# Text Description for “Southern Ring Nebula Sonifications (NIRCam and MIRI Images)”

## Southern Ring Nebula, Near-Infrared and Mid-Infrared Images Side by Side (Horizontal Video)

Near-infrared and mid-infrared images of the Southern Ring Nebula have been visualized and sonified. These interpretations are presented as a short video with an integrated soundtrack.

In the video, a glowing vertical line sweeps over the two images, which appear side by side, from left to right. The colors that appear in the image are converted into frequencies of sound. To ensure the sounds fall within hearing range, the frequencies of light are shifted 38 octaves lower so that they can be associated with sounds we can hear.

Two views of the Southern Ring Nebula are shown side by side. Both feature black backgrounds speckled with tiny bright stars and distant galaxies. Both show the planetary nebula as a misshapen oval that is slightly angled from top left to bottom right. In both images, light that appears redder produces lower tones, while blue light produces higher tones.

At left, the near-infrared image shows a bright white star with eight long diffraction spikes at the center. A large transparent teal oval surrounds the central star. Several red shells surround the teal oval, extending almost to the edges of the image. The red layers, which are wavy overall, look like they have very thin straight lines piercing through them. Near-infrared light is intentionally mapped to a higher range of pitches, because near-infrared light has higher frequencies. Listen for the lower pitch exterior and higher pitch interior in this portion of the track. These sounds reflect where the colors are changing from red to blue, and to red again. Mid-way through this section, listen for a loud clang, which represents the single star clearly seen in this near-infrared image.

At right, the mid-infrared image shows two stars at the center very close to one another. The one at left is red, the one at right is light blue. The blue star has tiny diffraction spikes around it. A large translucent red oval surrounds the central stars. From the red oval, shells extend in a mix of colors. Mid-infrared light is mapped to a lower range of pitches to reflect that mid-infrared light has lower frequencies than near-infrared light. Listen for the higher pitch exterior and lower pitch interior in this portion of the track. These sounds reflect where the colors are changing from blue to red, and to blue again. Mid-way through this section, listen for a low note just before a higher note, which denotes the two stars that were detected in mid-infrared light.

## Southern Ring Nebula, Near-Infrared Image Only (Horizontal Video)

Near-infrared image of the Southern Ring Nebula has been visualized and sonified. This interpretation is presented as a short video with an integrated soundtrack.

In the video, a glowing vertical line sweeps over the image from left to right. The colors that appear in the image are converted into frequencies of sound. To ensure the sounds fall within hearing range, the frequencies of light are shifted 38 octaves lower so that they can be associated with sounds we can hear.

The near-infrared image of the Southern Ring Nebula features a black background speckled with tiny bright stars and distant galaxies. The planetary nebula is shown as a misshapen oval that is slightly angled from top left to bottom right. Light that appears redder produces lower tones, while blue light produces higher tones.

The near-infrared image shows a bright white star with eight long diffraction spikes at the center. A large transparent teal oval surrounds the central star. Several red shells surround the teal oval, extending almost to the edges of the image. The red layers, which are wavy overall, look like they have very thin straight lines piercing through them. Near-infrared light is intentionally mapped to a higher range of pitches, because near-infrared light has higher frequencies. Listen for the lower pitch exterior and higher pitch interior in this portion of the track. These sounds reflect where the colors are changing from red to blue, and to red again. Mid-way through this section, listen for a loud clang, which represents the single star clearly seen in this near-infrared image.

## Southern Ring Nebula, Mid-Infrared Image Only (Horizontal Video)

Mid-infrared image of the Southern Ring Nebula has been visualized and sonified. This interpretation is presented as a short video with an integrated soundtrack.

In the video, a glowing vertical line sweeps over the image from left to right. The colors that appear in the image are converted into frequencies of sound. To ensure the sounds fall within hearing range, the frequencies of light are shifted 38 octaves lower so that they can be associated with sounds we can hear.

The mid-infrared image of the Southern Ring Nebula features a black background speckled with tiny bright stars and distant galaxies. The planetary nebula appears as a misshapen oval that is slightly angled from top left to bottom right. Light that appears redder produces lower tones, while blue light produces higher tones.

The mid-infrared image shows two stars at the center very close to one another. The one at left is red, the one at right is light blue. The blue star has tiny diffraction spikes around it. A large translucent red oval surrounds the central stars. From the red oval, shells extend in a mix of colors. Mid-infrared light is mapped to a lower range of pitches to reflect that mid-infrared light has lower frequencies than nearinfrared light. Listen for the higher pitch exterior and lower pitch interior in this portion of the track. These sounds reflect where the colors are changing from blue to red, and to blue again. Mid-way through this section, listen for a low note just before a higher note, which denotes the two stars that were detected in mid-infrared light.

## Southern Ring Nebula, Near-Infrared and Mid-Infrared Images (Vertical Video)

Near-infrared and mid-infrared images of the Southern Ring Nebula have been visualized and sonified. These interpretations are presented as a short video with an integrated soundtrack.

In the video, a glowing vertical line sweeps over the two images, which appear vertically, one on top of the other. The colors that appear in the image are converted into frequencies of sound. To ensure the sounds fall within hearing range, the frequencies of light are shifted 38 octaves lower so that they can be associated with sounds we can hear.

Both views feature black backgrounds speckled with tiny bright stars and distant galaxies. Both also show the planetary nebula as a misshapen oval that is slightly angled from top left to bottom right. In both images, light that appears redder produces lower tones, while blue light produces higher tones.

At top, the near-infrared image shows a bright white star with eight long diffraction spikes at the center. A large transparent teal oval surrounds the central star. Several red shells surround the teal oval, extending almost to the edges of the image. The red layers, which are wavy overall, look like they have very thin straight lines piercing through them. Near-infrared light is intentionally mapped to a higher range of pitches, because near-infrared light has higher frequencies. Listen for the lower pitch exterior and higher pitch interior in this portion of the track. These sounds reflect where the colors are changing from red to blue, and to red again. Mid-way through this section, listen for a loud clang, which represents the single star clearly seen in this near-infrared image.

At bottom, the mid-infrared image shows two stars at the center very close to one another. The one at left is red, the one at right is light blue. The blue star has tiny diffraction spikes around it. A large translucent red oval surrounds the central stars. From the red oval, shells extend in a mix of colors. Midinfrared light is mapped to a lower range of pitches to reflect that mid-infrared light has lower frequencies than near-infrared light. Listen for the higher pitch exterior and lower pitch interior in this portion of the track. These sounds reflect where the colors are changing from blue to red, and to blue again. Mid-way through this section, listen for a low note just before a higher note, which denotes the two stars that were detected in mid-infrared light.

## Alt Text

Near-infrared and mid-infrared images of the Southern Ring Nebula have been visualized and sonified. These interpretations are presented as a short video with integrated sound. Most videos are horizontals, scanning the image from left to right, but one scans the top portion of the image from left to right, followed by the bottom portion from left to right.