


UCSD Physics 10



Hollywood vs. Physics

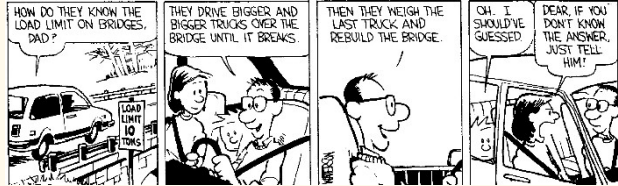
Why knowledge of physics ruins many a movie

Spring 2008

UCSD Physics 10

People Like to Make Things Up

- Hollywood producers never took Physics 10
 - It shows
- At least hire consultants
- Otherwise you just have to pull ideas out of...
 - thin air



Spring 2008

UCSD Physics 10

The Good Eggs

- Despite the general lack of care/concern for physics in movies, a few get things outstandingly right!
 - 2001: A Space Odyssey (1968, before moon landings!)
 - 2010 sequel to 2001
 - Modern Star Trek movies get a lot of the details right
 - but by no means all... Get seat-belts for gracious sake!
- Most movies in which they let Mother Nature take care of the choreography, things work out well
 - It's the rigged-up stunt scenes where things go wrong

Spring 2008

UCSD Physics 10

The Rotten Eggs

- Though entertaining (and I like some of these), among the most guilty betrayers of physics are:
 - Armageddon! (at the top of the list for a reason)
 - Mummy movies
 - Cliffhanger (couldn't even bear the previews)
 - Mission Impossible (either one)
 - Speed (fun, but wrong)
 - Mel Gibson, Schwarzenegger, James Bond movies
- Interesting case study: Armageddon vs. Deep Impact
 - Deep Impact hired science consultants and *did okay*

Spring 2008

UCSD Physics 10

Themes of physics misrepresentation

- **Everything goes BOOM, and explodes in huge fireball**
 - Real life more often just *crunches* (we're not loaded with dynamite)
- **Momentum seldom conserved**
 - Bullet sends victim flying out window, shooter remains motionless
- **Hearing sound in space**
 - no air to carry sound waves
- **Seeing laser beams in space**
 - What are they reflecting off of? Is it smoky?
- **Aerodynamic spaceships, airplane-like maneuvering**
- **Exploding rather than imploding submarines**
- **Fake props: wrong inertia properties**
 - Raiders of the Lost Arc: swiped huge gold statue like it was nothing!

Spring 2008

5

UCSD Physics 10

Movie Examples...

- **Goldeneye, catch up to airplane**
 - Terminal velocity of human: 50 m/s, up to 70 m/s if you reduce your effective area by a factor of two
 - Terminal velocity of plane in dive configuration: 75-80 m/s (more with engine at full power)
 - Got a late start, too...
 - Also problem pulling out of dive!

Spring 2008

6

UCSD Physics 10

Calculations relating to selected scenes

- **Speed, bus jump**
 - 150-200 ft, level (call it 45 m)
 - bus at 30 m/s (67 mph): takes 1.5 seconds to cross
 - drops 11 m (36 ft) in 1.5 s
 - *could* work, at 15-20 degree launch angle, no air drag

Spring 2008

7

UCSD Physics 10

Websites & Assignments

- **Websites**
 - www.space.com/opinionscolumns/opinions/plait_000217.html
 - www.badastronomy.com/
- **Assignments**
 - HW for 2/11: Hewitt 7.E.42, 7.P.9, 6.R.16, 6.R.19, 6.R.22, 6.R.23, 6.E.8, 6.E.12, 6.E.43, 6.P.6, 6.P.12, 8.R.29, 8.E.47, 8.P.9, plus **two more problems** accessible from assignments website

Spring 2008

8