Physics/Global Studies 280

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Matt Caplan, mcaplan@illinois.edu

Module 1: Introduction to the Course

Physics/Global Studies 280 Goals

(1) To provide a basic understanding of the nature of nuclear weapons, the threat they pose to humankind, and possible ways to reduce and eventually eliminate this threat.

(2) To improve technical writing skills, as used in academia, government and business.

Physics/Global Studies 280 Goals

Goal for Writing in 280

(1) Study and review course related material.

(2) Develop writing skills in changing technical writing styles:
Scientific American, Congressional Research Service, National Counter Terrorism Center (NCTC) brief, a scientific journal.

(3) Practice use of AI tools in technical writing.

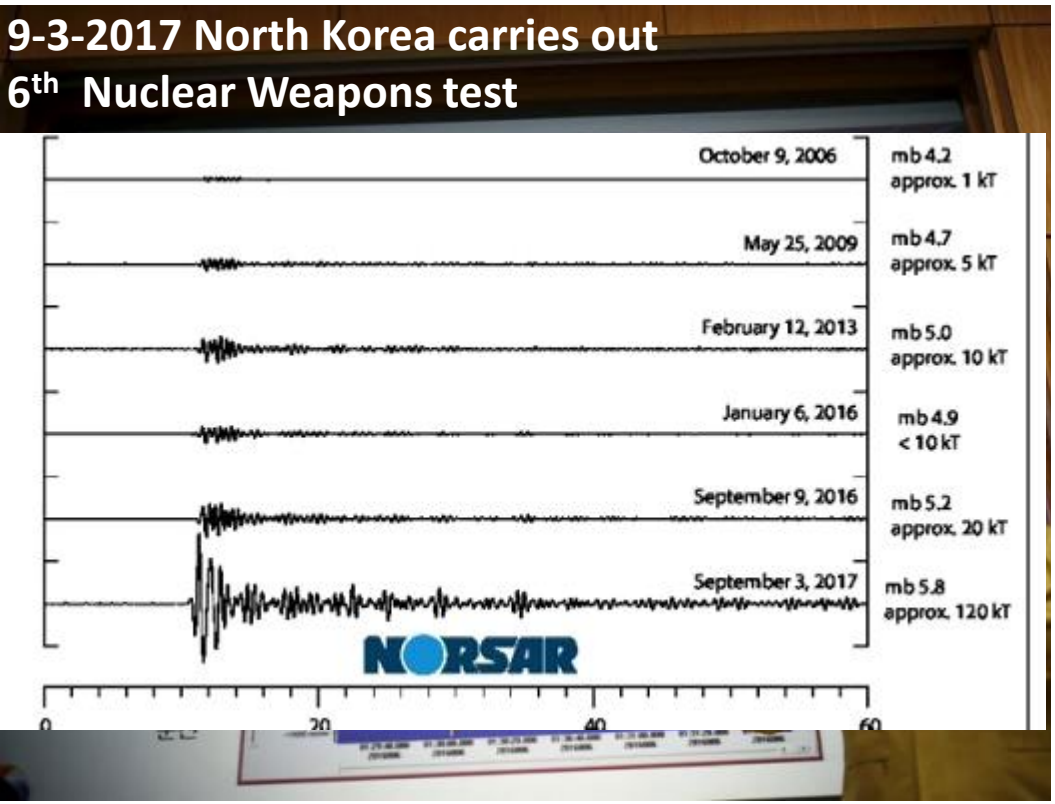
(4) Practice attention to detail that is necessary for successful professional writing.

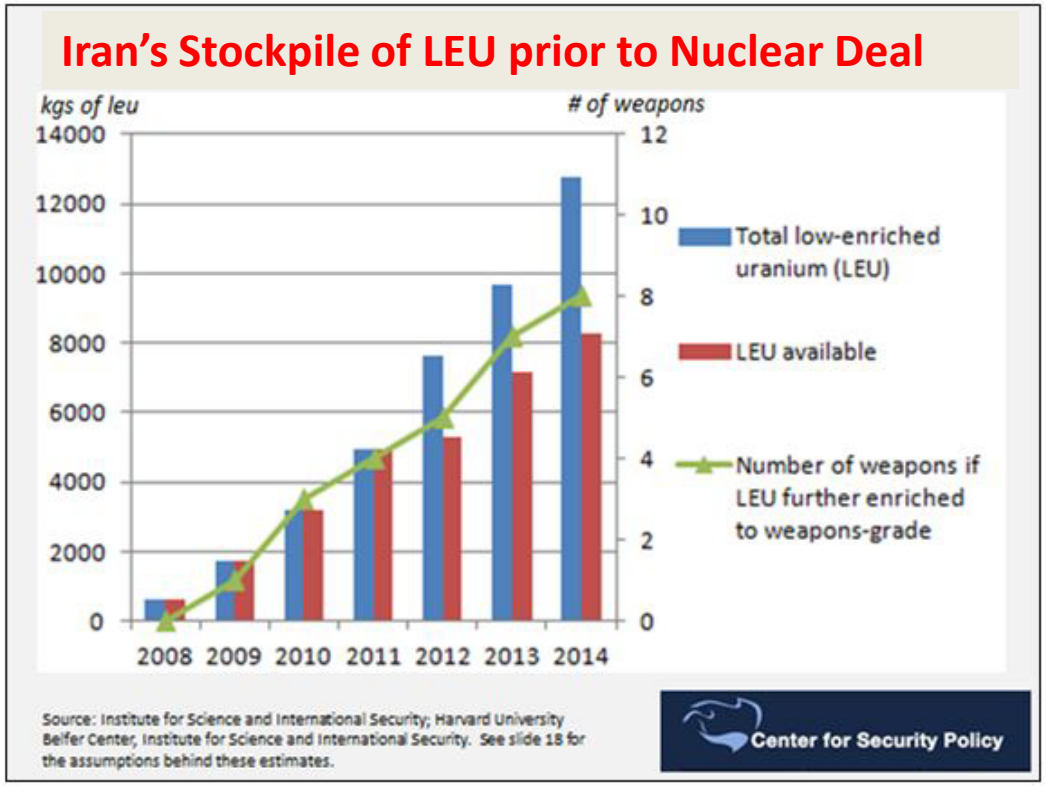
➔ Part of College of Engineering effort to improve technical writing skills. (alumni career surveys show that writing skills are highly important for professional success).

Physics/Global Studies 280: Motivation

What are current concerns with regards to nuclear weapons, 35 years after the end of the cold war?

Six examples: (I) Further proliferation of Nuclear Weapons
Challenges to Nuclear Non-Proliferation Regime





(II) Failure of nuclear arms control: First war in country with extensive civilian nuclear industries -> Ukraine

1991: Ukraine inherits ~5000 nuclear warheads from the disintegrating Soviet Union

1992: Lisbon Protocol – Russia assumes nuclear arsenals of the Soviet Union (START)

1994: Budapest Memorandum – Russia, UK and USA provide security guarantees for Ukraine

2014: Annexation of Crimea by Russia

2022: All out Russian assault on Ukraine – open threats with nuclear deterrent from Putin

Ukraine gave up nuclear deterrent in exchange for security guarantees.

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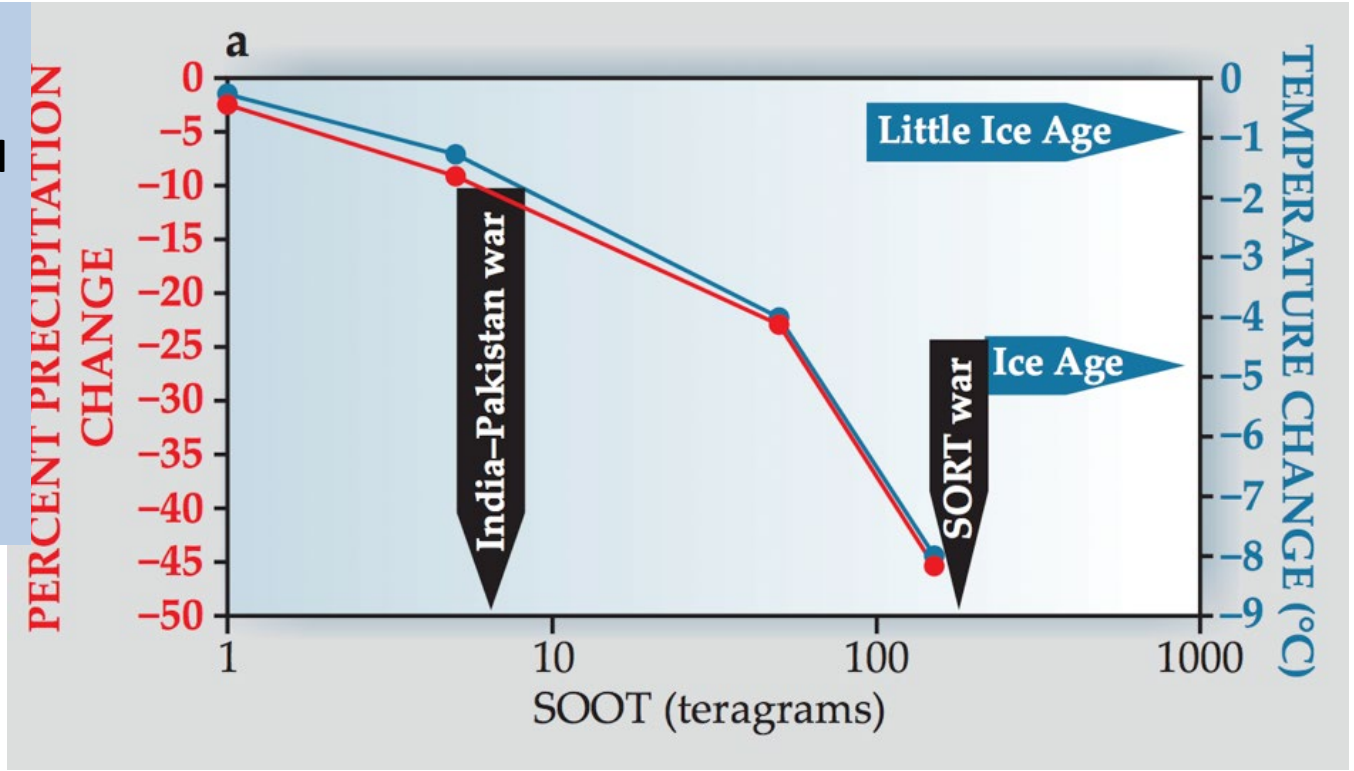
(III) Risk of "Limited scale" nuclear conflict:

Concerns include the situation in Ukraine, on the Korean Peninsula and the tensions between Pakistan and India. Possible future concerns include the middle east.

Temperature change from soot ejected into the atmosphere would lead to a temperature decrease:

"Nuclear Winter"



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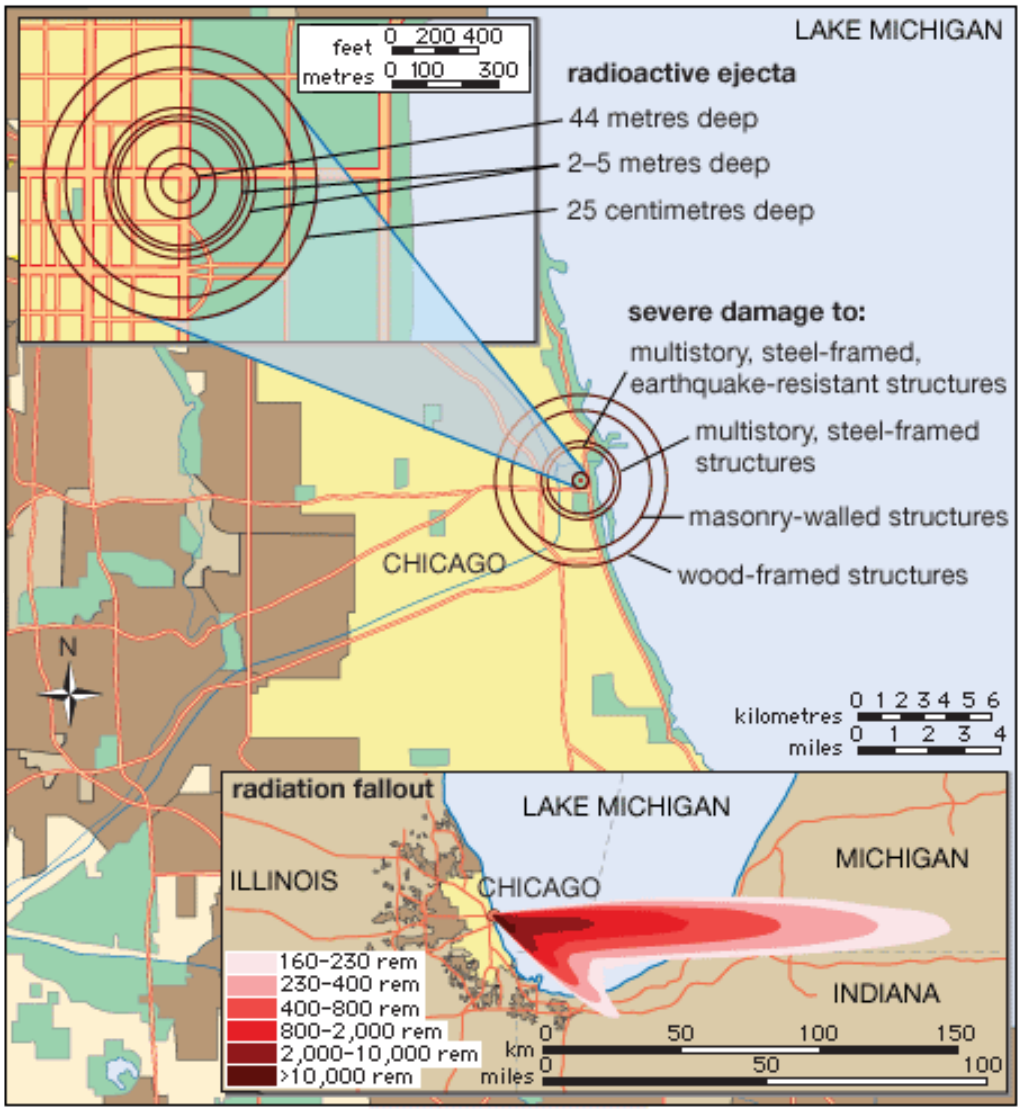
IV) Nuclear Terrorism

If terrorists could gain access to nuclear weapons they could target events such as the NATO summit that took place in Chicago in May of 2012 with all NATO heads of state present.



chicagotribune.com

Trial to begin of three charged with planning attacks at NATO summit

Mary Wisniewski

Reuters

7:31 AM CST, January 21, 2014

CHICAGO (Reuters) - Opening statements are due to begin on Tuesday in the trial of three men accused of plotting to attack high-profile targets, including President Barack Obama's re-election campaign headquarters, during the 2012 NATO summit in Chicago.

Brent Betterly, 25, Brian Church, 25, and Jared Chase, 29, are being prosecuted under an Illinois anti-terrorism law adopted after the September 11, 2001 al Qaeda attacks.

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V) The challenge to safeguard nuclear materials long-term:

U.S.

ELDERLY NUN SENTENCED TO NEARLY THREE YEARS FOR TENNESSEE NUCLEAR BREAK-IN

BY REUTERS AND BIZU.TV ON 2/19/14 AT 12:43 PM

In 2012 Sister Megan Rice, Michael Walli and Greg Boertje-Obed advanced through several fences reaching a storage facility for nuclear material at the Y-12 nuclear facility in Oakridge.

➔ If such incident can happen in the US: what are the standards for nuclear safeguards in other countries?

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VI) Challenge to sustain high quality nuclear forces under "hair trigger alert" long-term:

The New York Times http://nyti.ms/1iX3ZG8

POLITICS

Cheating Accusations Among Officers Overseeing Nuclear Arms

By HELENE COOPER JAN. 15, 2014

WASHINGTON — The Air Force said on Wednesday that 34 officers responsible for launching the nation's nuclear missiles had been suspended, and their security clearances revoked, for cheating on monthly proficiency tests that assess their knowledge of how to operate the warheads.

Defense experts say that the end of the Cold War and the elevation of counterterrorism in the American military has led to low morale among the men and women, known as missileers, who live and work within a hair trigger of the country's 450 nuclear missiles. The missileers have increasingly come to view their mission as a backwater, with little chance of advancement to the top ranks of the Air Force.

➔ What are the standards for military nuclear operations elsewhere?

Dual Use of Nuclear Energy: Civilian vs Military Uses

(1) Benefits of peaceful use of nuclear energy including applications in electricity production, medicine, agriculture, propulsion etc. should be available to all!

(2) At the same time want to prevent access to devastating nuclear weapons! (Materials, technology and manpower for weapons program can be re-directed from civilian nuclear efforts.)

Current solution emerged from President Eisenhower's initiative: "Atoms for Peace"

Civilian use of Nuclear Energy monitored by the International Atomic Energy Agency (IAEA) + treaty to stop proliferation of nuclear weapons!

Example: Meeting Increasing Energy Consumption will use mix of Fossil + Renewables + Nuclear Power

Environmental Science & Technology

Article

pubs.acs.org/est

2017

Burden of Disease from Rising Coal-Fired Power Plant Emissions in Southeast Asia

Shannon N. Koplitz,[*,†] Daniel J. Jacob,[‡] Melissa P. Sulprizio,[‡] Lauri Myllyvirta,[§] and Colleen Reid[∥]

[†]Department of Earth and Planetary Sciences, Harvard University, Cambridge, Massachusetts 02138 United States

[‡]John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts 02138 United States

[§]Greenpeace International, 1066 AZ Amsterdam, The Netherlands

[∥]Department of Geography, University of Colorado, Boulder, Colorado 80309 United States

Example: Meeting Increasing Energy Consumption will use mix of Fossil + Renewables + Nuclear Power

Environmental Science & Technology

Article

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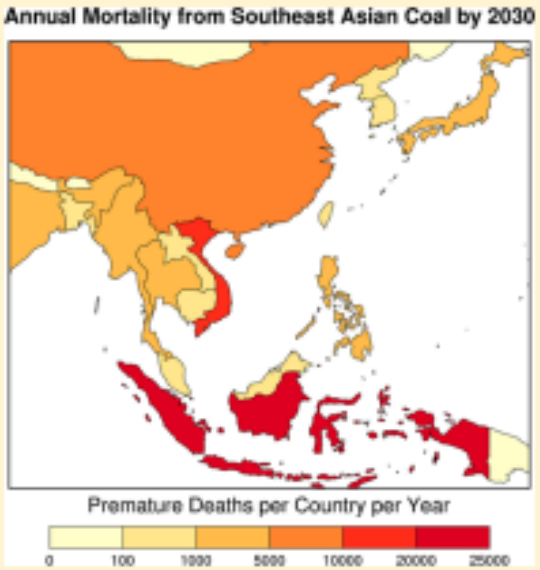
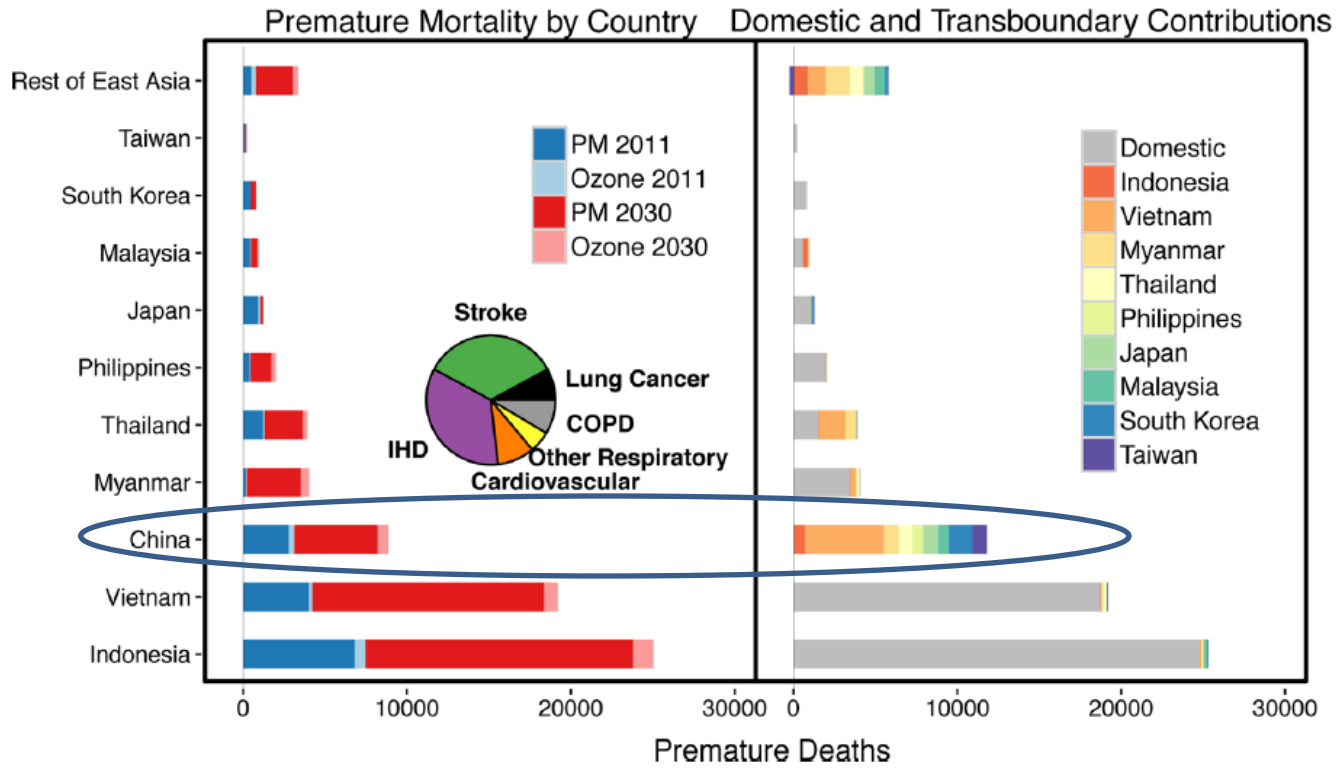
Burden of Disease from Rising Coal-Fired Power Plant Emissions in Southeast Asia

ABSTRACT: Southeast Asia has a very high population density and is on a fast track to economic development, with most of the growth in electricity demand currently projected to be met by coal. From a detailed analysis of coal-fired power plants presently planned or under construction in Southeast Asia, we project in a business-as-usual scenario that emissions from coal in the region will triple to 2.6 Tg a^{-1} SO_2 and 2.6 Tg a^{-1} NO_x by 2030, with the largest increases occurring in Indonesia and Vietnam. Simulations with the GEOS-Chem chemical transport model show large resulting increases in surface air pollution, up to 11 $\mu g\ m^{-3}$ for annual mean fine particulate matter ($PM_{2.5}$) in northern Vietnam and up to 15 ppb for seasonal maximum 1 h ozone in Indonesia. We estimate 19 880 (11 400−28 400) excess deaths per year from Southeast Asian coal emissions at present, increasing to 69 660 (40 080−126 710) by 2030. 9000 of these excess deaths in 2030 are in China. As Chinese emissions from coal decline in coming decades, transboundary pollution influence from rising coal emissions in Southeast Asia may become an increasing issue.



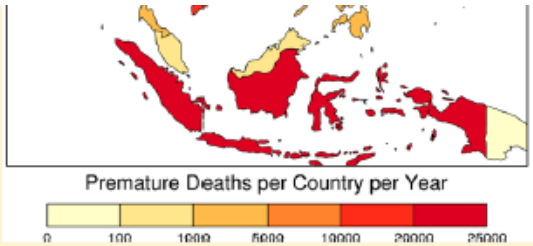
Example: Meeting Increasing Energy Consumption will use mix of Fossil + Renewables + Nuclear Power



ENVIRONMENTAL Science & Technology

Burden of Disease from Southeast Asia

ABSTRACT: Southeast Asia has economic development, with most be met by coal. From a detailed under construction in Southeast emissions from coal in the region with the largest increases occurrin Chem chemical transport model s 11 $\mu g\ m^{-3}$ for annual mean fine particulate matter ($PM_{2.5}$) in northern Vietnam and up to 15 ppb for seasonal maximum 1 h ozone in Indonesia. We estimate 19 880 (11 400–28 400) excess deaths per year from Southeast Asian coal emissions at present, increasing to 69 660 (40 080–126 710) by 2030. 9000 of these excess deaths in 2030 are in China. As Chinese emissions from coal decline in coming decades, transboundary pollution influence from rising coal emissions in Southeast Asia may become an increasing issue.



Each country will determine its own mix of fossil, renewables and nuclear power production.
Eg. past 5-year plan in China called for increase from 58 nuclear power plants to 88.
China intends to export nuclear reactor technology: **Dual use challenge of nuclear power is bound to stay!**

Example: Meeting Increasing Energy Consumption will use mix of Fossil + Renewables + Nuclear Power

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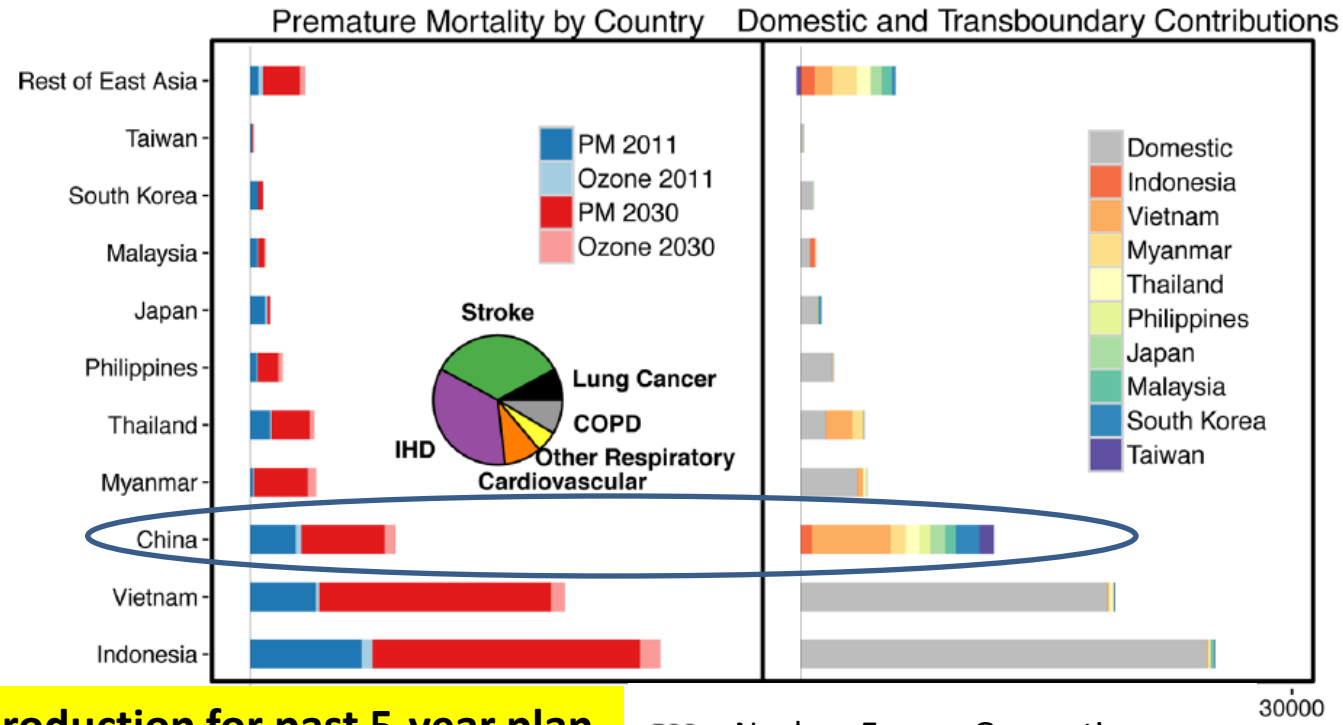
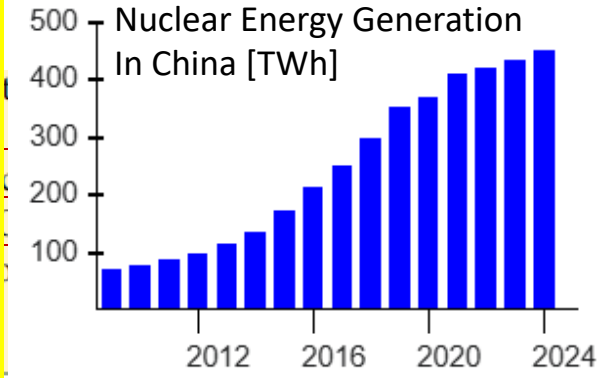
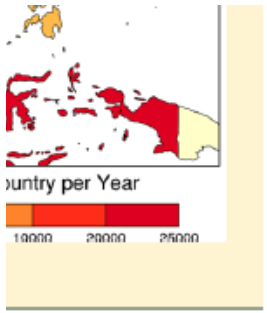


Chinese goals on electricity production for past 5-year plan

Coal - 1100 GW
Gas - 110 GW
Hydro - 340 GW
Wind – 210 GW
Solar – 110 GW
Nuclear – 58 GW (corresponding to 88 power plants)





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History of Physics 280

- First offered in Spring 1982
  - At the height of the nuclear arms race during the cold war
  - Motivated by concern about the growing threat of nuclear weapons and nuclear war
  - Professors Fred Lamb and Jeremiah Sullivan who developed and taught the course were active contributors to ACDIS at UIUC and arms control related work in the US
- Has been taught 41 times to 2000+ students
  - Integrated in ACDIS, many ACDIS students continue to take the class (ACDIS -> campus program for Arms Control and Domestic and International Security)
  - Has served as model for courses elsewhere

Physics 280 Topics

- Introduction
- Nuclear weapons
- Effects of nuclear explosions
- Terrorism and the possibility of Nuclear Terrorism
- Military systems for delivering nuclear weapons
- Arsenals of “nuclear weapon” states
- Defenses against nuclear attack
- Nuclear arms control
- Current events including Iran and North Korea
- Future directions

Interdisciplinary Subject:
280 Students from Diverse Set of Fields

The class subject is multidisciplinary and so are the backgrounds of the students and TAs in class.

Good opportunity to practice, how to learn from each other and how to communicate with experts
In different fields!

Physics	12
Economics	4
Computer Engineering	3
Computer Science (+X)	3
Psychology	2
Political Science	2
Mathematics	2
NPRE	2
16 other majors	1

Introduction of Physics 280 Staff

Dr. Matthias Grosse Perdekamp, Course Director
Physics

Dr. Matt Caplan, Instructor
Physics

Vesal Razavimaleki, TA
Physics

Arshiya Shah, TA
Political Science

Emre Kuscu, TA
Geography

Vijay Akash, TA
Physics

Ellie Kness, TA
Astrophysics and REEES

Jordi Salinas San Martin
Physics

Introduction of Physics 280 Staff

Dr. Matt Caplan, Instructor
Physics

Matt Caplan is a visiting associate professor at the University of Illinois and an associate professor at Illinois State University. He is a computational nuclear physicist studying high density matter in the interiors of neutron stars and white dwarfs, accretion flows around black holes, and nuclear weapons.

Beyond academia, Prof. Caplan is also a scriptwriter for Kurzgesagt and PBS Space Time, and he is the creator and host of the NPR podcast *Twelve Thousand Bombs* on nuclear weapons issues.

Introduction of Physics 280 Staff

Vesal Razavimaleki, TA
Physics

Vesal is a physics graduate student at the University of Illinois Urbana–Champaign, with a current focus on nuclear nonproliferation and security policy. Vesal has a BS in Engineering Physics from UC San Diego. He has worked on research projects ranging from balloon-borne telescopes to analyses of the impacts of US action on the Iranian nuclear program.

Arshiya Shah, TA
Political Science

Arshiya is a senior in Political Science with a concentration in International Relations and minors in Business and Legal Studies. She also holds certificates in Global Security and European Union Studies. Her research focuses on international security, with current work examining postcolonial border governance and transnational militancy (supported by the Jeremiah D. Sullivan Award for Undergraduate Research) and U.S. foreign policy crisis decision-making with Professor Don Casler in the Department of Political Science at UIUC. She has also conducted research on narco-terrorism and illicit financing networks at the Vivekananda International Foundation in New Delhi, India.

Introduction of Physics 280 Staff

Emre Kuscu, TA
Geography

Ömer Emre Kuşcu is a first-year PhD student in Geography, specializing in military geography and geopolitics. His research investigates the power of geographical knowledge and its capacity to shape spatial and political realities. Ömer holds an MA in Geography from Istanbul University, where he conducted research on military geography.

Vijay Akash, TA
Physics

Akash is a PhD student at the Anthony J. Leggett Institute for Condensed Matter Theory. He works principally in the field of quantum information theory as it relates to many body physics and gravity. I did my undergrad at the University of Edinburgh majoring in nuclear and particle physics and with a minor in economics.

Introduction of Physics 280 Staff

Ellie Kness, TA

Astrophysics and REEES

Ellie is a senior in Astrophysics and Russian, Eastern European, and Eurasian Studies. She works in nuclear physics research with Professor Perdekamp and previously worked at the United States Army War College researching the war in Ukraine.

Jordi Salinas San Martin

Physics

Jordi is a sixth-year PhD student in Physics. He received his M.Sc. from the National Autonomous University of Mexico where he studied the matter/antimatter imbalance in the universe and the magnetic fields generated in heavy-ion collisions. He is now working at UIUC with Professor Jacquelyn Noronha-Hostler on cutting edge simulations of the relativistic quark-gluon plasma generated in high-energy nuclear reactions

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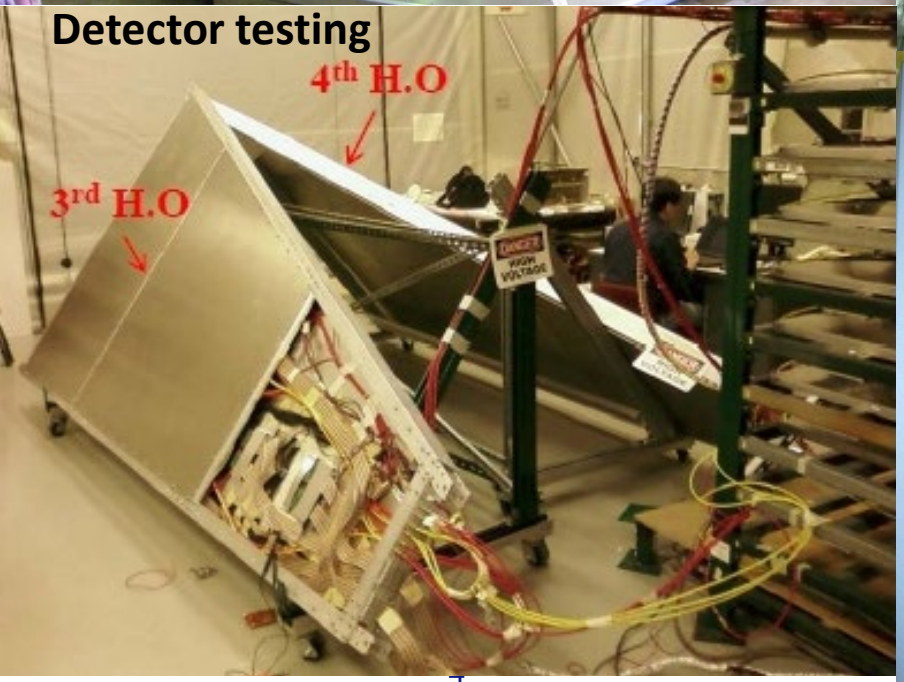
My Research: Nuclear Physics + Instrumentation

Physics:

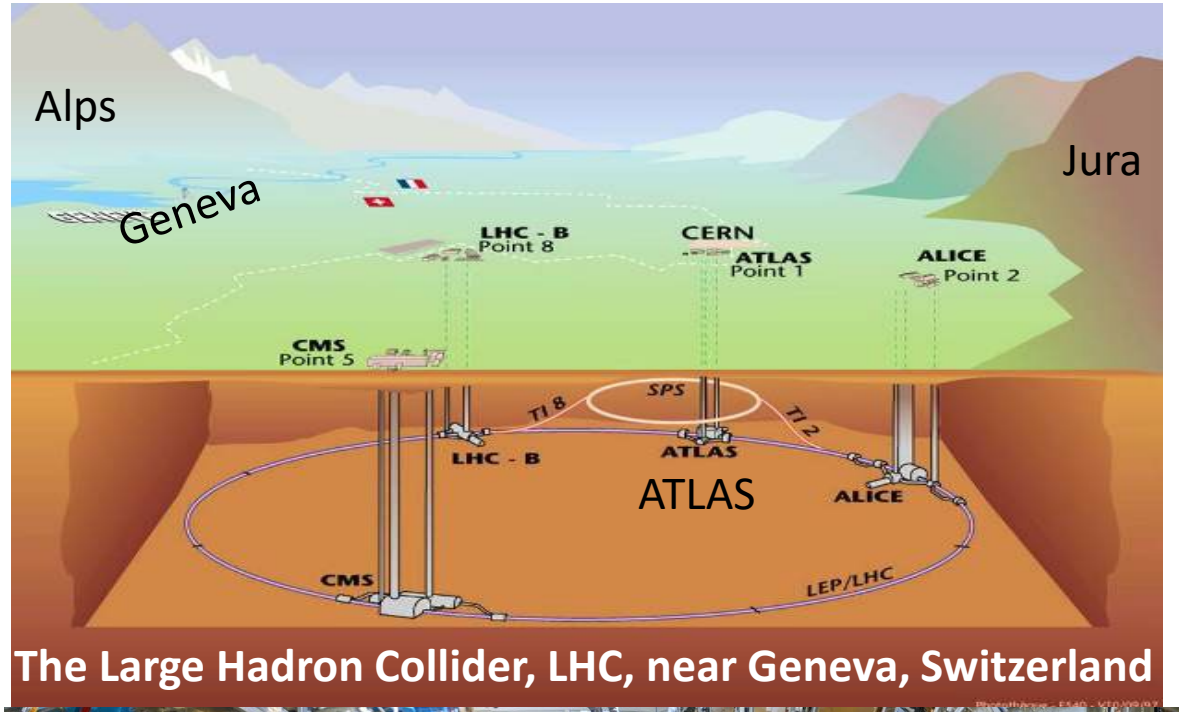
- **Precision tests for the weak and strong nuclear interactions**
- **Quark sub-structure of protons and neutrons**
- **Initial state of ions in collisions forming the Quark Gluon Plasma**

- **Instrumentation for experiments/applications using ionizing radiation :**
  - E1054 at Los Alamos National Laboratory, New Mexico
  - Muon g-2 at Brookhaven National Laboratory, Long Island
  - PHENIX at Brookhaven National Laboratory, Long Island
  - Detection of fissile materials with ionizing radiation, UIUC
  - Belle at KEK-B, Tsukuba, Japan
  - ATLAS and COMPASS at CERN, Geneva, Switzerland

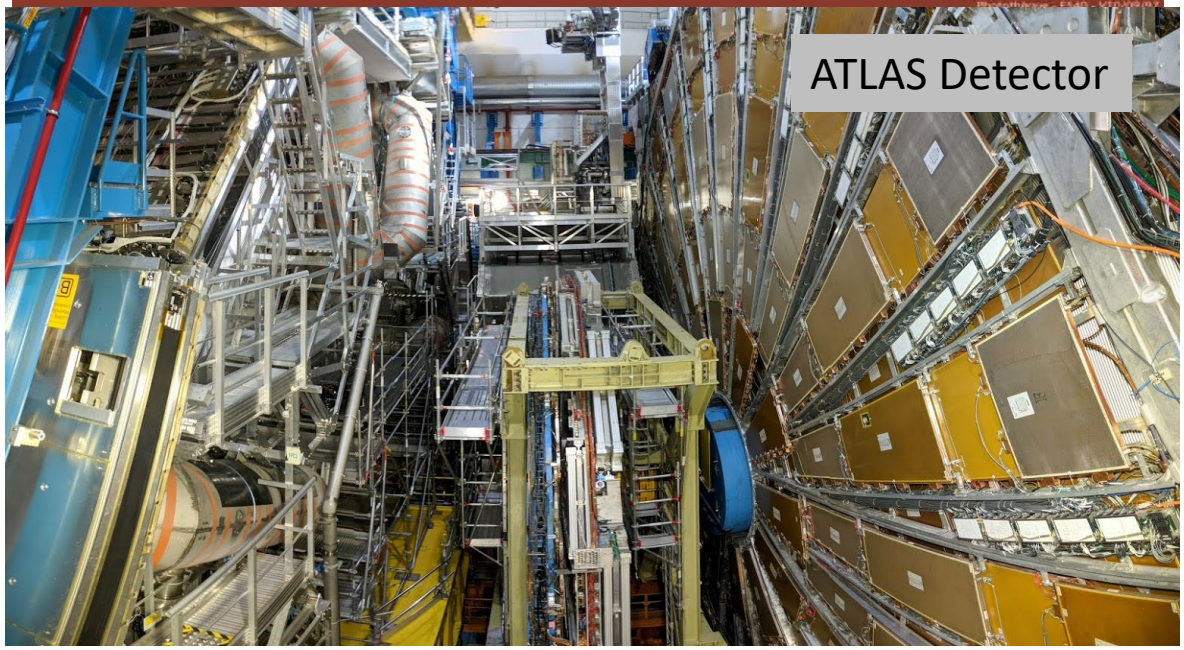
Instrumentation to Measure Quark and Anti-Quark Substructure of the Proton with the PHENIX Detectors



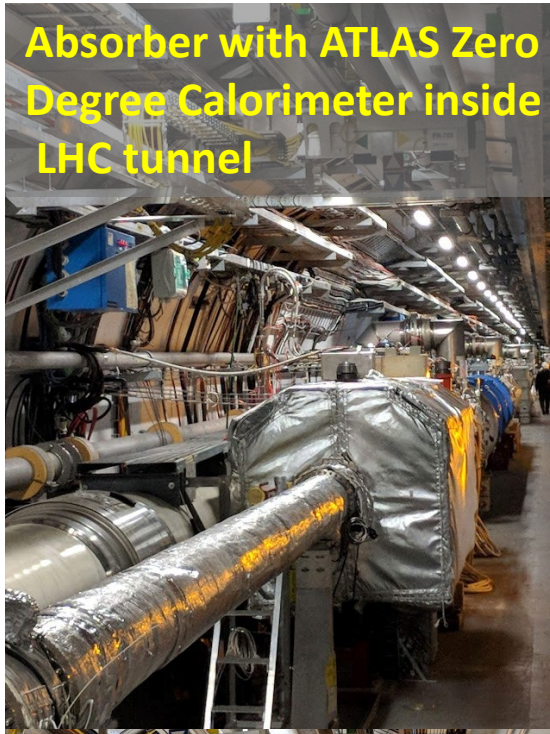
Instrumentation to Characterize Nuclear Pb-Pb Collisions at the LHC for the Study of the Quark Gluon Plasma



The Large Hadron Collider, LHC, near Geneva, Switzerland



ATLAS Detector



Absorber with ATLAS Zero Degree Calorimeter inside LHC tunnel

Michael Murray, Riccardo Longo and MGP at the ATLAS ZDC

The Physics 280 Web Site

The Physics 280 web site is the “Information Center” for this course
A first writing assignment, RE1 has been posted.

http://courses.physics.illinois.edu/phys280/sp2026/index.html

➔ ***instructions related to essay writing and submission will be followed very closely to emulate rules for technical writing.***

PHYS/GLBL 280 Subject ID for Email

If you send **e-mail: please start the subject line with**

26p280

This sorts 280 e-mail in my spring 2026
280 folder and will allow me to respond promptly.

280 Lectures, Writing Labs, Office Hours

- Lectures: Tuesdays and Thursdays, 2:00-3.20pm
  - —Lectures slides linked to schedule on course webpage
  - —Videos, demos, Q&A, discussions of readings and current events
- Writing Labs: Mondays, starting 1-26.
  - —Explanation of the writing assignments
  - —Instruction and guidance on how to write for the course
  - —Writing exercises, discussion of readings and current events, assessments
  - —Help in revising first versions of assignment
- Office Hours: Tue 3.30-4.30pm
  Wed 3 pm to 6 pm
  starting 1-27, next week.

280 – Required Reading

Required Textbooks

- *What Terrorists Want,* by Louise Richardson (paperback)

Required Online Readings

https://courses.physics.illinois.edu/phys280/sp2026/reading-assignments.html

For example,

- Selections from *The Day After Midnight: The Effects of Nuclear War*
- *Preventing Catastrophic Nuclear Terrorism*, by Charles Ferguson
- *The Gravest Danger*, by Sidney D. Drell and James E. Goodby

280 – Recommended Reading

Recommended texts:

(1) Alred, Gerald J., Oliu, Walter E., and Brusaw, Charles T. *The Handbook of Technical Writing*, 12th edition. New York: Bedford/St. Martin's, 2018.
e-book ISBN: 9781319107345
6-month e-book rental: $34.99 (or purchase: $50.99) direct from publisher:
https://www.macmillanlearning.com/college/us/product/Handbook-of-Technical-Writing/p/1319058523.

(2) Booth, Wayne C., Colomb, Gregory G., Williams, Joseph M., Bizup, Joseph, and FitzGerald, William T. *The Craft of Research*, 4th edition. Chicago: University of Chicago Press, 2016.
e-book ISBN: 9780226239873
available direct from publisher:
$18.00: https://www.press.uchicago.edu/ucp/books/book/chicago/C/bo23521678.html.

3) John A. Lynn II *Another Kind of War, The Nature and History of Terrorism,*
Yale University Press
ISBN 978-0-300-18881-3

Follow the News related to Nuclear Arms and Arms Control !

- Follow the news media with regards to topics related to the course (eg. North Korea, Iran Nuclear Deal etc.)
- *Bring questions and interesting articles to class to share!*
- *We will briefly present and discuss current news related to nuclear arms control.*

280 Writing Assignments - 1

280 is an Advanced Composition Course

- Previous credit for a Composition course is a prerequisite

280 has three types of Required Writings

- Required essays
- Research paper proposal
- Research paper
- Writing assignments will be due electronically by 10pm on Wednesdays. The first essay, required essay 1 (RE1), will be due next week on Wednesday, 1-28 at 10 pm. A paper copy will be due at the beginning of class on Thursdays.

The late deadline will be Friday at 4.00 pm electronically, (paper copy to be deposited in the yellow 280 homework box in the “interpass” between Loomis and MRL).

280 Writing Assignments - 2

- We strictly enforce the UI's rules on academic integrity
  - — All writing assignments are scanned using plagiarism detection software We use Turnitin including a library of all PHYS/GLBL 280 essays submitted in the past.
- Four Required Essays, RE1, RE2v1, RE2v2, …, RE4v2
  - — Essays 2-4 will be revised and re-submitted
  - — Peer review v1 essays of your co-students
  - — Both versions count equally
  - — There are penalties for late submissions

280 Writing Assignments -3

- *Research Paper Proposal (2 pages)*
  - —The topic will be chosen in consultation with your TA
  - — Your proposal must be approved in advance by your TA
  - —Your paper must address both technical and policy aspects of some issue (but the weights need not be 50–50)
  - — Your scores on the first and second versions count equally
- *Research Paper (7–10 pages)*
  - — Scores on the first and second versions count equally
- We will update writing prompts to integrate use of AI-tools in technical writing.
- *Optional Extra Credit Essay (about 1.5 pages)*
- *Writing Lab participation counts 6% of your writing grade*

Timeline for Physics/Global Studies 280

The Timeline is available on course webpage:

https://courses.physics.illinois.edu/phys280/sp2026/schedule.html

280 – Midterm + Final

- Mid-Term Exam: 2:00–3:20 p.m., (March 26th)
  - Location, Ceramics 218
  - Closed book
  - Tests factual knowledge and understanding
  - Includes essay question
- Final Exam: (time TBD)
  - Location TBD
  - Closed book
  - Tests factual knowledge and understanding
  - Includes essay question
  - The final exam will emphasize material presented after the mid-term exam

Lecture Questions

We will present lecture question

- to encourage and facilitate discussion and interaction
- to poll you about your experiences and opinions
- to monitor attendance

Grading of lecture questions (for extra credit)

- 50% for participation and 50% for correct answer

Question: iClicker, TopHat, show of hands + volunteers

280 – Grading Scheme

Writing Component – 70%

Required essays (7 essays)	34%
Research paper proposals and research papers	30%
Writing Lab participation	6%
Extra credit essay	2%

Exam Component – 30%

Midterm exam	12.5%
Final exam	17.5%
Lecture quizzes (extra credit)	5.0%

280 – Grade Boundaries

A+	95-100
A	90-94
A-	85-89
B+	80-84
B	75-79
B-	70-74
C+	65-69
C	60-64
C-	55-59
D	<55

The Beginning of The Atomic Age

Please Watch the 2015 PBS Documentary:

"The Bomb" (Documentary) Nuclear

Weapons – BBC 2017

(https://www.youtube.com/watch?v=Qrze43Uchm8)

(Can be also watched on PBS with WILL membership)

Next class will be Thursday 1-22 at 2pm in 218 Ceramics

Beginnings: PBS Documentary "The Atomic Bomb"

Discussion

Which issues related to nuclear weapons do you consider most important? Answers not limited to but may include:

o risk of accidental nuclear war between major nuclear powers
o threat from nuclear armed North Korea
o nuclear program in Iran
o US nuclear armament insufficient for effective deterrence
o proliferation to additional countries (eg. South Korea, Saudi Arabia)
o theft of nuclear materials by terrorist groups/nuclear terrorism
o need for modernization of nuclear armament
o cost of operating and modernizing nuclear arsenals
o environmental impact of nuclear arms production

280: Announcements

First Writing Lab Sessions: Monday, January-26th

First office hours: Tuesday and Wednesday

January-27th and 28th

280: Announcements

Electronic submission due Wednesday Jan 28 at 10pm; paper submission due Thursday Jan 29 at 2pm

RE1

For RE1 you will revise an essay using the scenario and guidelines described below. Your RE1 will be graded by your writing lab TA, who will use this rubric.

This essay has a number of problems, including factual errors, formatting errors, and issues with style.

Scenario

You are a writer for *Scientific American*, and your editor has assigned you to revise a brief report, written by a colleague, on the events related to the revocation of J. Robert Oppenheimer's security clearance in 1954. Your colleague's report has a number of issues making it unacceptable for publication in *Scientific American*. Your editor is looking for substantive revision of the report, **not just proofreading**. The report should be a summary of these events written for a general audience, not an editorial or discussion of whether or not the case was decided correctly in your opinion. News reporting should remain objective and focused on the facts of the case. The report should be based on the following sources:

1. "Letter on the Oppenheimer Affair," reference [1].

2. "The Oppenheimer Case," reference [2]. The article appeared in *Physics Today* 7(7) in 1954 (doi: 10.1063/1.3061714).

3. Material from the PBS Atomic Bomb documentary *The Bomb*, where applicable, reference [3].

280: Announcements

RE1

Guideline on Writing Process:

(1) Analyze the essay and compile a list of problems (factual, formatting, style)
(2) Instruct your AI-tool to carry out the identical analysis and to compile an AI generated list of problem.
(3) Based on your own and the AI list, produce a draft of the revision.
(4) Use your AI-tool to create a revision.
(5) Create the final version, based on your revision and using the comparison the AI-tool generated revision to improve.

Material to be submitted:

(1) The final revision
(2) An AI disclosure statement that describes how AI was used and states that all content and facts have been verified by the author.
(3) A writer's memo that will contain the following:
- both lists of problems: author and AI (including a log of the AI prompts)
- both revision drafts: author and AI (including lof of the AI prompts)
- answers to additional writer's memo questions

280: Announcements

RE1

Writer's memo (does not count against the length requirement for the essay):

- A paragraph that briefly answers the following questions:
  - What is your previous experience in technical writing? In non-technical writing?
  - What do you consider your strengths in writing? Which writing skills would you like to improve?

- Two lists of problems identified in the original essay: author and AI (include a log of all AI prompts)
  Two revision drafts: author and AI (including log of all AI prompts)

Short answers to the following questions:

- Are there factual errors the AI did not identify?
- Write a brief analysis of the differences between your author draft revision and the AI draft revision: overall structure, factual correctness, style, use of vocabulary (e.g. use of professional arms control terms). Is there a difference in voice? In which aspects to you prefer your own draft revision over the AI draft?
- Ask your AI tool to carry out the same analysis and include the response in the memo.

Grading: We will grade the final revision of the essay and the writer's log, including the AI prompts.

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President Lee Proposes Nuclear Arms Control Talks with North Korea

Proposal aligns with U.S. experts but risks legitimizing North's nuclear status

By Lee Ha-won

Published 2026.01.23. 00:50

THE CHOSUN Daily
(a longstanding conservative South Korean Newspaper)

President Lee Jaemyung enters the senior secretaries' meeting held at Cheong Wa Dae on the 22nd with Kang Hoon-sik, Chief of Staff. Behind the conference room door, Kim Hyun-ji, leftmost, head of the Office of the Private Secretary to the President, stands.

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Regarding North Korea's denuclearization, the president said, "In the first phase, we should pursue the most realistic suspension negotiations, followed by nuclear arms control negotiations." This marks a departure from the 'idealistic approach' of pursuing complete denuclearization, advocating instead for a realistic response. It is the first time since President Lee Jaemyung took office in June of last year that he has explicitly mentioned pursuing nuclear arms control negotiations, reigniting the possibility of a Trump-Kim meeting that collapsed last year. If Trump hints at arms control negotiations following the president's proposal, analysis suggests Kim Jong-un could enter negotiations with a significantly higher 'price tag' than during the Gyeongju APEC in October of last year.

The president's proposal particularly draws attention as it came shortly after the Washington Post argued in an editorial three days prior that arms control negotiations should be pursued instead of denuclearization. The newspaper stated, "Denuclearization of the Korean Peninsula is no longer a realistic option," and that negotiations limiting the number of nuclear warheads and missiles could instead serve as a practical risk management tool. Choi Kang, head of the Asan Institute for Policy Studies, said, "President Lee's proposal is identical to the arms control negotiation logic presented by the Washington Post," adding, "It reflects the perspective of Washington non-proliferation advocates, particularly former North Korea nuclear envoy Robert Gallucci, that freezing and reducing nuclear capabilities is better than doing nothing about North Korea's nuclear program." The Washington Post's editorial starkly illustrates perceptions prevalent in the White House and among U.S. diplomatic and security experts, suggesting the president's proposal could gain traction.

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Aligned with China's Dual Suspension and Dual-Track Approach President Lee's proposal for arms control negotiations aligns with the 'dual suspension and dual-track approach' (雙中斷·雙軌竝行) that China has long advocated as a solution to the North Korean nuclear issue. The dual suspension involves simultaneously halting North Korea's nuclear and missile development and suspending South Korea-U.S. joint military exercises, while the dual-track approach seeks to pursue denuclearization of the Korean Peninsula and transition to a U.S.-North Korea peace regime in parallel. Some diplomatic and security experts suggest that during President Lee's state visit to China from the 4th to the 7th, he might have discussed this issue with Chinese President Xi Jinping. Pursuing status quo or stabilization through nuclear arms control negotiations with North Korea is a point of shared interest among the leaders of South Korea, the U.S., and China —Lee Jaemyung, Trump, and Xi Jinping. Additionally, Kim Jong-un suffered the humiliation of the 'Hanoi no-deal' during the second U.S.-North Korea summit in 2019 due to a perceived lack of commitment to complete denuclearization, but this time, he may think differently as he bears no such burden. Above all, merely sitting at the arms control negotiation table with Trump allows Kim Jong-un to showcase North Korea's nuclear capabilities both domestically and internationally. Given that the arms control negotiations could lead to partial or full lifting of sanctions against North Korea, it can be considered a favorable game for Kim Jong-un.

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A photo of North Korean leader Kim Jong-un visiting a nuclear weapons factory on March 27, 2023. The newspaper suddenly discloses the appearance of mass production of a new nuclear warhead-like object believed to be named 'Hwasan-31'. /Rodong Sinmun-News1

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Potential Backlash from Recognizing North Korea as a Nuclear Power One expert stated, "Having witnessed the U.S. invasion of Venezuela and the deportation of President Maduro, Kim Jong-un may find it difficult to refuse dialogue again." There are concerns that if Kim Jong-un does not meet with Trump, he might fear 'retaliation' from him.

Skeptical views are also prevalent. Some analyses suggest that Trump's focus has shifted to other issues such as Venezuela and Greenland, making the resumption of a U.S.-North Korea summit unlikely. North Korea, which has already secured backing from China and Russia, might not respond to this proposal. Professor Kim Jae-cheon of Sogang University's Graduate School of International Studies questioned, "In a situation where it is unclear what North Korea can gain from arms control negotiations, it remains doubtful whether Kim Jong-un will agree."

President Lee's proposal for nuclear arms control negotiations could effectively 'pardon' North Korea's abandonment of the Geneva Agreements and the September 19 Joint Statement, potentially leading to a sequence that recognizes North Korea as a nuclear power. This carries significant risk if it fails. If arms control negotiations proceed, they would inevitably be assessed as a victory for Kim Jong-un's persistent strategy to pursue nuclear capabilities. Choi Kang, head of the Asan Institute for Policy Studies, pointed out, "If this scenario materializes, South Korea could lose its standing."

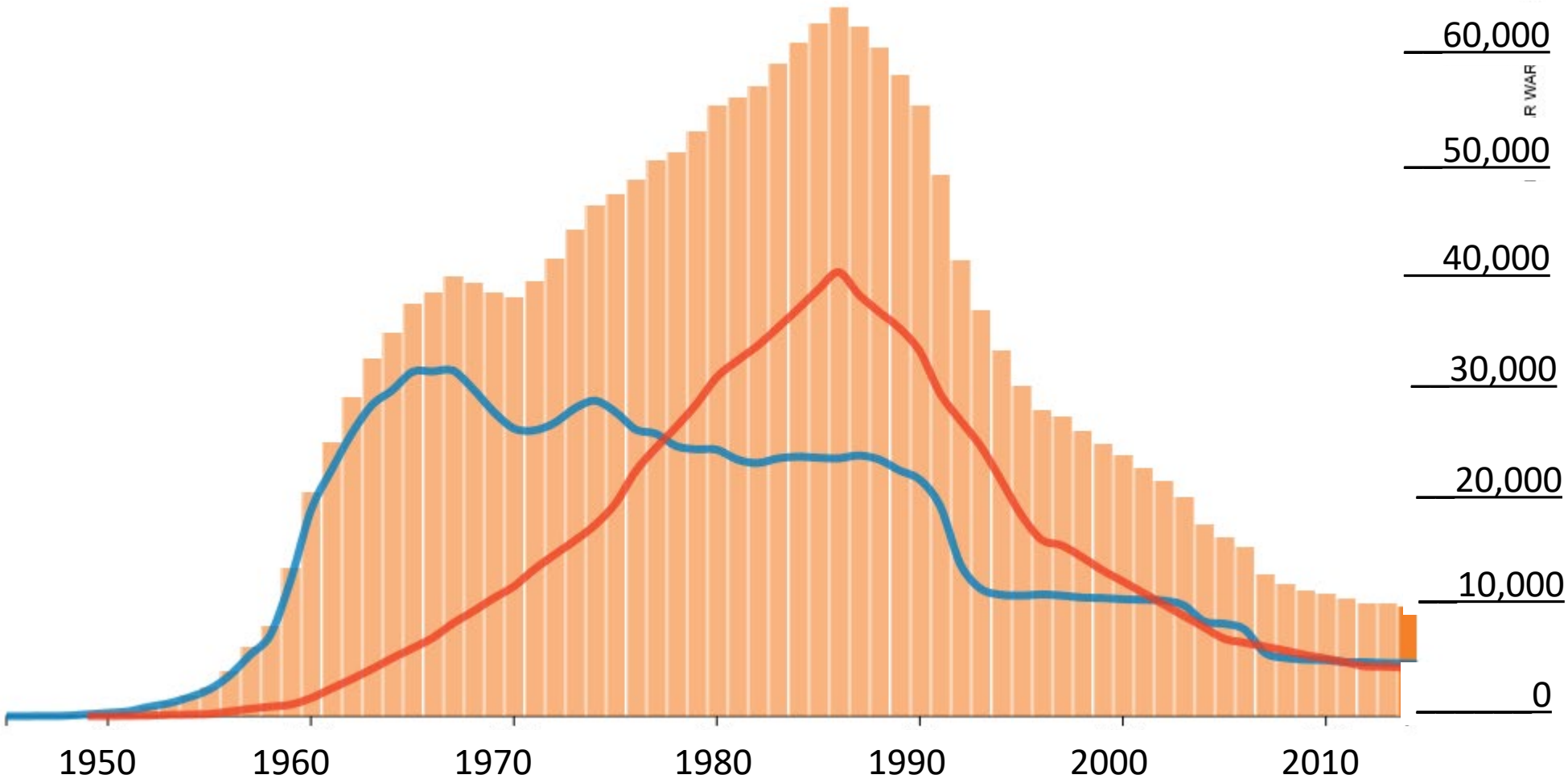
· This article has been translated by Upstage Solar AI.

Nuclear Powers: First Weapon Tests

The year each declared nuclear weapon state first tested a nuclear device:

United States:	1945
Soviet Union:	1949
United Kingdom:	1952
France:	1960
China:	1964
India:	1974 (1998)
Pakistan:	1998
North Korea:	2006

World Nuclear Weapon Stockpiles 1945–2014



Source: *The Bulletin of Atomic Scientists'* Nuclear Notebook, written by Hans M. Kristensen and Robert S. Norris, Federation of American Scientists
http://thebulleting.org/nuclear-notebook-nultimedia

The Beginning of The Atomic Age

Please Watch the 2015 PBS Documentary:

"The Bomb" (Documentary) Nuclear

Weapons – BBC 2017

(https://www.youtube.com/watch?v=Qrze43Uchm8)

(Can be also watched on PBS with WILL membership)

Next class will be Thursday 1-22 at 2pm in 218 Ceramics

End of Introduction to Physics 280

Writing Lab Assignments and Office Hours

Writing Laboratories – start Monday 1-26:

L11 10-10.50am	in CIF 4036	TBA
L12 11-11.50am	in CIF 4036	TBA
L13 12-12.50pm	in CIF 4036	TBA
L14 1-1.50pm	in CIF 4036	TBA
L15 2-2.50pm	in CIF 4036	TBA
L16 3-3:50pm	in CIF 4036	TBA

Mondays in Campus Instructional Facility

Office Hours – start Tuesday 1-27:

Tuesday (TBA)

3.30 pm TBA

Wednesday (TBA)

3 pm TBA

4 pm TBA

5 pm TBA