

Ethics in Research

Physics 3110

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American Physical Society (APS) Guidelines on Ethics

<https://www.aps.org/policy/statements/>

- The success of the scientific enterprise rests upon two ethical pillars.
- The first of them is the obligation to tell the truth, which includes avoiding fabrication, falsification, and plagiarism.
- The second is the obligation to treat people well, which prohibits abuse of power, encourages fair and respectful relationships with colleagues, subordinates, and students, and eschews bias, whether implicit or explicit.

Ethical Issues

- Experimental Techniques and the Treatment of Data
- Misconduct in Science
- Conflicts of Interest
- Publication and Openness
- Allocation of Credit and Authorship Practice
- Health & Safety
- Equal Opportunity

From On Being a Scientist – Responsible Conduct in Research, 2nd Edition, Committee on Science, Engineering, and Public Policy, National Academy Press, Washington, D.C. 1995

www.nap.edu/readingroom/books/obas

Experimental Techniques and the Treatment of Data

- “The experimentalist should feel a sense of responsibility for the numbers (data) obtained.” “You are responsible for your data.” The Art of Experimental Physics, D. Preston & E. Dietz, NY, John Wiley, (1991), pp.36 & 37.



- Describe your methods, so that others can test them.
- Question your own data.
- Selection of Data: be objective
- In Class: If you can not get your own data due to broken equipment, etc., you may use somebody else's provided you acknowledge it, with the instructor's permission.

Misconduct in Science

- Fabrication – Making up data or results
- Falsification – Changing or misreporting data or results
- Plagiarism – Using ideas or words of another person without giving appropriate credit
- Error versus Negligence
 - Honest mistakes versus haste, carelessness, and inattention

Jan Hendrik Schön, formerly a physicist at Bell Labs, was dismissed in 2002 for scientific misconduct.

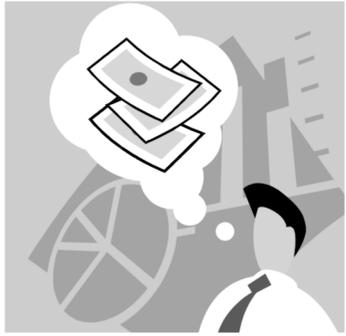
Allegations were made about 25 publications, involving 20 coauthors.

A Bell Labs (Lucent Technology) committee found that he had falsified published data, committed scientific misconduct in 16 papers.

He did not keep proper laboratory records, original electronic data files, or working devices. It is therefore not possible to confirm or refute his scientific claims.

2004, University of Konstanz revoked his Ph.D. Went to courts, revocation finally upheld in 2014.

“Report of the Investigation Committee on the Possibility of Scientific Misconduct in the Work of Hendrik Schon and Coauthors”,
http://www.lucent.com/news_events/pdf/summary.pdf



Conflicts of Interest

- If you are in a situation where conflict of interest could occur, you must report it.
- If it becomes a problem, you may need to quit an activity.
- Research versus funding agency
- Research versus personal interests
 - financial, friends and family, personal advancement

Publication and Openness

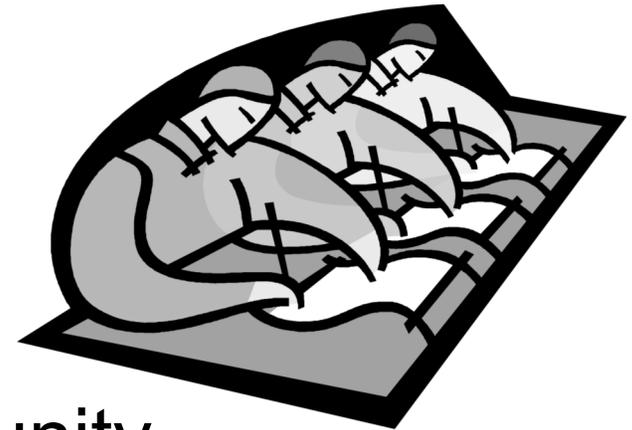
(When to share data and techniques.)

- Publication of results in a peer reviewed journal gives credit for the work to the authors, and makes it available to other scientists.
- Before publication, research results are privileged material.



Allocation of Credit and Authorship Practices

- Authorship, acknowledgments, references
 - See APS Supplementary Guidelines on Responsibilities of Coauthors and Collaborators
 - Authorship is limited to those who have made a significant contribution to the work.
- Order of authors' names
 - Convention
- Peer Review
 - Responsibility of Scientific Community



Notebooks: Ownership of Data

- At most institutions, lab notebooks and data are the property of the lab or institution, not the individual researcher.
- Ask Principle Investigator up front.

Equal Opportunity

- Women
 - Earn ~20% of physics B.S. degrees, since about 1995¹
 - Nearly 75% of women undergraduates report having experienced some form of harassment²
- Minorities
 - Earned ~13.5% of physics B.S. degrees in 2017³
- LGBTQ
 - 11% - 49% report having experienced some form of harassment⁴

•American Physical Society, Programs, <https://www.aps.org/programs/index.cfm>

•For specifics, see final slide.

Equal Opportunity

https://www.aps.org/policy/statements/88_1.cfm

...In particular, actions that create a hostile, intimidating, or offensive work environment for any group undermine the affirmative action efforts of the Society and should be eliminated. These actions include the public posting and viewing of materials that are insulting, derogatory, or exclusionary to a particular group.

We call upon all members of the Society to help ensure that persons of every race, gender, and ethnic origin may feel a welcome part of the physics community.

Revision Approved by the Council on November 9, 2018

Equal Opportunity

UH Diversity and Inclusion Statement

<https://uh.edu/about/diversity-statement/>

- The University of Houston embraces diversity and recognizes our responsibility to foster an open, welcoming environment where students, faculty and staff of all backgrounds can collaboratively learn, work and serve. We value the academic, social, and broader community benefits that arise from a diverse campus and are committed to equity, inclusion and accountability. ...

Ethics Case Studies

UH Who to Contact

- Your Professor
- Undergraduate Advisor, Dr. Koerner
- Graduate Advisor, Dr. Gunaratne
- Department Chair, Dr. Bassler
- Fraud and Non-Compliance Hotline, link at bottom of every UH webpage

References

1. American Physical Society, “Bachelor’s Degrees Earned by Women, by Major”, accessed 2/11/2020,
<https://www.aps.org/programs/education/statistics/womenmajors.cfm>.
2. Lauren M. Aycok, Zahra Hazari, Eric Brewe, Kathryn B. H. Clancy, Theodore Hodapp, and Renee Michelle Goertzen, “Sexual harassment reported by undergraduate female physicists”, *Phys. Rev. Phys. Educ. Res.* **15**, 010121 (2019).
3. American Physical Society, “Degrees Earned by Underrepresented Minorities in Physics”, accessed 2/11/2020,
<https://www.aps.org/programs/education/statistics/minorityphysics.cfm>.
4. APS Ad-Hoc Committee on LGBT Issues, “LGBT Climate in Physics”, presented at APS March Meeting (2016),
<https://www.aps.org/programs/lgbt/upload/LGBTMarchMeetingPresentation.pdf>.
Ethics Case Studies, APS Task Force on Ethics Education, Edited by Heide Doss and Gabriel Popkin, Illustrations and design by Nancy Bennett-Karasik,
<http://www.aps.org/programs/education/ethics/upload/Ethics-Case-Studies-Student-Edition.pdf>, accessed 9/12/14.
Moral Reasoning in Scientific Research, Cases for Teaching and Assessment, M. J. Bebeau, K. D. Pimple, K. Muskavitch, S. Borden, and D. Smith, 1995.

Ethics Homework

- According to the U.S. Federal Policy on Research Misconduct, which can be found in the APS Ethics Case Studies pdf, what are the three requirements for a finding of research misconduct?