



Practical Physically-Based Shading in Film and Game Production



bit.ly/s12shaders

- Notes and slides now/soon!



- 09:00 **Intro: The Importance of Physically-Based Shading** (Hill)
- 09:05 **Background: Physics and Math of Shading** (Hoffman)
- 09:30 **Calibrating Lighting and Materials in Far Cry 3** (McAuley)
- 10:00 **Beyond a Simple Physically-Based Blinn-Phong Model in Real-Time** (Gotanda)
- 10:30 *Break*
- 10:45 **Physical Production Shaders with OSL** (Martinez)
- 11:15 **Physically-Based Shading at Disney** (Burley)
- 11:45 **Reflection Model Design for WALL-E and Up** (Smits)

The Importance of Physically-Based Shading

Physically-Based vs Photo Realism

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“Photo-realistic rendering places emphasis on the appearance of its output rather than the techniques used to derive it. Anything goes, basically, as long as the final image looks nice.”

- Greg Ward

http://radsite.lbl.gov/radiance/refer/Notes/rendering_note.html

Mounting Complexity

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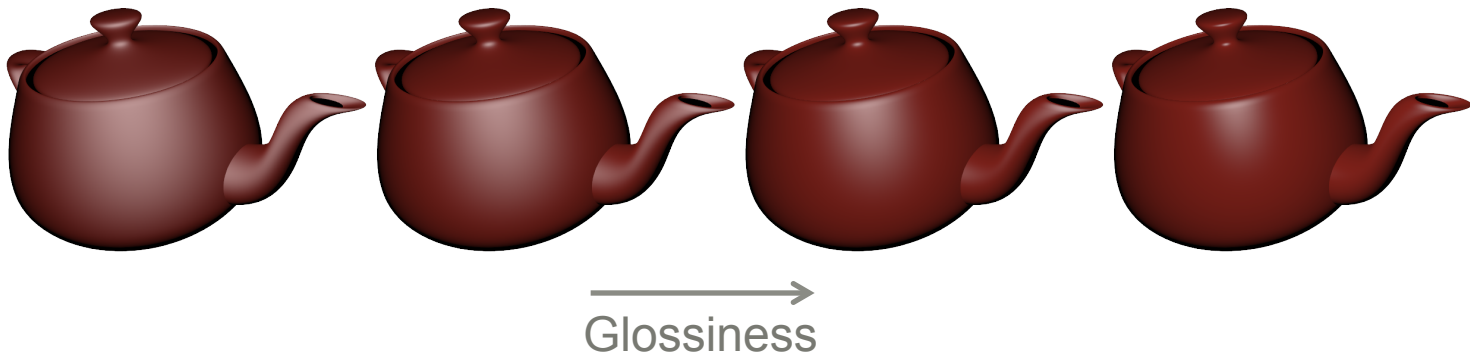


- Artists are the bottleneck
- Avoid:
 - 100s of sliders
 - Unintuitive, interconnected values
 - Complex shaders, passes
- Aim for:
 - Consistency of materials
 - “Works out of the box”



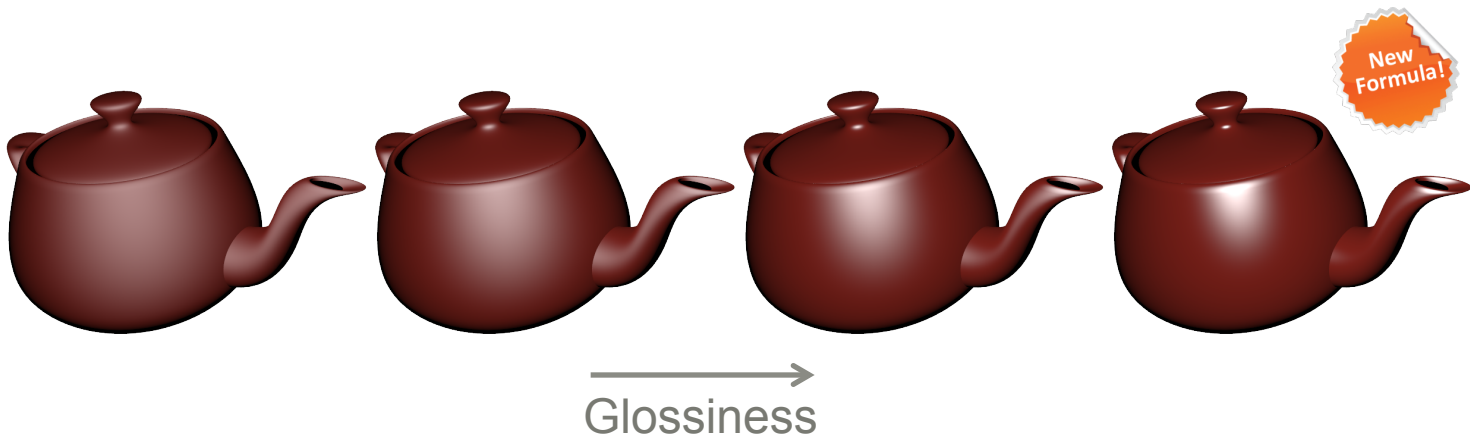


- Energy conservation:





- Energy conservation:



- Avoids gloss-reflectance dependency

It's a Framework

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- Input data
 - Calibrated textures
 - Artist guidelines
- Physical values
 - Lights
 - Material properties
- Architecture
 - Shading language
 - Renderer
- Bottom-line: less guesswork



It's a Common Language

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- Easier to breakdown production problems
 - “Why is my material too dark?”
 - Artists can self-diagnose
 - Missing effects can be reasoned about
- My hope in the future:
 - “I think you screwed up the energy conservation of the Ashikhmin-Shirley model. Take a look at my simple test case.”
- Language ⇔ understanding

