

minimalist game design: growing osmos

independent
games summit 2010

eddy boxerman
andy nealen

hemisphere games / rutgers university

This is you.



osmos

physics simulation

arcade game

hints of puzzle

aster-flOw-roïds

osmos in a nutshell

absorb or be absorbed

but

propulsion tied to size



osmos in a nutshell

absorb or be absorbed

but

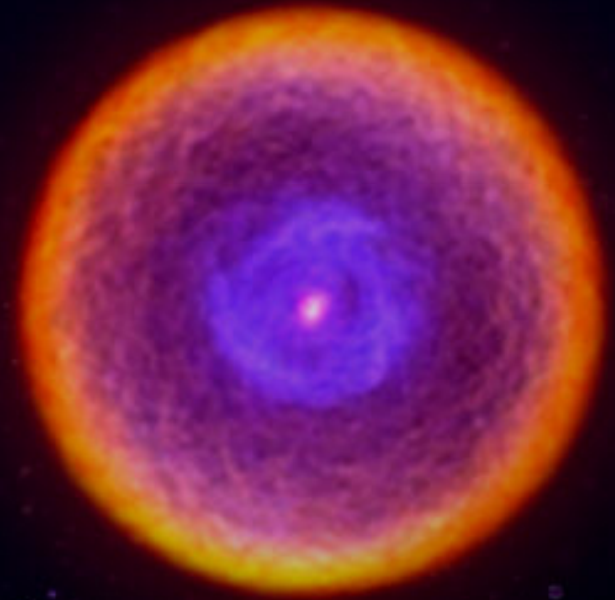
propulsion tied to size

momentum

coupling

trade-off

size = life



[demo osmos 0.7]

(start showing ambient level)

controls:

eject mass

zoom

warp time

[demo osmos 0.7]

(showing ambient level)

results: “zen”

minimal time pressure

game rules encouraged patience
and planning

music: ambient electronica

[demo osmos 0.7]

(showing ambient level)

one-man hobbyist project:
minimalist by necessity

[demo osmos 0.7]

(start showing “warped chaos” level)

procedural generation:

pseudo random level generation

infinite variety and difficulty curve

player size

mote velocities

gravitation

level size

[demo osmos 0.7]

(showing “warped chaos” levels)

procedural generation

difficulty curve = set of functions

input level number

output all slider values

tweak → feedback → tweak ...

[demo osmos 0.7]

(showing “warped chaos” levels)

solar system design story:

After a long hunt for parameters to generate an easy but interesting gravity level, a lateral design leap lead to the “signature” solar system levels.

(show “solar system” level)

[igf 2008 approaching]

developed some challenging ai opponents.

andy vs ai = SOLD!

Eat the ugly

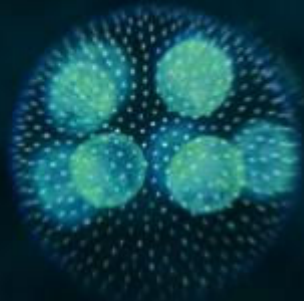


[igf 2008 approaching]

SCORE>

needed *real* art

kun chang helped out = awesome



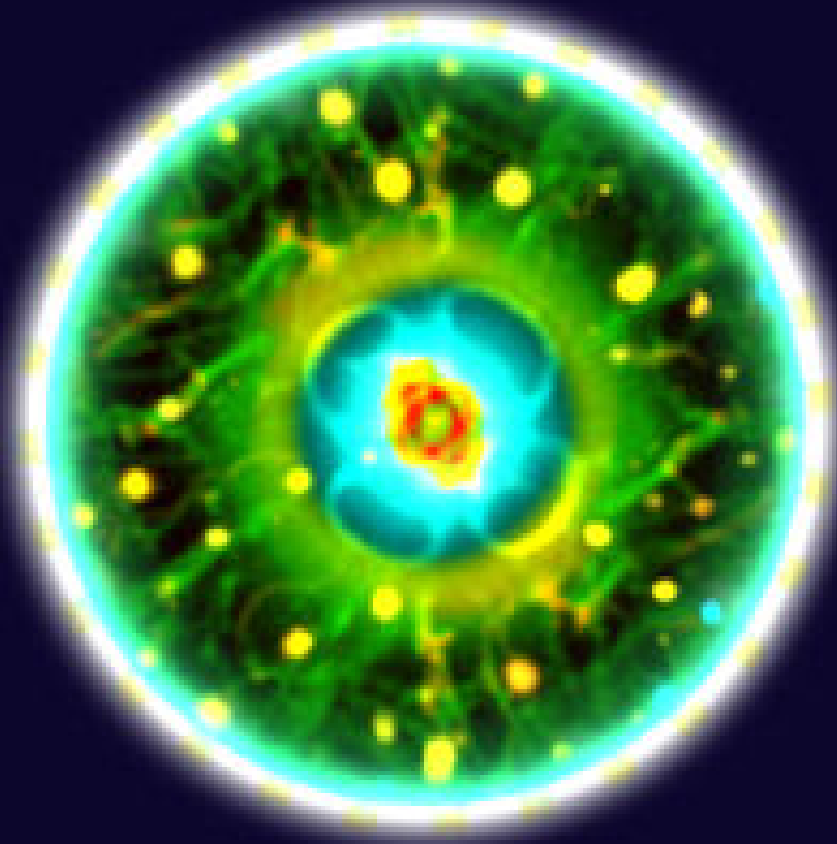
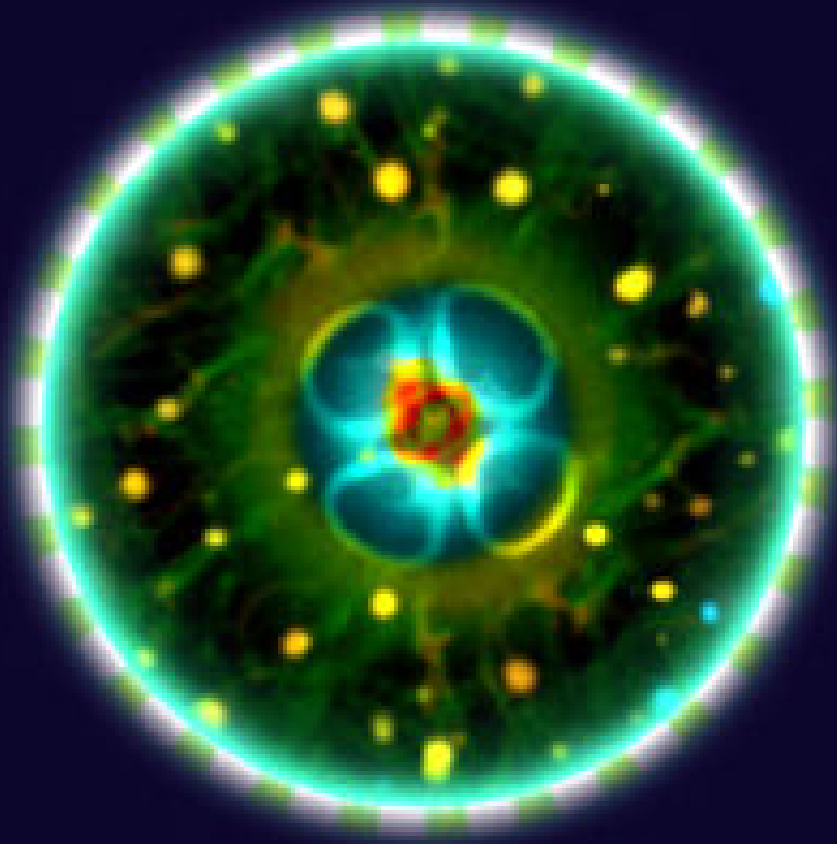
only mock-up we ever had (!)

built concepts in layers for notes

left their composition/animation to us

[demo igf1]

composited and animated **texture layers**
largely experimental exploration



[demo igf1]

needed a variety of great music

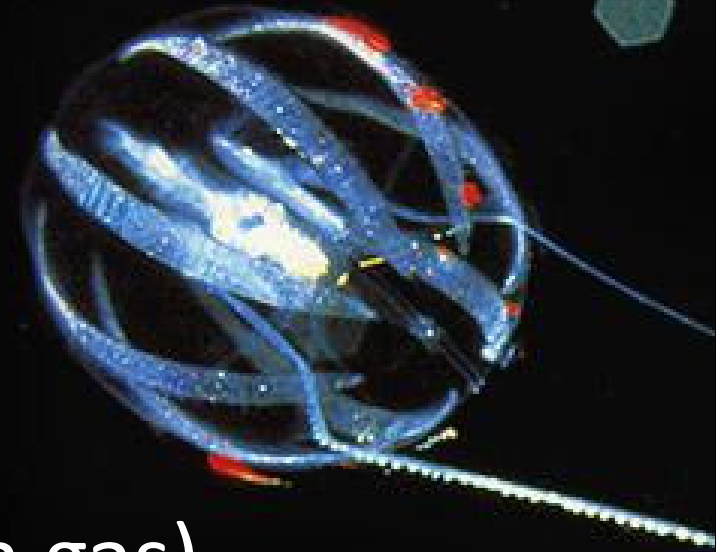
hunting + listening + choosing

contacted musicians

loscil | julien neto | gas | ...

very cool responses

especially from mat jarvis (aka gas)

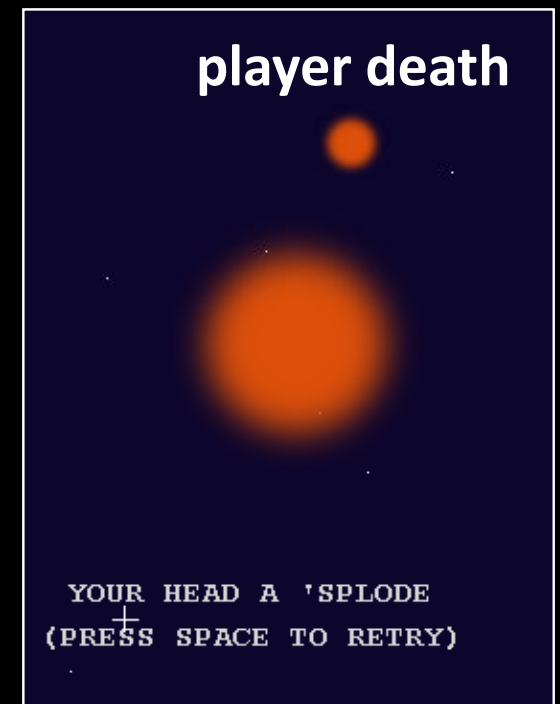
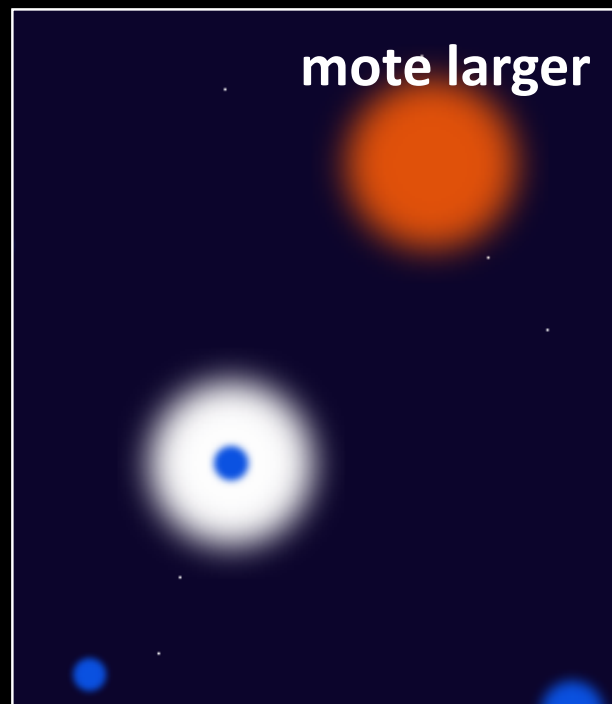
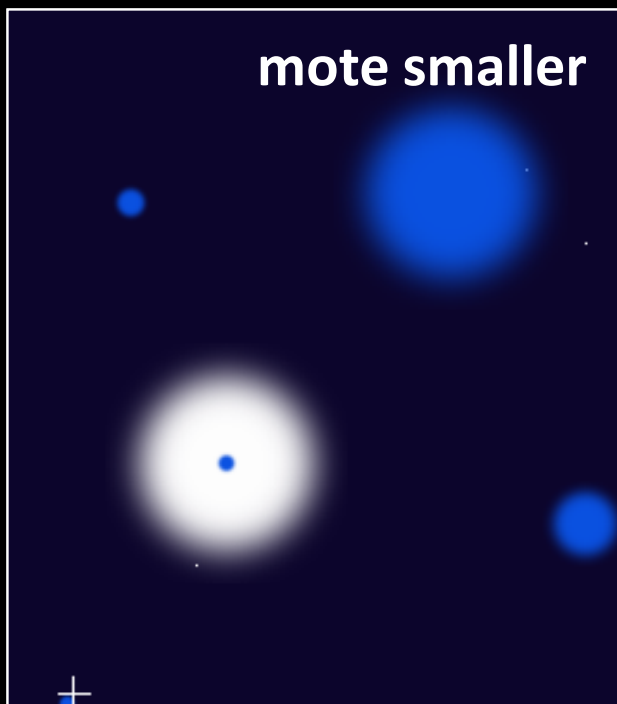


gas0095

visual design

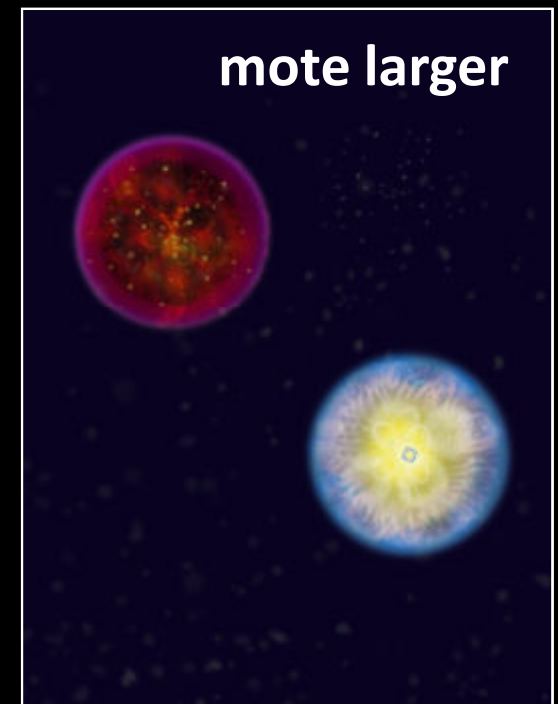
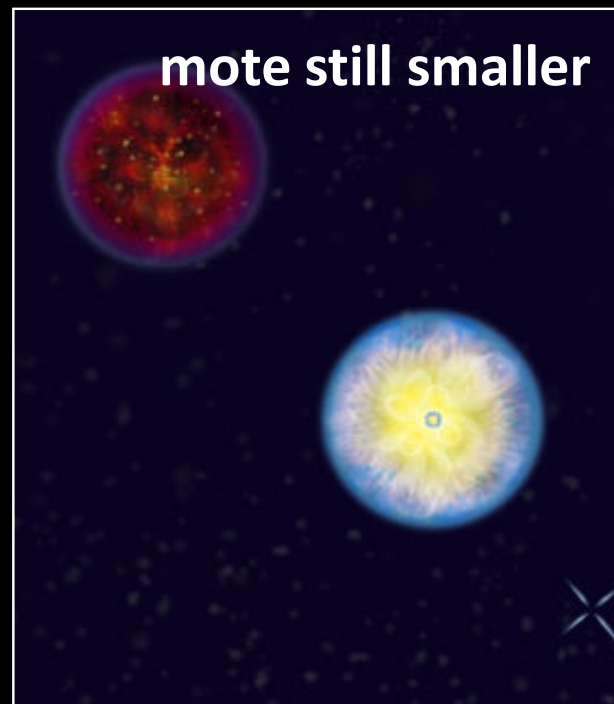
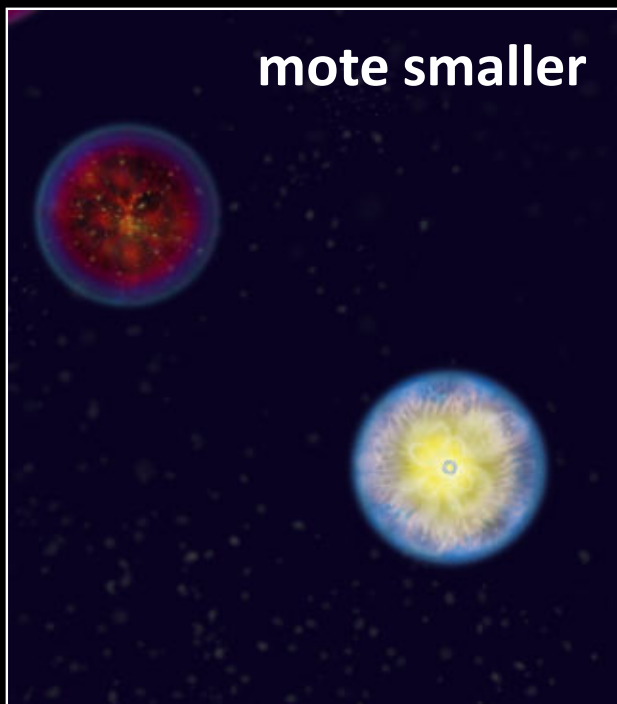
binary render

click too many times ... ASPLOSION!



visual design

continuous render of implicit state
visual warning avoids frustration



igf 2008 results...

good feedback

∅ nominations



igf 2009

took a break | got some distance

dave joined | engine improvements

collision particle system

more levels + tweaking

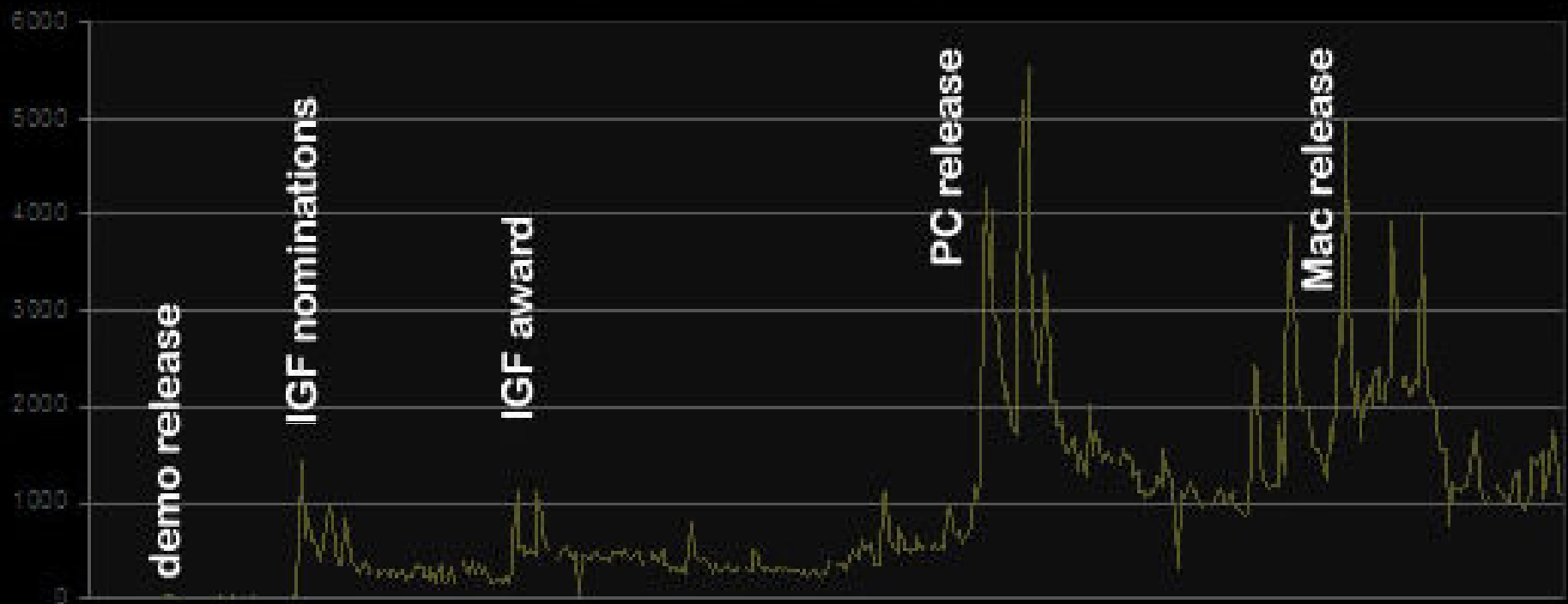
worked a lot on first five minutes

playtest with *virgins*: split wall of text into
two intro levels



three nominations at igf 2009
successful launch in 2009
distribution with D2D and steam

traffic (visits/day)



final release

[demo release]

final release crunch

lots of work on engine:

- optimizations
- menu system
- localisation system
- Achievements
- ...

visuals:

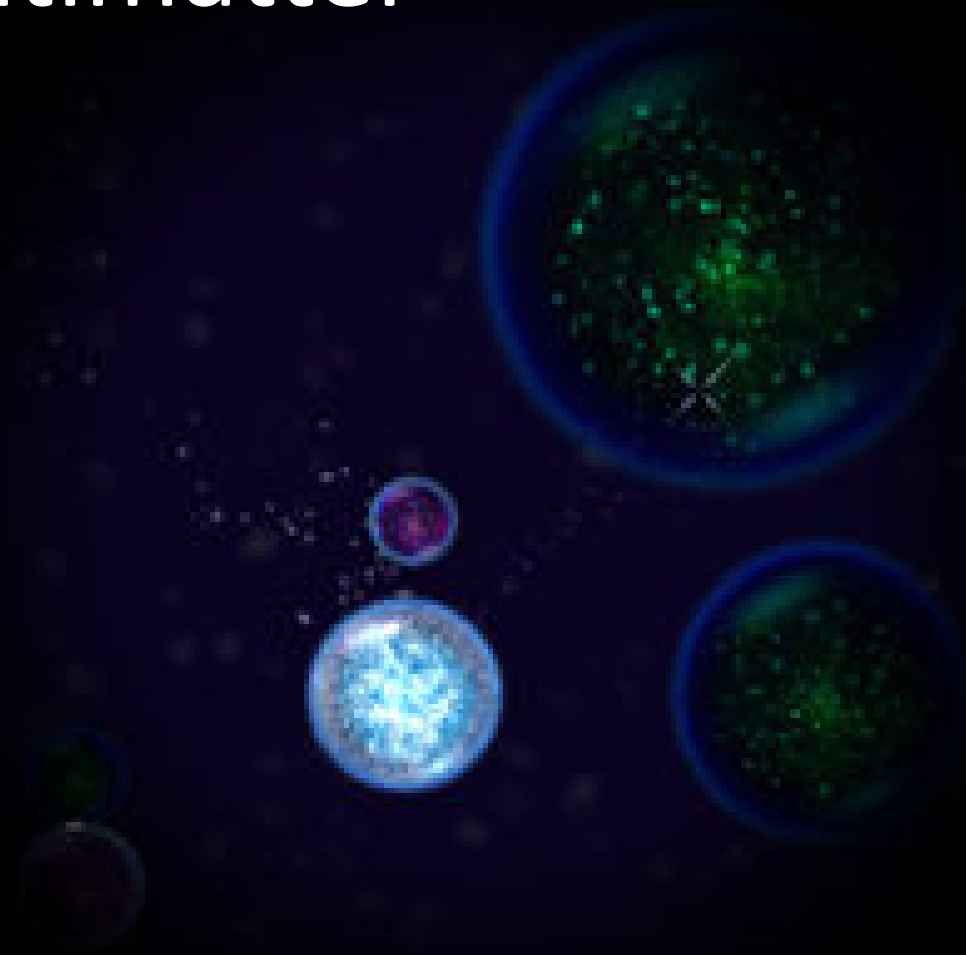
- more mote "looks": art assets
- flight-404 inspired particle systems

[demo release]

new level type: antimatter

more care required

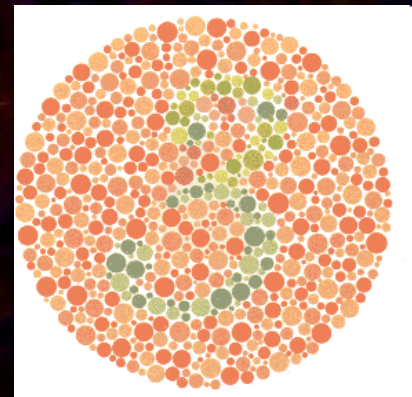
less time pressure



[demo release]

new level type: impasse

Discovery of procedural puzzle levels with
emergent “pushing” gameplay



[demo release]

mass = density \times *size*

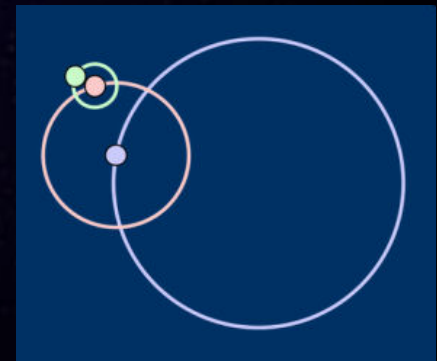
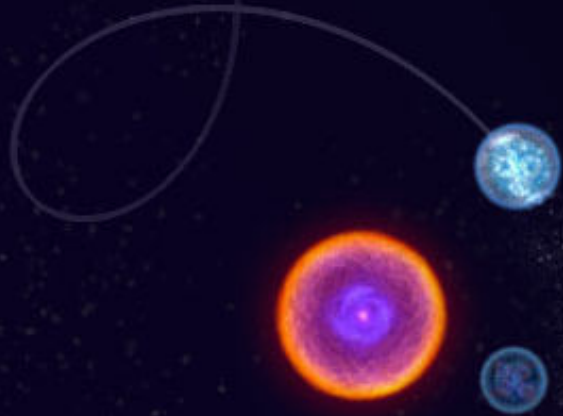
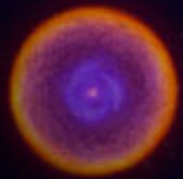
in 2d \rightarrow size = πr^2

in 3d \rightarrow size = $\frac{4}{3} \pi r^3$

playing with the power strongly
affects **merging behavior** and
level packing

[demo release]

new level type: epicycles



[demo release]

time and space challenge:

solar system is “big”

...and “slow”: neptune takes 164 earth years
to orbit the sun

lots of gameplay/physics tweaking (and
“cheats”) to *compress* levels.

player powers: zoom + time warping

**nutty
professor
time**



game design minimalism
economy | coherence

minimalism.economy

minimalism.economy

three kinds of minimalism in games

audiovisual

input

system

minimalism.economy

three kinds of minimalism in games

audiovisual

input

system

Goal

expose only the
meaningful actions
provided by the system

perceived affordances

Norman, *The Design of Everyday Things*

minimalism.economy

can be interpreted **economically**

audiovisual

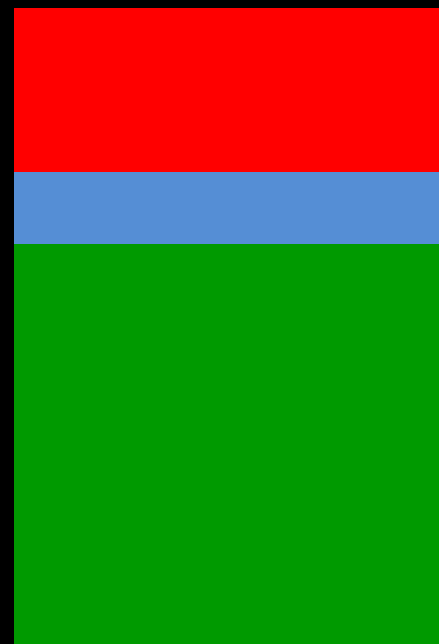
input

system

minimalism.economy

can be interpreted economically

audiovisual
input
system



mote viz
sound/music

mouse
control

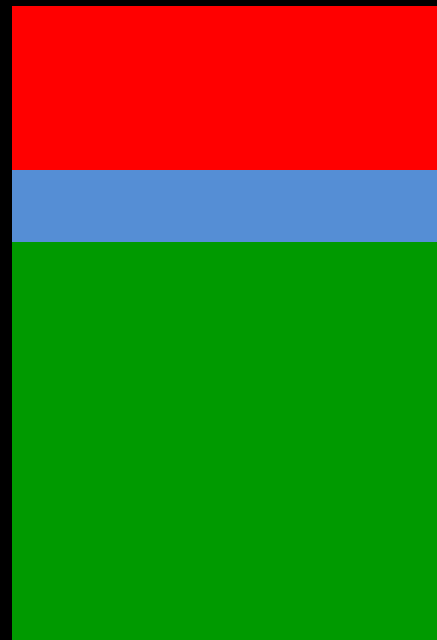
mostly
physics

osmos

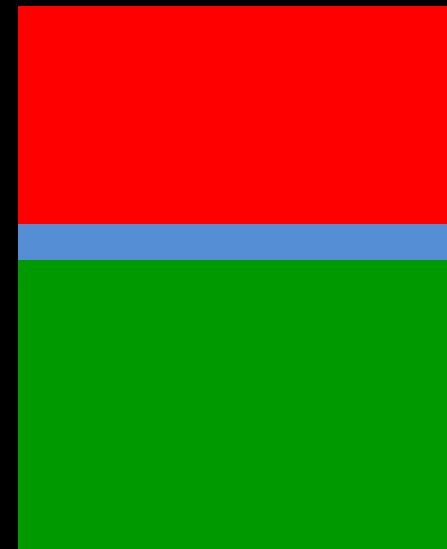
minimalism.economy

can be interpreted economically

audiovisual
input
system



osmos



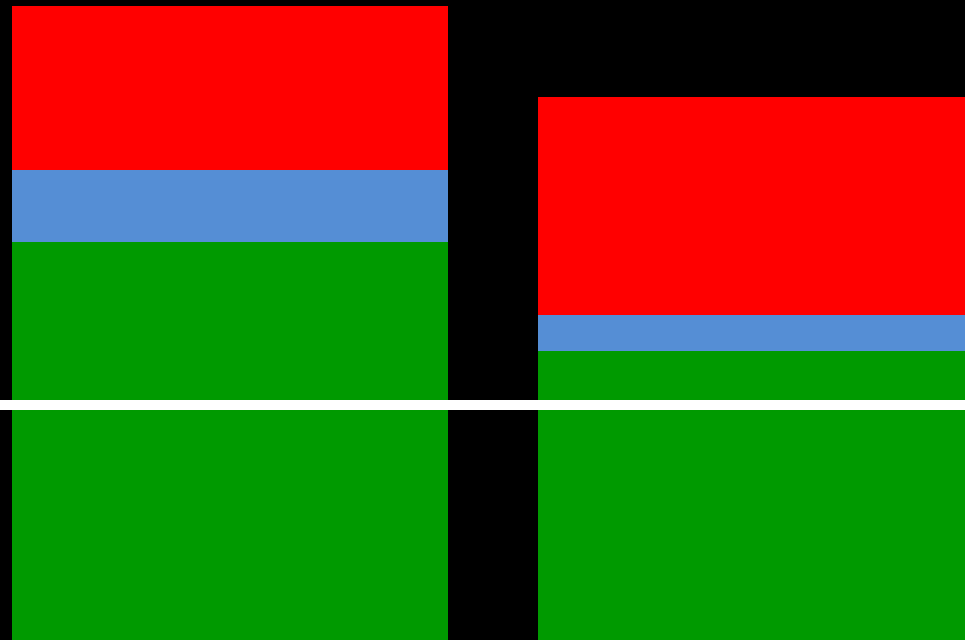
canabalt

minimalism.economy

overload/frustration

sweet spot ?

boredom



osmos

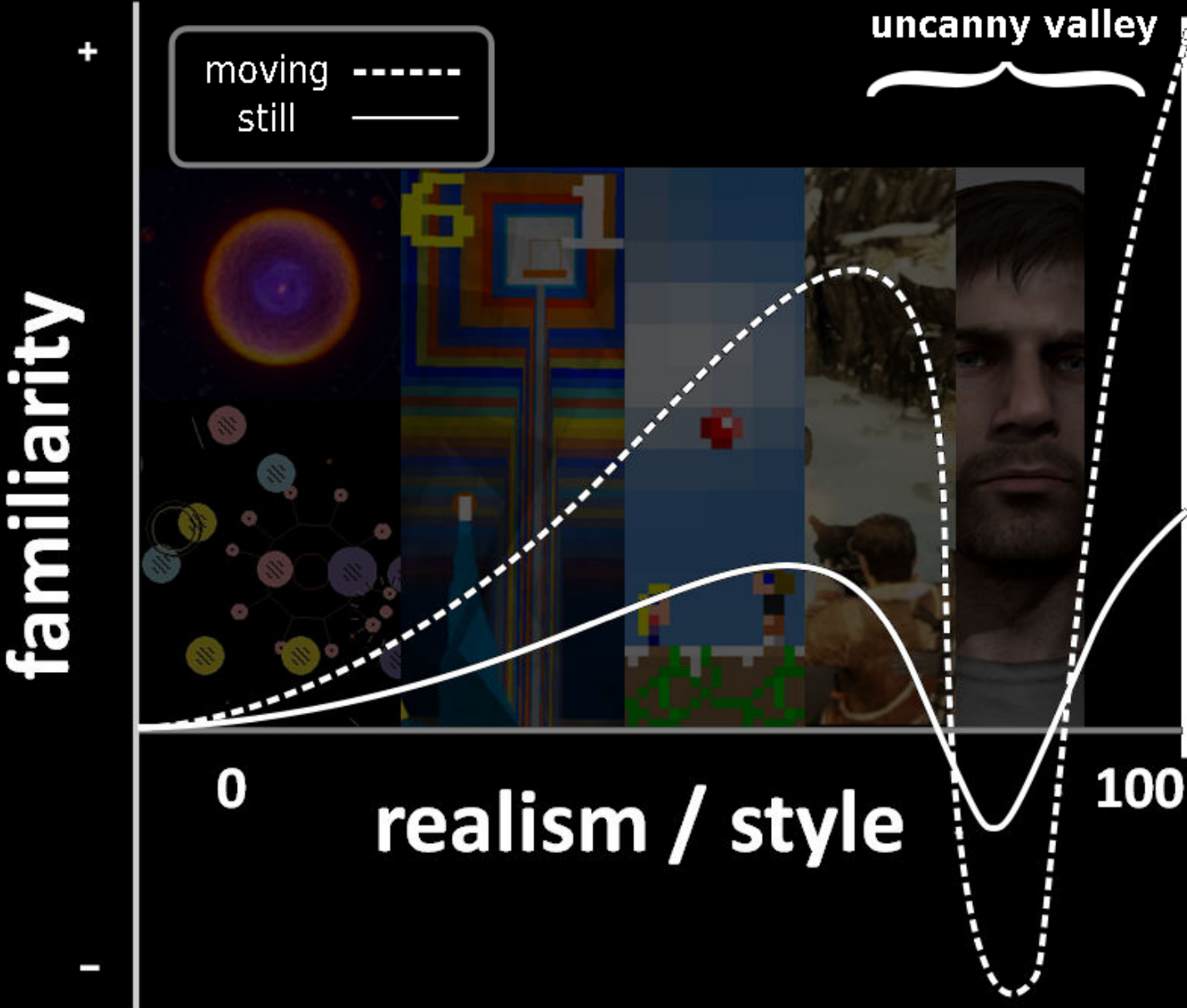
canabalt

minimalism.coherence

minimalism.coherence

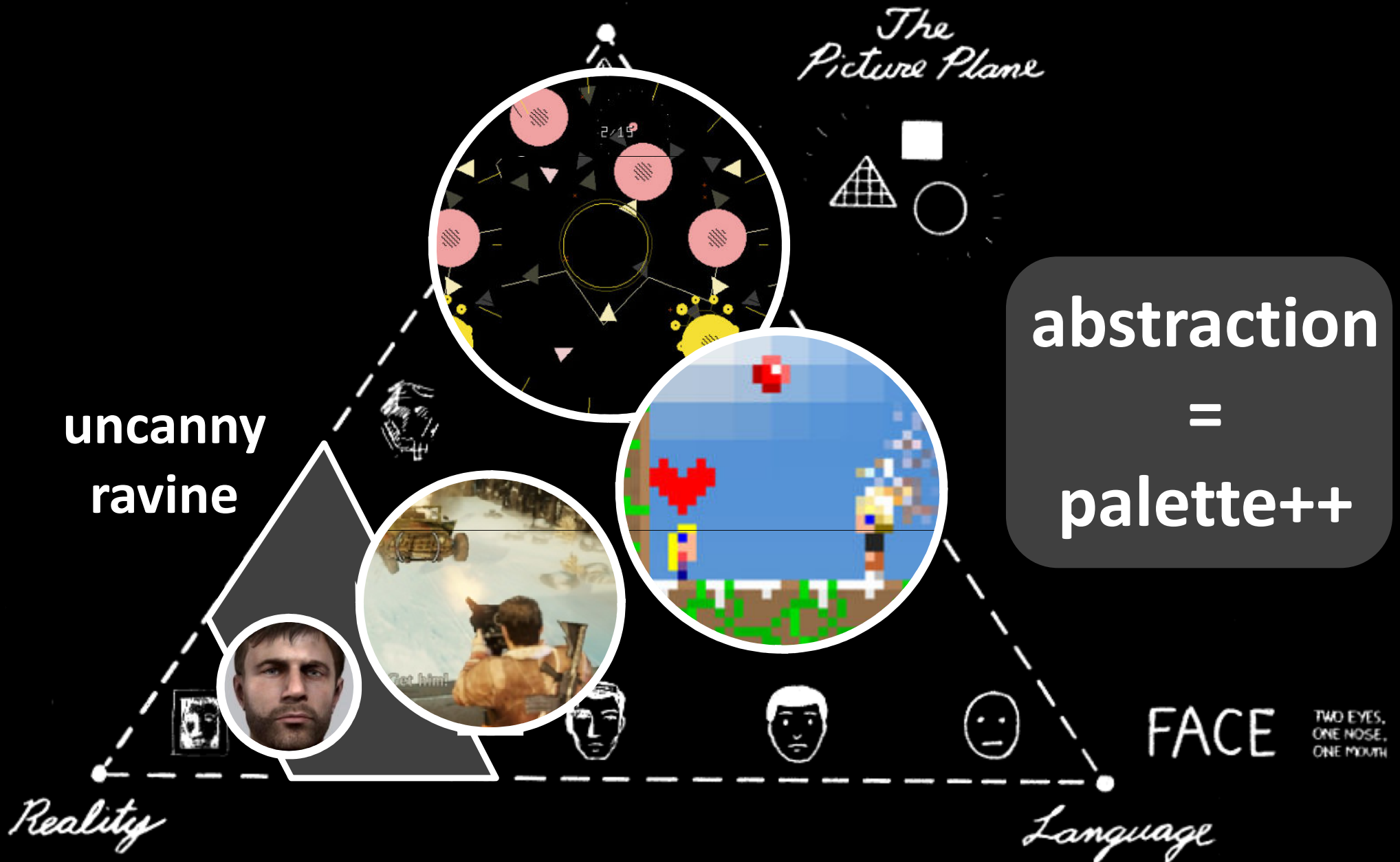


minimalism.coherence

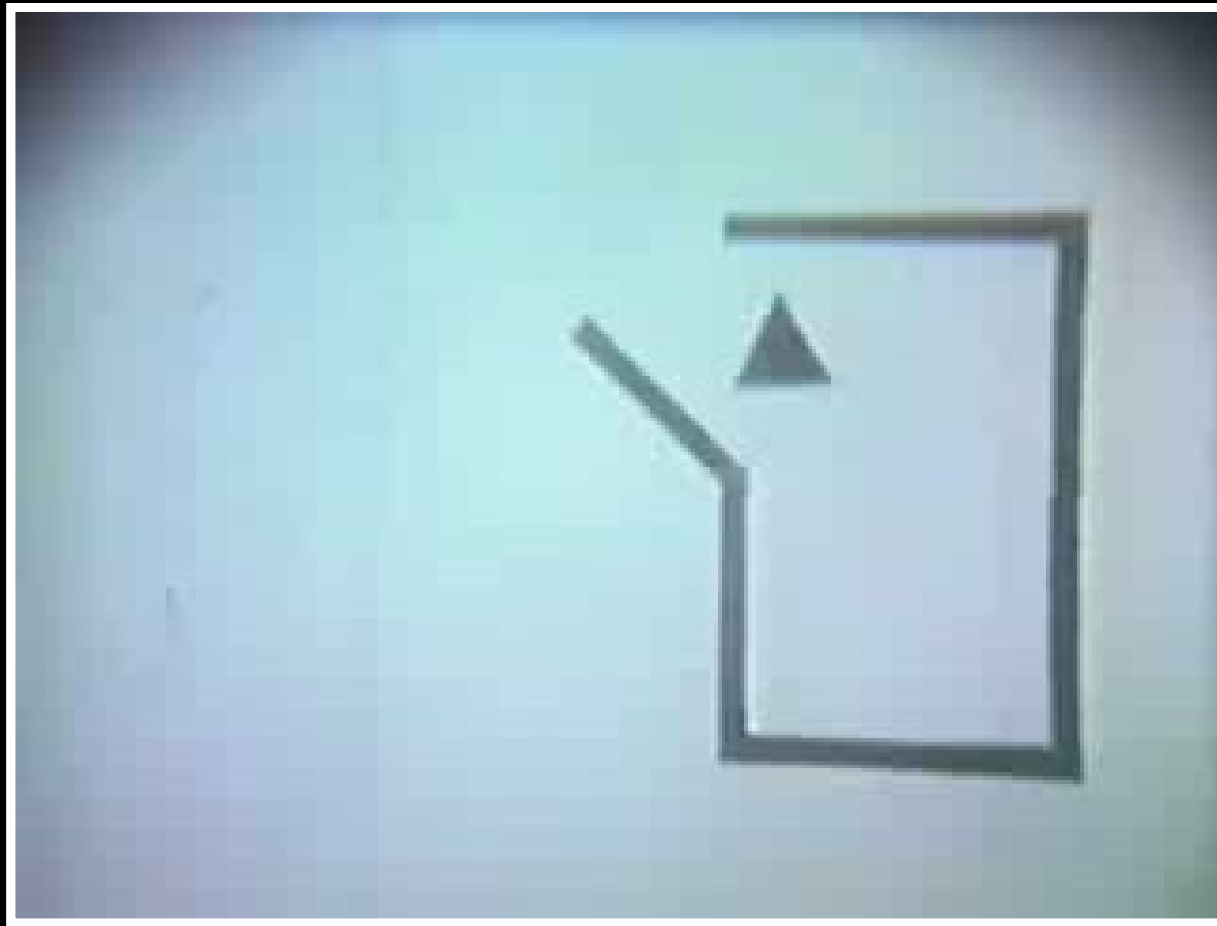


McCloud, *Understanding Comics*

minimalism.coherence



minimalism.example



[Heider and Simmel 1944] *An experimental study of apparent behavior.* American Journal of Psychology



Thanks!

www.hemispheregames.com



This is you.

osmos