

## Asian Americans and STEM

Fall 2024 – AMST 099 / ER&M 089 / HIST 059 / PHYS 047

**Instructor:** Dr. Eun-Joo Ahn  
**Time:** Tuesdays and Thursdays; 9:00-10:15am; Humanities Quadrangle (HQ) C64  
**Office hours:** Tues 10:30-11:45am & Thurs 11:45am-1pm outside Beinecke Library  
(cold/rain location: Schwarzman Center)  
If these times do not work, email me to set up a time to meet in-person or via Zoom  
**Email:** [eun-joo.ahn@yale.edu](mailto:eun-joo.ahn@yale.edu)

(Syllabus updated on October 14, 2024)

### Course Description

As both objects of study and agents of discovery, Asian Americans have played an important yet often unseen role in the fields of Science, Technology, Engineering, Math (STEM), and Medicine in the United States. This course will bring together the humanities fields of Asian American history and American Studies with the STEM fields to explore: 1) the ways in which scientific practice has been shaped by U.S. histories of imperialism and colonialism, migration and racial exclusion, domestic and international labor and economics, and war; 2) the scientific research undertaken in these fields and delve into key scientific principles and concepts to understand the impact of such work on the lives of Asians and Asian Americans; 3) and how the migration of people may have impacted the migration of ideas and scientific progress. There will be guest lecturers to introduce students to the work of prominent Asian American scientists at Yale and other institutions on topics.

This course is designated as eligible for both humanities and science distributional credit. Per Yale College academic regulations, however, the course may only be applied to one of these two areas. For more on the distributional requirements and guidelines, please see [Yale College Programs of Study 2024-2025](#).

### Reading materials

Please procure the following book:

- Erika Lee, *The Making of Asian America: A History*, Simon & Schuster, 2015 (hardback) 2016 (paperback).

*note on the edition:* There is a recent edition published in 2021. I will be using the 2016 edition in class. You may purchase, rent, or borrow either version.

All other readings and course materials will either be available in the “Modules” and “files” section of the Canvas course site or electronically through Yale’s internet library resources. Please consult the class meetings schedule below to see the materials assigned for the week.

## Grading Structure

- Class participation (40%): includes attendance, in-class discussion and posting questions.
- Weekly homework (30%): 8 1-2 page writings or problem sets on assigned readings or scientific material.
- Research Project (30%): 8–10 pages paper due on 12/17.

## Course Requirements

### Class Participation

A successful seminar is a vibrant and warm intellectual community built through the enthusiastic participation of each student. Please be respectful of each other's comments and questions. We will consider each class meeting an invaluable opportunity to learn from one another and engage with important historic and scientific questions.

### Weekly Questions

On Canvas, there is a section titled Weekly Questions. By **Wednesday 6pm** (or by stated date and time) on relevant weeks, please post a question or topic in fully formed sentences you would like to discuss in Thursday's class. Posting questions is part of class participation.

### Reading

Unless expressly stated and listed under Thursday, please do the weekly reading **before Tuesday's** class. This will facilitate our discussions and make the most of our time. Scientific articles are bulleted with "◇": try to grasp the big picture of the scientific method rather than trying to understand the scientific details line by line.

### Weekly homework

For some weeks, you will be asked to complete a 1-2 page assignment such as a prompted reading response or a science problem set focusing on key scientific concepts explored. The course aims to have a balance of 50% readings-based and 50% science-based questions and will often have writing prompts that combine both readings and science-based questions into a single assignment. The weekly homework will be submitted via "Homework" on Canvas by **midnight on the Friday** that the assignment is due. Homework is graded using a 10-point scale.

### Final Research Project

You will research an Asian American scientist whose life history illustrates any of the themes in late 19th to 20th century Asian American history that we will study in this course. "Science" here is broadly construed and stands for STEM and medicine. Your final paper will situate their life and work in historical context and explain the ways in which their life and career offer a way to understand any of the central themes in Asian American history explored in this course, such as: Asian exclusion, immigration, migration, colonialism, imperialism, citizenship, labor, war, and more. Your paper

should also walk us through their scientific work and its importance to their particular field. You are required to meet with the course instructor to discuss your paper topic and receive approval prior to submitting your research proposal. There will be three short assignments culminating in the final research paper:

Monday 10/7	Research Proposal (1-2 pages)
10/29, 10/31	In-class Mid-Project Presentation
Friday 11/15	Primary Source analysis – historical and/or scientific discussion (2-3 pages)
Tuesday 12/17	Final paper due (8-10 pages)

- **Research Proposal** (1-2 pages, due Monday 10/7 midnight):

Please submit your proposal providing a brief biography of the scientist you have chosen and the historical question you plan to address. Please also provide a brief description of your subject's scientific or technical work. In addition, attach a list of potential primary and secondary sources you plan to consult for your project. The list of sources will most likely change as you carry out your research and your question may change. This is part of the research process and they are fine. However, please consult with me if your question and/or list changes significantly.

- **In-class Mid-Project Presentation** (6-minute, 10/29, 10/31):

You will give a short presentation to your classmates on the status of your work. Please prepare 1-3 pages of slides that contain the person you are researching on, the historical question, a tentative thesis, sources you have consulted and are planning to, issues or problems you ran into and navigated. You will also give feedback to your classmates' presentations (more detail to come).

- **Primary Source analysis** (2-3 pages, due Friday 11/15 midnight):

Select a key primary source – historic or scientific – that will be central to your paper. Provide an analysis of the source by placing it in its historical context and discussing its importance for understanding the scientists' life and/or work. If choosing a scientific source such as a journal article, please provide a walkthrough and explanation of the key concepts and its importance to the field at that time. Whether it be historical or scientific, you will be engaging your key primary source with your secondary source(s).

- **Final paper** (due Tuesday 12/17 midnight):

8-10 pages excluding bibliography, doubled spaced, 1-inch margin, in pdf. More details to come.

## Guest lecturers

We will have faculty from Yale and other institutions visit our class to enrich our learning. They are volunteering their time to share their expertise so please be respectful. Attendance is mandatory for guest lectures. Please be on time.

## Feedback

As an interdisciplinary class, I welcome feedback on all aspects of the course, including readings, assignments, and guest lecturers. Besides the official course evaluation carried out by the college towards the end of the semester, please feel free to talk to me after class, during office hours, or via email. You can also leave comments anonymously through the feedback section on Canvas.

## Class Meeting Schedule

### Week 0

Thursday 8/29 Introduction

**Assignment 1:** "Help us get to know you". Due **Saturday 8/31 midnight**.

### Week 1

Readings:

- Bowler and Morus, *Making Modern Science* (2005 edition), chapter 1.
- *The Making of Asian America*, Introduction, skim chapter 2 (chapter 1 is optional).

Tuesday 9/3 History of Science and Perception of Asian Americans

Thursday 9/5 Scientific Method

We will analyze two articles for the *methods*:

- ◇ Joseph R. Fauver et al., "Coast-to-Coast Spread of SARS-CoV-2 during the Early Epidemic in the United States", *Cell* 181 (2020) 990–996.
- ◇ C. S. Wu, E. Ambler, R. W. Hayward, D. D. Hoppes, and R. P. Hudson, "Experimental Test of Parity Conservation in Beta Decay" *Phys. Rev.* 105 (1957) 1413.

**Assignment 2:** History of Science and Asian Americans. Due Friday 9/6 midnight.

### Week 2 Immigration and Citizenship

Reading:

- Paul Spickard, *Almost All Aliens*, (New York: Routledge, 2007), chapter 1.
- *The Making of Asian America*, chapters 3, 4, 5.
- optional: Natalia Molina, *Fit to be Citizens: Public Health and Race in Los Angeles, 1879–1939* (Berkeley: University of California Press, 2002), chapter 1.
- optional: Juliet Nebolon, ““Life Given Straight from the Heart”: Settler Militarism, Biopolitics, and Public Health in Hawai’i during World War II”, *American Quarterly*, 69 (1): 23–45.
- between this week and Dec 3rd: *The Making of Asian America*, chapters 6, 7, 8, 9.

Tuesday 9/10 Laborers and immigration

primary source analysis:

- “Chinese Labor”, *San Francisco Chronicle*, Feb 17, 1876.
- “Contractor Derby”, *San Francisco Chronicle*, Jun 13, 1876.

**Post questions by Wednesday 6pm**

Thursday 9/12 Immigration Acts and eugenics

primary source analysis: Johnson-Reed Act 1924

**Week 3 Incarceration and Biology**

Readings:

- *The Making of Asian America*, chapters 10, 11.
- “Terminology” from <https://densho.org/terminology/>
- Jonathan van Harmelen, “The Scientists and the Shrub: Manzanar’s Guayule Project and Incarcerated Japanese American Scientists,” *Southern California Quarterly*, 1 February 2021; 103 (1): 61–98.
- D. T. MacDougal, “Can We Grow Our Own Rubber?” *Scientific American*, Vol. 139, No. 1 (JULY 1928), pp. 16-19
- ◇ M. S. Nishimura, Robert Emerson, T. Hata, and Akira Kageyama. “The Propagation of Guayule from Cuttings,” *American Journal of Botany* 31, no. 7 (1944): 412-18.
- ◇ James Bonner, “Effects of Temperature on Rubber Accumulation by the Guayule Plant,” *Botanical Gazette*, Vol. 105, No. 2 (Dec., 1943): 233–243.

Tuesday 9/17 Japanese American incarceration during World War II

Thursday 9/19 Guayule research during war time

analysis of articles by Nishimura et. al and Bonner.

**Assignment 3:** Incarceration and biology. Due **Friday 9/20 midnight**.

## **Week 4 Race in Mathematics and Computer Science**

Readings:

- Mary Ting Yi Lui and Theodore Kim, “Global Routes and Hidden Labor in the American Mathematical Society’s Cold War Chinese Mathematics Translation Program”, *Historical Studies in the Natural Sciences* vol 1 June 2024; 54 (3): 291–334.
- Theodore Kim, “The Racist Legacy of Computer-Generated Humans”, *Scientific American*, August 18, 2020.  
<https://www.scientificamerican.com/article/the-racist-legacy-of-computer-generated-humans/>
- Theodore Kim, “Racism in our curriculums isn’t limited to history. It’s in math, too”, *Washington Post*, December 8, 2021. <https://www.washingtonpost.com/outlook/2021/12/08/racism-our-curriculums-isnt-limited-history-its-math-too/>
- optional: *Your Computer is On Fire*, edited by Thomas Mullaney et al., (Cambridge: MIT Press, 2021) Introduction and chapter 16.

Tuesday 9/24 Mathematics and race

Guest lecturer: Professor Mary Lui

Thursday 9/26 Race and Computer graphics

Guest lecturer: Professor Theodore Kim

**Post Questions by Friday (9/27) midnight**

## **Week 5 Race and Gender**

Reading:

- Bowler and Morus, *Making Modern Science*, chapter 21.
- “Wu Chien-Shiung”, by Zuoyue Wang, *New Dictionary of Scientific Biography*, 363–368.
- “Text of Columbia Report on Physics Experiments” *New York Times*, January 16, 1957.  
*[note: this article is the full-page NYT]*
- optional: “Basic Concept in Physics is Reported Upset in Tests” *New York Times*, January 16, 1957.
- article on Emmy Noether  
<https://www.sciencenews.org/article/emmy-noether-theorem-legacy-physics-math>

Tuesday 10/1

Discussion of last week's guest lectures; basics on the Standard Model of Particle Physics

Thursday 10/3 Race and gender in science

**Assignment 4:** Basic physics and Emmy Noether.  
writing part due **Friday 10/4 midnight**;  
problem-solving due **Tuesday 10/8 in-class**.

## **Week 6 The State and the Cold War**

**Research Proposal due 10/7 midnight**

Tuesday 10/8 the case of Qian Xuesen

Reading:

- *The Making of Asian America*, chapters 12.
- optional: Zuoyue Wang, "Transnational Science during the Cold War: The Case of Chinese/American Scientists," *Isis* 101, no. 2 (2010): 367–77
- Iris Chang, *Thread of the Silkworm*, (Basic Books, 1995), chapters 15–23.
- optional: Book review of *Thread of the Silkworm* by Zuoyue Wang, *Isis*, vol. 91, no. 3, 2000, 628–629.

Thursday 10/10 State and Immigration, Immigration Act of 1965

Reading:

- Madeline Y. Hsu, *The Good Immigrants: How the Yellow Peril Became the Model Minority* (Princeton: Princeton University Press, 2015), chapter 1.
- Gabriel J. Chin, "The Civil Rights Revolution Comes to Immigration Law: A New Look at the Immigration and Nationality Act of 1965," *North Carolina Law Review*, November 1996.
- David S. FitzGerald and David Cook-Martín, "The Geopolitical Origins of the U.S. Immigration Act of 1965," *Migration Policy Institution*, (February 2015)  
<https://www.migrationpolicy.org/article/geopolitical-origins-us-immigration-act-1965>

**Assignment 5:** On Qian Zuesen's plight. Due **Friday 10/11 midnight**.

## **Week 7 Big Science in Physics and Astronomy**

Reading:

- David Helfand, "Bang: The Supernova of 1987," *Physics Today*, **40**, 8, 24 (1987)
- AIP NBI oral history: interview on Masatoshi Koshiya: read pdf copy pp.124-136 related to the detection of neutrinos from Supernova 1987A (optional to read all) <https://www.aip.org/history-programs/niels-bohr-library/oral-histories/24870>
- ◇ K. Hirata et al., "Observation of a Neutrino Burst from the Supernova SN1987A," *Physical Review Letters*, 58, 1490 (1987). (Kamiokande collaboration)
- ◇ R. M. Bionta et al., "Observation of a neutrino burst in coincidence with supernova 1987A in the Large Magellanic Cloud," *Physical Review Letters*, 58, 1494 (1987). (IMB collaboration)

Tuesday 10/15

Phenomena of supernova and neutrino detection, international collaboration

*Fall Recess*

## **Week 8 Big Science in Physics and Astronomy**

Reading:

- Arthur Roberts, "Take away your billion dollars," printed in *Physics Today* **1** (November, 1948).
- (optional) Alvin Weinberg, "Impact of Large-Scale Science on the United States," *Science*, **134** (July 21, 1961) 161–164.
- Leandra Swanner, "Instruments of Science or Conquest? Neocolonialism and Modern American Astronomy," *Historical Studies in the Natural Sciences* 47 (2017): 293–319.
- "Path forward for Thirty Meter Telescope and Mauna Kea begins to emerge" (2023) <https://www.astronomy.com/science/path-forward-for-thirty-meter-telescope-and-mauna-kea-begins-to-emerge/>
- "Two Giant U.S. Telescopes Are Threatened by Federal Funding Cap" (2024) <https://www.scientificamerican.com/article/two-giant-u-s-telescopes-are-threatened-by-federal-funding-cap/>

Tuesday 10/22 Transnational science, collaboration, neo-colonialism

Big science, basic survey of astronomy: historical and scientific; (neo)-colonialism in astronomy

**Post questions by Wednesday 10/23 6pm**

Thursday 10/24 Transnational science, collaboration, neo-colonialism con't

discussion



**Assignment 6:** Basic astronomy problem set (based on Weeks 7 and 8);  
Due **Tuesday 10/29 in-class.**

## **Week 9 Student mid-project presentation**

Tuesday 10/29 and Thursday 10/31

6-minute presentation per student, written feedback

## **Week 10 Racial Exclusion in Science and Medicine**

Tuesday 11/5 China Initiative and racial discrimination in federal funding

Guest Lecturer: Professor Sandy Chang

Reading:

- Mara Hvistendahl, "Exclusive: Major U.S. Cancer Center Ousts 'Asian' researchers after NIH flags their Foreign Ties," *Science*, April 19, 2019.
- ◇ Wu, X., Zhao, H., Suk, R. et al. "Genetic susceptibility to tobacco-related cancer." *Oncogene* 23, 6500–6523 (2004).

## **Post questions by Wednesday 11/6 6pm**

Thursday 11/7 Racial exclusion

Reading:

- Uzma Quraishi, 'Racial Calculations: Indian and Pakistani Immigrants in Houston, 1960-1980', *Journal of American Ethnic History* 2019, 38.

**Assignment 7:** Medicine. Due **Sunday 11/10 midnight.**

## **Week 11 Racism and Healthcare Workers**

Reading:

- David H. Yang et al., "Experiences with Racism Among Asian American Medical Students" *JAMA Network Open*, 2023; 6 (9).
- Lindy Zhang et al., "Characterizing Asian American medical students' experiences with microaggression and the impact on their well-being" *Medical Education Online*, 9:1, 2299534.
- Peter Sang Uk Park et al., "Representation of Asian American Populations in Medical School Curricula" *JAMA Network Open*, 2022; 5 (9).

Tuesday 11/12 Racism and Healthcare Workers

Guest Lecturer: Professor David Yang

**Post questions by Wednesday 6pm**

Thursday 11/14 STEM and Medicine pipeline

Reading:

- "Southeast Asians are underrepresented in STEM. The label 'Asian' boxes them out more"  
<https://www.npr.org/2021/12/12/1054933519/southeast-asian-representation-science>

**Primary Source Analysis due Friday 11/15 midnight.**

## **Week 12 Nursing and Race**

Reading:

- Christine Peralta, "Nursing the Nation: The Intellectual Labour of Early Migrant Nurses in the US, 1935–1965" (289–306), chapter from *Global Migration, Gender, and Health Professional Credentials: Transnational Value Transfers and Losses* (edited by Margaret Walton-Roberts) (Toronto: University of Toronto Press, 2022).
- Catherine Choy, *Empire of Care: Nursing and Migration in Filipino American History* (Durham: Duke University Press, 2003), chapter 1.

Thursday 11/19

research on your own

Tuesday 11/21 Nursing and Race

Guest lecturer: Professor Christine Peralta

**Assignment 8:** Nursing, gender and race. Due **Friday 11/22 midnight.**

## **Week 13 Inclusion, Exclusion, and Personal Toll**

Tuesday 12/3 Espionage charges and personal toll

Reading:

- Risen and Gerth, "Breach at Los Alamos", *New York Times* (1999). (pdf includes "From the Editors", *New York Times* (2000)).

- Hvistendahl, "Not Guilty as Charged", *Science* (2015).
- Yang & Du, "Dr. Xiaoxing Xi on false science espionage accusations, advocacy, and Oppenheimer," *MIT Science Policy Review* (2024).

Thursday 12/5      Concluding discussions on Asian Americans and STEM and Medicine

Reading:

- *Making of Asian America*, chapter 17 and Epilogue
- Alsop, "New American Success Story", *Los Angeles Times* (1971).
- McGrath et al., "Confucian Work Ethic: Asian-born students head for the head of the class", *TIME* (1983).
- Hwang, "The New White Flight", *Wall Street Journal* (2005)

**Weeks 14, 15**

Final Assignment due **5pm, December 17.**