

# Evolution of the Varrier™ Autostereoscopic VR Display: 2001-2007

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January 29, 2007



# Varrier-ites



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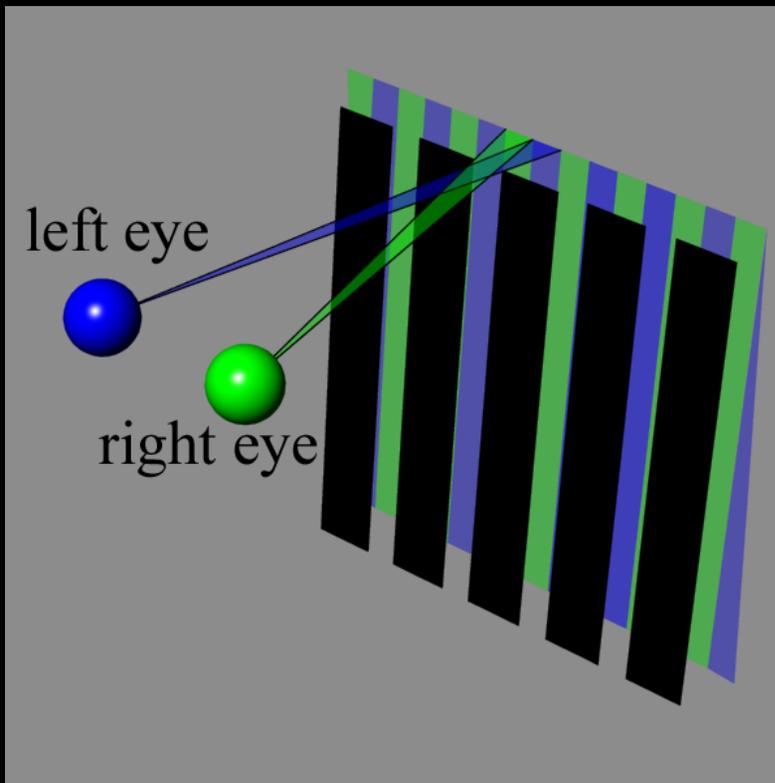


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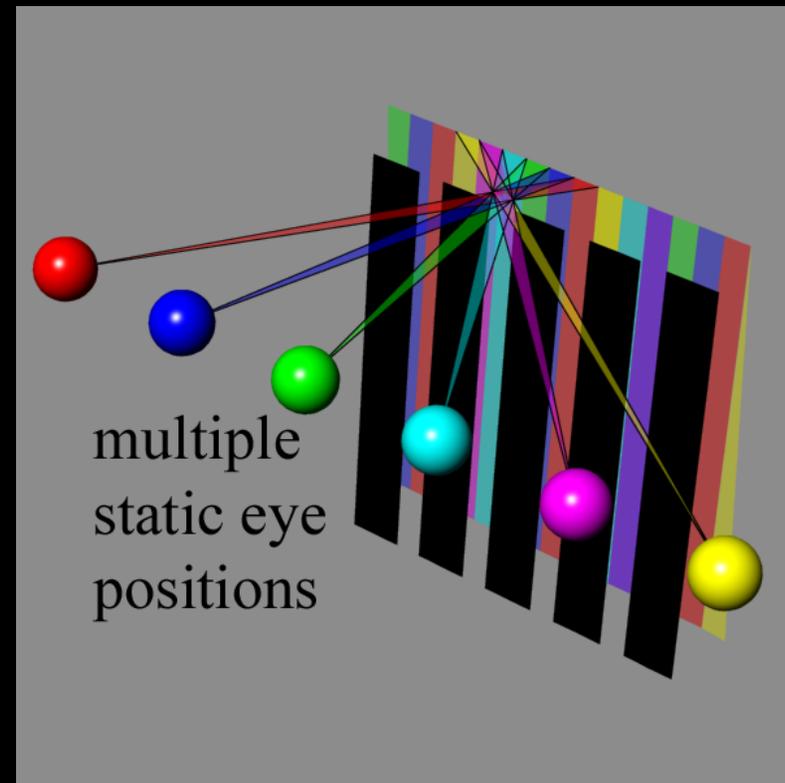
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# Parallax barrier autostereoscopy



Tracked 2-view



Untracked panoramagram



# Parallax barrier trade-offs

## Good

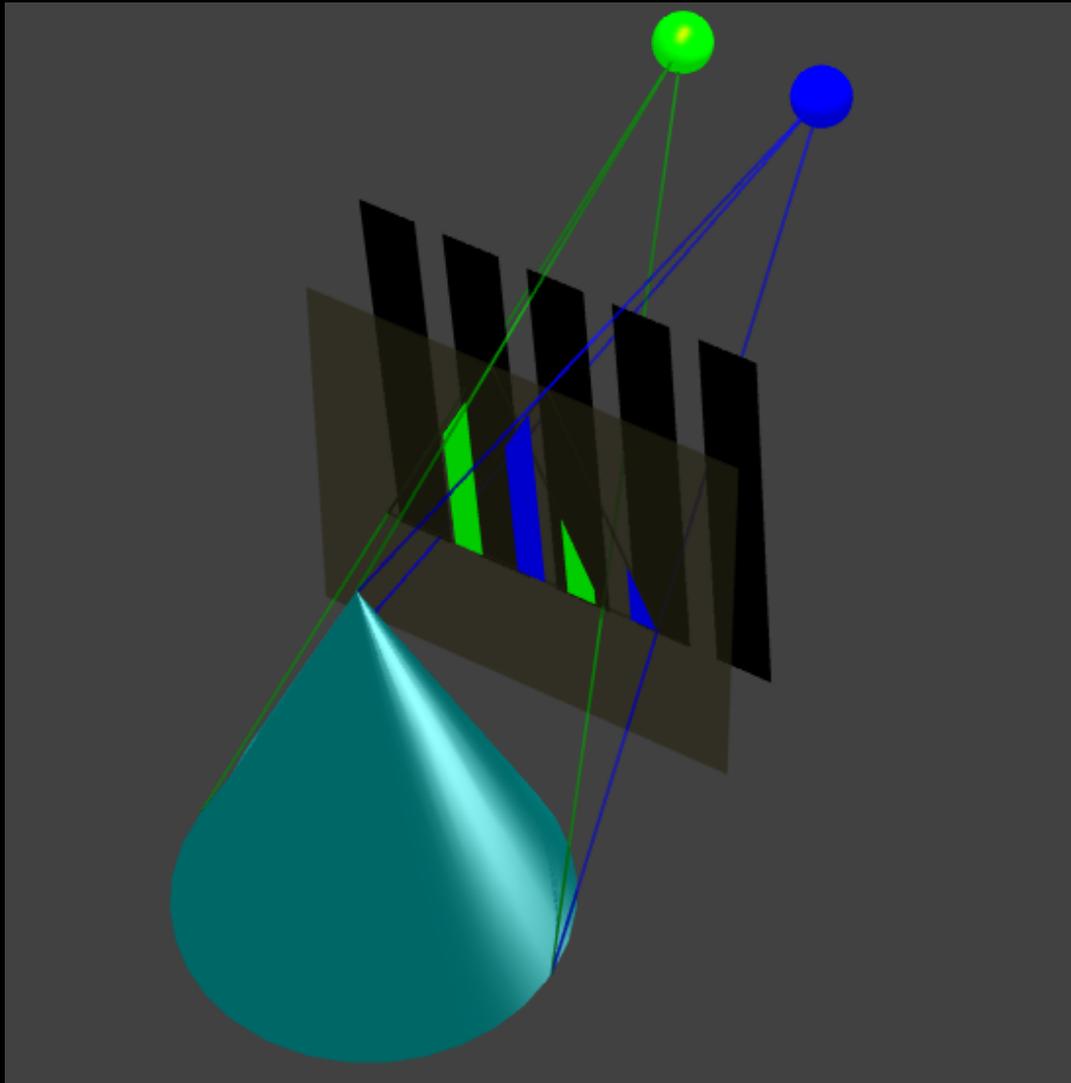
- inexpensive
- hi-res (tiled)
- VR quality

## Bad

- Lo-res (single tile)
- dark
- single user
- latency-critical



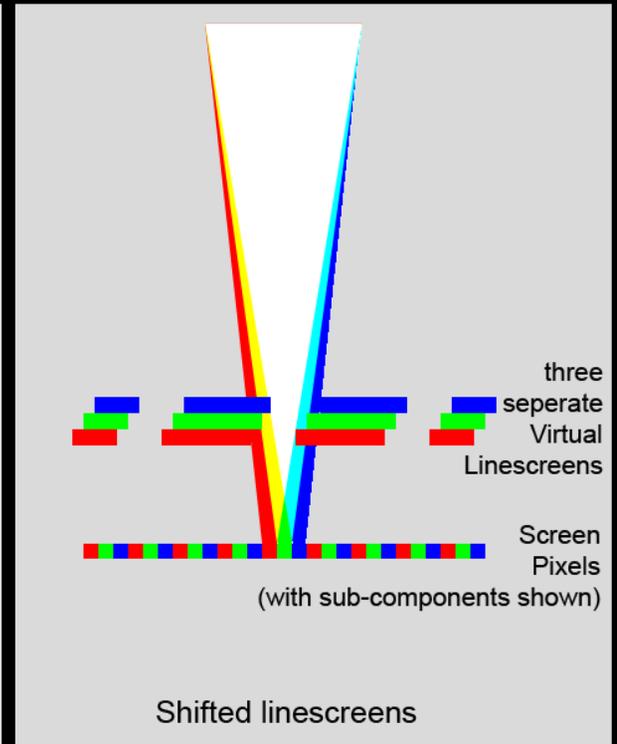
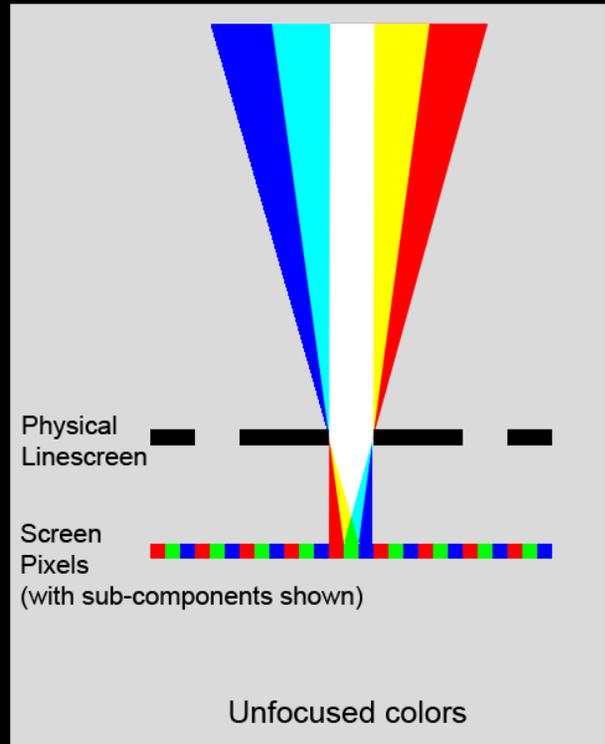
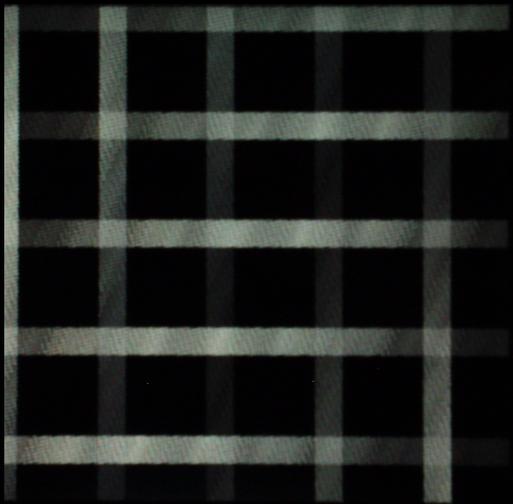
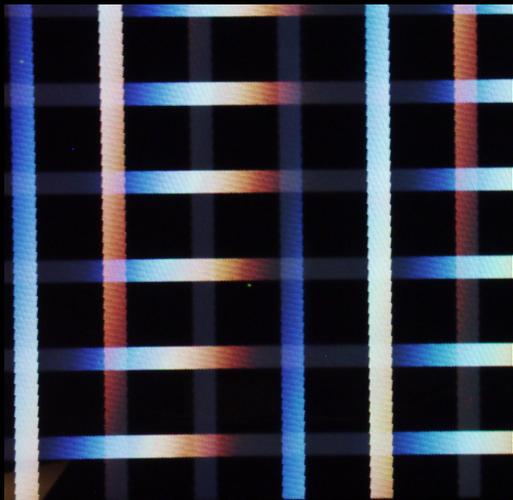
# Barrier computational model



Floating point,  
Continuous  
barrier model



# Color shifts



# Timeline

Jan 01



V-1

Jan 04



CV-35

Aug 05



FV-6

Jan 06

Sept 06



PV-3

Jan 07



CV-4

PV-1



CV-65



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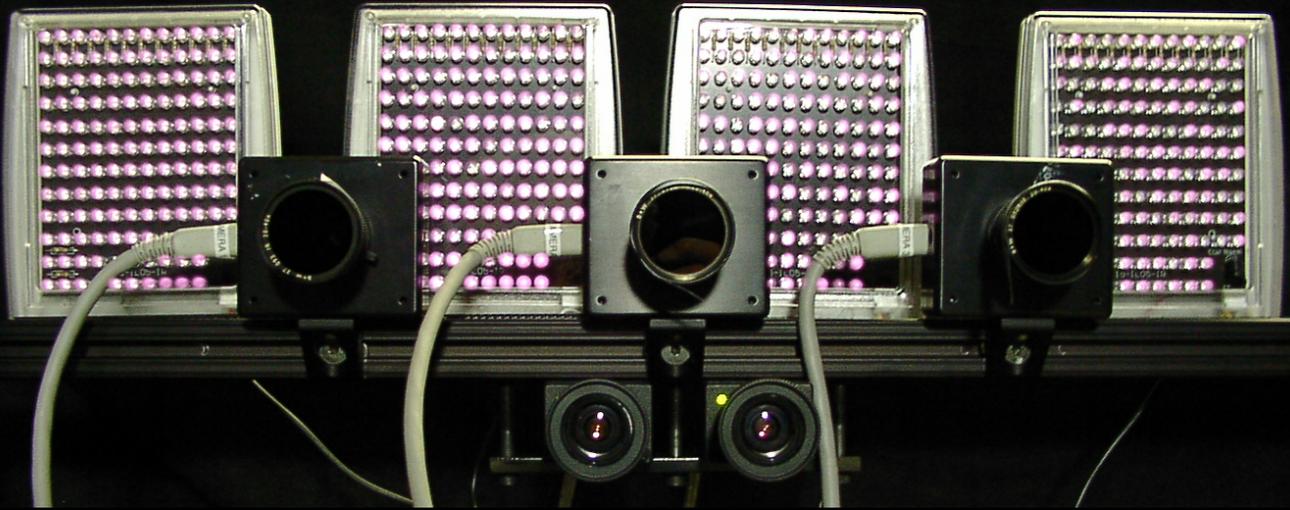
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# Form factors

System	Panel size	Net res	Tracking	\$
CV-35	20 in.	2600 x 6000 15.6 MP	IS-900 face tracker	\$210 K
PV-1	30 in.	600 x 1600 1.0 MP	face tracker	\$50 K
FV-6	20 in.	1110 x 2400 2.6 MP	face tracker	\$75 K
CV-65	20 in.	9230x6000 55.4 MP	ART face tracker	\$320 K
PV-3	30 in.	2270x1600 3.6 MP	face tracker	\$65 K



# Tracking

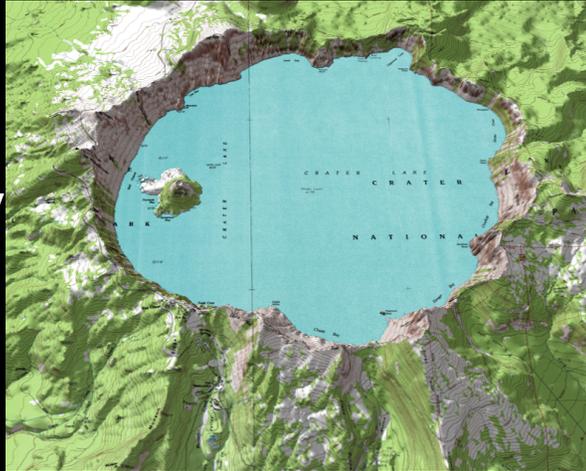


- Intersense acoustic-inertial
- ART camera-marker based
- Neural net camera-based

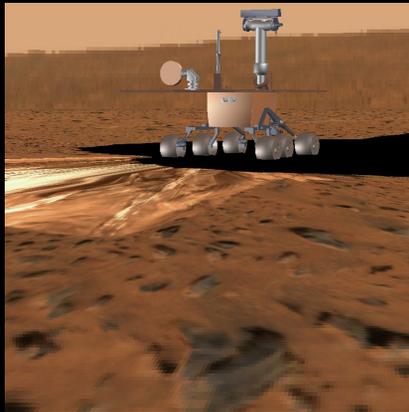


# Variety of applications

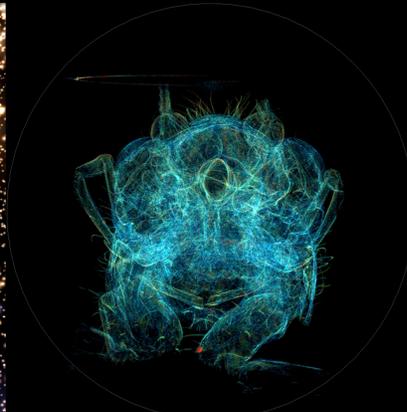
Geology



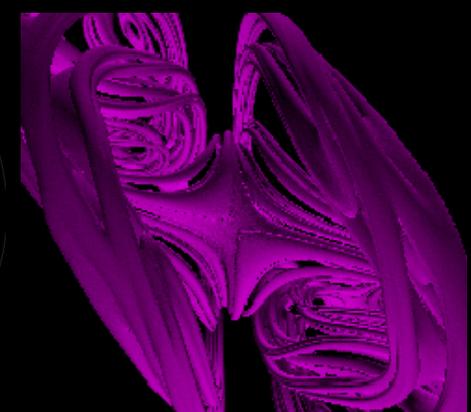
Telecon



Astronomy



Biology



Art



# Six years of progress

## Constants

- Tracked 1<sup>st</sup> person VR
- Orthoscopic
- Guard bands
- Floating point

## Improvements

- Algorithms
- Construction, calib.
- Barrier resolution
- Performance

## Ongoing

- Dynamic barrier
- Haptic autostereo
- Tracking improvements



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