

IN MEMORY OF VICTOR VASARELY -  
THE FATHER OF OP ART

"His experiments transformed the flat surface into a world of unending possibilities,  
way before the advent of computers, making an era in the history of art."

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## HOW TO PRODUCE OP ART REFRACTIONS IN BRYCE 5

### DEFINITION

According to Snell's Law, when light passes from one transparent medium to another, it bends.

Light rays change direction as they go from air into the glass, and they change direction again when they exit the glass spheres and enter air.



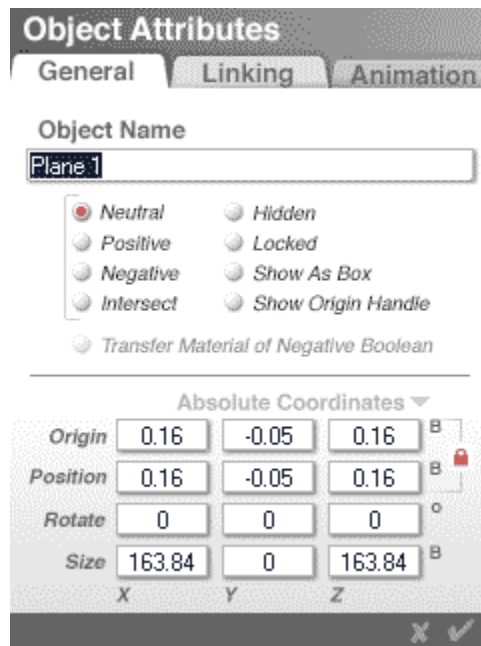
**This optical effect is due to Refraction of light.**

### **STEP ONE - MAKING THE GROUND PLANE**

Open a new scene in Bryce with Screen Size 'Photo 768:512' pix and select the Ground Plane.

Go to Edit>Material Presets>Simple&Fast and select the texture 'Classic Checkerboard'.

Click on the 'A' box to enter the Object Attributes and set all adjustments as in the image below.



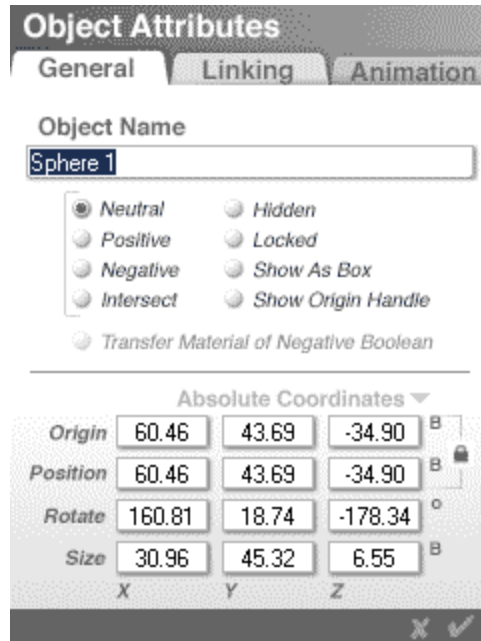
Go back to the main scene window.

Click on the 'M' box to enter the Materials Lab and set the adjustments as shown below.



## STEP TWO - MAKING THE SPHERES

Exit the Materials Lab. Go back to Bryce Scene Editor and create a Sphere. Click on the 'A' box to enter the Object Attributes and set all adjustments as in the image below.



This flatten out the Sphere and change its size and position.

It's time to make the Sphere transparent.

Go to Edit>Material Presets>Glasses and select the hardest glass - 'Diamond'. Every material has an absolute index of Refraction. The value of Diamond is 2.417

This causes the Ground Plane's checkerboard patterns to be distorted.

Click the Render button to see what the scene looks like after adding the first Sphere.

If you like the result duplicate the Sphere and move it to the left of the first Sphere.

Try a test render.

Finally render the image as Super (Fine Art AA) quality.

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## NEW OP ART REFRACTION EXAMPLES

**More advanced stuff you can do. I'm going to give you some ideas:**

Change the Ground Plain materials.

Change the Sphere's position in space.

Try other primitives instead of a Sphere.

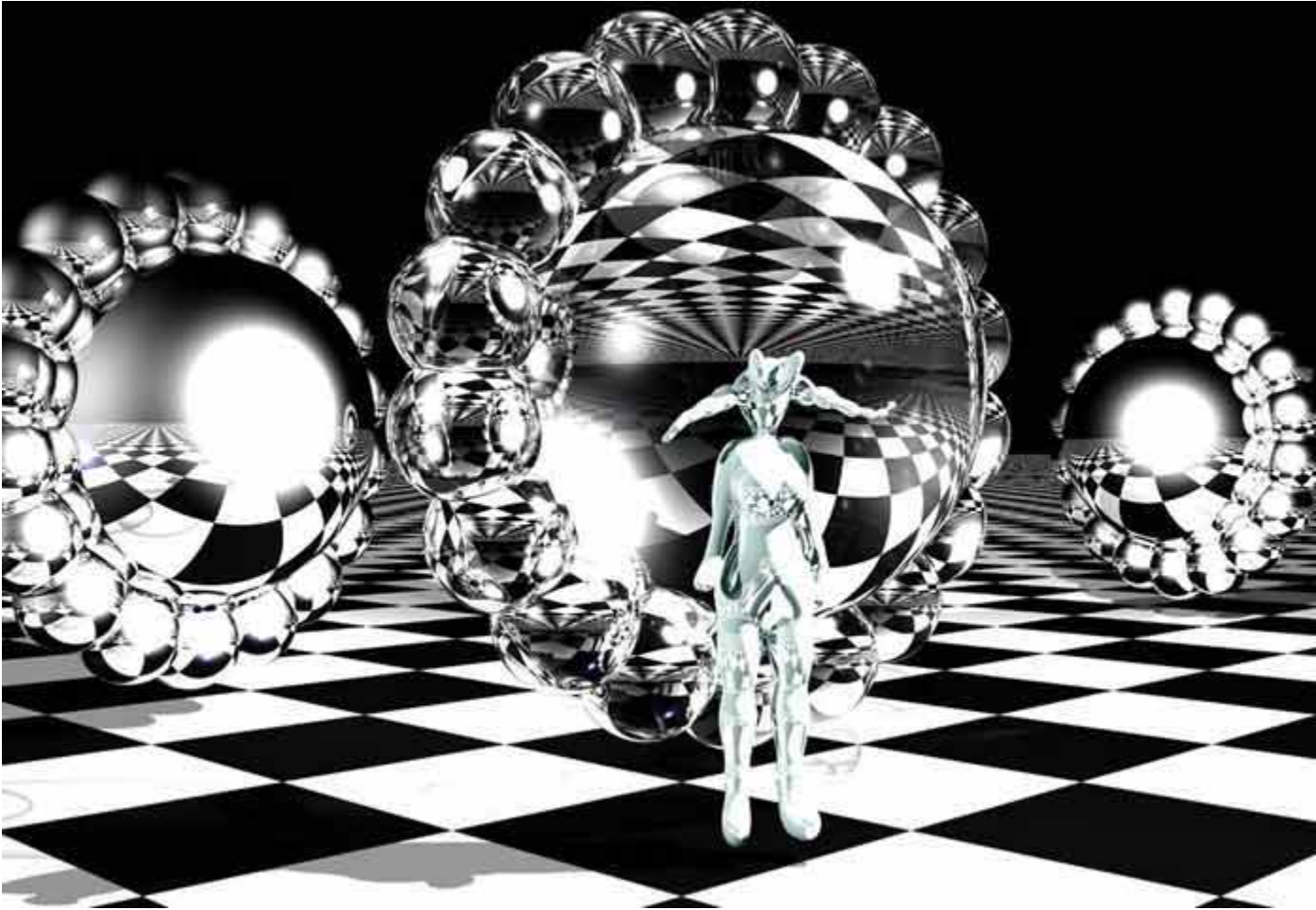
Try with other skies.

Change the position, intensity and color of lighting.

Play about with different settings to give yourselves an idea of what is the final result.



**All Op Art Refraction Images was created using the same method,  
but will require lots of experimenting and playing in front of the monitor.  
Good luck!**



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Thanks to Victor Vasarely for the inspiration!

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Greetings and have fun to all of you,  
Dimiter  
June 2004

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**BRYCE 5 NEXT MONTH TUTORIAL**  
**A PERSPECTIVE VIEW WITH MULTIPLE VANISHING**  
**POINTS**  
**Is it possible?**

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**THIS IS A 500 YEARS OLD STORY**  
Linear Perspective is a tool used to create illusion of depth in visual arts.  
The Linear Perspective is one of the greatest Renaissance inventions.  
In an early stage, the Renaissance masters developed perspective with only one

## Vanishing Point.

Later, painters like Leonardo da Vinci and many others, overcome the Linear Perspective

by experimenting and mixing into the picture a number of Vanishing Points and several horizons as expanded sophistication in perspective illusion.

Now, if you are curious, you can find in Google more than 65,000 web sites about

Multiple Vanishing Points. Almost all of them are about history or theory of perspective,

but I haven't seen a single example of visual, practical solution into the 3D Digital Graphic Art.

So, I took the liberty to share my humble practical efforts and results of producing 3D perspective view with Multiple Vanishing Points method created in Bryce 5 and Photoshop.

What is the practical use? Only a strange, interesting and unusual point of view? Or another example how 3D Graphic Art can enhance our everyday perspective world?

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### Preview of Bryce 5 Multiple Vanishing Points Tutorial





A perspective view with Multiple Vanishing Points into the distance.  
**Bryce 5 Tutorial coming soon.**