Out of This World Shading: Look Development for Aliens in Pixar's *Elio*

TRENT CROW, MARIA LEE, and PATRICK YU WANG, Pixar Animation Studios, USA

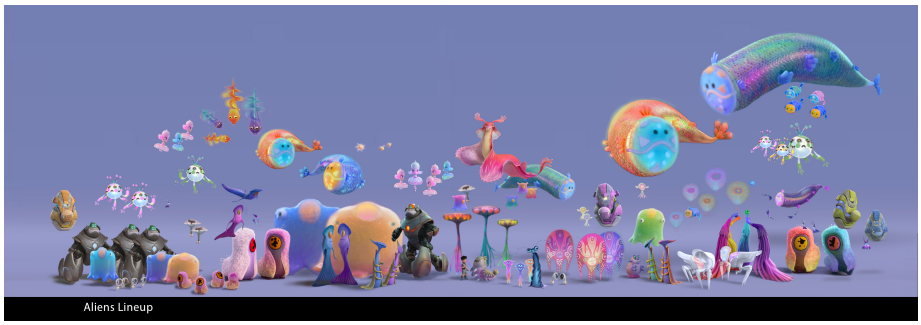

Fig. 1. Alien species in Pixar's *Elio*. ©Pixar

The aliens in Pixar's *Elio* commanded a unique look in space. We crafted each species individually with respect to its own characteristic features, carefully choosing colors and material properties to create over 18 species. Their designs took inspiration from various flora and fauna including micro-organisms, worm-like, bird-like, and sea creatures. They needed to be appealing, organic, and tactile but without feeling "earth bound". To implement these designs and help them feel unique and alien, our team explored combining illumination models and animated shading techniques in ways not commonly found in earth species and materials. This process created a collaborative and interactive approach to our look development to celebrate diversity and inclusivity in *Elio*'s fantastic space aliens.

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1 LOOK DEVELOPMENT CUES

Look development for the alien species was an enjoyable collaboration between art and technical that started with the art team deciding on colors and characteristics that made each species interesting and fun. Designs for the species belonging to the main alien characters were created first, followed by those of the secondary and tertiary characters to effectively budget the design costs across the many species needed.

Different collections of images guided us to focus our materials exploration and gave us some real-life reference we could use to ground our materials with substances we could relate to. One explored various patterns and colors for how to approach eyes, but trying to steer away from typical human or common eye anatomy and structures. Another

Authors' address: Trent Crow, tcrow@pixar.com; Maria Lee, marialee@pixar.com; Patrick Yu Wang, patrickyuwang@pixar.com, Pixar Animation Studios, USA.

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exploring bioluminescence seen in insects, sea creatures, and plant life was heavily referenced. We sought for images to inspire how to add glowing elements to skin and other features or how to combine patterns made from clouds, stars, and lines in different ways to depict body features.

2 MATERIAL EXPERIMENTS

Even before model designs were completed, we explored combining different material illumination models and pushing their properties in ways not commonly found in earth species, such as mixing refraction and subsurface with long scattering distances with iridescence and glow. By using a test geometric model with both curves and hard angle surfaces, we tested our materials using just basic colors for a base on which to build our materials. We combined some ideas, like a fake light below a screen pattern, glitter on a highly subsurface material, or combining subsurface and refraction.

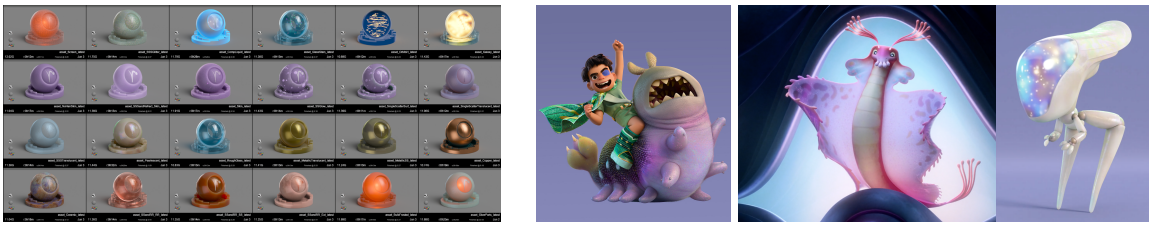

Fig. 2. Materials exploration on test geometry and examples of their use on alien species. ©Pixar

3 ART INVITES TECHNICAL EXPLORATION

Beyond just thinking about material properties, we looked at the designs for opportunities for different types of shading methods that would set the looks apart from familiar earth materials. One way we achieved this was to look for opportunities for animated features or elements that changed over time, which are not typically found in most of our characters based on earth species. Another was to explore shading techniques considered more expensive and thus not used on the average character, such as ray marching inside of a space to fake the appearance of particles, non-homogenous volumetric shaders, procedurally instancing geometry across a surface or inside of a volume, and tracing from one geometry to another to create a certain effect.

Shading artists collaborated with the design artists to help determine the final look of some of our alien characters. During most projects shading artists are used to receiving a shading art packet with reference art, photos, and descriptions as a specific guide to shading the character. This process proved to be more difficult when trying to imagine how some of our alien designs combined with some of our more creative material explorations would look on a character. Also, shading artists often need space to try out technical solutions to their own ideas to help inform or add to the design. Thus, our new process for the aliens was for shading to first receive a more informal design packet with general ideas for the character. The shading artist then used those ideas to start experimenting with the look of the character, checking in with the design artist several times to iterate on what became the final look of the character. Often the shading artist helped to gather reference images and paint concept images and draw-overs to contribute ideas to the design. This flexible back-and-forth process was highly efficient in yielding impressive yet practical shading results true to their original design goals.