#scene-container {
    width: 100vw;
    height: 100vh;
    display: flex;
    justify-content: center;
    align-items: center;
    background: radial-gradient(circle at center, #ffffff 0%, #dfe6e9 100%);
}

/* Info overlay (optional) */
#info-box {
    position: absolute;
    top: 20px;
    left: 20px;
    background-color: rgba(44, 62, 80, 0.85);
    color: white;
    padding: 12px 16px;
    border-radius: 8px;
    font-size: 14px;
    max-width: 300px;
    box-shadow: 0 4px 12px rgba(0,0,0,0.2);
}

/* Symbolic labels (optional) */
.label {
    position: absolute;
    color: #2c3e50;
    font-weight: bold;
    background-color: rgba(255,255,255,0.8);
    padding: 4px 8px;
    border-radius: 6px;
    font-size: 12px;
    pointer-events: none;
}

/* Fade-in animation */
@keyframes fadeIn {
    from { opacity: 0; transform: scale(0.95); }
    to { opacity: 1; transform: scale(1); }
}
```

```
#scene-container, #info-box {
    animation: fadeIn 0.8s ease-out;
}
```

js subdirectory

solids.js

```
// js/solids.js
function createSolid(type) {
  switch (type) {
    case "tetrahedron": return new THREE.TetrahedronGeometry(1);
    case "cube": return new THREE.BoxGeometry(1, 1, 1);
    case "octahedron": return new THREE.OctahedronGeometry(1);
    case "dodecahedron": return new THREE.DodecahedronGeometry(1);
    case "icosahedron": return new THREE.IcosahedronGeometry(1);
    default: return new THREE.TetrahedronGeometry(1); // fallback
  }
}
```

inside threejs_visuals Directory

index.html

```
<!DOCTYPE html>
<html lang="en">

<head>
<meta name="viewport" content="width=device-width,  initial-scale=1.0" />
    <meta charset="UTF-8" />
    <title>SacredSolids 3D Viewer</title>
    <!-- <link rel="stylesheet" href="./css/styles.css" /> -->
    <script
src="https://cdnjs.cloudflare.com/ajax/libs/three.js/r148/three.min.js"></script>
    <script src="js/solids.js"></script>
    <!-- <style>
  body {
    margin: 0;
    padding: 0;
    background-color: #f0f4f8;
    font-family: 'Segoe UI', sans-serif;
    overflow: hidden;
  }

  #scene-container {
    width: 100vw;
    height: 100vh;
    display: flex;
    justify-content: center;
    align-items: center;
    background: radial-gradient(circle at center, #ffffff 0%, #dfe6e9 100%);
  }
</style> -->

</head>

<body>
    <div id="scene-container"></div>
    <div id="info-box">🔺 Tetrahedron: Symbol of Fire, Willpower, and Transformation</div>

    <script>
        // Scene setup
        const scene = new THREE.Scene();
        scene.background = new THREE.Color(0xf0f4f8);

        const camera = new THREE.PerspectiveCamera(45, window.innerWidth / window.innerHeight, 0.1, 1000);
        camera.position.set(3, 3, 3);

        const renderer = new THREE.WebGLRenderer({ antialias: true });
        renderer.setSize(window.innerWidth, window.innerHeight);
        document.getElementById("scene-container").appendChild(renderer.domElement);
```

```
// Lighting
const ambientLight = new THREE.AmbientLight(0xffffff, 0.6);
scene.add(ambientLight);

const directionalLight = new THREE.DirectionalLight(0xffffff, 0.8);
directionalLight.position.set(5, 5, 5);
scene.add(directionalLight);

// Tetrahedron geometry
const geometry = new THREE.TetrahedronGeometry(1);
const material = new THREE.MeshStandardMaterial({
    color: 0xe74c3c,
    flatShading: true,
    transparent: true,
    opacity: 0.9
});
const tetrahedron = new THREE.Mesh(geometry, material);
scene.add(tetrahedron);

// Wireframe overlay
const wireframe = new THREE.LineSegments(
    new THREE.EdgesGeometry(geometry),
    new THREE.LineBasicMaterial({ color: 0x2c3e50 })
);
tetrahedron.add(wireframe);

// Animation loop
function animate() {
    requestAnimationFrame(animate);
    tetrahedron.rotation.x += 0.005;
    tetrahedron.rotation.y += 0.005;
    renderer.render(scene, camera);
}
animate();

// Responsive resize
window.addEventListener("resize", () => {
      camera.aspect = window.innerWidth / window.innerHeight;
      camera.updateProjectionMatrix();
      renderer.setSize(window.innerWidth, window.innerHeight);
    });
  </script>
</body>

</html>
```

Inside streamlit_app/utils Directory

geometry.py

```
            import json
from pathlib import Path

SYMBOLS_PATH = Path("assets/symbols/platonic_symbols.json")

def load_symbol_data():
    with open(SYMBOLS_PATH, "r") as f:
        return json.load(f)

def get_solid_info(solid_name):
    symbols = load_symbol_data()
    return symbols.get(solid_name, {
        "element": "Unknown",
        "symbol": "❓",
        "color": "#7f8c8d",
        "meaning": "No data available"
    })

SOLID_MAP = {
    "tetrahedron": {"faces": 4, "element": "Fire"},
    "cube": {"faces": 6, "element": "Earth"},
    "octahedron": {"faces": 8, "element": "Air"},
    "dodecahedron": {"faces": 12, "element": "Ether"},
    "icosahedron": {"faces": 20, "element": "Water"},
}

def get_solid_info(name):
    return SOLID_MAP.get(name, {})
```

Inside streamlit_app Directory

main.py

```
        import streamlit as st
import numpy as np
import plotly.graph_objects as go
from sympy import symbols, Eq # noqa
from sympy.abc import V, E, F # noqa

from components.sacred_viewer import show_3d_viewer
from components.solid_selector import get_solid, symbolic_description
from components.solid_selector import select_solid # noqa
#print("Selected solid:", select_solid("cube"))

# --- Page Setup ---
st.set_page_config(page_title="SacredSolids", layout="wide")
st.title("🔷 SacredSolids: Platonic Geometry Explorer")

# --- Custom CSS ---
try:
    with open("assets/styles.css") as f:
        st.markdown(f"<style>{f.read()}</style>", unsafe_allow_html=True)
except FileNotFoundError:
    st.warning("Custom styles not found.")

# --- Optional UI Extras ---
try:
    from streamlit_extras.add_vertical_space import add_vertical_space
except ImportError:
    def add_vertical_space(n): st.write("\n" * n)
```

```
add_vertical_space(1)

# --- Solid Selection ---
solid_name = st.sidebar.selectbox("Choose a Platonic Solid", ["Tetrahedron", "Cube", "Octahedron", "Dodecahedron"])
vertices, faces = get_solid(solid_name)

# --- 3D Viewer Embed ---
try:
    show_3d_viewer(solid_name)
except FileNotFoundError as e:
    st.error(f"3D viewer not found: {e}")

# --- Plotly Visualization ---
def plot_solid(vertices, faces, name):
    fig = go.Figure()

    for face in faces:
        face_vertices = vertices[face]
        x, y, z = face_vertices[:, 0], face_vertices[:, 1], face_vertices[:, 2]
        x = np.append(x, x[0])
        y = np.append(y, y[0])
        z = np.append(z, z[0])
        fig.add_trace(go.Scatter3d(
            x=x, y=y, z=z,
            mode='lines',
            line=dict(color='royalblue', width=4),
            name="Face"
        ))

    fig.add_trace(go.Scatter3d(
        x=vertices[:, 0], y=vertices[:, 1], z=vertices[:, 2],
        mode='markers',
        marker=dict(size=5, color='orange'),
        name='Vertices'
    ))
```

```
        fig.update_layout(
            title=f"{name} Visualization",
            margin=dict(l=0, r=0, b=0, t=40),
            scene=dict(aspectmode='data')
        )
        return fig

    # --- Symbolic Description ---
    if vertices is not None:
        fig = plot_solid(vertices, faces, solid_name)
        st.plotly_chart(fig, use_container_width=True)

        eq, values = symbolic_description(solid_name)
        st.subheader("🔣 Symbolic Description")
        st.latex(eq)
        st.write(f"Vertices (V): {values.get('V')}, Edges (E): {values.get('E')}, Faces (F): {values.get('F')}")

        st.markdown("---")
        st.caption("Built with ❤️ by Jagdev Singh Dosanjh")
```