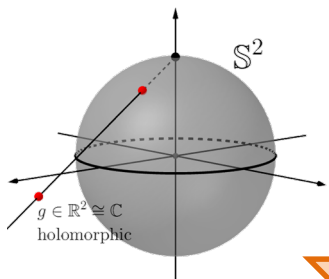




# Differential geometry of smooth and discrete surfaces

## Lecturer Masashi Yasumoto

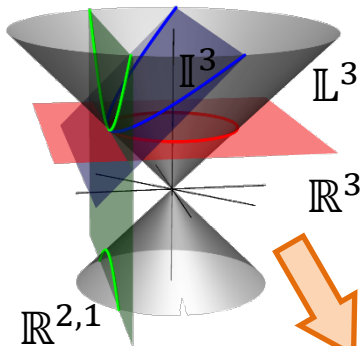
<図表>



Inverse image of stereo. proj.

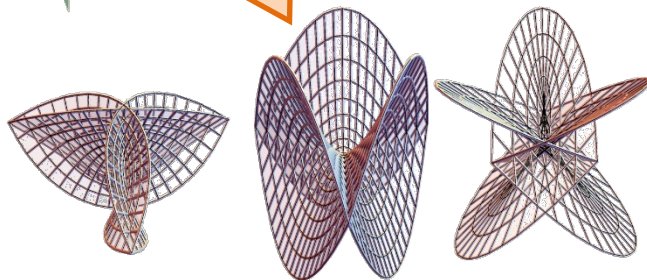
$$\mathbb{C} \ni g \mapsto \left( \frac{2\operatorname{Re}(g)}{1+|g|^2}, \frac{2\operatorname{Im}(g)}{1+|g|^2}, \frac{-1+|g|^2}{1+|g|^2} \right)$$

Lift it to 4-dimensional  
Minkowski space



We can describe spaces  
in a unified way, including  
the Euclidean space.

Applying a transformation...



We can construct various  
smooth and discrete surfaces.

Content:

Differential geometry of surfaces is an important research field with a long history that forms the basis of modern differential geometry. Recently, with the development of computer science and related fields, it has been actively studied to reorganize and reconstruct conventional differential geometry in a discrete setting.

I am working on the differential geometry of surfaces and discrete surfaces. In the study of differential geometry, there is a concept of curvatures that describe how curved geometric objects such as curves and surfaces are. The study of differential geometry with specific curvature conditions is interesting because it intersects with various mathematical studies.

In our recent work, we derived constructions of various discrete surfaces by developing discrete surface theory in 4-dimensional Minkowski space. This includes discrete minimal surfaces in 3-dimensional Euclidean space. This result not only unifies the conventional constructions of discrete surfaces, but also leads to the construction of new discrete surfaces.

Keywords: discrete differential geometry,  
integrable systems

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