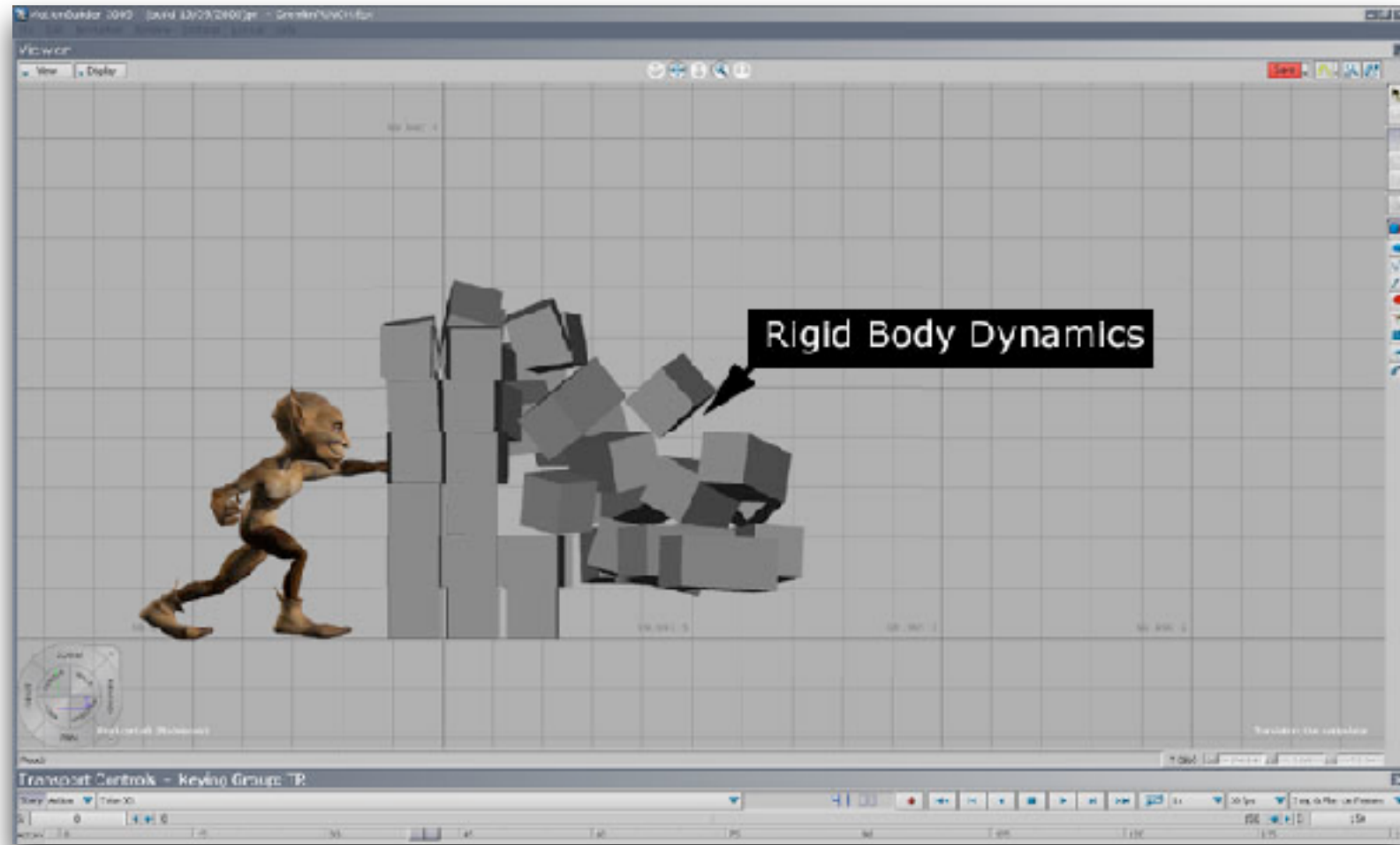


# Physik



# Festkörperphysik

# Festkörperphysik



Massen

Kräfte



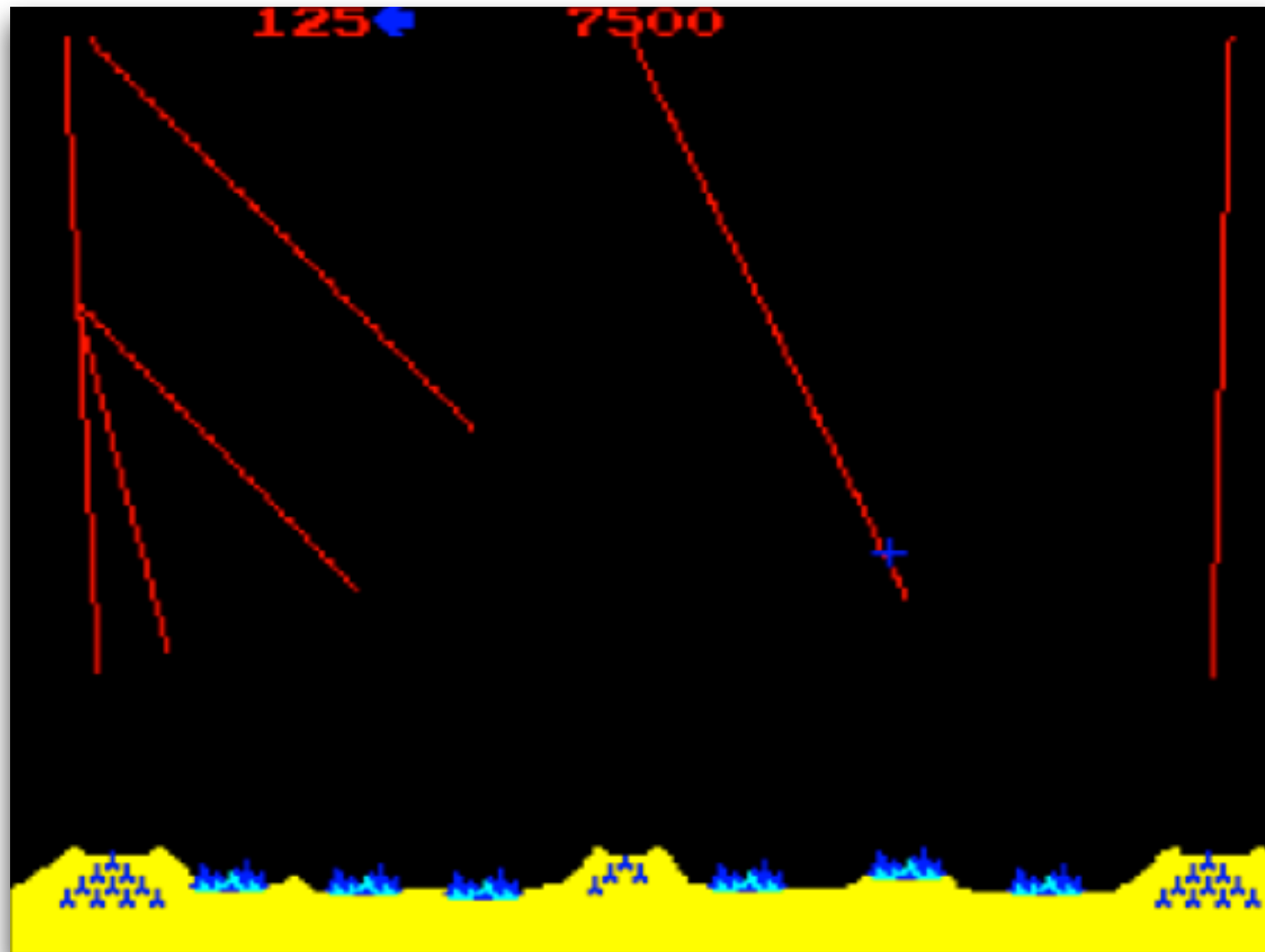
# Position



Civilization



# Geschwindigkeit



Missile Command

# Rotation



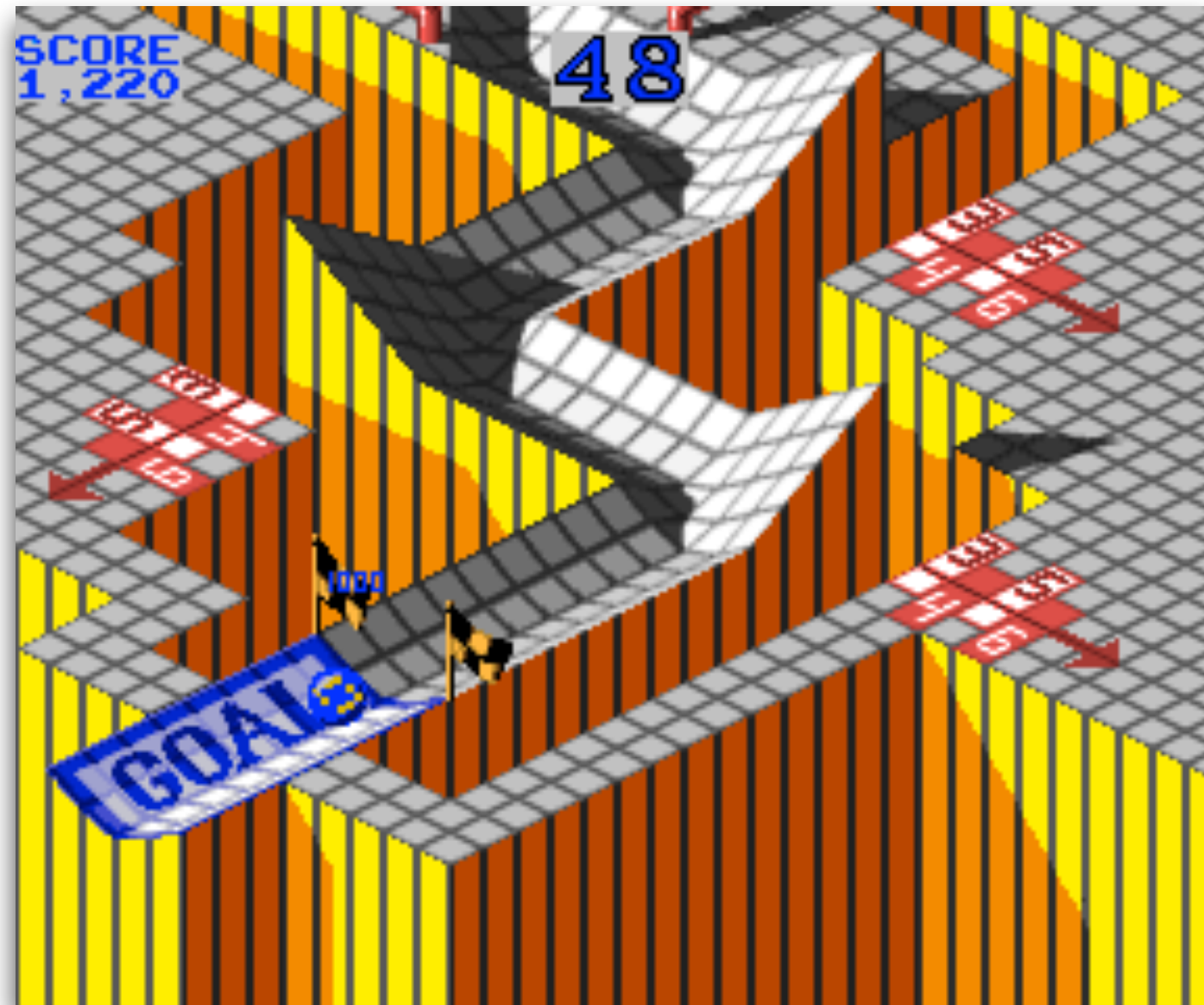
Time Pilot



Katamari Damacy

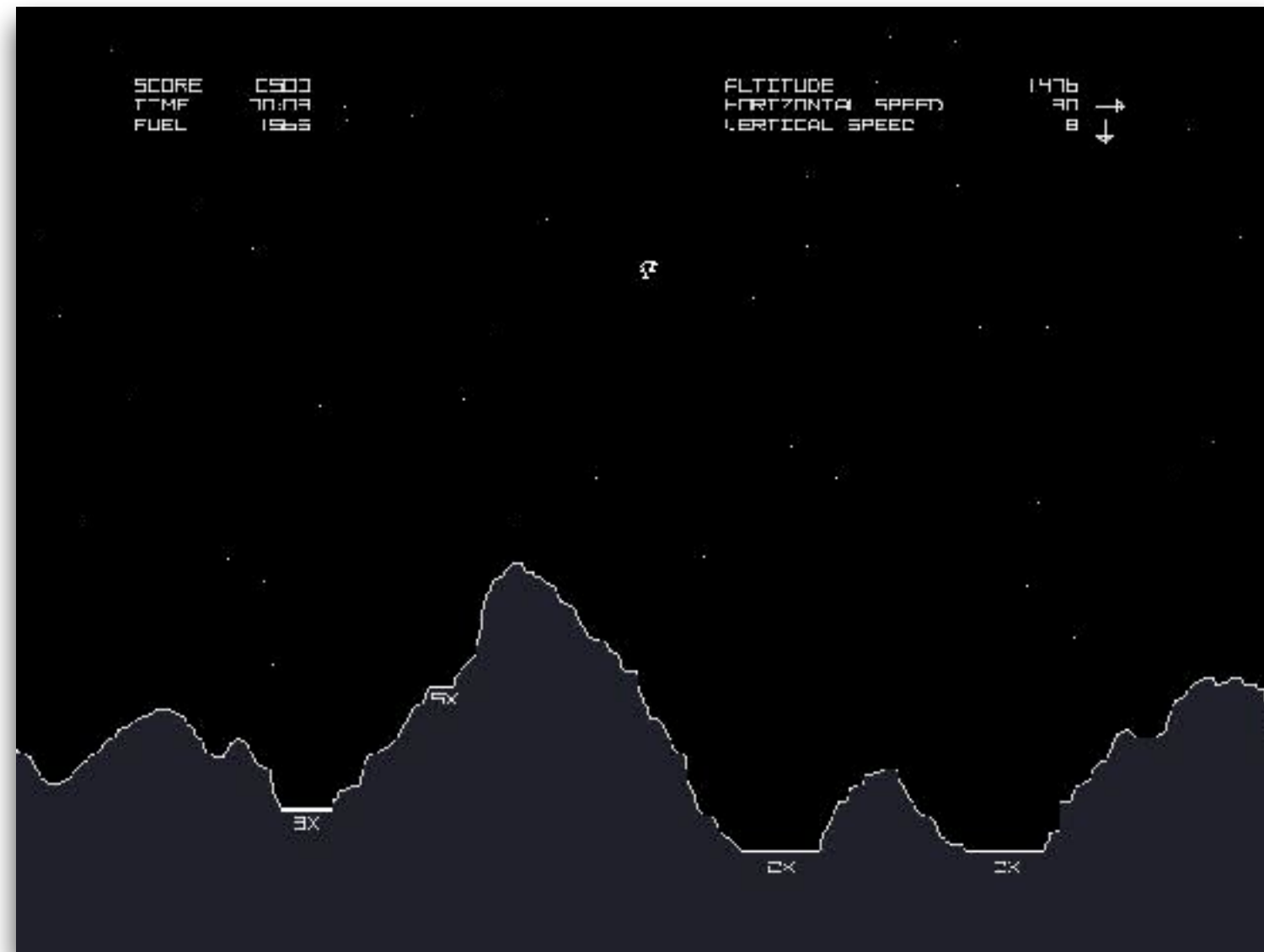


# Kraft



Marble Madness

# Beschleunigung und Schwerkraft



Lunar Lander

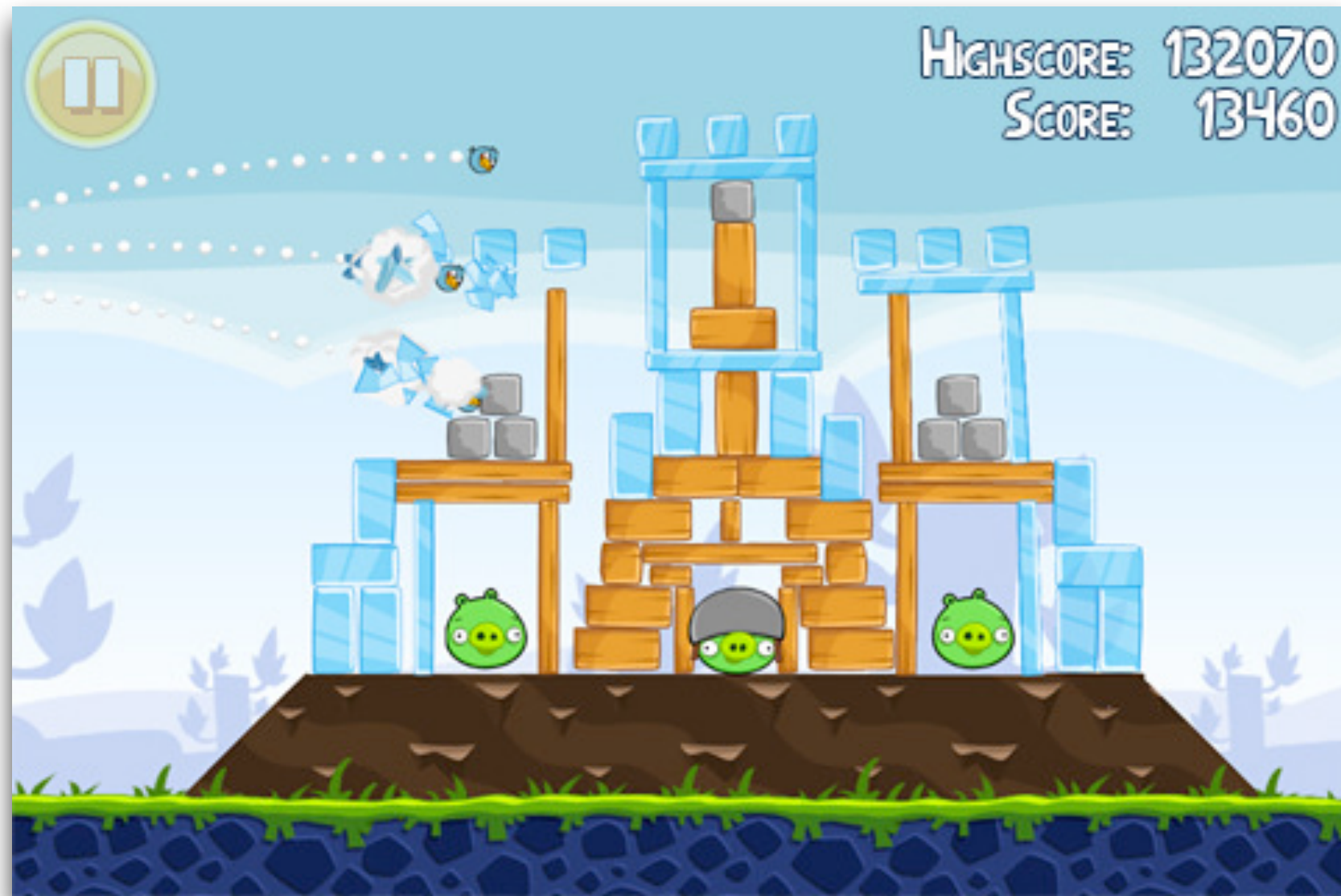


# Reibung



Asteroids

# Impuls



Angry Birds

# Drehimpuls



<http://www.kongregate.com/games/ttursas/imperfect-balance>

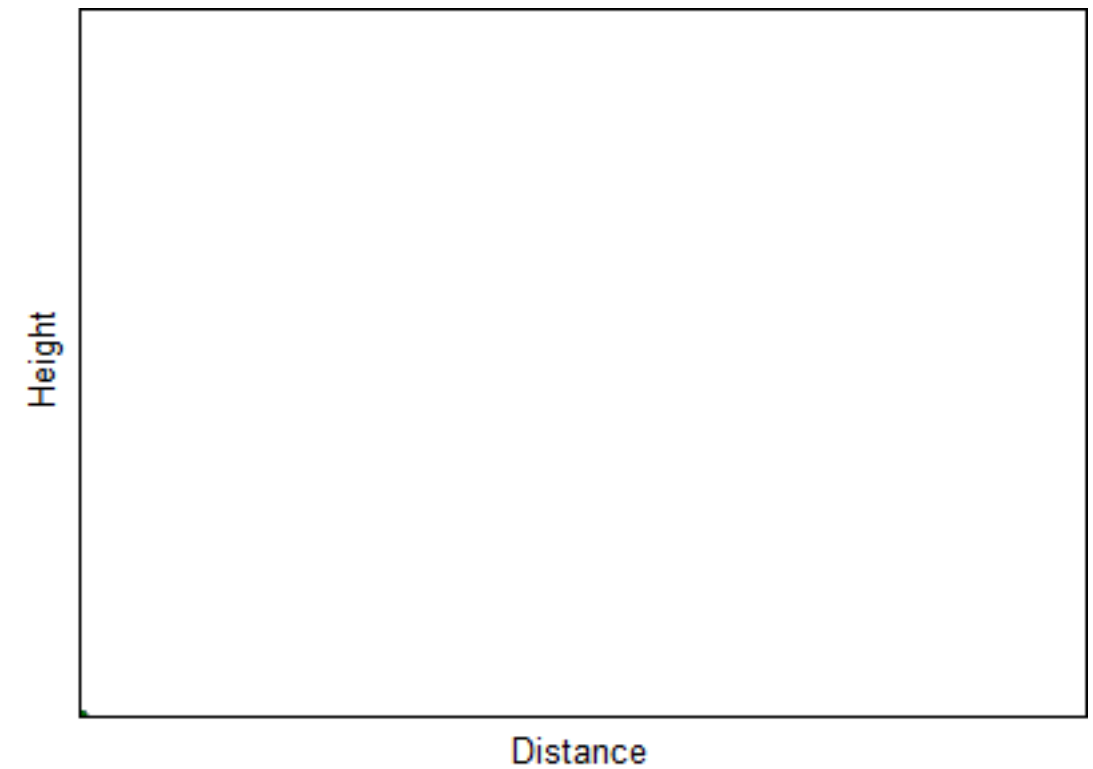
Imperfect Balance



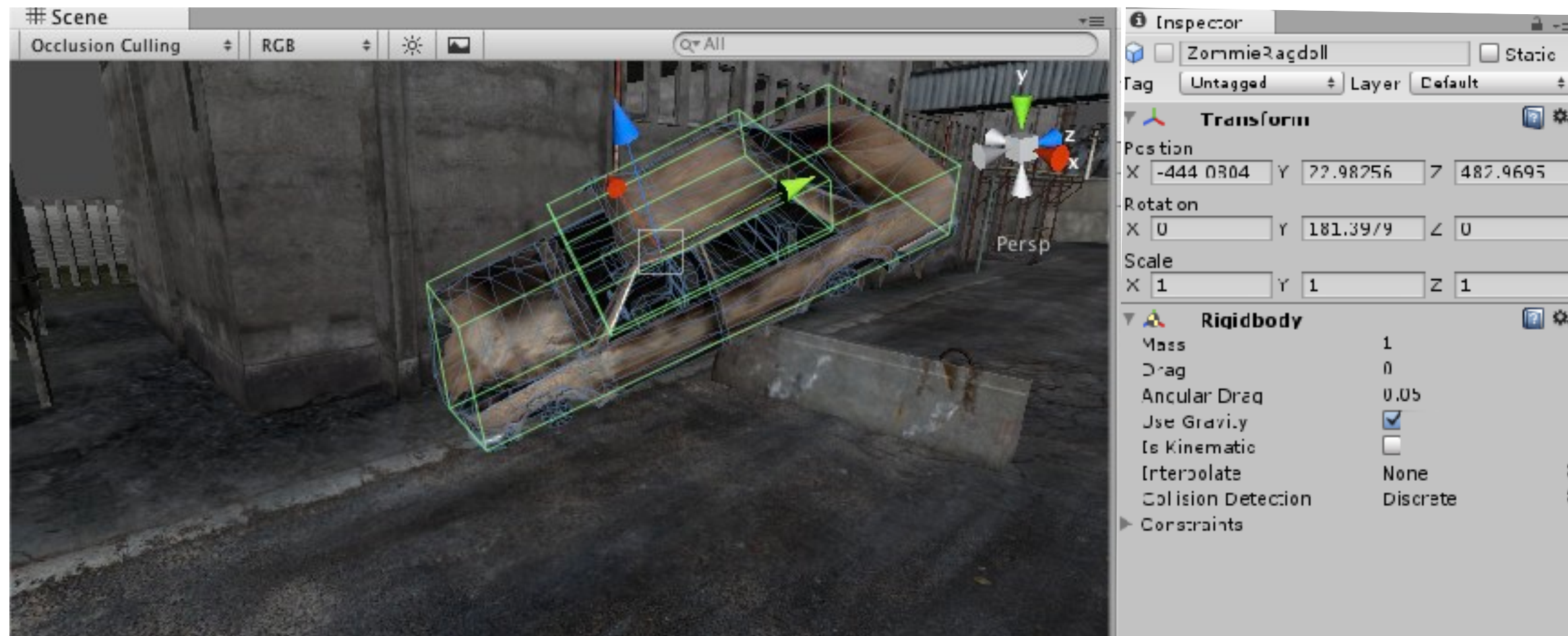
# Ballistik



## Raft Wars



Unterschiedliche Flugbahnen bei einem [schiefen Wurf](#) ohne jegliche Reibung (Schwarz), mit [Stokes-Reibung](#) (Blau) oder mit [Newton-Reibung](#) (Grün)  
<http://de.wikipedia.org/wiki/Ballistik>



Position (3 Koordinaten)

Orientierung (Rotation um 3 Raumachsen)

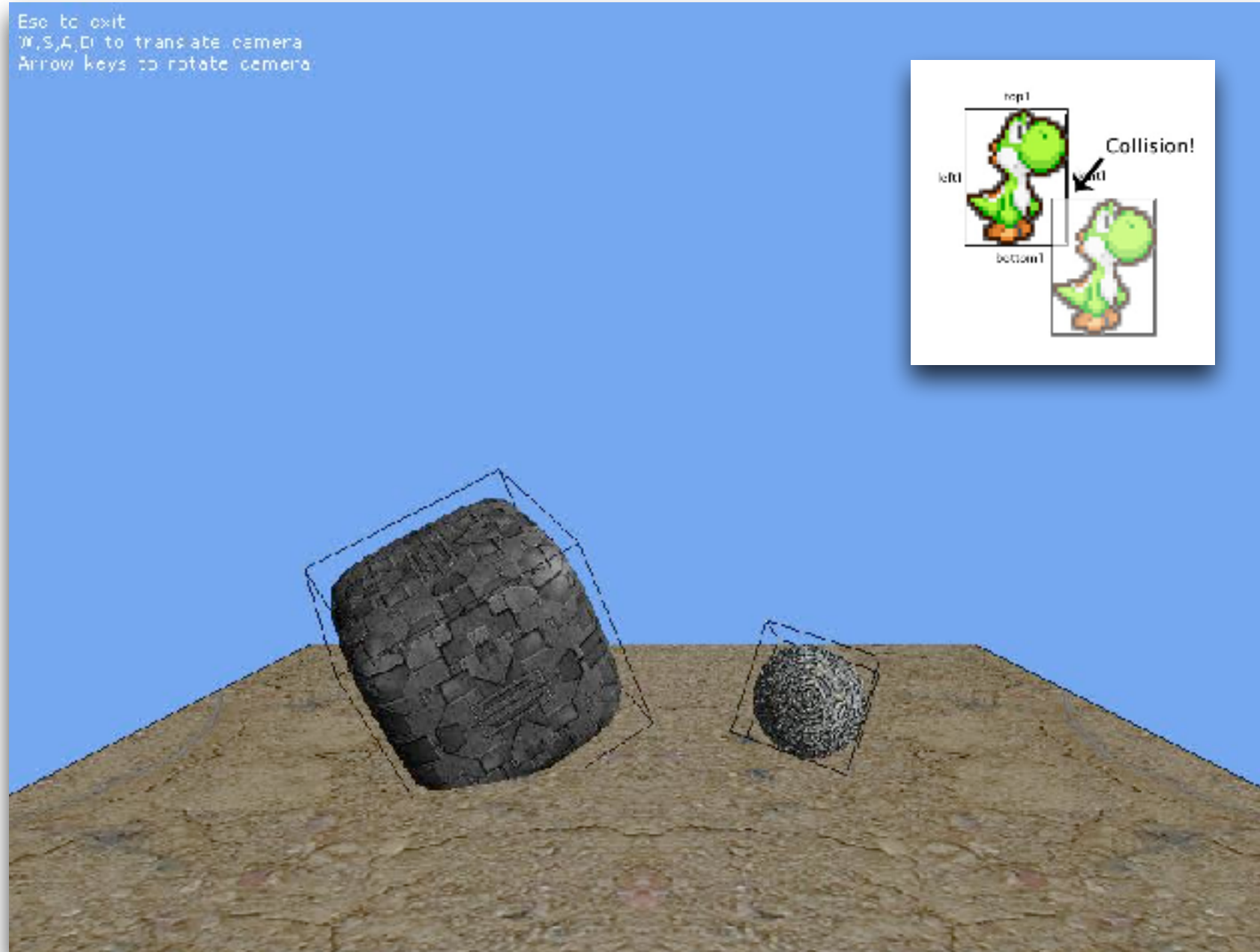
Masse

Impuls (Masse \* Geschwindigkeit)

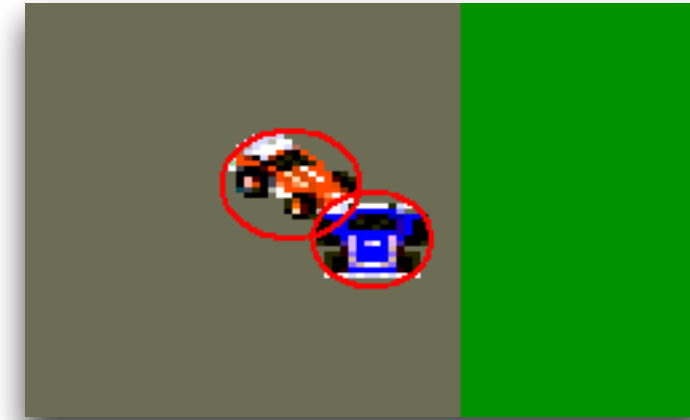
Drehimpuls (z.B. Kreisbewegung)

# Festkörperphysik

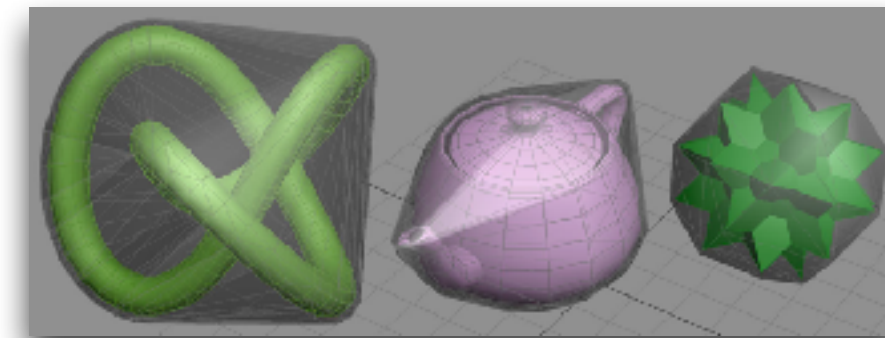
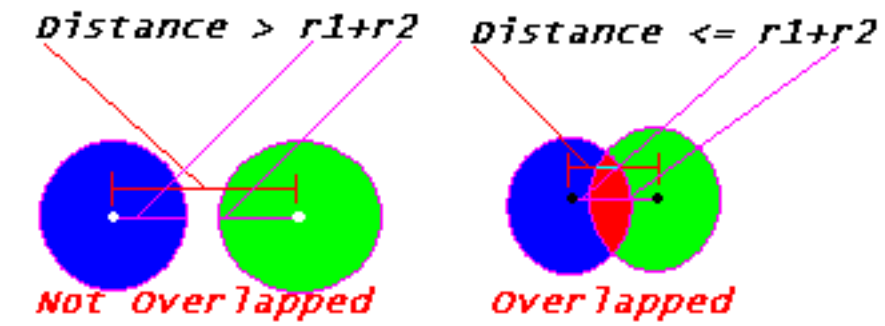
# Kollisionen



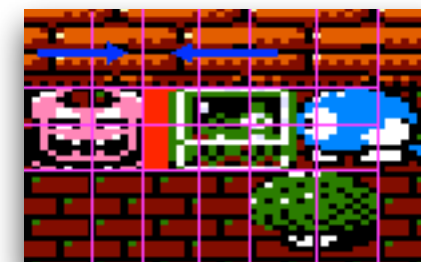
Bounding Box



Bounding Circle



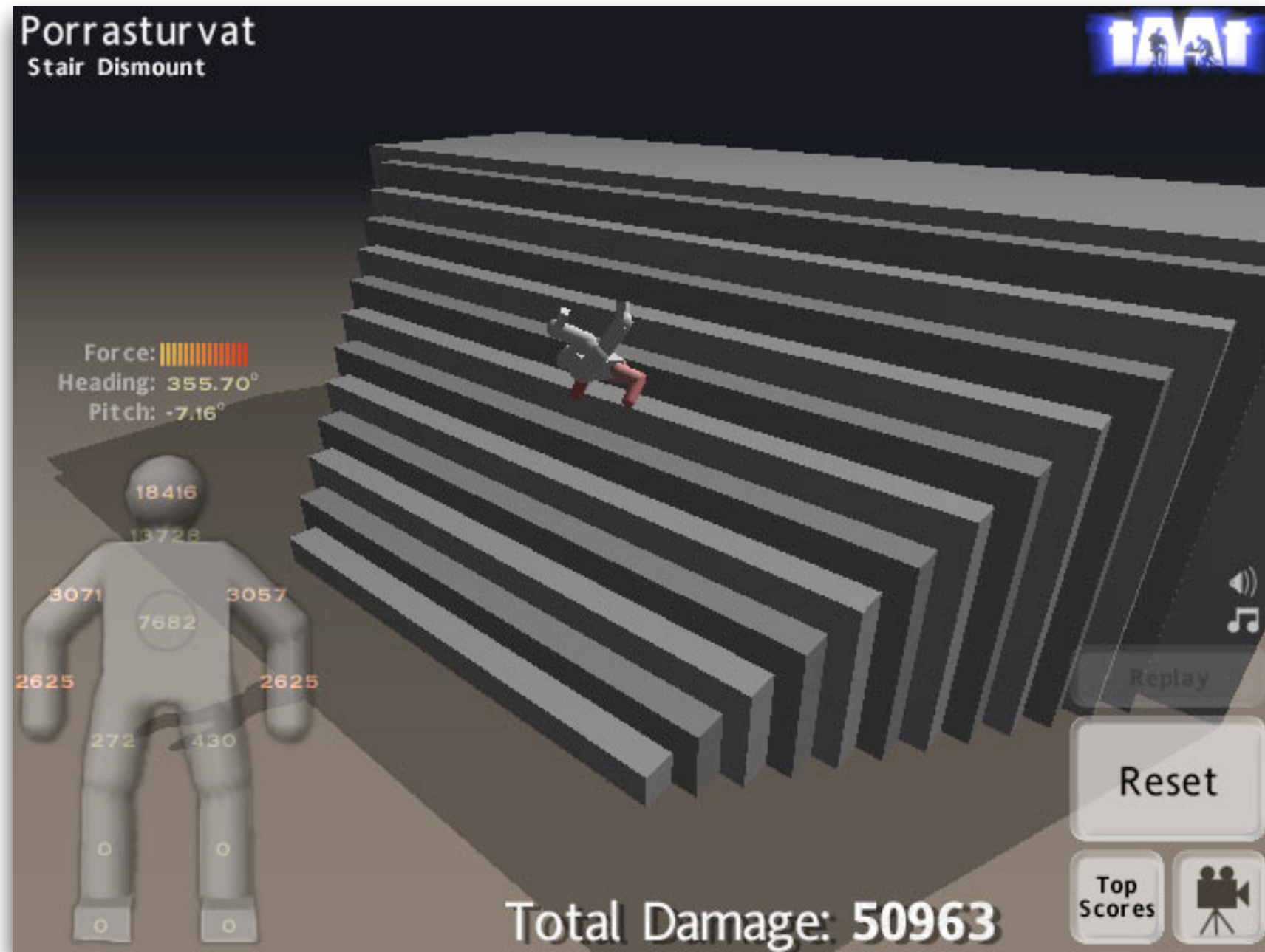
Convex Hull



Grid Based



# Ragdoll Physics



Porrasturvát (Stair Dismount)

# Umgebungsphysik



## **Realistic environmental physics**

Trespasser (1998)

Ragdoll physics started here, as did the idea of physics puzzles in a shooter. You could throw objects at other objects, and they'd react in an almost-realistic way, which was pretty novel for the time.

<http://www.gamesradar.com/gamings-most-important-evolutions/?page=7>

<https://www.youtube.com/watch?v=i6cWEbkBeZQ>



# Fracture Physics



<https://www.youtube.com/watch?v=ATU6IGCMpUA>

Killzone 2

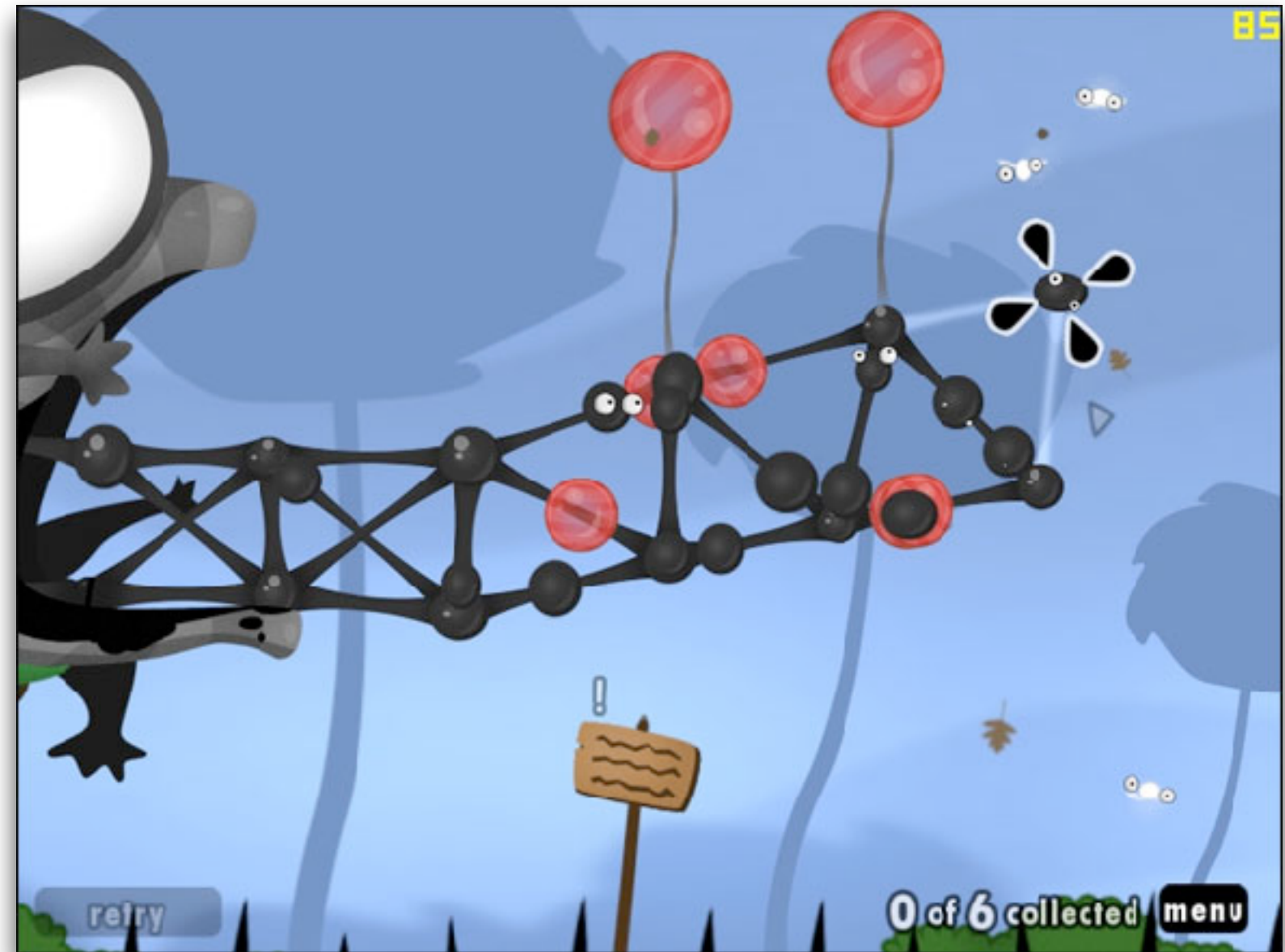


# Soft Body Physics

# Seile und Federn



Cut the Rope



World of Goo

# Oberflächenverformung



Jelly Car





Tearable Cloth

PhysX ON

PhysX OFF

Kleidung (Cloth)



02:48

# Wasseroberflächen

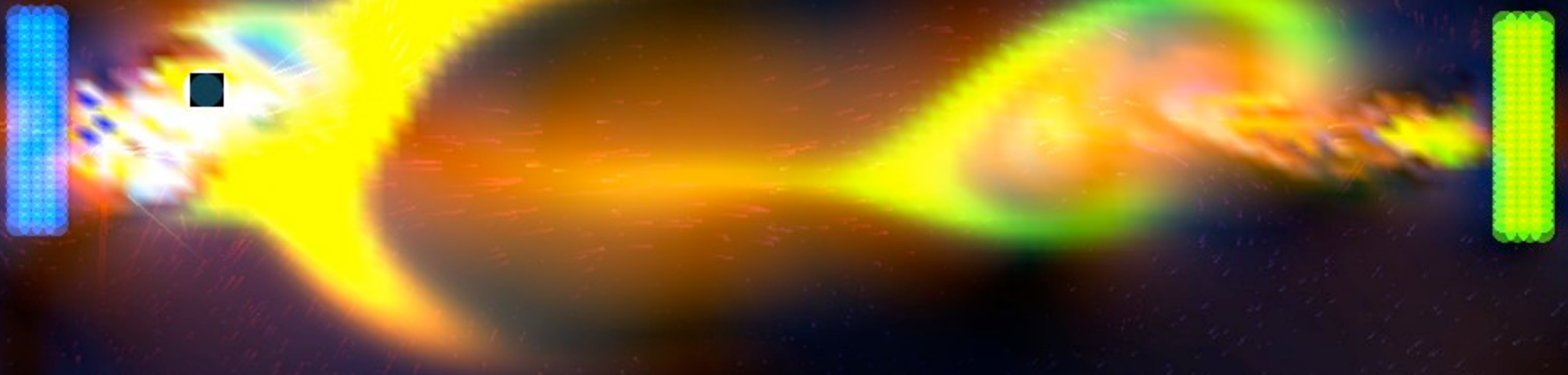


Crysis





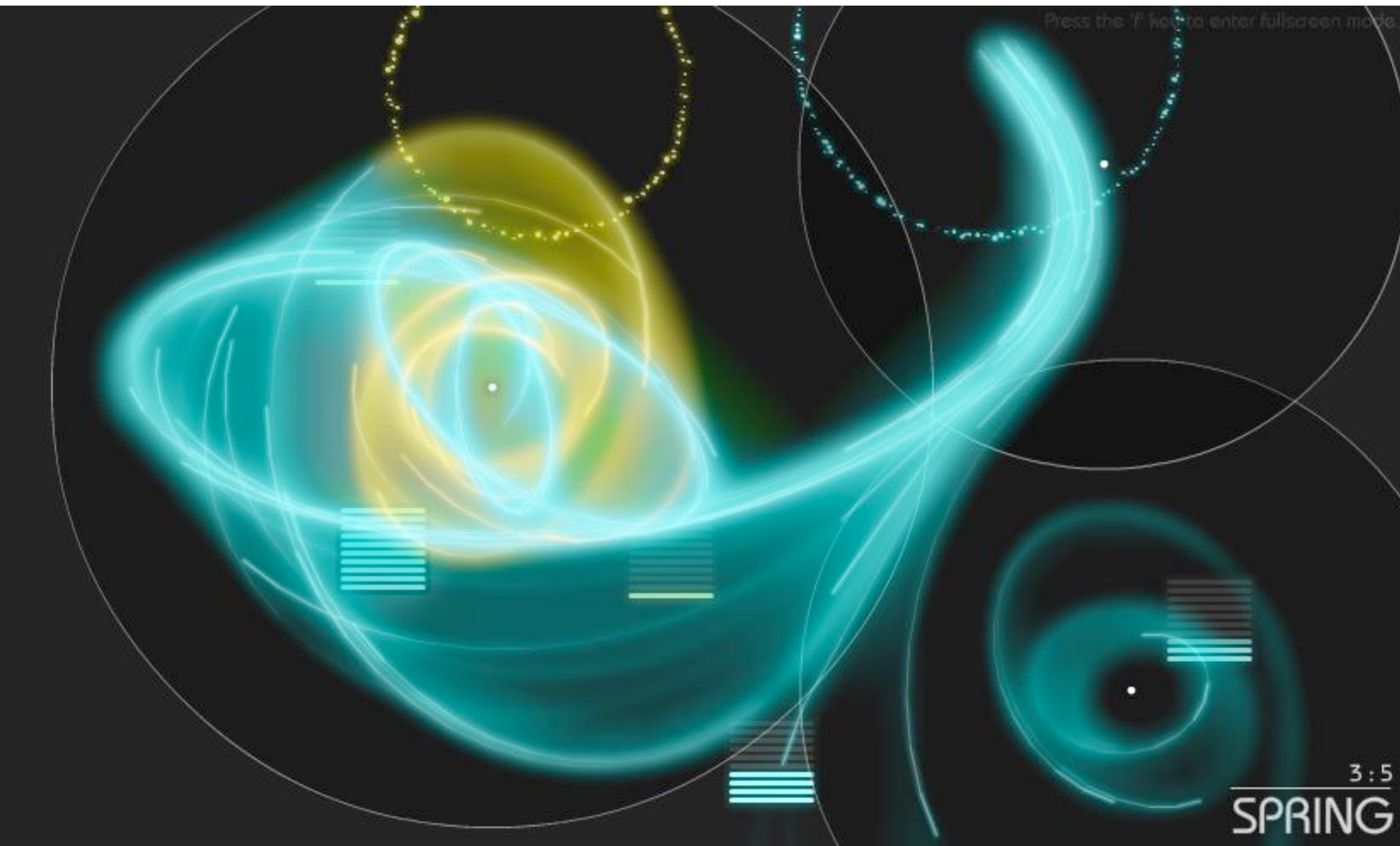
# Strömungsdynamik



Plasma Pong



# Partikelströme



<http://www.playauditorium.com/>

Auditorium



SCORE  
279,775

UUUU

HIGHSCORE  
279,775

Partikel: Explosionen, Feuer

20 20 20 20

10 20 20 20  
MULTIPLIER 2

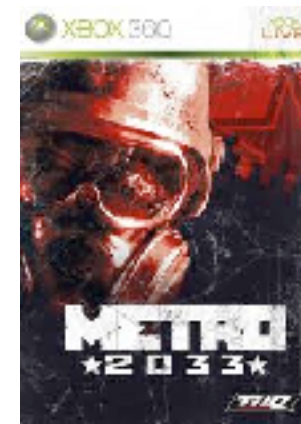
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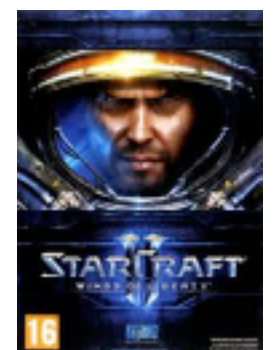
# Physik Engines

PhysX<sup>®</sup>  
by NVIDIA

<http://physxinfo.com/>



havok<sup>®</sup>



# Open Source Physik Engines



[http://ode-wiki.org/wiki/index.php?title=Products\\_that\\_use\\_ODE](http://ode-wiki.org/wiki/index.php?title=Products_that_use_ODE)

