

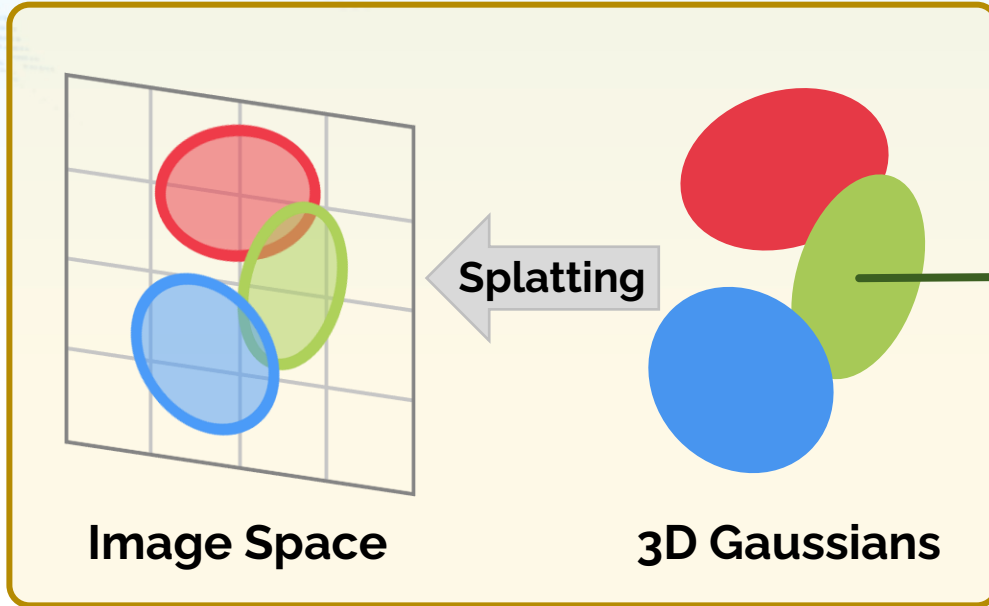
# Ref-GS: Directional Factorization for 2D Gaussian Splatting

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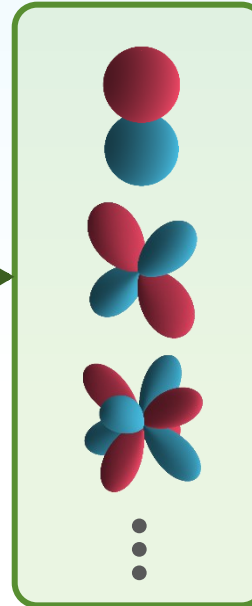


## 3D Gaussian Splatting



- ✓ Fast Training
- ✓ Real-Time Rendering
- ✓ Better Quality

## Spherical Harmonics



- ✗ Smooth
- ✗ Low-frequency
- ✗ Limited Details

## Rendering



Low-order SH cannot model high-frequency details.



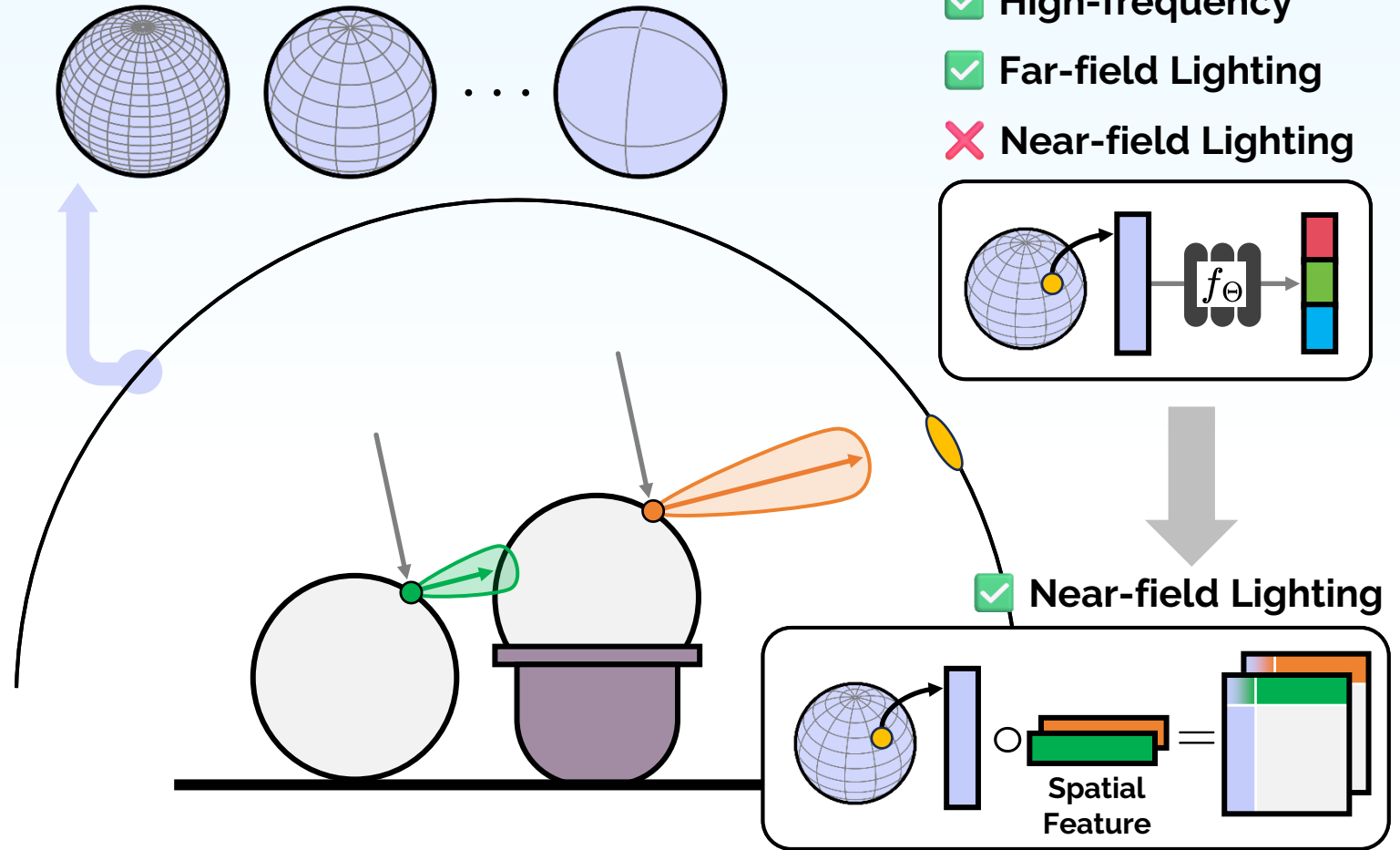




# Methods

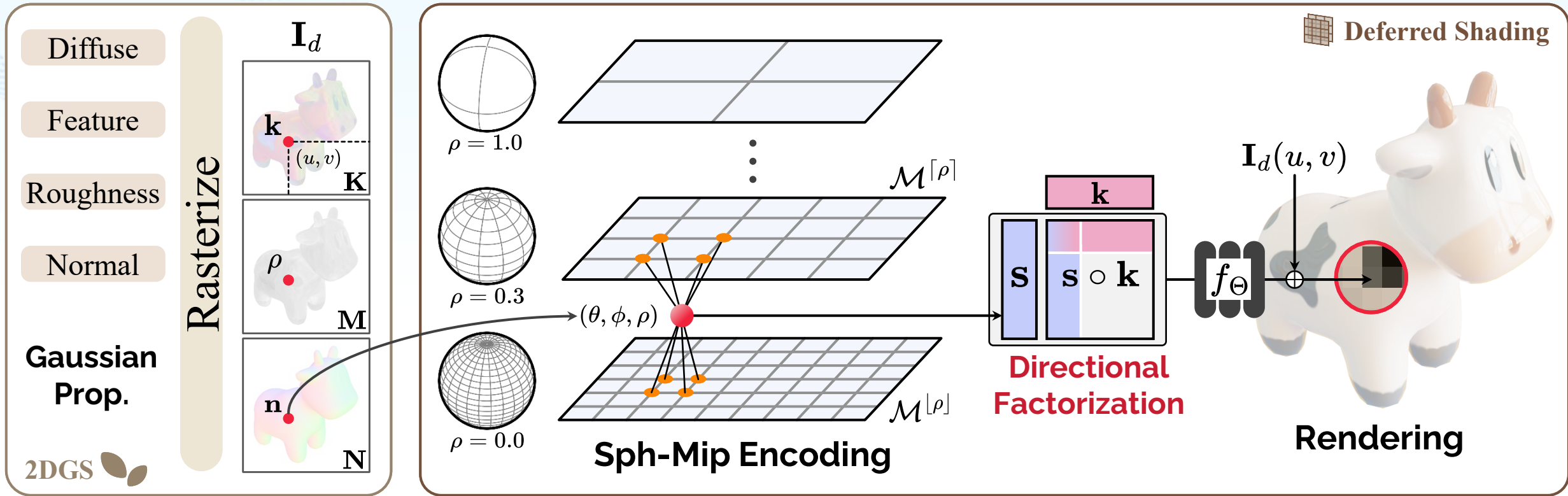


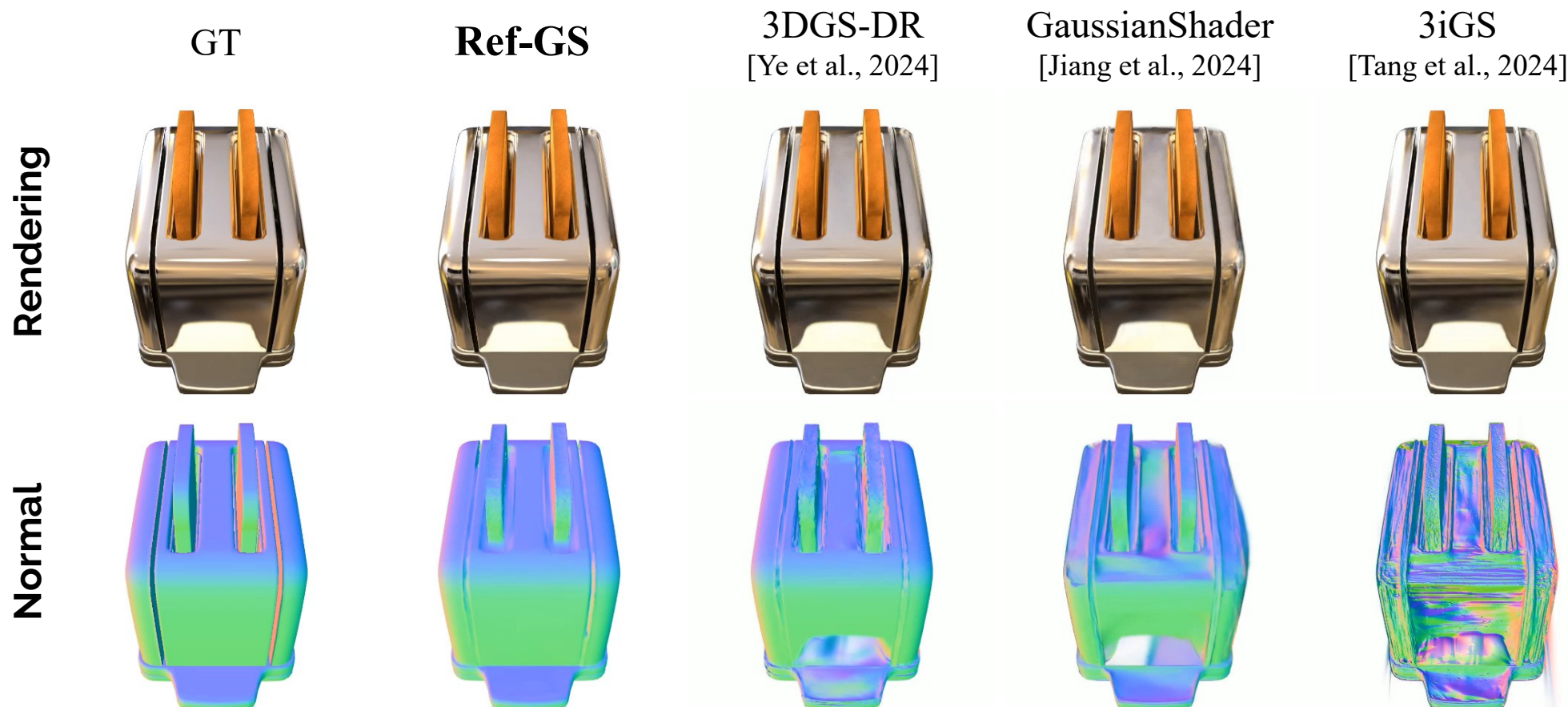
## Multi-level Mipmap Feature



**Directional Factorization**

# Overview of Ref-GS





Ye, et al. 3D Gaussian Splatting with Deferred Reflection. SIGGRAPH. 2024.

Tang, et al. 3iGS: Factorised Tensorial Illumination for 3D Gaussian Splatting. ECCV. 2024.

Jiang, et al. GaussianShader: 3D Gaussian Splatting with Shading Functions for Reflective Surfaces. CVPR. 2024.

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## Baseline



- ✗ Popping Artifacts
- ✗ Blurry Rendering
- ✗ Near-field Lighting

## Ref-GS



- ✓ High-frequency
- ✓ Far-field Lighting
- ✓ Near-field Lighting

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# Ref-GS: Directional Factorization for 2D Gaussian Splatting



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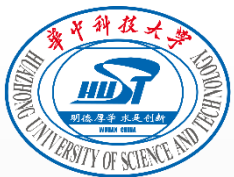
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