Outline

- Science Communication
  - Writing
    - Journalism
    - Freelance
  - Editing
  - Public Relations
  - Also includes technical writing
- Science Policy
Science Journalism

- Newspapers
- Magazines
- Television
- Radio
- Internet

1. SKY & Telescope
2. npr
3. The New York Times
4. Discovery Channel
Number of Newspapers Continue to Decline
Weekday and Sunday Editions, Yearly Increments

Source: Editor and Publisher Yearbook data
Note: The Yearbook is no longer published, so these figures have not been updated since 2009

PEW RESEARCH CENTER’S PROJECT FOR EXCELLENCE IN JOURNALISM
2012 STATE OF THE NEWS MEDIA
Newsroom Workforce Declining, But More Slowly

Number of Workers

Source: American Society of News Editors, Newsroom Employment Census, 2010. ASNE dates its data according to the release date. PEJ presents the data according to the year the data were compiled.
Note: Minorities include Native Americans, African Americans, Latinos and Asian Americans.
In their own words

It turned out I was lucky. A series of unpaid work placements and a lot of experience with student media meant that after a couple of months of applying, many rejections and several unsuccessful interviews, I ended up – in October 2009 – with three job offers.

When I got rejected for a science reporter internship at the *Economist*, the e-mail said there were some **250 applicants for one space**. Even a journalistic science communication job at the Science Museum, where **six of us got shortlisted for interviews, had 60 applicants**.
More of their words

“An article in the *Globe and Mail* has the potential to be read by a half million to a million people,” and he considered that he might never come close to such extensive communication in his entire lifetime career as a scientist.”-Wally Cherwinski, National Research Council Canada

“I realized that I really love science but not spending my time just focusing on a particular aspect of it.” –Maria Cruz, associate editor of *Science*

“Being able to write about these issues in an engaging manner is critical for bringing information and fact to the forefront of discussion. I like to think that better coverage will result in better solutions.”-Susan Matthews
Salaries
(according to the Center for the Advancement of Science Writing) 11

- Small circulation newspaper: $40,000
- Large circulation newspaper: $80,000
- Small circulation magazine: $40,000
- Large circulation magazine: $70,000
- Large circulation magazine, w/ years of experience: $100,000
- Small websites: $30,000-$50,000
- Experienced writers at large websites: $90,000
Freelancing

- Newspapers, magazines, websites, industry
- Earn $1.00-$2.00 per word.\textsuperscript{11}
  - But no benefits!
  - Rejection is very common
- Independence is a big draw
- Working alone can be lonely
  - “My editorial staff consists of two golden retrievers”\textsuperscript{12}
Michael Schirber: Freelancer

- PhD: 2004 Ohio State - “Quasars and the cosmic ultraviolet background”
- NYU Masters in Journalism

“Science writing appealed to me because it seemed to touch on a broad range of topics.”

“I enjoyed taking complex subject matter and finding a way to express it in language that my non-scientific friends could understand.”
“I think what I like most is the fact that my story topics are constantly changing…. I never feel bored.”

“I guess that the thing I have disliked the most is the stress that sometimes comes with story deadlines”
I would recommend this career."
• "There are less job opportunities for science writers than astronomers."
• "Breaking in can be difficult" due to budget cuts.
• Went to journalism school
  • But, "Not something I would wholeheartedly recommend."
• Start a blog
• Pitch stories to university or local paper
• Volunteer for university’s public relations department
• Join the National Association of Science Writers
Leila Belkora

- PhD: Colorado 1995, Solar Radio Astronomy
- Editor, Press Officer, Author, Course Developer, and more

“I think the quality of life of our family is enhanced by the fact that I work from home, and I feel privileged to be able to do so.”

“I missed being involved in research, but I enjoyed the more social work environment and the writing.”
## Is it worth it?

<table>
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<tr>
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<td>Exposure to variety of scientific fields</td>
<td>Job market</td>
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<td>Sharing knowledge</td>
<td>Pay</td>
</tr>
<tr>
<td>Independence</td>
<td>Deadlines</td>
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<tr>
<td>Flexibility</td>
<td>No research</td>
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Will you be prepared?

- Scientific background
- Clear writing
- Published works
- Industry contacts
  - Science
  - Communications
- Living frugally
- Multimedia skills
  - Design tools (e.g. Photoshop)
  - Web programming
  - Video editing
Entry Requirements

- Degree program?
- Internships
- Writing
  - Published media
  - Personal blog
- “Read!”
  - Science writing
  - Literature (the other kind)
Getting Started

- **Blogging**
  - "You need to blog at least once a week—any less than this, and you'll see your audience numbers decrease rapidly." \(^{15}\)
  - "You need to find your own voice, your own angle" \(^{15}\)

- **Multimedia and the Internet**
  - Youtube— "LHC Rap", "Fund me Maybe"…
  - Twitter
Getting Started

- **Internships**
  - Have a portfolio\(^1\)
    - Offer to work with university press release
    - Undergrads: Journal of Young Investigators
    - Grads: astrobites.com
  - Outreach counts for something
  - Experience editing is great

- **Internship Interviews**
  - Come with story ideas
  - It’s OK to discuss scientific experience—but don’t focus on being specialized
Additional degree or not?

- Having 'dips' is most important. Science writing programs make generating a body of work easier.
- Programs provide links to internships.

"The sad truth is regardless of your ability, with so few jobs, competition will be fierce and my sense is that employers tend to favor those with writing degrees or lots of experience." - Jennifer Frazer, environmental reporter.
Programs

- Graduate Program in Science Writing at MIT
  - Accepts 6-8 students a year
  - Tailors program to students' career plans
  - One year masters

- Science Communication Program at UC Santa Cruz
  - Accepts 10 students a year
  - One year certificate program
  - Requires science background including 6 months research experience

- Boston University
- John Hopkins University
Internships

1. Science News Writing Internship
   - Six month position
   - Undergraduate degree or graduating seniors
   - September 15 (Jan-June), March 1 (June-Dec)

2. Science Magazine Minority Writers
   - Ten week position
   - Undergraduates
   - Deadline: March 1
Internships

AAAS Mass Media Science and Engineering Fellowship

- Ten week internship
- Must NOT be in a journalism program
- Must be enrolled undergraduate senior or graduate student (or less than one year since graduation)
- Stipend $450.00/week
- 15-20 Fellows/summer
- Deadline: January 15

http://www.aaas.org/programs/education/MassMedia/apply.shtml
Summer School!

- Workshop in science communication
- Cambridge, MA
  - June 13-June 15
  - Some travel support available
- Application due March 1

http://workshop.astrobites.com/
Editing

- Newspapers, Journals, Magazines, Publishing Companies, Freelance
- Correct Manuscripts
- Manage staff
- Select story ideas
- Produce content
- Average Salary: $51,470
In their own words

“If you would go mad having to worry about whether a word has been hyphenated consistently all the way through a 40-page manuscript...then the production end of publishing is probably not for you”- Penny Smith, Blackwell Publishing

“As for me, I enjoy the fact that I can combine my scientific training with my English skills, and I'm happy that, even though I chose not to carry on with astronomy research, I'm still involved in some small way with a subject that has fascinated me since childhood.”- Penny Smith

“When we look for manuscript editors we like to appoint people who have a Ph.D. in an appropriate subject, plus postdoctoral experience and a good publications record, and a wide interest in scientific areas beyond their immediate research”- Andrew Sugden, Science International Managing Editor
Public Relations

- Public information officer, press officer, communications manager, external affairs manager, education officer …
- Scientific organizations, universities, industry
- Some freelancing or consulting via PR agencies
- Demand: 21% growth between 2010-2020
- Salary (2011 in Michigan): $52,400-$71,900
  - National Science Foundation Public Affairs Specialist: $105,000-$136,770
Public Relations

- Write press releases
- Organize media briefings
- Field inquiries from members
- Help write major grant proposals
- Work with outreach organizations

Corporate Liaison
  - Investors and researchers
  - Marketing and researchers
In their own words

“Meeting the audience is particularly difficult for scientists… what you do is make the information accessible to the audience.” - Eileen Patterson, Los Alamos National Laboratory

“It is challenging to write things that are understandable, but at the same time you get the feeling you are educating people and helping science-helping in a small part to continue scientific funding.” - Kendra Snyder, Brookhaven National Laboratory

Anyone pursuing [a career in science writing] needs to be highly inquisitive and cannot write out of ego.” - Jeff Berger, Los Alamos National Laboratory
Will you be prepared?

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<th>Astronomy Graduate School</th>
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<td>Scientific background</td>
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</tr>
<tr>
<td>Clear writing</td>
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</tr>
<tr>
<td>People skills</td>
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</tr>
<tr>
<td>Deal with bureaucracy</td>
<td>Deal with bureaucracy</td>
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# Public Relations: Pros and Cons

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<th>Con</th>
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</thead>
<tbody>
<tr>
<td>• Sharing science with public</td>
<td>• Don’t do research</td>
</tr>
<tr>
<td>• Exposure to latest research</td>
<td>• Deadlines</td>
</tr>
<tr>
<td>• Work with scientists</td>
<td>• Job market</td>
</tr>
<tr>
<td>• Variety of topics</td>
<td>• Limited positions in academic and</td>
</tr>
<tr>
<td>• Job market</td>
<td>government settings</td>
</tr>
<tr>
<td>• If you include industry</td>
<td></td>
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</tbody>
</table>
Science Com Resources

- National Association of Science Writers
  - http://www.nasw.org/
- Council for the Advancement of Science Writing
  - http://www.nasw.org/
- World Federation of Science Journalists
  - http://www.wfsj.org/
- Council of Science Editors
  - http://www.councilscienceeditors.org/
Policy: Where they work

- Advocacy associations (AAS, American Association for the Advancement of Science)
- Government agencies (NSF, Department of Defense, Department of Energy, NASA)
- Lobbying firms, Think Tanks
- Advisor/Staffer
  - Legislative (Congress)
  - Executive (White House)
- You could even run for office!
  - Bill Foster (D-IL 14th), Rush Holt (D-NJ 12th)
Policy: What they do

- Lobby
  - Research funding
  - Science education policy
  - Scientifically based laws
  - Industry issues
- Manage grant programs
- Advise lawmakers
- Make laws
Melanie Leitner 2001-2002 Congressional Fellow (AAAS Internship)

- Work for a congress person or committee
- Keep track of issues, inform “boss”
- Find new initiatives connected to agenda
- Attend hearings

“The most important tool on the Hill is probably the telephone.”

“Things move very quickly on the Hill, so you have a great deal of autonomy and freedom, and you are expected to be able to communicate clearly and succinctly.”

“One of the most effective ways to stay informed was to talk to other staff members, advocacy groups, and interested constituents.”
Why bother?

I choose science policy because it combined writing--and public communication of science--with something tangible that has a more direct impact on society.-Laura Sheanhan, National Academy of Sciences

It is our conviction that decisions on these and other critical issues will require governmental access to the best available scientific and technological information.“-Cargine Commission on Science, Technology, and Government

I decided I wanted to work in a profession where I would be able to use my scientific expertise and have a positive impact on people's lives, but on a more rapid time scale than is permitted by academic research”-Melanie Leitner
Kevin Marvel

- Position: Executive Officer AAS
- PhD NMSU, 1996
  - “The Circumstellar Environment of Evolved Stars as Revealed by Studies of Circumstellar Water Masers”
- “I was always interested in politics”
  - Involved in student government during graduate school
  - While applying for AAAS Fellowship discovered opening for AAS policy position
- Spent a month calling 2 people/day for 30 days
Kevin Marvel-What he did

“"A lot of writing”
  • Emails, action alerts, newsletter articles

Organize Congressional Visits Day

Lobby, visit the Hill

Follow and communicate with science collations
  • NSF, Dept. of Energy, and others

What he liked: Diversity of duties, strategizing—“figuring out how to accomplish something”

What he doesn’t like: “Sometimes you are trying to accomplish something and you loose for reasons completely unrelated to your attempt”
• Read up on current events and important issues
• Gain skills in management and HR
  • Graduate school, post-doc help teach some of these skills
• Get involved with AAS activities
  • Communicate with Washington
  • Be active regionally
  • Invite local politicians to the department or public outreach night
Joel Parriott

- Director of Public Policy, AAS
- Previously: White House Office of Management and Budget
  - Responsible for NSF and Dept. of Energy
- Previously: National Research Council
  - Assisted with the Decadal Survey
- PhD: University of Michigan
  - Computational astrophysics
Bethany Johns
Bahcall Fellow 2010-2011

- PhD: Physics, Clemson
  - Certificate in Policy Studies
- Department senator in student government
  - Assisted with a graduate student grant program
  - Helped found South Carolina Graduate Professional Alliance
## Policy: Pros and Cons

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service to science, nation, world</td>
<td>Little or no research</td>
</tr>
<tr>
<td>Live in Washington DC!</td>
<td>Live in Washington DC?!</td>
</tr>
<tr>
<td>Shape the future of science</td>
<td>Frustration when nothing changes</td>
</tr>
<tr>
<td>Share knowledge</td>
<td>Competitive job market</td>
</tr>
<tr>
<td>Change the world!</td>
<td>Pay comparable to academia</td>
</tr>
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Will you be prepared?

- Scientific background
  - Research experience is important
  - Professorship not a bad thing
- Communication skills vital
- Quick thinking
- Analysis of new subject matter
- Contacts
- Experience in policy
  - Helpful for some positions
“Most of those interviewed for this article believe that formal training in science policy is unnecessary. According to some, it can even be a disadvantage. But take that with a grain of salt: My sample was severely skewed; hardly representative. The bottom line is that there are many routes into science policy, so take the one that most appeals to you.”

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Getting Started...

• GSU Student Government Association
  • Currently three graduate students in senate
  • There is a vacancy for a senator from Arts & Sciences
  • Applications for elections are now open
  • http://www.gsu.edu/sga/

• AAS Public Policy events
  • Congressional Visit Day

• Local Activism and Outreach
Getting Started

- Presidential Management Fellows
  - Two year program
  - Graduate students who complete their degree by August 31 of the year
  - Agencies include NASA, Dept. of Energy, Dept. of Commerce, and Dept. of Defense
  - Salary: $40,000-$90,000 depending on experience and location
  - In 2012: 628 finalists out of 9100 applicants
  - Can become permanent position
  - [http://www.pmf.gov/become-a-pmf/find-a-job.aspx](http://www.pmf.gov/become-a-pmf/find-a-job.aspx)
Getting Started

• AAAS Fellowship programs
  • One year program
  • PhD by December 5 of application year
  • Congressional : AAAS, American Geophysical Union (AGU), American Institute of Physics (AIP), American Physical Society (APS), Executive: NSF
  • Salary: $74,000 for AAAS sponsored, society sponsored: $55000-85000
  • http://fellowships.aaas.org/04_Become/04_Review_Selection.shtml
Getting Started

- **American Institute of Physics**
  - One year program
  - PhD required
  - Membership in AAS makes one eligible
  - Salary: $74,000
  - Deadline: January 15
  - [http://www.aip.org/gov/fellowships/cf.html](http://www.aip.org/gov/fellowships/cf.html)

- **American Physical Society**
  - PhD required
  - Membership in APS required
Getting Started

- **AAS John Bahcall Public Policy Fellowship**
  - One year program, renewable for second year
  - PhD and membership in AAS required
  - Maintain relationships with policy officials, coordinate Congressional Visits Day, write in newsletter and budget book, email alerts, attend policy events...
  - Salary: $72,000 (same as AIP Fellowship)
  - Applications OPEN!
    - Deadline May 1
1) http://www.coseti.org/skytelcv.htm
2) www.npr.org
3) www.nytimes.com
4) http://en.wikipedia.org/wiki/Discovery_Channel
6) http://blog.linkedin.com/2012/03/08/economic-report/
7) http://www.sciblogs.com/balkan_science_beat/ so-you-want-your-first-science-journalism-job/
8) http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2003_05_09/nodie.10738708987164258742
9) http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2008_07_11/careedit.a0800105
10) http://blogs.scientificamerican.com/incubator/2013/01/14/introducing-susan-matthews/
11) http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2005_05_20/nodie.15477115808780287114
12) Personal Communication
14) http://www.nature.com/scitable/blog/scholarcast/how_science_blogging_can_lead
15) http://blogs.nature.com/naturejobs/2013/01/28/getting-an-internship-in-science-journalism
16) http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2002_02_01/nodie.3083151221506242204
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62) Personal Communication
Additional Career Resources

- **Science Careers**
  - [http://sciencecareers.sciencemag.org/](http://sciencecareers.sciencemag.org/)

- **Nature Jobs**
  - [http://www.nature.com/naturejobs/science/](http://www.nature.com/naturejobs/science/)

- **Writing**
  - **The Open Notebook**
    - [http://www.theopennotebook.com/](http://www.theopennotebook.com/)
  - **Incubator Blog**