SCIENCE WRITING
2023 SES WRITING SEMINAR

Instructor: Claudia Geib

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Location: Starr Room 115

Description & Goals

Three decades ago, Carl Sagan wrote, "We live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology." This sentence still rings true today. There are many factors you could blame: the education system, U.S. politics, social media, misinformation, the TV news cycle, or increasingly siloed scientific fields. In reality, all of these factors play a role. Here's another to add to the list: scientists are trained to explain their work to other scientists, but not to the public at large.

Simultaneously, most members of the public do not have the training to read and understand scientific research. Yet that does not mean the public lacks an *interest* in science. According to Pew Research polls, the majority of Americans are interested in learning about science, health, and technology. If scientists want to help this interested public look past misinformation, trust in research, and vote for science-based solutions, there's one major thing they can do: learn how to communicate their science clearly and concisely, without the specialized jargon often found in scientists' writing.

That's what you're here to learn. No matter what path you choose to follow professionally, you will leave the course with the skills to construct simple and compelling stories from complex scientific ideas, and to convey accuracy without sacrificing clarity.

About the Instructor

[Claudia Geib](#) (she/her) is a freelance science journalist based here on Cape Cod. Her work primarily focuses on the environment, marine science, and wildlife, though she has reported on topics ranging from astrophysics to meteorology to health. She is the producer of [Gastropod](#), a podcast that looks at science and history through food. She also works as a researcher, producer, and script writer on science films, as well as an occasional fact-checker. She holds a master's degree in science writing from MIT and is the author of the book *Secrets of the Elephants* from National Geographic as well as a forthcoming book on ocean exploration and technology from Johns Hopkins University Press.

Reading Assignments:

Your four reading assignments are not graded or checked; rather, they will provide material for thoughtful discussion in class. Additionally, reading others' writing is one of the best ways to learn style, structure, and form, and to gain ideas for your own work. The more you read, the better you will write.

For each assignment, there will be 3-4 options of published stories that fit the discussion topic. Please read at least one; if you wish, read them all! See pg 5 for a detailed breakdown of each assignment, which can also be found in the Assignments tab on Canvas.

Writing Assignments:

You will complete three writing assignments of progressively longer lengths, from 400 to 800 to 1500+ words. All writing assignments should be submitted via UChicago Canvas (in the form of a Word document) by the time class begins on the due date. **Please do not submit assignments by email.** Revisions will be returned electronically via Canvas. See pg 6 for a detailed breakdown of each assignment, which can also be found in the Assignments tab on Canvas.

For all writing submissions, **please** title your document with your first name, last initial, and the assignment number as "-a#." (So if your name is Jane Doe, your title for the first assignment would be "JaneD-a1.doc). This might sound like a nitpicky request, but really helps me keep track of everyone's work!

Grades:

Writing Assignments: You will receive an initial grade (out of 100) for the unedited version of your assignments. If you complete the revisions and send them back to me, your final grade will be based on the revised version. These assignments make up the bulk (85%) of your grade in this class.

Participation: In order to facilitate discussion in class, participation makes up 15% of your grade in this seminar. The best way to ensure a good participation grade is to complete your reading assignments before class and take notes on questions, thoughts, and concerns about the topics that we are discussing.

Note: You do not need to ask dozens of questions per class in order to earn a good participation grade; however, I will be taking note of who is engaged and appears to be thinking critically about the material, and how that translates to your participation in class.

Need Help?

Please don't hesitate to contact me if you have questions or if you'd like to arrange an appointment, which can be held either in-person or virtually via video call.

Seminar Schedule

Friday, September 8 (1:30 – 3 p.m.) – Science Writing Basics

- Topics vs. Stories
- How to read (and translate) a scientific paper
- Story structure
- Introduction to interviewing
- In-class work: How to find a science paper, for writing assignment #2

Friday, September 15 (1:30 – 3 p.m.) – Class with MBL Seminar speaker: Osvaldo Sala

- Developing interview skills
- **Seminar Activity #1 due on Canvas by midnight Sunday, Sep 17**

Friday, September 22 (1:30 – 3 p.m.) – The Art & Science of Storytelling

- **Writing assignment #1 due**
- **Please complete reading assignment #1 ahead of class.**

- How to find a story
- Gathering descriptions, from the field or from afar
- Discussion of writing assignment #2 - topic selection

Friday, September 29 (1:30 – 3 p.m.) – Interviewing / Feature Writing

- **Please complete reading assignment #2 ahead of class.**
- Finding & contacting sources
- Interview basics & ethics
- In-class practice

Friday, October 6 (1:30 –3 p.m.) – Institutional Science Writing

- **Please complete reading assignment #3 ahead of class.**
- Guest speakers: Diana Kenney - MBL Press Office

Friday, October 13 - NO CLASS

Friday, October 20 (1:30 –3 p.m.) – Guest speaker - Kendra Pierre-Louis

- Discussion of final projects
- **First draft of writing assignment #2 due**
- 2-3pm: Guest speaker Kendra Pierre-Louis - climate reporting & working across different mediums in science writing

Friday, October 27 (1:30 –3 p.m.) - Class with MBL Seminar Speaker: Susan Natali

- Applying interviewing skills
- **Seminar Activity #2 due on Canvas by midnight Sunday, Oct 29**

Friday, November 3 (1:30 – 3 p.m.) – MBL Community Panel: Covering Local Environmental Stories

- Guest speakers: Heather Goldstone and Eve Zuckoff

Friday, November 10 (1:30 – 3 p.m.) - Ethical Reporting

- **Please complete reading assignment #4 ahead of class.**

Wednesday, November 15 (1:30 – 3 p.m.) **-** Final seminar! Making a career, hobby, or art of science writing

- How do I freelance? Finding stories, pitching articles, and staying sane
- Jobs in science writing
- Blogging, essaying, book writing and more
- **First draft of writing assignment #3 is due by midnight!**

Friday, November 17 (1:30 – 3 p.m.) - Class with MBL Seminar Speaker: Linta Reji

- **Seminar Activity #3 due on Canvas by midnight Sunday, November 19**
- **Reminder:** Final draft of writing assignment #3 is due by the end of term. (December 18)

Reading Assignment #1: The Art & Science of Storytelling

Please read the following from The Craft of Science Writing:

- Finding the Science in Any Story (pg 75)
- Like Being There: How Science Writers Use Sensory Detail (pg 198)

- How to Read A Scientific Paper (pg 232)

The following science reporting options cover news updates using narrative, unique structure, and/or a strong voice. Please read at least one of the following published works before class **on Sept. 22.**

"[When an Eel Climbs a Ramp to Eat Squid From a Clamp, That's a Moray](#)" (PDF on Canvas)

"[What the Dippin' Dots 'cold chain' can teach us about COVID-19 vaccines](#)"

"[They Didn't Find Life in a Hopeless Place](#)" (PDF on Canvas)

"[The turtle egg that pinged back: Tracing a poaching pathway in Costa Rica](#)."

Reading Assignment #2: Interviewing

Please read the following from The Craft of Science Writing:

- Is Anyone Out There? Sourcing News Stories (pg 123)
- How to Conduct Difficult Interviews (pg 138)
- Including Diverse Voices in Science Stories (pg 145)

The following science stories do an exceptional job of integrating interviews into the story. Please read at least one of the following published works before class **on Sep. 29.**

"[A Disturbing Twinkie That Has, So Far, Defied Science](#)"

"'[Nonlethal Beanbags' From Police Cause Serious Injury, Possible Brain Damage](#)"

"[Tiny Jumping Spiders Can See the Moon](#)"

"[The Chanterelle Hunter](#)"

Reading Assignment #3: Institutional Science Writing

The following science stories are examples of institutional science writing produced by our guests: Diana Kenney, MBL's Associate Director of Communications, and Emily Greenhalgh, MBL's Digital Media Manager.

Please read/watch them before class on **Friday, October 6**, when we will be

discussing institutional writing with these members of the MBL Press Office.

[Breakthrough Prize Recognizes Discovery at MBL of New Organizing Principle in Cells](#) (Writing: Diana; Visual Timeline: Emily)

[Cuttlefish Flamboyant on Special Occasions Only](#) (Writing: Diana; Video Explainer: Emily)

Reading Assignment #4: Ethical Reporting

Please read the following from The Craft of Science Writing:

- A Conversation with Annie Waldman on 'How Hospitals Are Failing Black Mothers' (pg 166)
- A Conversation with Linda Nordling on 'How Decolonization Could Reshape South African Science' (pg 215)
- Spotting Shady Statistics (pg 244)

The following science stories are instructive cases of how journalists can develop stories while keeping inequity and justice in mind. Please read at least one of the following published works before class **on Nov. 10.**

"[Dr. King Said Segregation Harms Us All. Environmental Research Shows He Was Right.](#)" (PDF on Canvas)

"[The Design Bias of Heart Failure](#)"

"[The Heavy Toll of the Black Belt's Water Crisis](#)" (PDF on Canvas)

"[The Reason Black Americans Are Getting Vaccinated At A Much Slower Rate Is Not Because They're Reluctant](#)"

Writing Assignment #1: Translate Science into English

Choose one of six recent scientific papers (sent by email after class) and write an accessible and engaging news story about it. No interviews are required. 300-500 words. **Due Sept. 22 via Canvas**.

Writing Assignment #2: Tell A Short Science Story

Apply the techniques we have discussed in class to your first short science story. Choose a recently-published scientific paper, report, or other form of scientific update of your choosing and develop it into an 800-1000 word story. Please interview one expert connected to the story and one outside source. **Due Oct. 20 via Canvas.**

Writing Assignment #3: Final Project

Expand the paper that you chose for writing assignment #2 into a long-form science story, 1500 words or more. The form is of your choosing: a science feature or profile of a researcher. Each story should include at least two interviews. **First draft due Nov 10. Final draft due by the end of term.**

Examples of each form for the final project are provided below.

- **Science Feature**: A reported exploration of a recent science advance or trend
    - Kathryn Schulz's Pulitzer Prize-winning "The Really Big One"
    - Sarah Gilman's "The Mystery of Mountain Lions"
    - Ed Yong's Pulitzer Prize-winning reporting on COVID long-haulers
    - Nicola Twilley's "The Billion-Year Wave"
        > **For a behind-the-scenes look at this story, see The Open Notebook's "storygram" of the article*

- **Scientist Profile**: An exploration of an individual's work, life, and impact
    - Rachel E. Gross' profile of bioengineer Linda Griffifth
    - Cory S. Powell's profile of planetary astronomer Sara Seager
    - Erica Klarreich's profile of mathematician Maryam Mirzakhani
    - Darcy Fray's profile of climate scientist George Divoky

Feature Writing Tips

To come up with your final project, you may find it helpful to review the selections from Writing Assignment #1 in order to ensure you have a solid story idea. I also recommend taking a look at "Is This A Story? How to Evaluate Your Ideas Before You Pitch" on pg 63—the infographic on pg 66-67 is particularly good —as well as the pitches in "What Makes A Good Pitch? Annotations from the Open Notebook

Database," on pg 94 of The Craft of Science Writing, which will help familiarize you with how science writers structure ideas for pitching stories.

Seminar Activities

The SES Speaker series provides a great opportunity to work on interviewing skills while in a low-pressure environment. While our speaker is giving their lecture, please think about **2-3 questions** you would ask if you were interviewing this speaker, and collect **1-2 quotes** that you think would be a good addition to an article about their work.

Remember, these questions should relate to topics that you could answer by reading their papers or by listening to a lecture —though they can be scientific in nature, or clarifying if there is something you don't understand!—but instead provide first-person insight that you could only gain by talking to this person.

Some general examples:

- "How did you feel when you realized the potential applications of your research?"
- "What was the first thing that came to mind when you achieved [X result] in your work?"
- "What are the big unsolved mysteries in your field? If there was one question you could answer tomorrow, what would it be?"
- "How does your work relate to [X specific aspect] of your life?" or, "How does [X aspect of your work - going to sea, traveling, performing experiments on animals] influence how you see things in your daily life?"

Similar to the above, good quotes provide color, personality, and emotional heft to work; they explain things in a way that scientific writing cannot, and show who the interviewee is as a person.

Some guiding examples:

A bad quote: "In spring of 2020 the Lobster Foundation of Massachusetts found funding to purchase equipment," Pugh said. "It's a deck box and suite of data loggers. The data are loggers about the length of your forearm, and they go into lobster traps. Those loggers are continuously recording dissolved oxygen and temperature data."

A good quote: "The funding from the Lobster Foundation of Massachusetts changed everything for this research," Pugh said. "Besides putting a logger in each trap, the fishermen don't have to do much at all, and yet we're still getting this stream of data that provides us an almost continuous view of how conditions are changing in the bay."

A bad quote: "There was a technology demonstration conceived using change detection and tracking techniques on the AI vision processing side," says Doyle.
"We felt we had the means to be able to detect dust devils and track them while they were occurring. There was an experiment to do exactly that, and it was successful, designed carefully with the scientists so that when a dust devil is tracked there is a whole data package assembled."

A good quote: "For a long time we assumed that we would always miss weather events like this, because by the time we realized something interesting was unfolding on Mars, that came out in data that was hours or even days ago," says Doyle. "But when the first package arrived, I was just like: wow. It felt like being there. We gave the robot the authority to make these decisions, and it was like having a proxy for our own eyes 200 million miles away."

Submit your quotes and questions on Canvas by midnight on the Sunday after the Friday seminar. These assignments are pass/fail, though we will discuss some of your submissions in the next class.

MORE RESOURCES

Organizations:
- National Association of Science Writers, www.nasw.org
- Society of Environmental Journalists, www.sej.org
- Council for the Advancement of Science Writing, www.casw.org
- Association of Health Care Journalists, www.healthjournalism.org
- American Association for the Advancement of Science, www.aaas.org

Books:

- *A Field Guide for Science Writers*, edited by Deborah Blum, Mary Knudson, and Robin Marantz Henig
- *On Writing Well* by William Zinsser
- *Bird by Bird* by Anne Lamott
- *Am I making myself clear? A scientist's guide to talking to the public* by Cornelia Dean
- *The Science Writers' Handbook: Everything You Need to Know to Pitch, Publish, and Prosper in the Digital Age*, by the Writers of SciLance, Thomas Hayden and Michelle Nijhuis
- *Best American Science and Nature Writing* series

Online resources:
- The Open Notebook, www.theopennotebook.com
- Pew Research Center's Project for Excellence in Journalism, www.journalism.org
- Covering Climate Equitably: A Guide for Journalists https://thesolutionsproject.org/tools/covering-climate/

Funding:
- Fund for Environmental Journalism, www.sej.org
- NASW Idea Grants, www.nasw.org
- Institute for Journalism & Natural Resources, www.injr.org

Science Writing Internships
- AAAS Mass Media Fellowship - places students and recent graduates (within 1 year of graduation) with media organizations for science writing training
- AAAS Diverse Voices in Science Journalism Internship
- The Economist Richard Casement Internship
- Science News Writing Internship
- FermiLab Science Writing Internship
- The Scientist Internship
- Science Journalism Internship at the European Organisation for Astronomical Research in the Southern Hemisphere (ESO)
- Science Friday Summer Radio Internship (usually opens for applications in spring)

…And places to look for more internships and jobs:

- [Journalism Jobs and a Photo of My Dog](#) newsletter
- [Science Writing News Roundup](#) newsletter
- [Council for Science Editors](#)
- [Culture Dish](#) on Twitter