Day: Jan 2, 2023
Time: 10:30 – 11:30AM
Room: 56-154

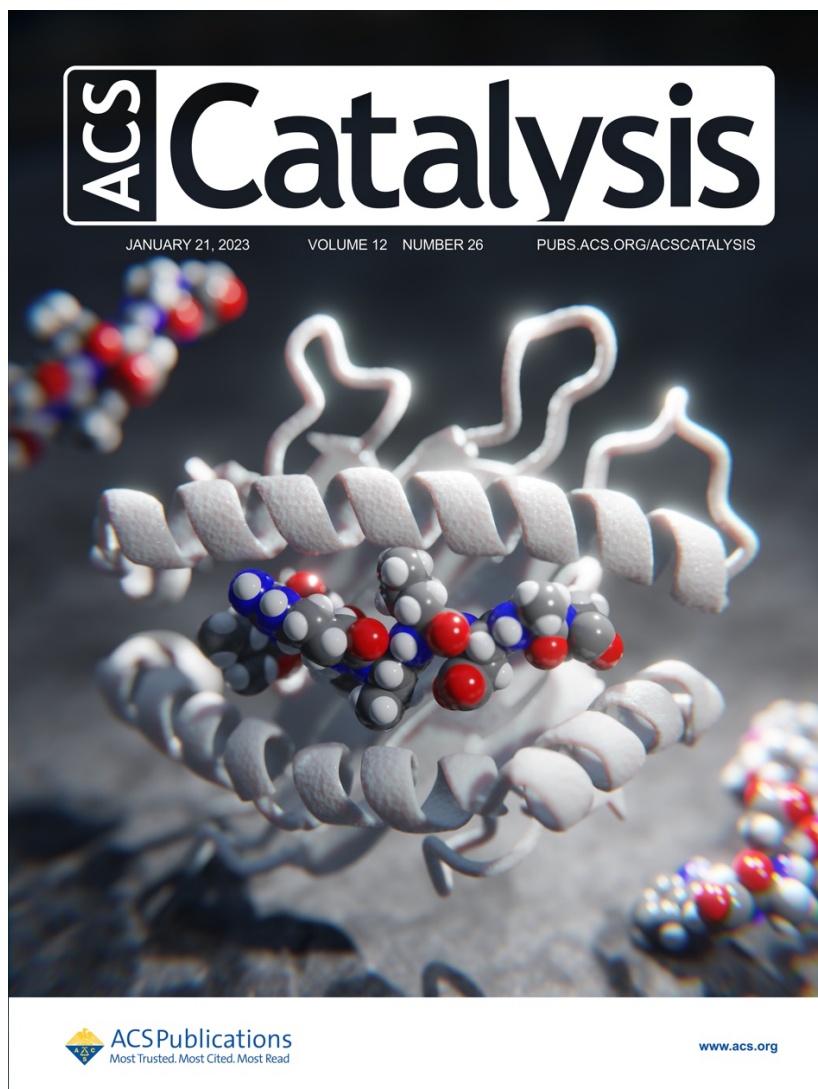# Lecture 2: Designing a Journal Cover Notes

Figure 1. The final render of this lesson, after combining environmental textures, procedural materials, and realistic PBR materials.

Lesson Summary

Congratulations on finishing the first lesson! I hope it wasn't too overwhelming. In this next lesson, we will be using our render from the previous lesson to design a journal cover. We will pull from what we learned in the previous lesson but will also introduce almost all the topics you will need to consider yourself a Blender expert. You should feel a little overwhelmed after this lecture but trust me that is the only way to learn 3D modeling!

Tools

Environmental Textures: https://polyhaven.com/hdris
BlenderKit: https://www.blenderkit.com/
PBR textures: https://ambientcg.com/, https://polyhaven.com/textures

Class Schedule

1. **Viewing your molecular scene from the lens of a journal cover**	15 min
2. **Using environmental textures to improve molecular scenes**	10 min
3. **Adding procedural material to molecules**	10 min
4. **Adding realistic PBR material to molecules**	10 min
5. **Create a dust and smudged lens effect with Blender's compositor**	10 min
Total Time	55 min

---

1. Viewing your molecular scene through the lens of a journal cover (15 min)

Before we start building a front-cover worthy render, it is helpful to add a journal cover to your scene so you can see what it will look like when published. There are often large spaces of the scene that the journal would like to be blank and uninteresting, which can be disorienting without a reference.

- **Shift+A** → **Image** → **Reference** → Select a cover template image
  - Rename the reference image to **Cover**
- Click on the image and move it in front of the camera
  - You will need to use **Move**, **Scale**, and **Rotate**
- Let's next update the camera dimensions to match the cover dimensions
  - Click on **Output Properties** in the **Properties Window**
    - **Resolution X** = 3840
    - **Y** = 2912
- Go into **Camera View** by selecting the camera image in the **Orbit Gizmo** and resize the Cover image
  - It doesn't have to be exact. It is only for reference.
- Play around with the object we already have to get something you like
- This is already looking really good and would have a good shot at the front cover. But it is always a good idea to create multiple very different versions for vetting.

Figure 2. The results of applying the scene from the previous lesson to a journal cover.

2. Using environmental textures to improve molecular scenes (10 min)

The first version turned out great, but what if the journal you are submitting to prefers realistic less-stylized covers? Think Nature and Science. Let's start with adding more realistic lighting. We can do this with an Environmental Texture. An environmental texture is a 360° image that captures all the light from a real scene, which we can then import into our scene.

- Go to: https://polyhaven.com/hdris
- Download an HDRI such as: https://dl.polyhaven.org/file/ph-assets/HDRIs/hdr/4k/canary_wharf_4k.hdr
- Go to the **Timeline Window**, click on the clock in the left-hand corner. This dropdown is called the **Editor Type**
- Select **Shader Editor**, which is an image of a sphere

- Change from **Object** to **World**
- Congrats! You just leveled up to working with **Nodes**, one of the most powerful aspects of Blender
- Let's add an environmental texture
  - **Shift+A → Search → Environmental Texture**
  - Connect **Color** to **Color**
  - Click **Open** and find your HDRI file
  - In the **Background** node change **Strength** to 0.1
- Visualize the results by selecting the **Rendered** view in **Viewport Shading**

---

3. Adding procedural textures to molecules (5 min)

The scene has a more realistic feel now, but the molecule feels out of place, like a cartoon in the real world. Let's add some realistic textures to our molecule. We will use BlenderKit, which offers a wide change of different textures for free. Make sure to download BlenderKit before this lesson.

- Download the BlenderKit zip file: https://www.blenderkit.com/get-blenderkit/
- Go back to Blender and open **Edit → Preferences → Add-ons → Install**
  - Click on the blenderkit zip. DO NOT UNZIP IT or it will not work.
  - Click the drop-down on the BlenderKit Add-on and select **Login**
- Go to the BlenderKit website and find a realistic texture that you like
  - For example: https://www.blenderkit.com/get-blenderkit/54ed14c0-3c65-4586-a567-b3f080e7de77/
  - The texture will appear in the top left-hand corner of the **3D Window**
  - Drag and drop the texture to the protein
  - Go to the **Node Editor** for the Object and inspect the Node layout
  - Change **Subsurface** to 0.2
- Lastly, play with the lighting to get some interesting shadows

---

4. Enhance your backdrop with realistic PBR materials (10 min)

There are many benefits to working with procedural textures but if you want an even more realistic texture, PBR materials are the way to go. These materials are usually photographed or scanned directly from the real world and can produce the most realistic renders. In this next, we are going to add a realistic cement floor to our scene

- In the 3D Window press **Shift+A → Mesh → Plane**
  - A new **Plane** object was just created in the center of the scene
- Toggle the **Camera View** by pressing the camera button in the **Orbit Gizmo**
- Use **Move**, **Scale**, and **Rotate** to position the plane just below the protein
  - Scale the plane so that it is large enough to fill most of the camera's view, although you won't need to fill all of it as the furthest parts of the background will be black
- Now we will apply the texture to the plane

- A dark cement texture would look interesting with this scene and go well with the snow texture of our molecule. However, feel free to use any texture. I will be using this one:
  - AmbientCG: https://ambientcg.com/view?id=SurfaceImperfections015
  - Download the texture by selecting **2K-PNG.zip**
  - Navigate to your downloads folder and unzip it
- Install the Node Wrangler plug-in that comes with Blender but that needs to be activated
  - **Edit → Preferences → Search → Node Wrangler →** check the box
- Select the plane in the **3D Window**
- Go down to the **Timeline Window** and switch the **Editor Type** to the **Shader Editor**
  - Press **New** to add a new material to the plane
  - Click on the **Principled BSDF** node
  - Press **Shift+Control+T**
    - This is a shortcut from **Node Wrangler** that will save us a lot of time
    - It will create the entire node setup for the PBR texture for us
  - In the file navigator, find the PBR material files that we downloaded
  - They should be in your downloads folder
  - Select all of the following files:
    - **Color**: SurfaceImperfections015_2K_Color.png
    - **Displacement**: SurfaceImperfections015_2K_Displacement.png
    - **Normal**: SurfaceImperfections015_2K_NormalGL.png
    - **Roughness**: SurfaceImperfections015_2K_Roughness.png
  - The node setup was automatically created
- In the node space of the **Shader Editor**, find the **Mapping group**
- Change the Scale of the **X**, **Y**, and **Z** values to **0.2**
- Move the peptides around so that they look good in the screen space
  - Make sure the left peptide is sitting directly on the ground for the best effect
- You are now ready to render the scene
  - **Render → Render Image**

---

5. Adding a dust effect in the compositor

Similar to lecture 1, we will be doing some post-processing in Blender's compositor to make our scene look more compelling. We will be adding some simple dust particles and camera smudges. This step is optional and just depends on the style preferences.

- Go to the compositing node in the **Info Window**
- Let's add a few nodes so that we can see what is going on
  - **Shift+A → Scale**
    - **X** = 0.2
    - **Y** = 0.2
  - **Shift+A → Viewer**
- Connect the **Lens Distortion** node into the **Scale** node into the **Viewer node**
  - You should now be able to see the render
- Now let's add the camera smudges
- Drop and drop the **camera_smudges.jpg** image into the node space

- o   A new node will appear for the image
- Add a Scale node
  - o   **Shift+A → scale**
  - o   Change the size to **Render Size** and the type to **Crop**
  - o   Connect the **Image** node to the **Scale** node
- Add a mix node between **Lens Distortion** and **Scale**
- Connect the **Scale** node for the lens smudge image to the second **Image** port on the **Mix** node
  - o   **Fac** = 0.1
- There you go! That is what the new cover will look like
- Connect the **Mix** node back to the **Viewer** node
- Rerender the scene