



RTT Stellar™ – A Novel Material Rendering Technology

Dr. Thomas Ullmann





Motivation

Emotions sell ...





Motivation

... but
realism matters!



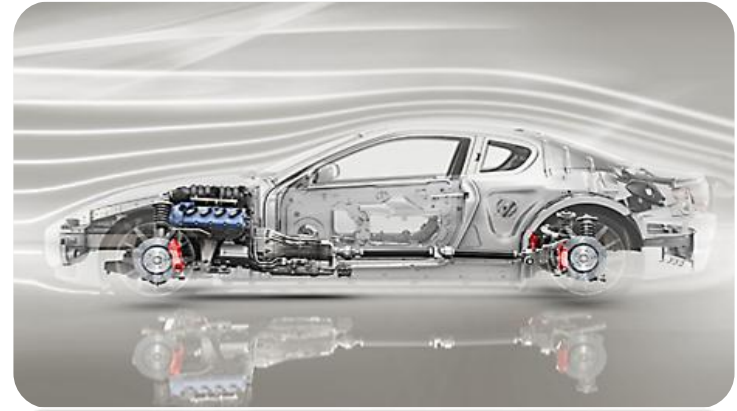


Visualization Paradigms



Physics based rendering

- Instant, photo-realistic images
- Low manual effort
- Well portable / reusable
- Suitable for automation



Artistic rendering

- Emotional, marvelous images
- High manual effort
- Not portable / reusable
- Less suitable for automation

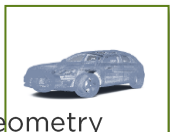
Combination of Both Worlds as a Key Success Factor!



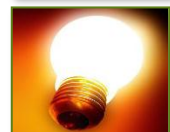
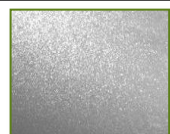
Visualization Pipeline Today

Scene setup

Input components:



Rendering



GI-Shader (Look2)

RT-Shader (Look2)

OpenGL-Shader (Look2 / CgFx)

Display image

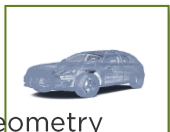




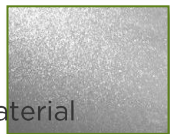
Strategic Material & Light Handling

Scene setup

Input components:



Geometry



Material



Lights

Rendering

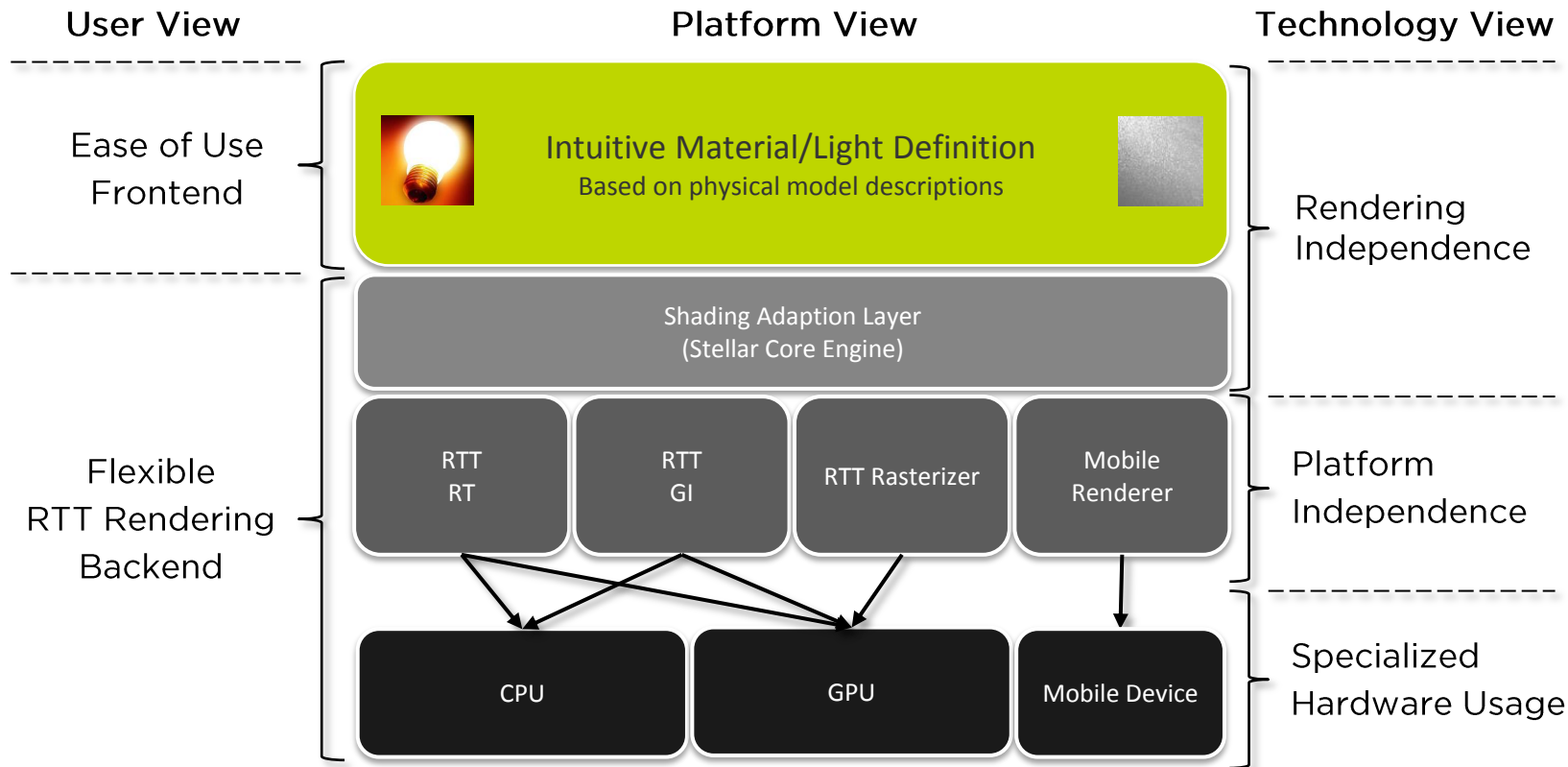


Display image





RTT Stellar™ – Revolutionary Visualization Architecture





Details of Material Model





Material Model

Key: Descriptive (not imperative)

Optical properties



Structural properties



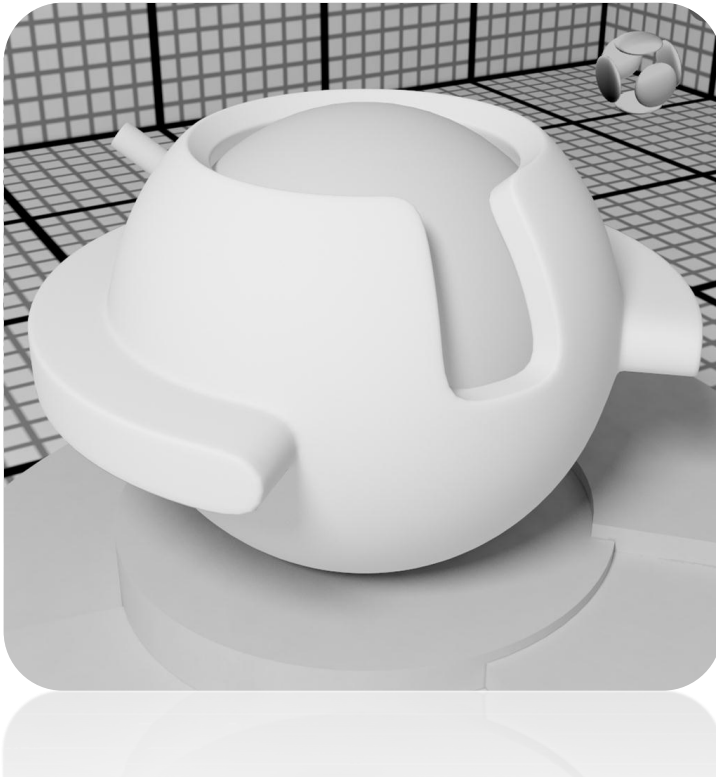
Volumetric properties



Combine multiple layers



Examples of Flexibility - Diffuse

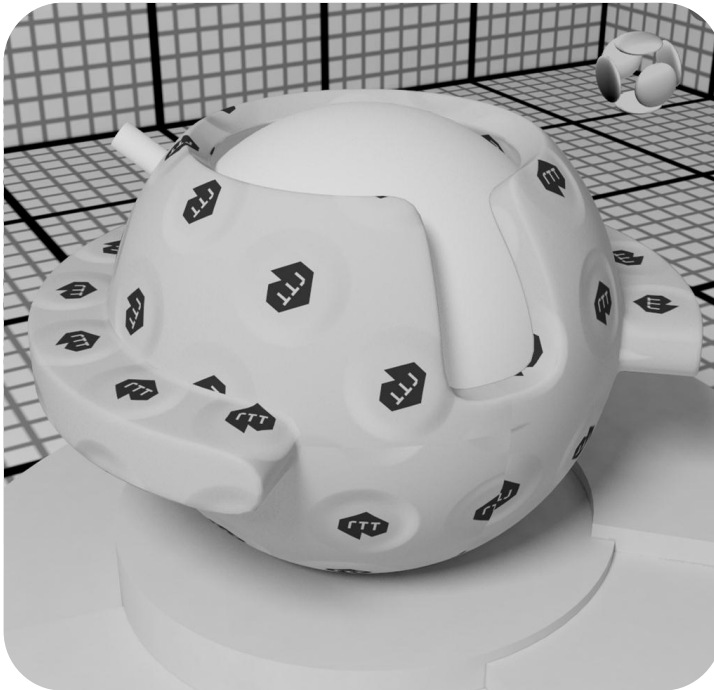


Components:

- Lambert BRDF



Examples of Flexibility - Textured Diffuse, Structure

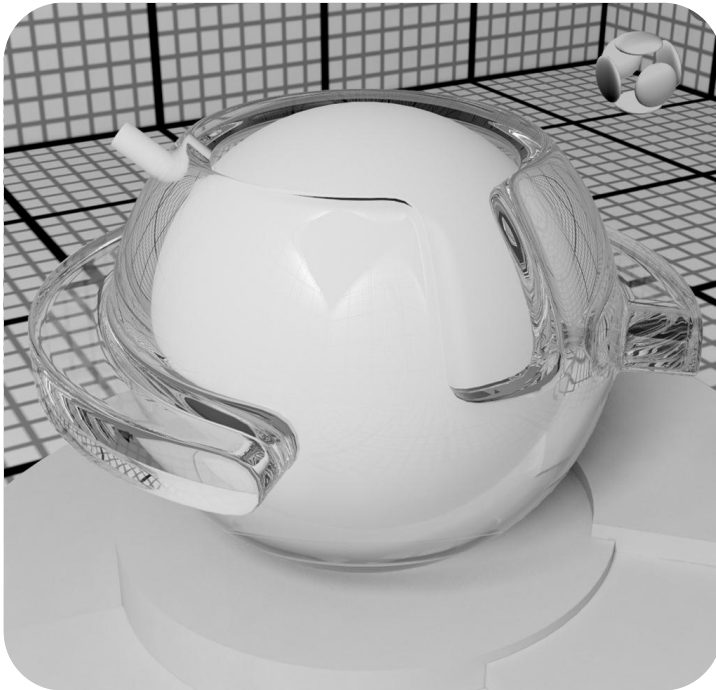


Components:

- Lambert BRDF
- Diffuse Texture
- Normal Texture



Examples of Flexibility - Glass

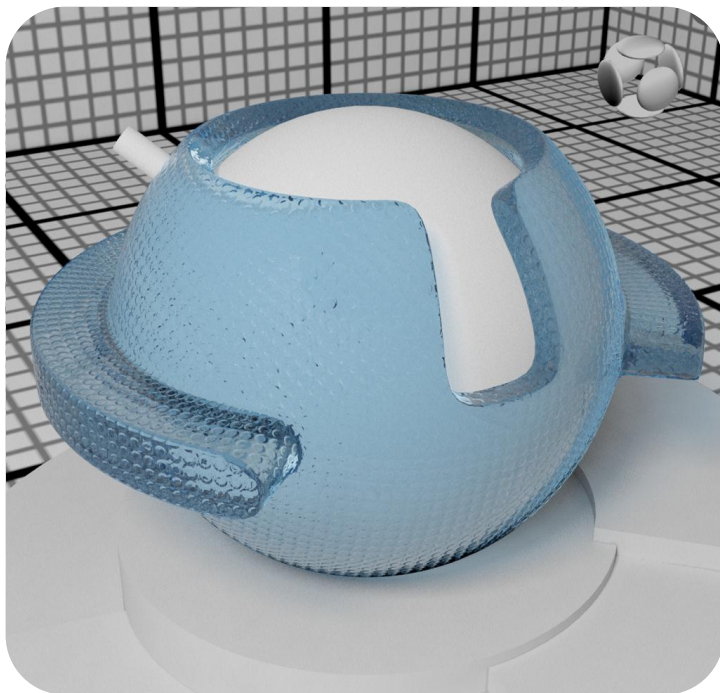


Components:

- Reflection BRDF
- Refraction BTDF
- Dielectric Fresnel



Examples of Flexibility - Structure, Absorption

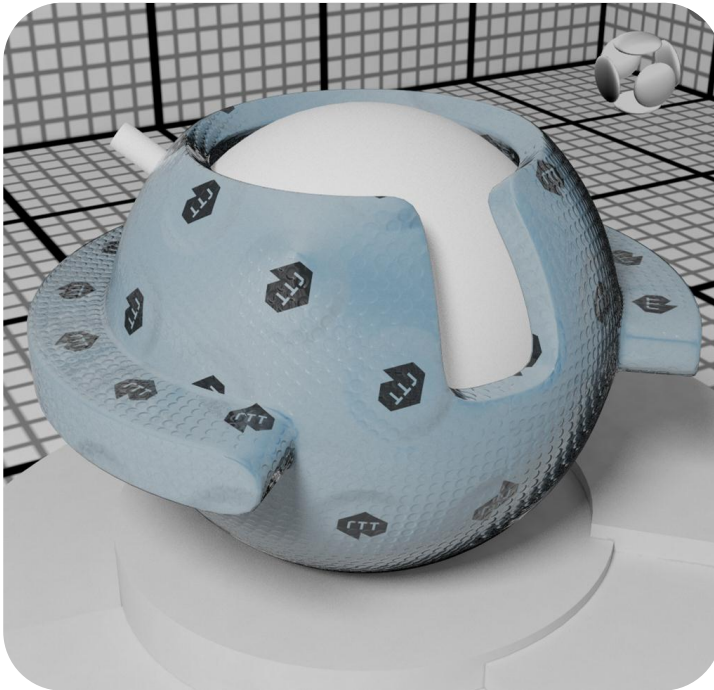


Components:

- Reflection BRDF
- Refraction BTDF
- Dielectric Fresnel
- Normal Texture
- Absorption

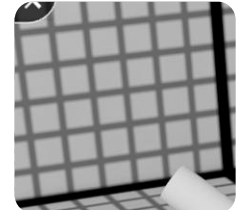


Examples of Flexibility - Layered



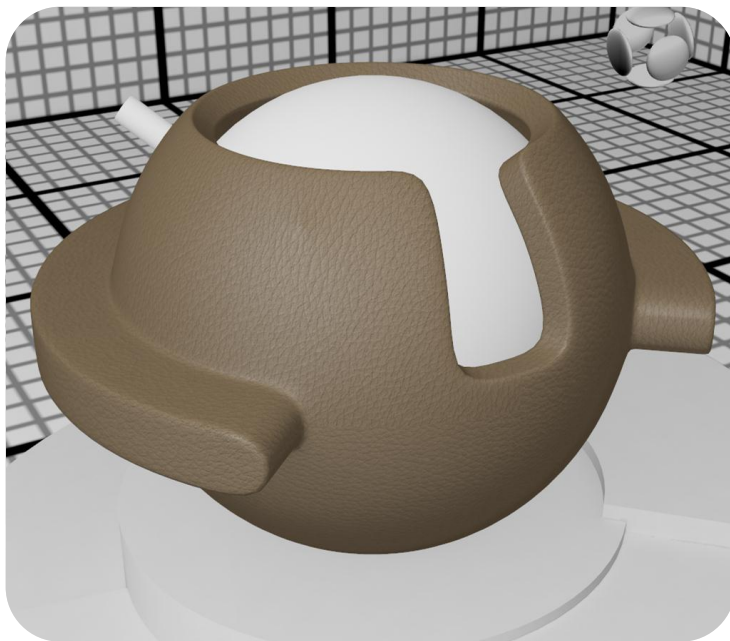
Components:

- Bottom Layer
 - Lambert BRDF
 - Diffuse Texture
 - Normal Texture
- Top Layer
 - Reflection BRDF
 - Refraction BTDF
 - Dielectric Fresnel
 - Normal Texture
 - Absorption

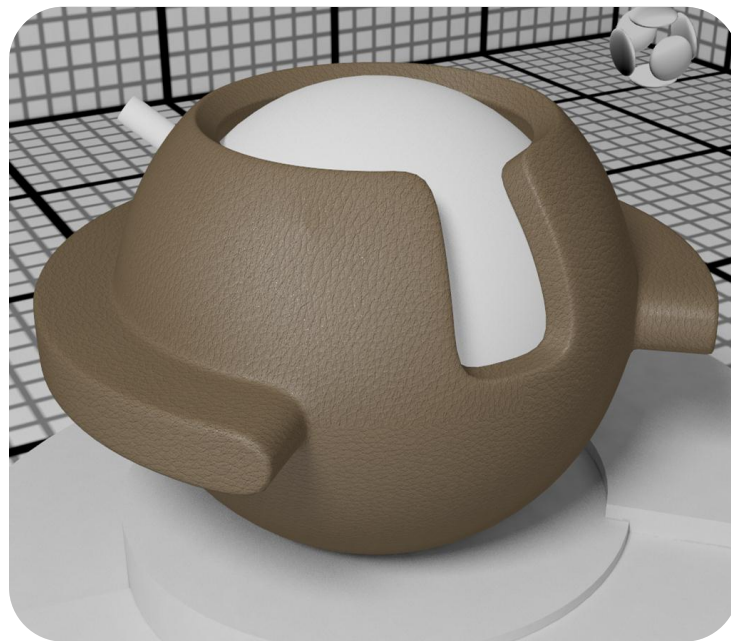




Consistency - Basic Features



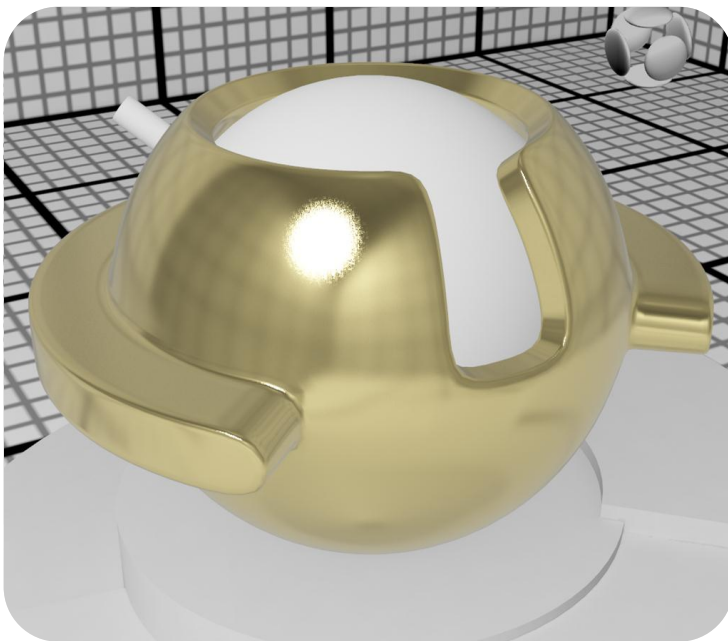
Rasterization



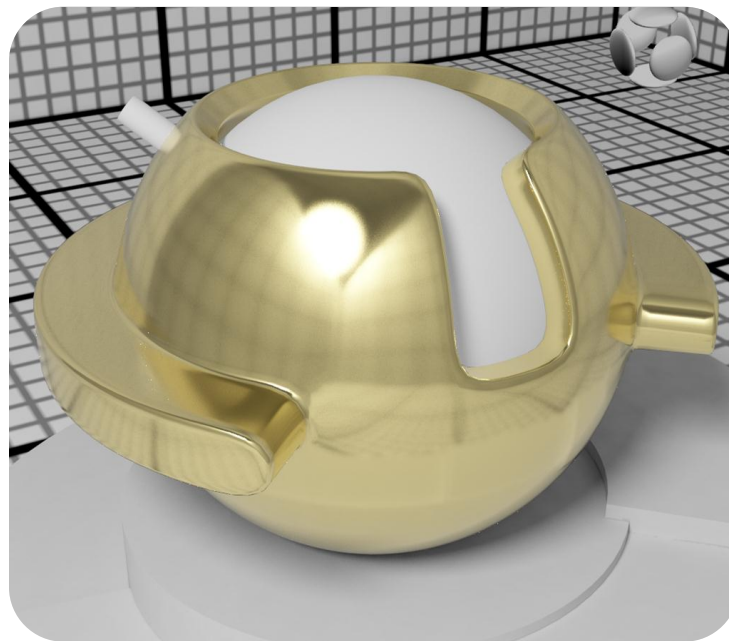
Raytracing



Consistency - Reflection



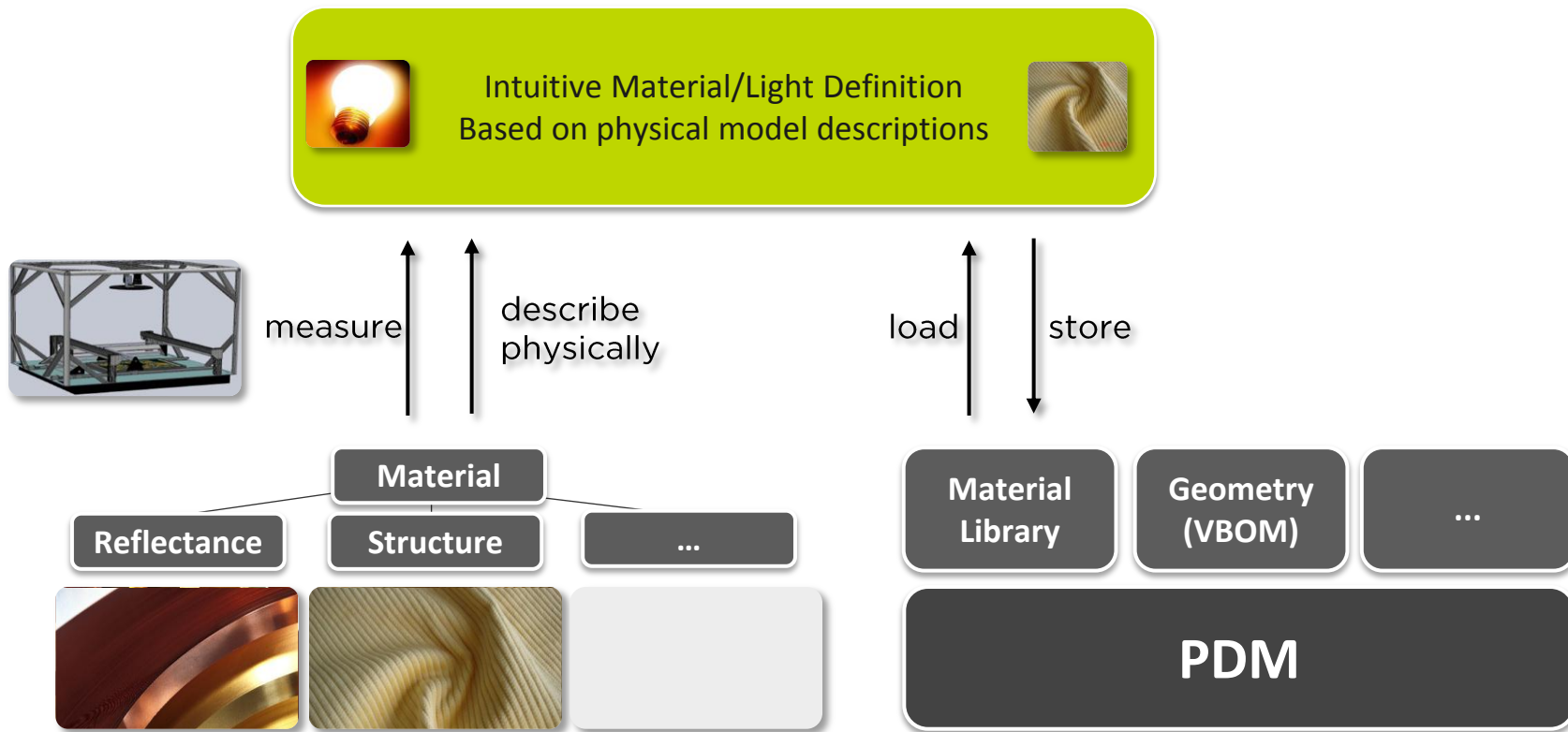
Rasterization



Raytracing

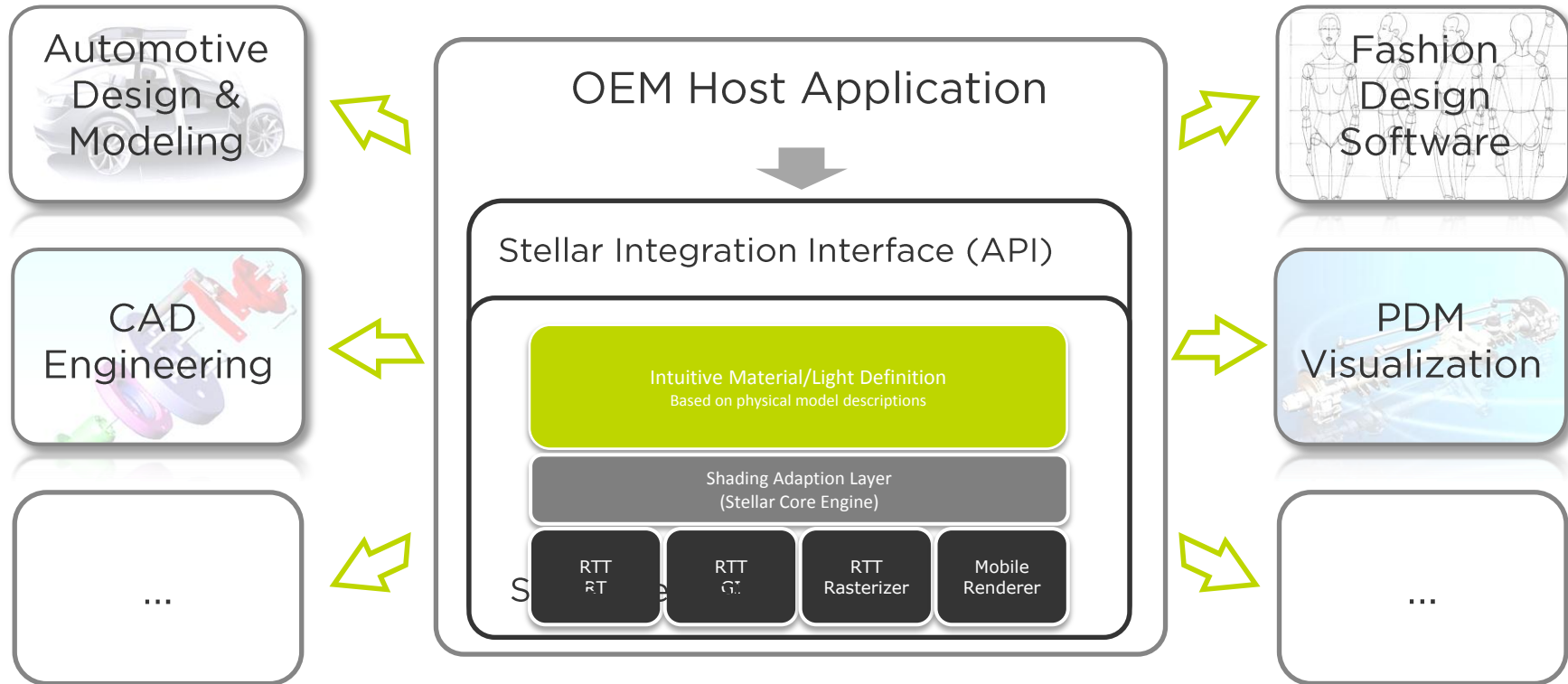


Physically based Material Libraries





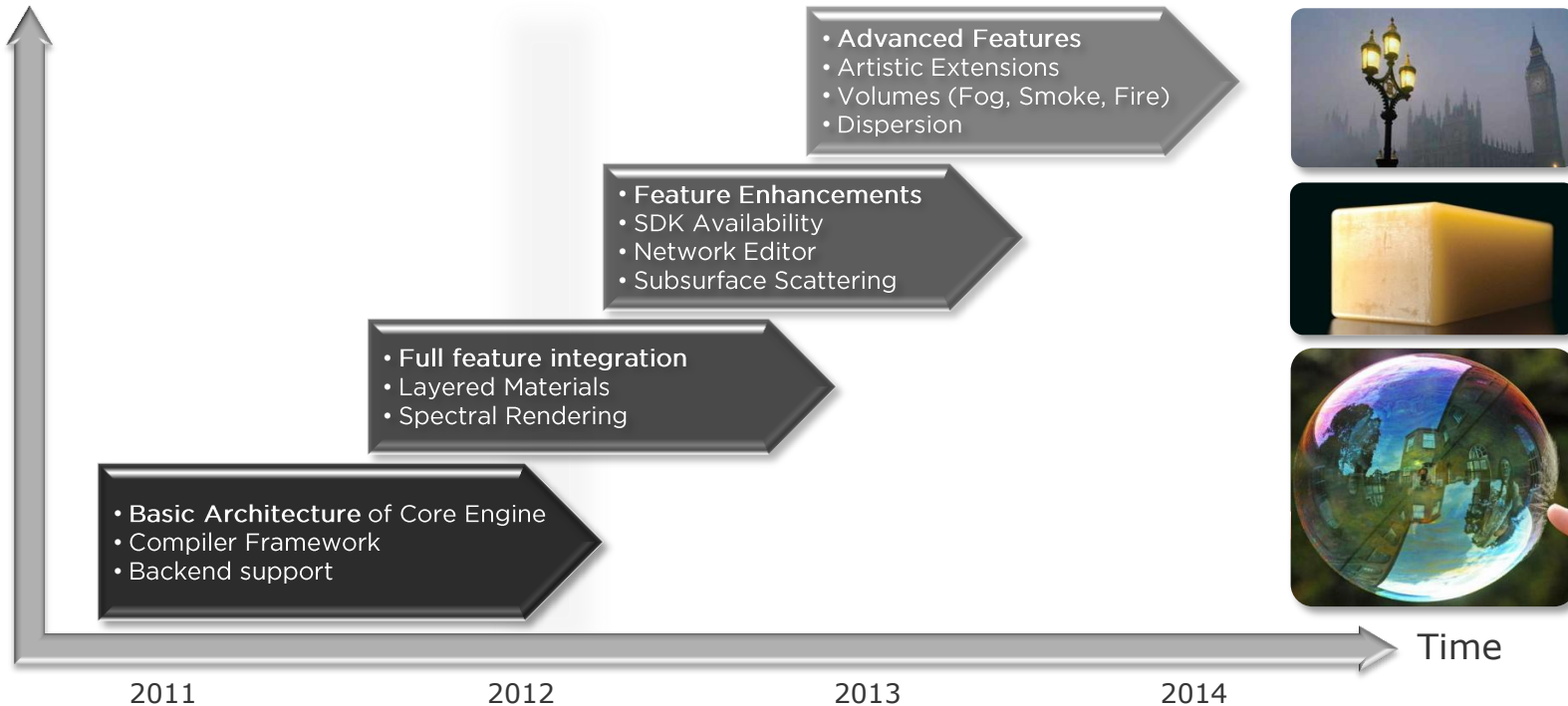
A 3rd Party Rendering Component





RTT Stellar™ – Roadmap & Outlook

Capability
Level





Thank you for Attention! Questions?



