

Climate Change

Riordan Program Introductory Lecture

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About Me

- ▶ Well-known professional economist
- ▶ Boomer = Bad Humor
 - ▶ rhymes! (bad!)
 - ▶ do not expect political correctness from me
 - ▶ if easily offended, skip this one. go get coffee instead.
 - ▶ ***my*** academia exists to challenge you, not to keep you comfy.

About You

- ▶ I will treat you like my students (and family)...
 - ▶ may include well-spirited making fun of you
 - ▶ I can take it as well as I can dish it out

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Mercilessly!

Environmentalism

- ▶ Climate Change, *Free Text Book* online
- ▶ Surprisingly little should be controversial
 - ▶ if you want more uncomfortable controversial books that may challenge your core beliefs, please ask me after class. Never to be forced.

Humanism and Enlightenment

- ▶ Amateur Humanist
 - ▶ every world philosophy: *golden rule*
 - ▶ “owe” it to help those not as well off as you, *every* background!
- ▶ It's pure selfish self-indulgence.
 - ▶ makes *you* happier
 - ▶ won't mean much to you right now
 - ▶ but it will in a few decades
 - ▶ life will go by quicker than you think

Why Academia?

- ▶ Meaning of Life
 - ▶ Music, Art, Money, Science, Sports, Politics?
 - ▶ everyone has to find their own goal in life
 - ▶ you don't owe spending your life for your parents
- ▶ For *me*, meaning of life is *interesting learning*.
 - ▶ I hate PC, because it makes it more difficult to ask questions and learn...and I have a strange sense of humor.
 - ▶ The road to hell is paved with good intentions

Don't Shoot The Messenger!



All I am offering is the truth, nothing more.

Climate Change is Everywhere

- ▶ California: Deluges and Droughts
- ▶ 4-year drought in Somalia; 20,000 dead children
- ▶ Hurricanes are becoming worse
- ▶ Coastal region flooding
- ▶ Polar bears are dying out
- ▶ More vulnerable people are dying from heat
- ▶ Affects people of color more

Bullshit?

- ▶ Some is true, some is not.
 - ▶ Weather is not Weather
 - ▶ Water mismanagement is not climate change
 - ▶ 400 million people soon 4 billion people
 - ▶ Affects poor people more!
 - ▶ no causality but correlation

Weather is not Climate Change

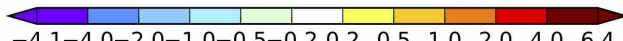
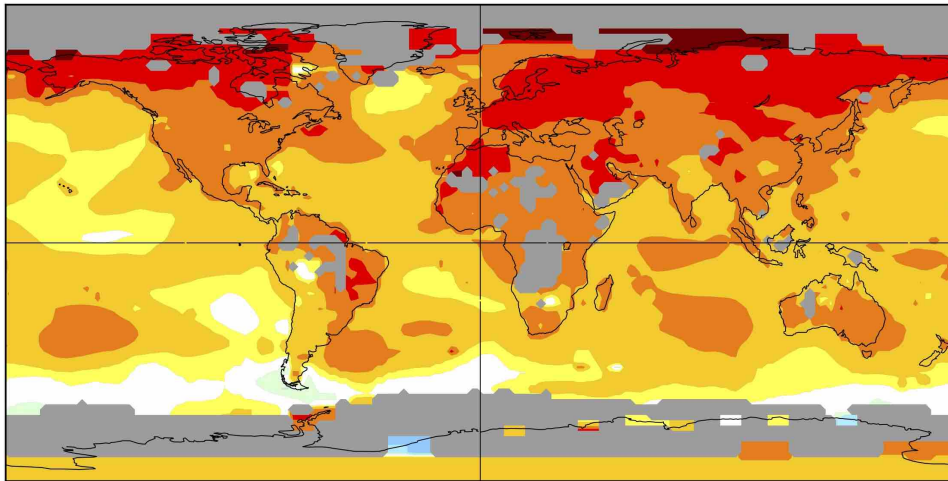
- ▶ Need Measurements (Satellites, Stations, etc.)
 - ▶ Only over decades, does GCC change become noticeable.

Where?

Annual J-D

L-OTI(°C) Change 1960-2021

1.01



No Doubt

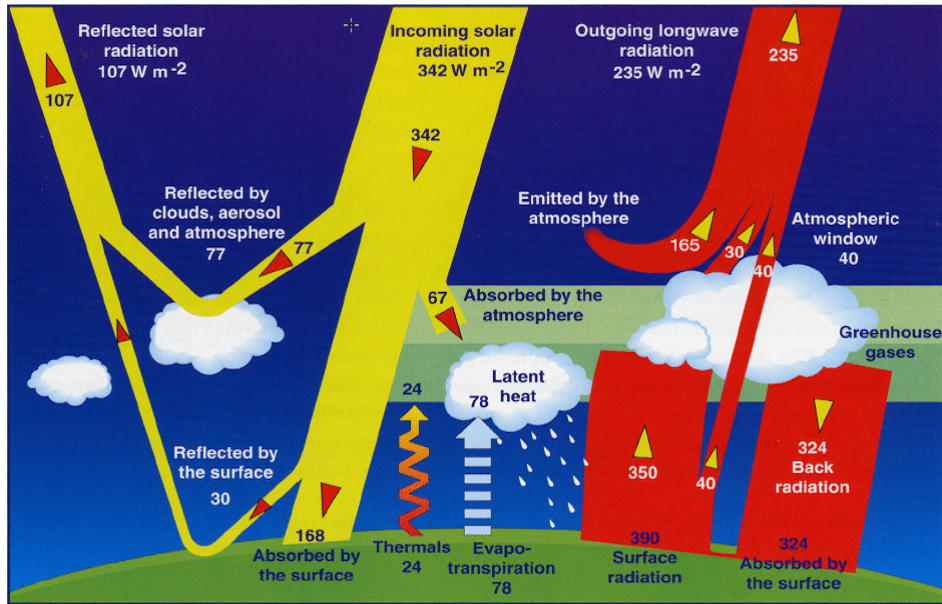
- ▶ Earth is heating up dramatically at the moment
- ▶ It will cause great misery *in some places*
- ▶ It will be only a nuisance *in other places*
- ▶ Nothing is certain.
 - ▶ it's definitely a big deal, unusual, severe

Evidence

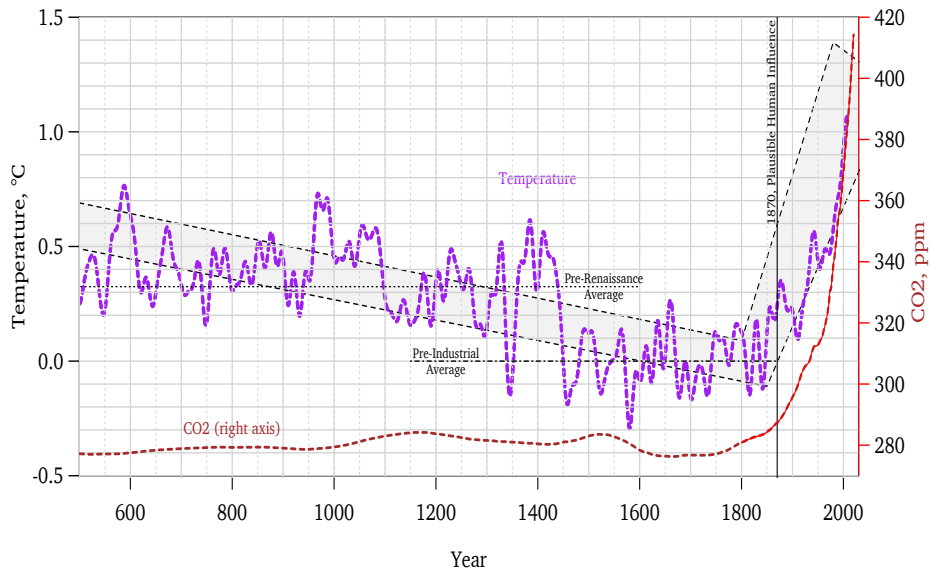
- ▶ Earth already heated by about 1-1.2°C rel to 1800
 - ▶ most since 1980
- ▶ will heat by another 1.5°C (to 2-3°C) by 2100
- ▶ ...with great uncertainty about exact number
 - ▶ will be much worse in some places
 - ▶ could be much worse overall, too
 - ▶ but much much worse than 2-3C is unlikely
 - ▶ and much much better than 1-2C is unlikely

What causes it

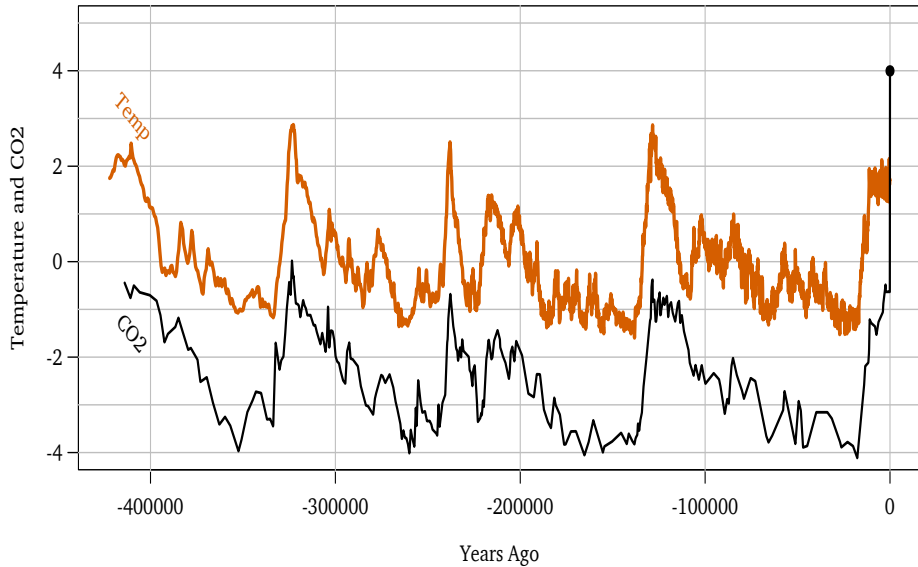
- ▶ Certain: 3/4 is fossil-fuel caused
 - ▶ why does this even matter?
 - ▶ fossil fuel guys are not nice, but they did a lot of good
- ▶ Indirect also: population



Hockeystick



Temperature



Is Climate Change An Existential Threat?

- ▶ No serious scientist expects it to be.
- ▶ Humanity survived much bigger temperature swings
- ▶ Every serious scientist believes CC will be dead-serious.
- ▶ Most harm will be in equatorial poor countries.
 - ▶ No scientist predicts harm for USA, Canada, Europe
 - ▶ Nuisance in West, not killing thousands or millions
- ▶ One of many legitimate threats to be concerned about
 - ▶ population; ecosystem collapse; overfishing; supervolcanos; asteroids; epidemics; etc.

Don't Believe Me?

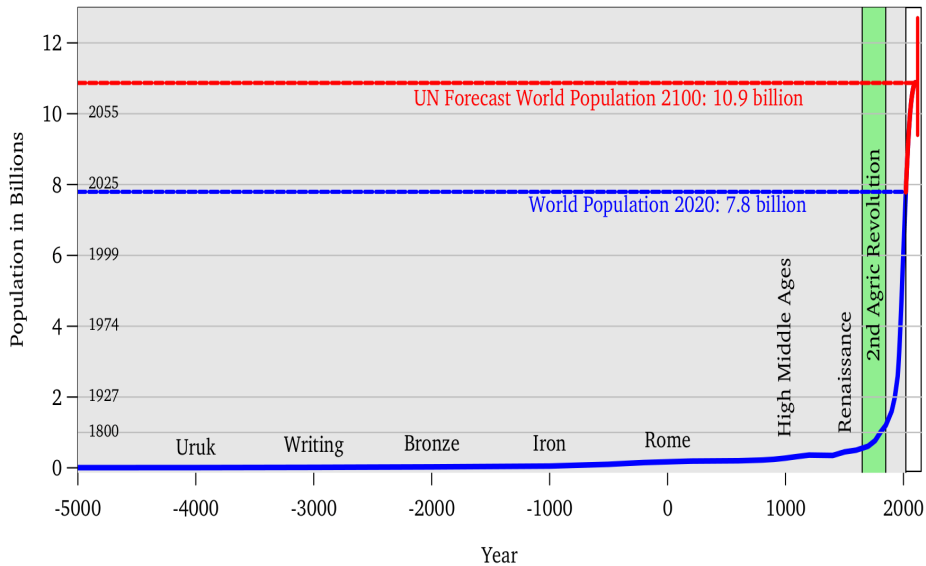
What's 4C ?

	Boston	New York	DC	Atlanta
Avg Temp	11.1C	+13.2C	15.2C	17.6C

- ▶ Will change the places, but it will not kill them.
- ▶ Rich people can easily live in Arizona or Singapore

The Prime Cause of the World's Problem

- ▶ industrialization ?
- ▶ big bad fossil-fuel companies ?
- ▶ capitalism?
- ▶ US? West?
- ▶ us?



Indisputable: Fossil Fuel Era

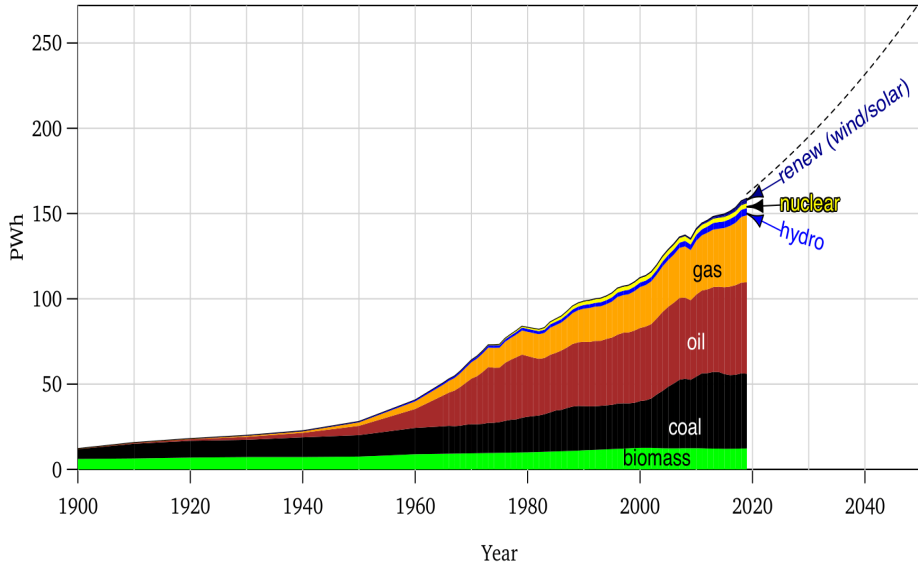
- ▶ You are sitting in this nice building because your ancestors built a modern economy of fossil fuels.
 - ▶ 10 times richer than past generations;
 - ▶ life expectancy > 35 years; no famines;
 - ▶ healthcare. education. retirement. holidays. TV. phone.
 - ▶ it's *not* primarily about plastic straws and vacation trips.
 - ▶ *capitalism* is the only system that ever lifted people out of poverty. Donation boxes and communism failed.
 - ▶ unfair, sometimes inhumane, but effective. sucks!

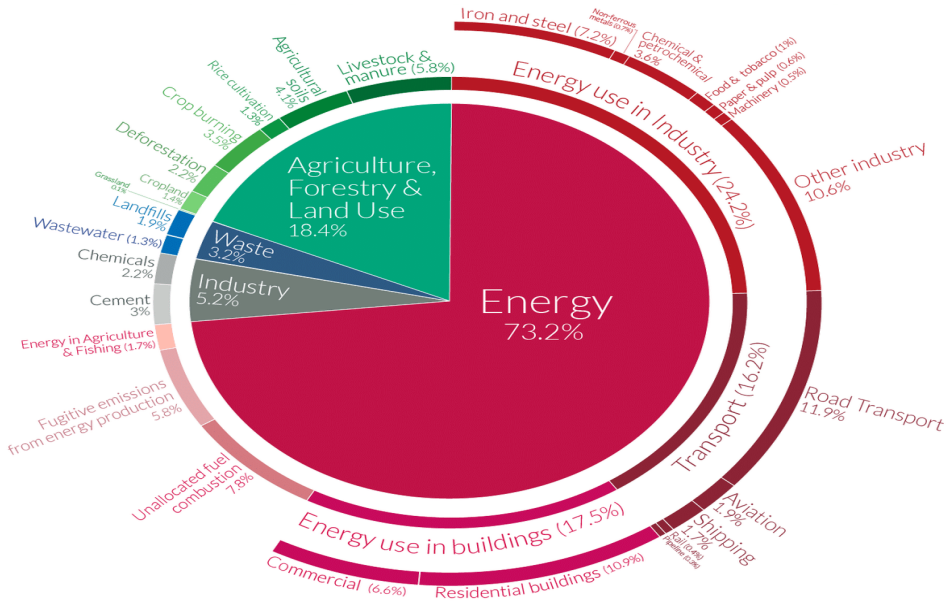
► Modernity is *not* everywhere

- Greta Thunberg: Who cares about Sweden. Does India need less poverty or less global warming? How?
- Greenpeace: Africans are migrating to slums because of us
 - Big bad oil and Western companys are ***guilty!***
 - BS: 4 billion people will live in 2100 where 200 million people used to live in 1850.
 - population in SSA doubles every 30 years or so!
 - (Need more womens' rights!)

- ▶ “Deserve” is irrelevant.
 - ▶ But in my ethics, the global poor deserve what we have,
 - ▶ not that we should (would) step down to how they live.
- ▶ Reduce inequality?
 - ▶ One Way? Destroy US! Would not help the poor, but reduce inequality.
 - ▶ GCC is not about race or ethnicity. It’s about poverty and temperature.
 - ▶ (Talk about what unites us, not what divides us!)

Fossil Fuel Use





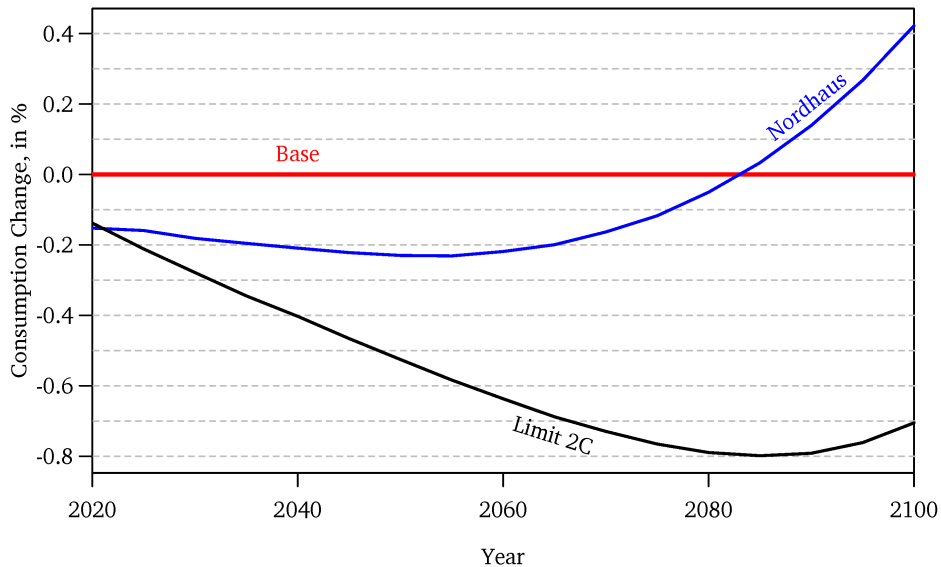
- ▶ Past: 50-50 population growth, standard of living
 - ▶ increase in *standard of living* means no famine, healthcare, heat; then transportation, cell phones, etc.

Indisputable: Fossil Fuel Era, Time To Go

- ▶ World collectively would ***now*** be better off burning less fossil fuel
- ▶ *Not* possible in the past, but *now*:
 - ▶ because renewable energy is becoming a lot cheaper
 - ▶ go into energy storage
 - ▶ most exciting revolution for your generation
 - ▶ **Do good *and* get rich!**
- ▶ Fossil fuel use is expected to grow only in poor countries.
 - ▶ help make them want to skip

What Can You Do?

SKIP: Get Ready!!



Should You Watch Your Carbon Footprint?

- ▶ Not a bad idea, often healthier;
- ▶ but it will not make *any* difference to global warming!
- ▶ If other people do it, they will do it regardless of whether you do it.
- ▶ World needs scaleable solutions, not “New Year Resolutions”

Should We Solve By United Nations Treaty?

- ▶ Wealthy countries soon only about 1/4 of emissions
 - ▶ We are no longer the starring players
 - ▶ Think India, China, Southeast Asia, etc.

Treaties

- ▶ IMHO absurd to expect success.
- ▶ Not about “what’s right” but about “what’s realistic”
 - ▶ Countries will act in their own self-interests.
 - ▶ India (soon emitting 2 times as much as US) will not forego bringing its people out of poverty.
 - ▶ China will not do it. Russia will not do it.
 - ▶ Africa and Bangladesh would prefer escaping poverty ASAP
 - ▶ (Everyone wants reparations, of course. Want \neq Get.)
 - ▶ Cost Estimate = Make all higher ed free.

Simple Better Reasoning

- ▶ Countries will not reduce their carbon footprints for the same reason why they will not eliminate their militaries.
 - ▶ yes, world would be better off;
 - ▶ even their country's poor might be better off;
 - ▶ but it's not in their self-interest!!

- ▶ Think Self-Interest

- ▶ How can you bend the worlds' self interest for generations?

- ▶ Think Actionable!

- ▶ If you found out that nuclear war was twice as bad as you thought before, what difference would it really make?

- ▶ What is advocatable right now?

- ▶ Local pollution; technology improvement; trees



Give Up?

- ▶ Only approaches not strongly against self-interest can be effective.
- ▶ This is **not** a nihilistic approach, **at all!**
- ▶ Many things we can **efficiently** subsidize:
 - ▶ energy-storage research; impact [not ESG] investing; local fossil-fuel taxes; tree planting; grid creation and improvements; smart education; pricing; better regulation;
- ▶ Not “shake and lament” every year again. (madness...)

Better Environmentalism!

- ▶ We already know nuclear war and GCC are bad enough.
 - ▶ what difference will it actually make to know this?
- ▶ Why are environmentalists focusing primarily on global SCC / tax at COPs and not on better alternatives?
 - ▶ common hostility to technology and capitalism?

Electricity Prices Per MWh (est rough)

Cost	2020	2050
Solar	\$35	\$15
Wind	\$35	\$20
Nuclear	\$70	\$60
NatGas, Peaker	\$40	\$50
Coal	\$75	\$65

Solar When No Sun?

- ▶ Needs Storage
 - ▶ Water hydrodams = lots of energy, low efficiency, not everywhere, expensive
 - ▶ Batteries = most exciting changes now. Not there yet.
 - ▶ If improvements are coming, should you wait?
- ▶ 1MWh delayed: $\$35 + \$200 = \$235$. (can go to \$120!)
- ▶ Others
 - ▶ Transmission and Infrastructure
 - ▶ Reliability

Electricity Gen (2/3?), TWh

Region	Coal	NatGas	Nuclear	Hydro	W+S
USA '30	800	1,600	800	300	500
China	4,300	300	300	1,100	850
World	8,200	6,500	2,600	4,000	2,500
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USA '50	600	2,000	600	300	1,900
China	3,500	800	1,000	1,500	4,500
World	8,100	7,300	3,000	5,500	17,000

WARNING:

- ▶ Electrifying is Great(!), but
 - ▶ Electricity is only 1/3 of our emissions
 - ▶ Another 1/3 may be economically electrifiable
 - ▶ 1/3 is not electrifiable (think agriculture, flying)
- ▶ Let's grab all the low-hanging fruit now

Controversy Among Smart Parties?

- ▶ There is not that much that is *actionable* to disagree about.
- ▶ There are many *distractions* about we can disagree about:
 - ▶ e.g., “self-interested” vs. “honest” (Big Oil)
 - ▶ e.g., “righteous” vs. “non-righteous” (Greenpeace)
 - ▶ e.g., what’s right...stand up! (Niemoeller)
- ▶ Should not disagree about:
 - ▶ e.g., *net-zero* nonsense (80% with 10h; 99% 100x!)
 - ▶ e.g., expensive ESG bureaucracies

Resources

- ▶ <https://climate-change.ivo-welch.info/>
- ▶ <https://www.climate-change.ivo-welch.info/home/16-cribsheet.html>

MBA Programs

- ▶ MBA Programs are “local,” not national
 - ▶ Strong local alumni networks
 - ▶ If you want to live in LA, try UCLA (or USC)
 - ▶ If you want to live in North Carolina, try Duke and UNC
 - ▶ Ranks #20-#80 are not bad, either.
 - ▶ Only worldwide exceptions: HBS, Stanford, Chicago
 - ▶ MBA program curricula are similar
 - ▶ Our profs were educated there, their's here.

Movie Recommendations for Riordan Scholars?

Please stop watching meaningless predictable superhero sh*t.

► Recommendations

- In the Heat of the Night (1967)
- Shoah (1985)
- Mississippi Burning (1988)
- Glory (1990)
- Schindler's List (1993)
- Lives of Others (2006)
- 12 Years a Slave (2013)
- The People vs. Fritz Bauer (2015)
- The US and the Holocaust (2022) — also “The Civil War”