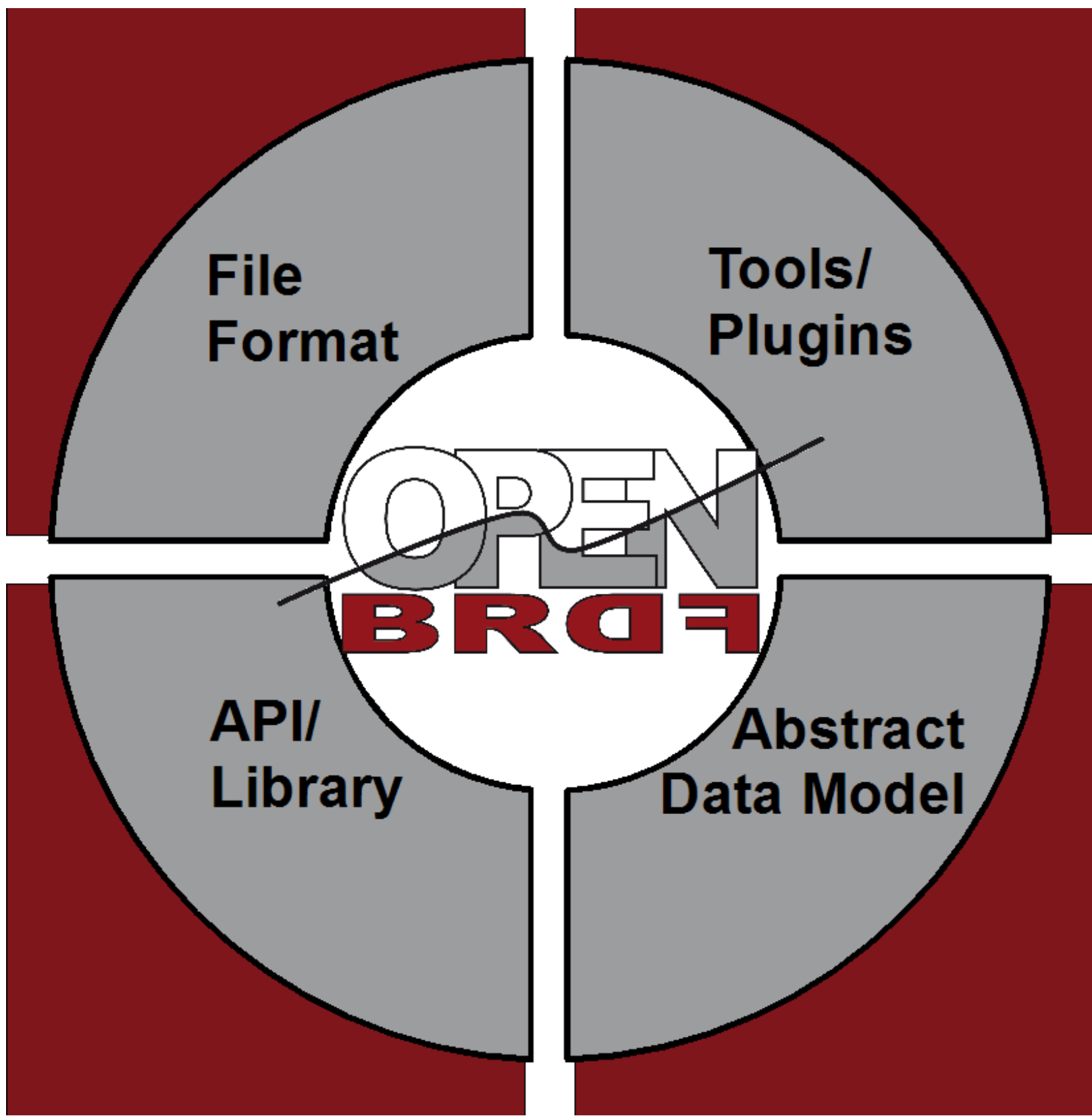


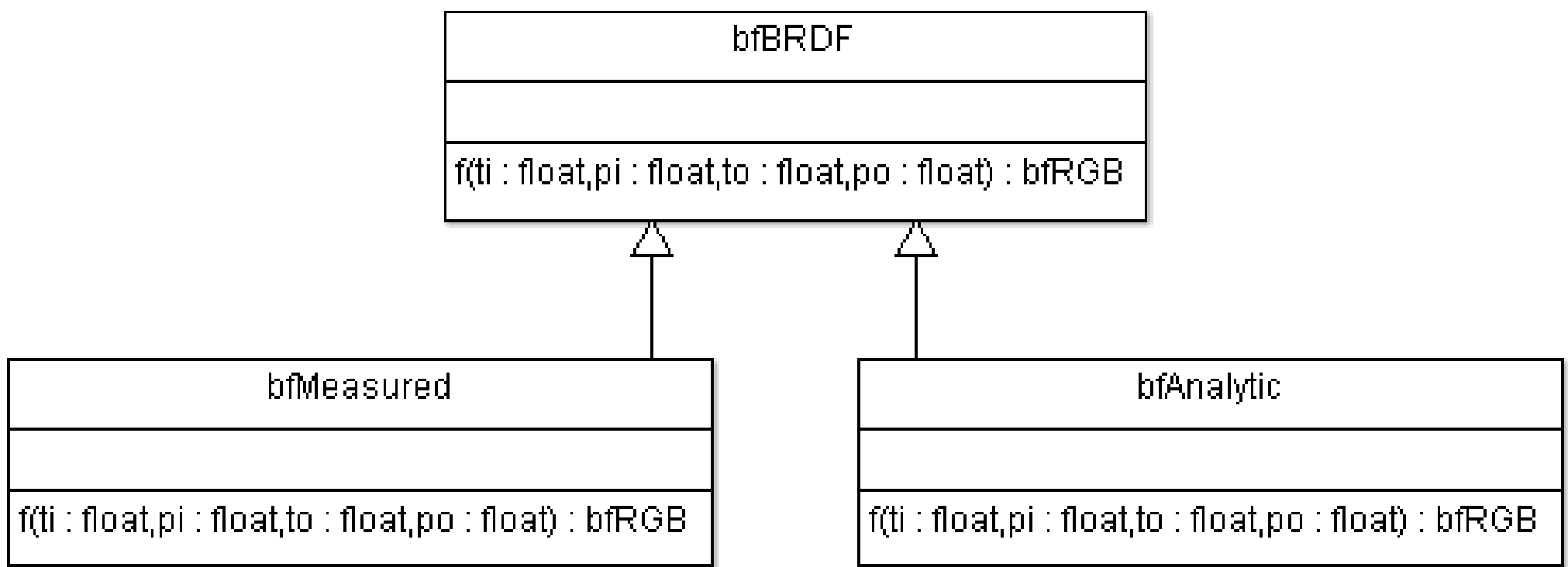
Motivation

- In computer graphics heuristic models or more advanced physically based lighting models describe the appearance of materials.
- Rather than attempting to model material many efforts have been made to develop methods to sample them ([Dan01, MPBM03b, MMS\*04, HNZ\*05, WLL\*08]).
- Much more samples will soon be available: commodity sampling devices can be expected in the near future.
- An open system for measured surface reflectance and transmittance distribution functions is needed!

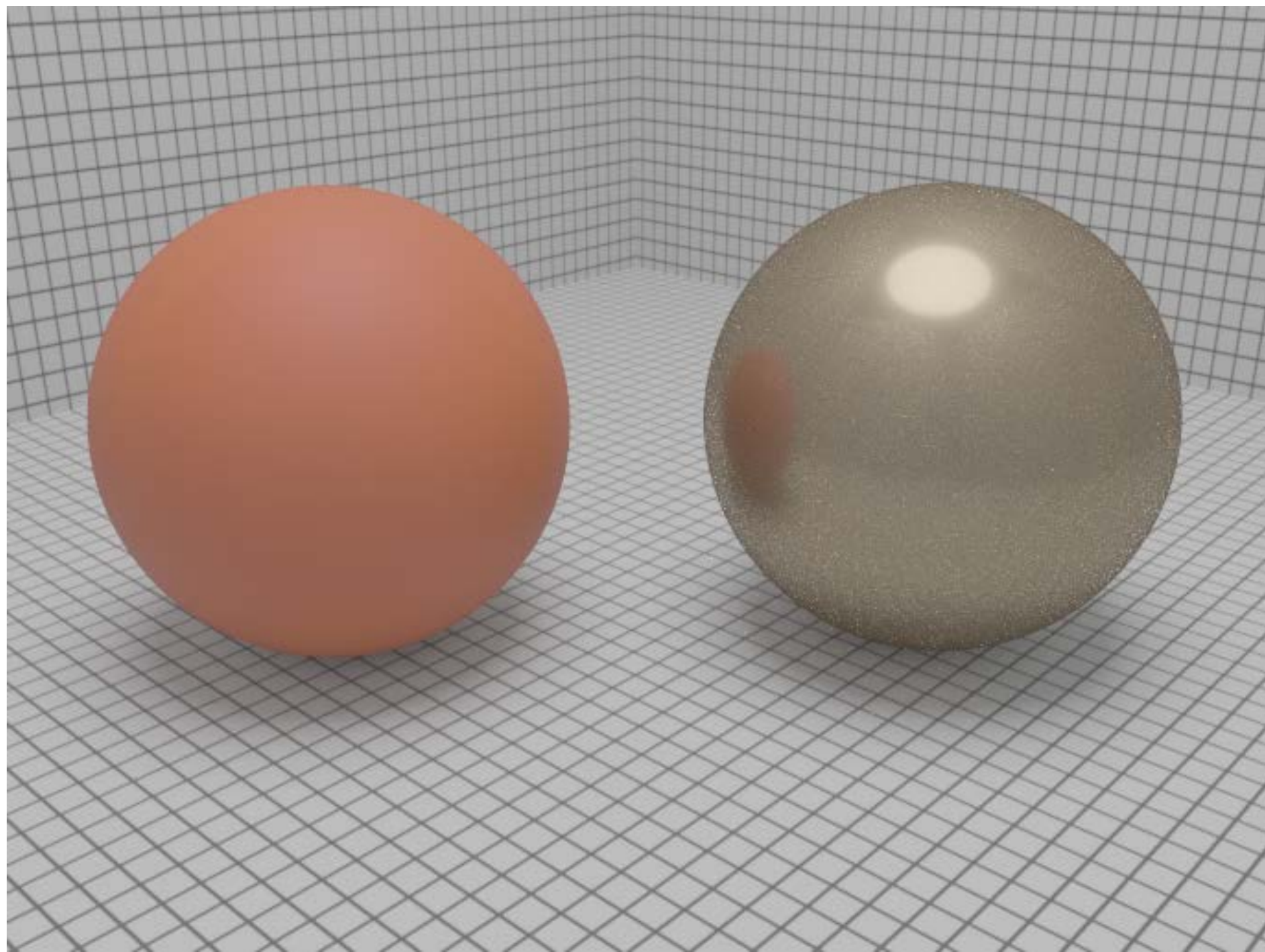


Results

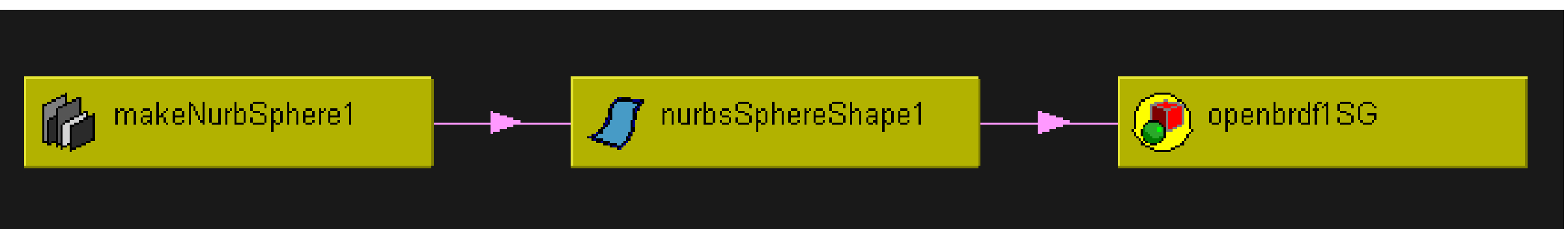
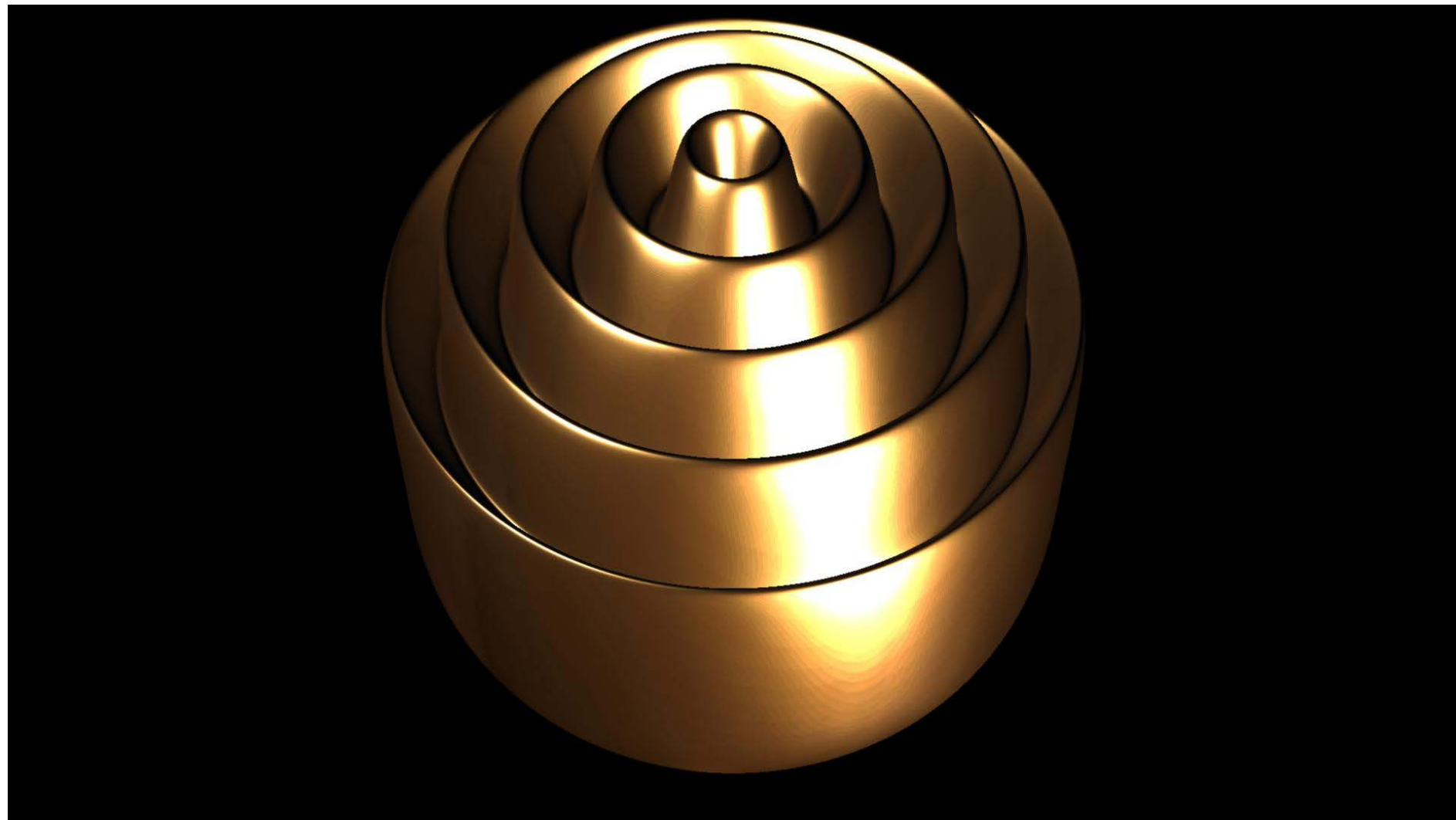
- Abstract data model and C++ toolkit
- Im- and exporters for datasets
- Approximation and conversion of datasets



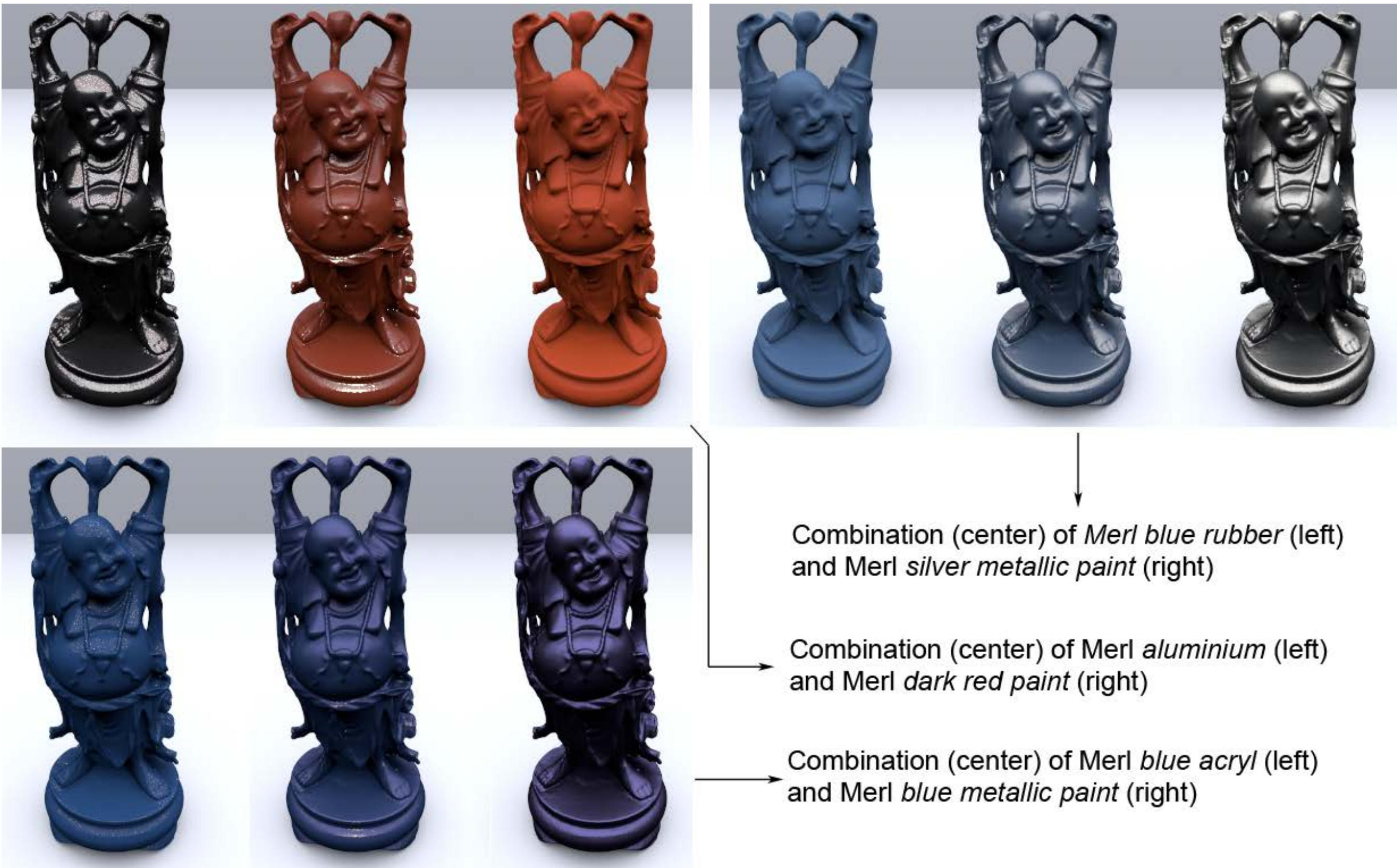
- Integration in pbrt 2.0 [PH04] using the OpenBRDF API (Left: measured diffuse light-brown, right: gold metallic paint, MERL [MPBM03a])



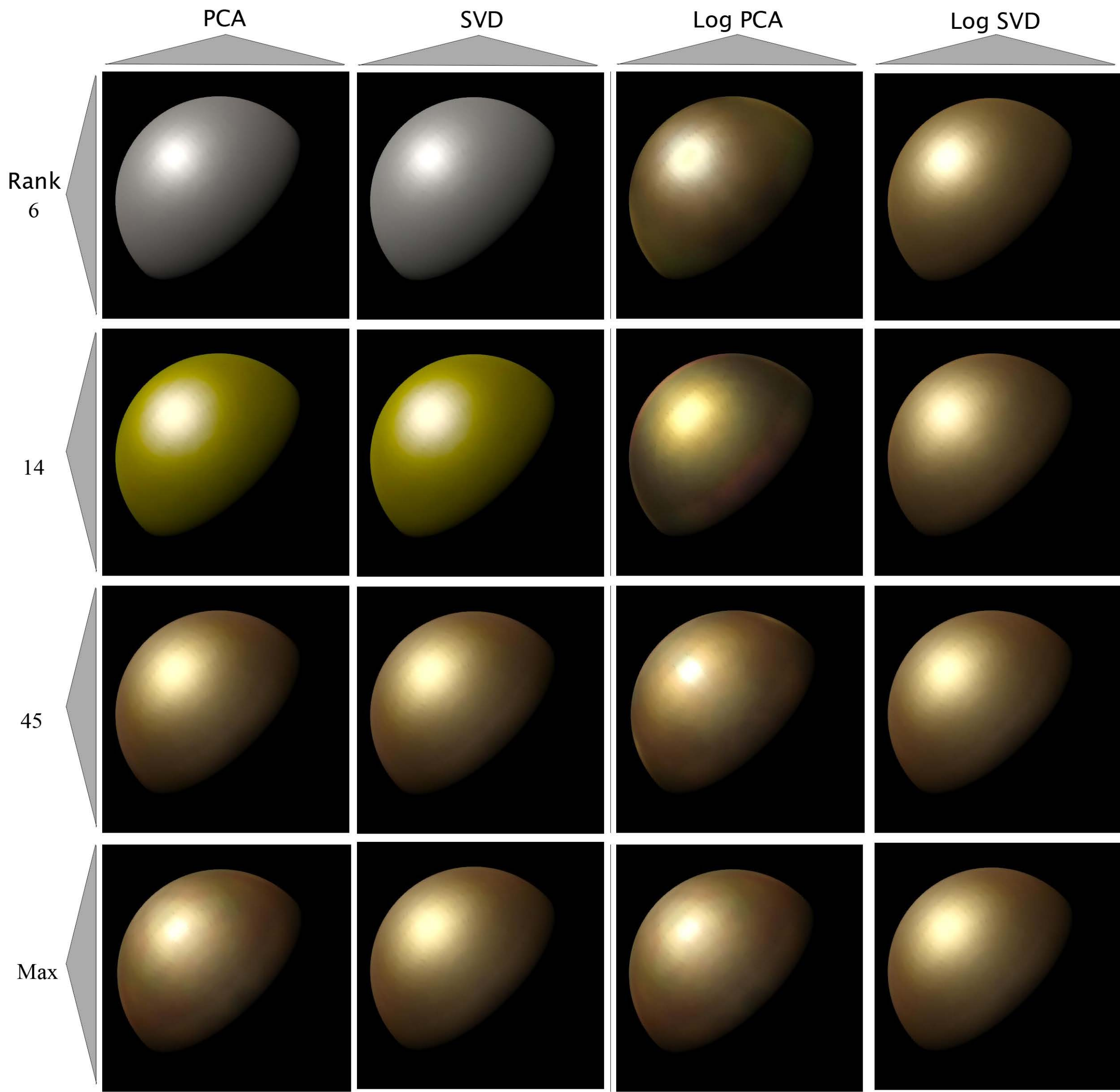
- Integration in mental ray 3.7 and Autodesk Maya 2010



- Linear dimension reduction algorithms using Principal Component Analysis and Singular Value Decomposition
- Creating new materials using linear combinations of measured materials in low-dimensional subspaces.



- A MERL gold metallic paint rendered with pbrt (Different ranks (6,14,45,100), different algorithms for dimension reduction (SVD, PCA), with and without logarithmic scale).



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