

Academic Honesty and Professional Ethics

Laszlo Mihaly, Chair of P&A, August, 2015

- ❖ Academic Honesty
- ❖ Stony Brook Policies
- ❖ Conflict of Interest
- ❖ Responsible Conduct in Research

None of us is expert on these issues, but we must understand them as they affect us all in vital ways. It is part of building a collegial, productive, and professional environment in which we can all learn and do research. It allows us to trust one another.

It is important that you consider and engage these questions now, before they arise in your career that begins here. One hopes that the negative aspects will never arise, but they have arisen in our profession. We will review two such sad cases that ended the careers of two young “star” physicists.

We expect honorable and ethical behavior by all our students, faculty and staff in the Department.

Academic honesty: Departmental procedures

Putting forward the ideas or work of others as your own without appropriate attribution is dishonest.

Cheating on exams: **both giving and getting** information from others is cheating; it will be punished. The penalty can range from

- ZERO on the exam,
- failure in the course,
- suspension from the University.

Homework policy: do not assume that collaborating on homework, lab work, etc., is allowed; some instructors encourage cooperation for some assignments, but others don't. **ASK FIRST!**

Plagiarism

Term papers, research reports, seminar talks: What you write (or say) is expected to be your own if not attributed to the work of others.

PLAGIARISM is the use of the written work of others as if it were your own.

With the Internet, access to written material on nearly any subject is readily available. It is easy to locate the work of others and, therefore, also easy to detect and track plagiarism in student papers. (See German politicians, Hungarian President for cases when Ph.D. was withdrawn.)

If you are summarizing the work of others, give the reference you use and indicate clearly what work or ideas comes from others and what is your own interpretation or synthesis. If you use the words written in someone else's work, put them within quotation marks “ ” and give the reference to their source.

The penalty for plagiarism will range from ZERO for the particular project, to failing the course, to being suspended from the university.

Action on reports of academic dishonesty

The first line of action will be recommended by the relevant faculty member for the course or research project. For undergraduate students nearly all cases are immediately reported to the University's Academic Judiciary, http://www.stonybrook.edu/commcms/academic_integrity/
As a TA, please consult the course instructor if you detect cheating.

Graduate students accused of academic dishonesty may appeal and request a hearing by the Department. A grievance committee will be appointed by the Grad Director/Chair; it should have equal representation from faculty and students (people not involved in the particular case). The committee does fact-finding and proposes an action to Chair and Graduate Director, who impose an appropriate penalty.

Appeal of decision at Department level can be made to the Dean of the Graduate School and, ultimately, to the President of the University.
http://www.grad.sunysb.edu/pdf/about/policy/Grievances_Appeals.pdf

Similar rules apply if a charge made by a student regarding misbehavior

Some past examples:

1. TA in PHY 515 (Graduate Lab) gives copy of old lab experiment to a friend taking the course, “to use as a guide”. The friend writes up a lab report that is very similar to the old report given by the TA. Upon investigation and after accusation, copying was admitted.

TA support was denied for one semester for both students. The student who copied the lab had to retake PHY 515 and do new (different) experiments. Letters of censure were entered into the files of both students.

2. Students use papers from the web, without attribution, in a term paper assignment. Instructor finds the original papers with a simple Google search and recommends failure in the course for the accused students.
3. Student is found consulting with another during a comprehensive exam. Both fail the exam.

Faculty responsibility to students:

The faculty is responsible for treating students fairly and with respect. No harassment of students will be condoned. There shall be no bias based upon ethnic group, national origin, or gender.

The department is committed to a fair and timely evaluation of work done by students.

The faculty is committed to adequate preparation for courses and to provide a description of the material and expectations for students at the beginning of the semester (syllabus). If you are in a course with no written syllabus, please report it to the Grad. Program Director.

The work of students shall be fully and fairly recognized in courses and in research publications. Faculty and research staff participation as authors in publications shall be based on the same rules as applied to student.

Failure to fulfill these responsibilities by faculty and staff will be dealt with by the same procedure used to resolve allegations of student misconduct.

Formal training: Responsible Conduct of Research and Conflict of Interest

Misconduct: “fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results”

Conflict of interest: taking unfair advantage of one’s University position that results in personal gain

The Stony Brook educational program involves 2 components:

- On-Line Training ('CITI'):
Completion of RCRS modules provided by the web-based Collaborative Institutional Training Initiative (CITI).
- In Person Training ('IPT'):
Eight (8) hours every 4 years, or 2 hours annually.

Responsible Conduct of Research Training

Required for all graduate students.

RIGHT NOW:

Follow instructions on <http://research.stonybrook.edu/responsible-conduct-research-and-scholarship/rcrs-training> to pass WEB training in the “Responsible Conduct of Research” (RCR) module relevant to Physical Sciences. **No need to do “human subject” and others modules.** Also do the Conflict of Interest (COI) training.

LATER: You and your advisor should discuss topics related to research ethics at least 2 hours per Academic Year.

OPTIONAL: view any of the GRD 500 lectures listed on this page: <http://research.stonybrook.edu/responsible-conduct-research-and-scholarship/rcrs-training>

EXCEPT: If your advisor is recipient to NIH grant, you will need to do more training.

Conflict of Interest (COI) or Financial Conflict of Interest (FCOI):

University Policy: <http://www.stonybrook.edu/policy/policies.shtml?ID=209>

Financial Conflict of Interest:

“Conflicts of interest in the conduct of externally and applicable internally supported activities, may take various forms, but typically arise when an Investigator at the University is, or may be, in a position to influence activities or University decisions in ways that could lead to personal gain for the Investigator or the Investigator's family, or give an improper advantage to third parties in their dealings with the University. Conflicts may also arise when Investigators have outside obligations of any kind that are in substantial conflict with the Investigator's University responsibilities or the public interest.”

Conflicts of Commitment, Conscience, and Institutional Conflicts of Interest:

- a member of the University community has a relationship that requires a commitment of time or effort to non-University activities, such that he/she cannot meet the usual obligations to the University.
- personal beliefs interfere with the ability to perform job duties objectively
- biasing a grant proposal or manuscript review, because of the reviewer's relationship to the author

More on conflicts of interest:

Most physicists “owe” respect and loyalty to more than one person or group. Research support by for-profit enterprises (“companies”) with a stake in outcomes can generate conflicts of interest.

1. You will be called upon to write letters of recommendation for students or colleagues – for jobs or for financial support. If the person is a friend or close colleague you want to do the best you can to promote his or her career. But what about your responsibility to the person who wants and needs the best information possible to make a hire or award a grant?
2. What would be the effect on your career if you are sponsored by a company whose business depends on the process you are developing, and they reserve the right to review it and possibly deny publication to retain some proprietary advantage?
3. You are called on to review the manuscript of a competitor’s research paper. You are close to getting a similar important result and by delaying your review, you might catch up and “scoop” the competitor.

Responsible Conduct of Research (RCR) and Scholarship (RCRS)

University policy:

<http://www.stonybrook.edu/policy/policies.shtml?ID=211>

1. conflict of interest - personal, professional, and financial
2. mentor/mentee responsibilities and relationships
3. collaborative research including collaborations with industry
4. peer review
5. data acquisition and research tools; management, sharing and ownership
6. research misconduct and policies for handling misconduct
7. responsible authorship and publication
8. the scholar as a responsible member of society, contemporary ethical issues and the environmental and societal impacts of research in the discipline
9. policies regarding human subjects, live vertebrate animal subjects in research, and safe laboratory practices

Research Misconduct

Fabrication: making up data or results and recording or reporting them.

Falsification: manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

Plagiarism: the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Professional Conduct (based on APS guidelines)

Scientific research is conducted on the basis of trust that the work is accurately recorded and reported and is analyzed without bias. The entire scientific enterprise rests on the assumption that the data and analysis are as stated in the report.

❖ **Research records** The data reported should be actual observations made by the authors. All data should be recorded and maintained in a form that allows analysis and review.

❖ **Plagiarism** Do not use the work of others without referencing. The description of the problem, the methodology of the study, and the conclusions should be those of the authors unless they are noted and referenced.

❖ **Fair authorship** The authors listed all made significant contributions to the research and that others whose contributions should be recognized have not been omitted. All authors are responsible for the results, but not equally.

❖ **Peer review** If requested, it is an **obligation** to provide fair and objective evaluations. When objectivity and effectiveness cannot be maintained, the activity should be avoided or discontinued.

More on authorship from the APS guidelines:

All collaborators share some degree of responsibility for any paper they coauthor. Some coauthors have responsibility for the entire paper as an accurate, verifiable, report of the research. These include, for example, coauthors who are accountable for the integrity of the critical data reported in the paper, carry out the analysis, write the manuscript, present major findings at conferences, or provide scientific leadership for junior colleagues.

Coauthors who make specific, limited, contributions to a paper are responsible for them, but may have only limited responsibility for other results. While not all coauthors may be familiar with all aspects of the research presented in their paper, all collaborations should have in place an appropriate process for reviewing and ensuring the accuracy and validity of the reported results, and all coauthors should be aware of this process.

Every coauthor should have the opportunity to review the manuscript before its submission. All coauthors have an obligation to provide prompt retractions or correction of errors in published works. Any individual unwilling or unable to accept appropriate responsibility for a paper should not be a coauthor.

Flawed scientific results can be a result of

- a) **Bad luck:** Statistical fluctuations can give a new and surprising result even when there is best intent on the part of the researchers. Some fields have standards: a “3 sigma” result gives ‘evidence for’; ‘discovery’ requires at least a “5 sigma” result. All experimental results must be accompanied by an appropriate and well-explained analysis of uncertainties, both random and systematic (the “error analysis”). Theoretical papers must clearly state the assumptions and methods.
- b) **Mistakes:** Mathematical or computational errors; using incorrect reagents or materials; misapplication of probabilistic methods. Mistakes can be honest, but when found they must be admitted publicly and their effects rectified.
- c) **Misconduct:** Deliberate manipulation of data; claim to have performed cross-checks that were not done; wholesale falsification of data (“inventing things that never happened”).

In the end, the best defense against bad luck, mistakes, or misconduct is subjecting the claims to independent confirmation of the results – new experiments or calculations, carried out by others or by you (with others).

Some recent examples of flagrant misconduct - physics

Discovery of transuranic elements:

Victor Ninov and collaborators at Lawrence Berkeley Laboratory announced the discovery of elements $Z=116$ and 118 in 1999. In 2001 the co-authors withdrew the papers because they were unable to reproduce the evidence. They found evidence that the data had been fabricated in a major way. Subsequent examination of the data related to the discovery of elements 111 and 112 in Germany, also showed signs of data manipulation (in a non-significant way) by Ninov.

Mesoscopic devices:

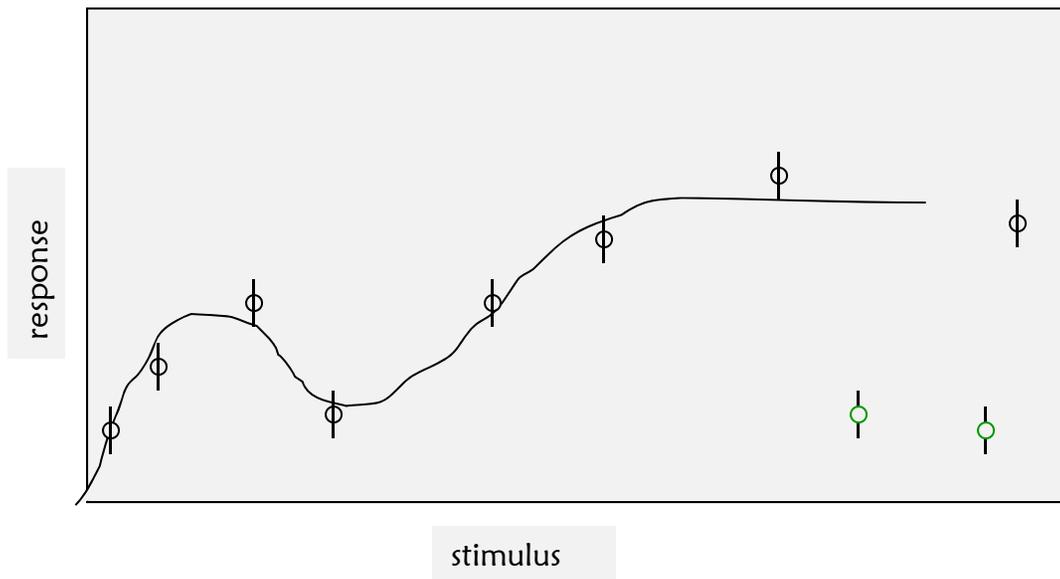
In the 1990s Jan Hendrik Schön at Bell Labs published a series of papers on molecular scale electronic devices, ranging from thin films to new organic superconductors. Though the papers had coauthors, Schön did the experiments alone. Primary data were deleted from computer disks; evidence was found that reported data were fabricated. Data were in some cases replaced with mathematical functional forms. Graphs from different experiments had the same “points”. The papers were formally retracted from the journals. Schön’s Ph.D. was revoked in 2004. Currently he is rumored to be a car salesman in Brazil.

Lessons from these blatant cases of scientific misconduct:

1. Ninov and Schön were highly respected rising stars in their fields with great future prospects. After their scandals broke, both lost their jobs due to misconduct. Their scientific careers are ruined.
2. The taint of these fabrications is felt not only by the authors but by the institutions they worked for and the entire physics community.
3. The coauthors in both cases, though not accused of dishonesty, clearly failed in their responsibility to check data and results. If you cosign a paper, you have a responsibility for the integrity of the result. If your name is there, you are responsible.
4. In the end, both cases were self-correcting. (It always is when the science is important. The only question is how long it takes before the correction comes.) The long-standing requirement that a new discovery be subject to independent confirmation meant that these fabrications were brought to light, in these cases, rather quickly.
5. Primary data must be preserved and protected with integrity. This includes computer files, notebooks, and details of calculations. Your memory is not sufficient!

Some hypothetical examples to discuss :

A graduate student and postdoc do a measurement on semiconductor materials at a neutron source facility. Back home they plot and compare their data to the new theoretical curve shown. They also know that other researchers are preparing a publication that confirms the theory (solid line). The postdoc suggests omitting the green points on the basis that these data are “obviously wrong”.



What should they do? (They have a logbook, and they find that there were anomalous intensity fluctuations during the time they took data for the green points)

Should the green points be included in tests of statistical significance?

Where to go to get advice?

An international student starts in the Stony Brook Physics Ph.D. program, but still has unpublished experimental results from research conducted at his home institution. The paper is drafted and ready to go for submission while the student is in stony Brook.

Should Stony Brook be listed as the affiliation of the student?

A researcher published a series of papers on measurements several different materials. He is asked to write a review paper that will summarize his results.

Is it OK for him to cut and paste sections of his own earlier papers into the review paper without quotation marks?

A variation on the theme: A researcher published a series of papers on measurements several different materials. These papers had student and other co-authors with him, but he was the lead researcher. He is asked to write a single-author review paper that will summarize his results.

Is it OK for him to cut and paste sections of his own earlier papers into the review paper without quotation marks?

A large international collaboration made measurements of the same physical parameter (the mass of a new particle) using two different techniques with different data sets. The two measurements were made two years apart, and in that time the collaboration membership changed somewhat.

The whole introductory section in both papers that describes the scientific motivation for the measurement and outlines the basic methodology used was the same.

Did this constitute plagiarism?

In a small international collaboration several papers are published under the guidance of a SBU faculty member. Later the faculty member is asked to write a review paper (single-author). He cuts and pastes parts of the earlier papers into the review. All of the earlier papers are referenced in the review in a generic way.

Did this constitute plagiarism?

The simple rules

- ❖ Be an ethical professional. Don't cheat and don't plagiarize in written or oral work in courses or research. The penalties can be severe.
- ❖ Respect the scientific tradition and report all data honestly and factually. Keep records.
- ❖ Be objective : Make conclusions based on what is in your data or calculations, not on what outcome you want.

The harder issues are in the grey areas, where you have conflicting pressures from different sources. The best rule of thumb for these is to ask and discuss the issues with colleagues and mentors.