Phong Shading

- Non-physically based way to create view-dependent hightlights
- For each surface point, uses the angle between the direction towards the eye (V), reflected direction (R) of the light direction (L) about the surface normal (N)

- $$\vec{R} = 2\left(\vec{L} \cdot \vec{N}\right)\vec{N} - \vec{L}$$

  (all vectors are assumed normalized)

- Then, the light information is given by:

  $$I = k_a + k_d \left(\vec{L} \cdot \vec{N}\right) + k_s \left(\vec{R} \cdot \vec{V}\right)^{\alpha}$$

  with constants for ambient (k_a), diffuse (k_d), and specular (k_s) lighting

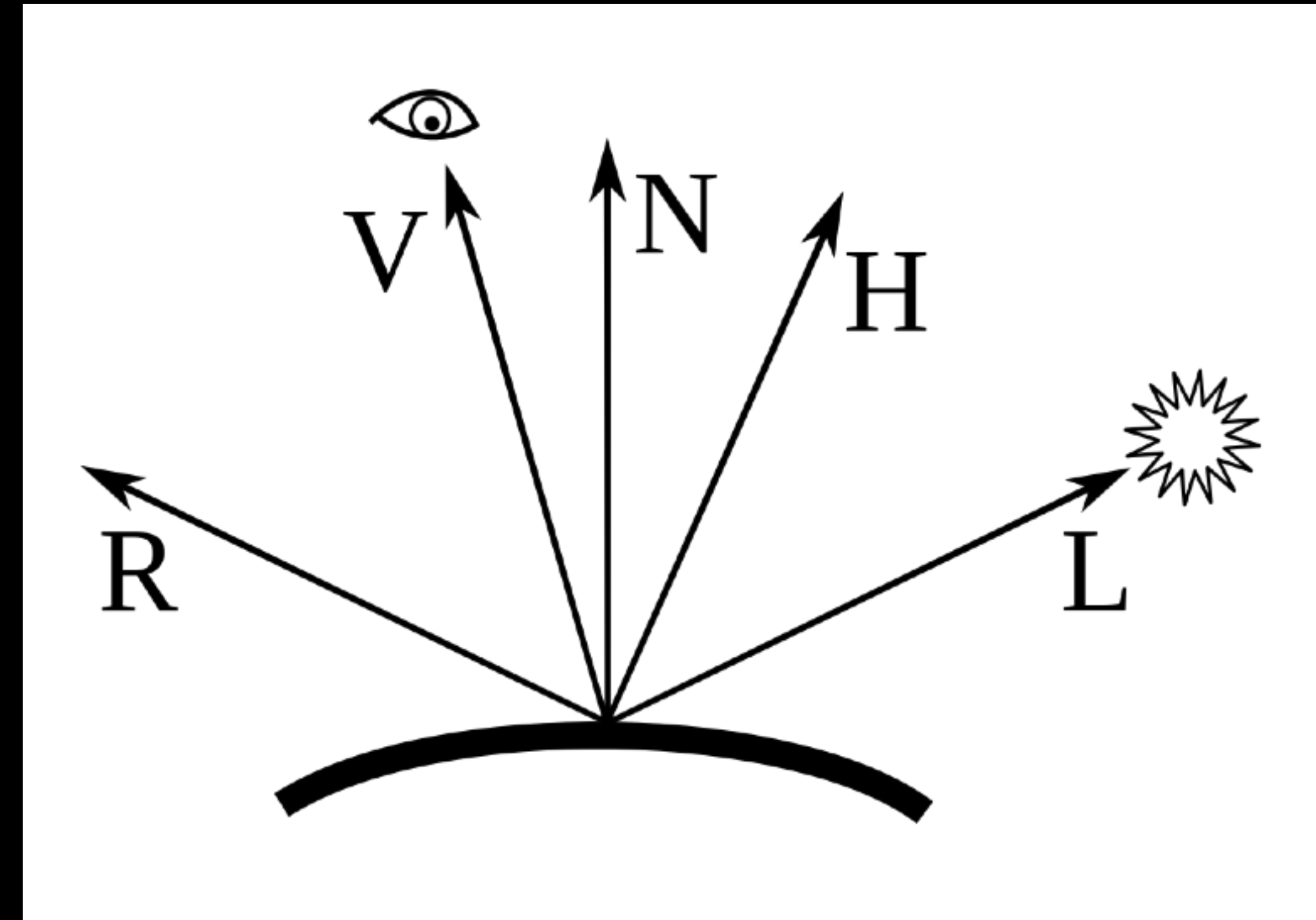- α determines the level (=size) of specular highlights

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Blinn-Phong Shading

- In Phong shading L has to be reflected about N every frame for each position in order to compute R * V

- Blinn-Phone shading replaces R * V with N * H, where H is the half-way vector:
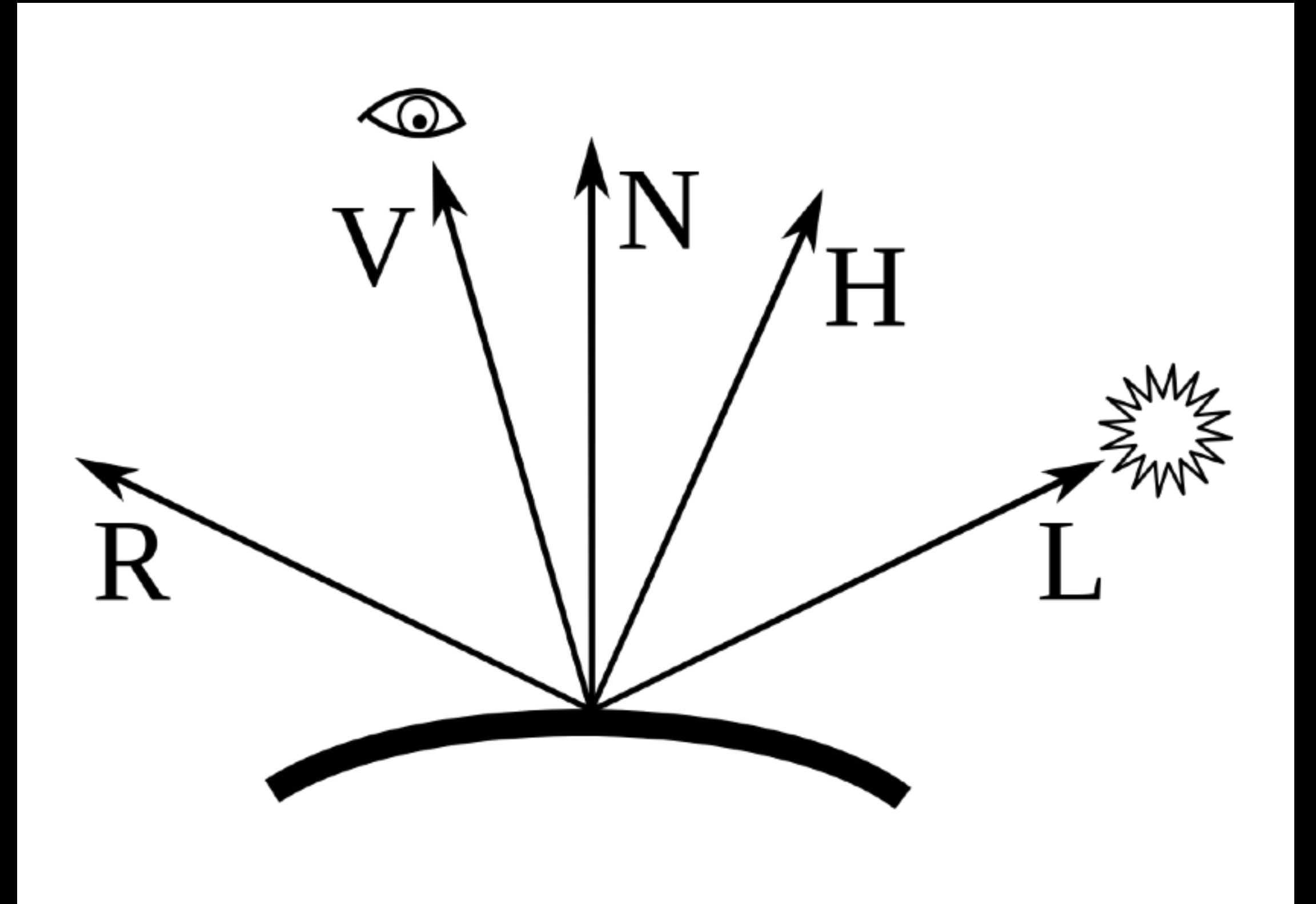
$$\vec{H} = \frac{\vec{L} + \vec{V}}{||\vec{L} + \vec{V}||}$$

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