

The Physics of Interstellar

HON 210, Fall 2020

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Syllabus

Introduction

Science in the Movies

Interstellar - The Movie

The Syllabus

- **Website**

<http://people.uncw.edu/hermanr/Interstellar/>

- **Grades**

Item	Percentage
Assignments	35%
Presentation	15%
Exam	20%
Final Exam	30%

- **Textbooks**

The Science of Interstellar, Kip Thorne, 2014.

Interstellar: The Complete Screenplay, J. Nolan and C. Nolan, 2014.

See also - <http://people.uncw.edu/hermanr/booklist.htm>

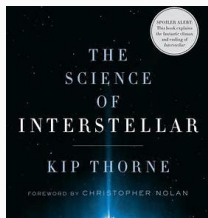
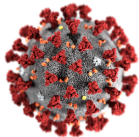


Figure 1: Main Textbook.

COVID-19 Instruction

- This class is: Face to Face unless ...
- <https://uncw.edu/coronavirus/>
 - Social Distancing
 - Face Coverings
 - Wash Hands
- Office Hours



Following CDC Guidelines, UNC System directives, and out of mutual respect as outlined in the UNCW Seahawk Respect Compact, all faculty, staff, and students will wear face coverings while inside buildings. Students who are unprepared or unwilling to wear protective face coverings will not be permitted to participate in face-to-face sessions and will need to leave the building. Noncompliant students will be referred to the Dean of Students for an Honor Code Violation. Any student who has a medical concern with wearing a face covering should contact the Disability Resource Center at (910) 962-7555.

Students who experience COVID-19 symptoms should immediately contact the Abrons Student Health Center at (910) 962-3280.

The Science of Interstellar - Kip Thorne

- Preface
 - To Explain How Science Works
 - The science is at the frontier of understanding
- Thorne explains the science
- And interprets what is in the movie
- Wants it different than other movies!



Figure 2: Thorne at Board of *Interstellar*.

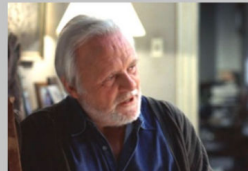
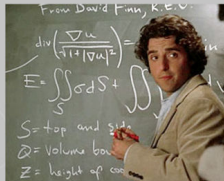
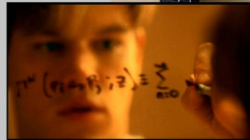
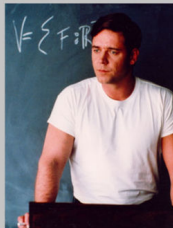
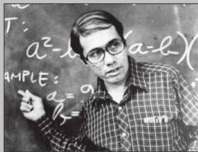
PHYSICS AND MATHEMATICS IN THE MOVIES

from October 2010



Mathematicians

Real and fictional mathematicians

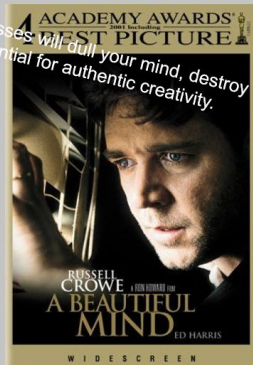
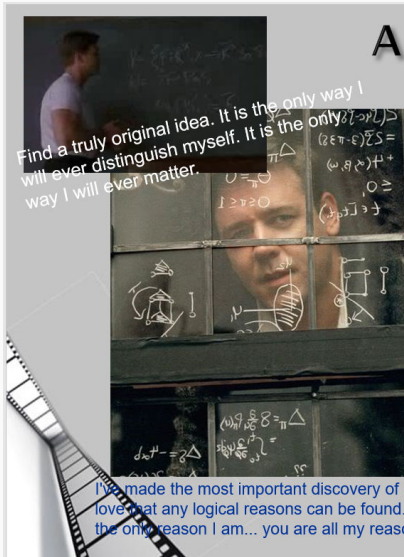


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A Beautiful Mind

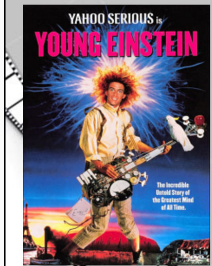
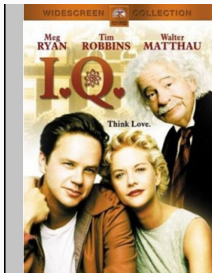
Find a truly original idea. It is the only way I will ever distinguish myself. It is the only way I will ever matter.

Classes will dull your mind, destroy the potential for authentic creativity.

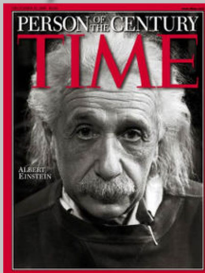


I've made the most important discovery of my life. It's only in the mysterious equation of love that any logical reasons can be found. I'm only here tonight because of you. You are the only reason I am... you are all my reasons.

Physicists in Movies



Physicists



LIGHTS ALL ASKEW IN THE HEAVENS

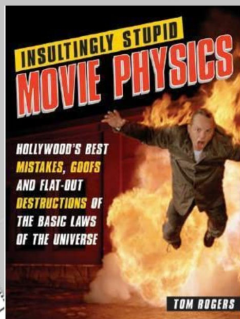
Men of Science More or Less
Agog Over Results of Eclipse
Observations.

EINSTEIN THEORY TRIUMPHS

Stars Not Where They Seemed
or Were Calculated to be,
but Nobody Need Worry.



Movie Physics



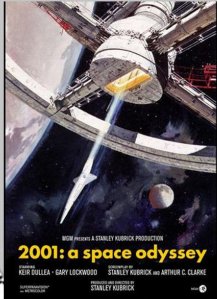
<http://www.intuitor.com/moviephys>

Faster-than-light travel
 People move in slow-motion in zero gravity
 Dodging faster-than-light weapons (e.g., James)
 Weedy asteroids aren't down close by gravity
 Eyes in space / Unshielded explosion
 Wild depictions of exposure to vacuum
 Weird depictions of humans & aliens
 Easy communication with aliens
 Easy interbreeding between humans & aliens
 All planets have one climate planet-wide
 All planets have Earth gravity
 Sound in space

2001: A Space Odyssey					✓			✓
Contact	✓			✓				
Space Cowboys	✓							✓
Armageddon	✓					✓	✓	
The Black Hole (1979)	✓						✓	✓
Deep Impact	✓					✓	✓	
Mission to Mars	✓					✓		✓
Serenity		✓	✓				✓	
Solaris (1972)	✓	✓	✓					
Stargate		✓		✓	✓			
Sunshine (2007)	✓					✓	✓	
Alien Movies		✓	✓		✓	✓		
Moonraker	✓						✓	✓
Enemy Mine	✓	✓	✓			✓	✓	✓
The Last Starfighter	✓	✓	✓				✓	✓
Star Wars Movies	✓	✓	✓	✓		✓	✓	✓
Apollo 13						Clean bill of accuracy!		
The Right Stuff						Clean bill of accuracy!		

BAD Science in Movie!

2001 A Space Odyssey



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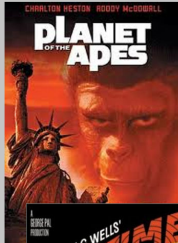
Star Trek - 1966-1969



Can you hear me now, Spock?

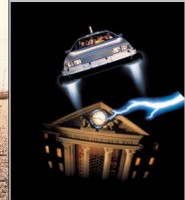
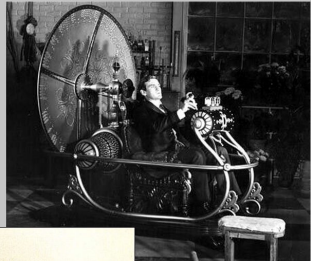


Time Travel

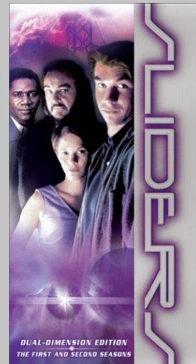


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Time Machines

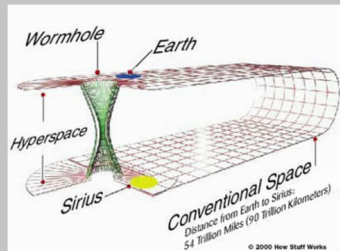


Taking a Quantum Leap



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Wormhole Portals



Black Holes in Film

- The Black Hole, 1979
- A Brief History of Time, 1992
- Event Horizon, 1997
- The Black Hole, 2006
- Star Trek, 2009
- Interstellar, 2014
- The Theory of Everything, 2014



Interstellar - The Movie

