JET PROPULSION LABORATORY **INTEROFFICE MEMORANDUM**

January 2017

To: The JPL Research Community

From: The Office of the Chief Scientist and Chief Technologist,
Jet Propulsion Laboratory, California Institute of Technology

Subject: Guidelines for Ethics in Research

Foreword

JPL is a leading institution supporting the NASA mission, whose highly talented employees are expected to adhere to the highest standards of professional ethics and scholarship.

While JPL's research community operates in a highly professional and ethical manner, it is useful to discuss in one document the ethical and professional standards that are at the foundation of our core values as individuals and that JPL expects of its researchers. These guidelines are meant to address key elements of professional standards that ensure that individual researchers establish and maintain the strongest personal reputation, and that JPL's reputation as a research institution remains of the highest caliber, to provide guidance towards avoidance and resolution of conflicts, and to identify unethical behaviors that result in disciplinary action.

The guidelines, while not attempting to be complete, are intended to inform employees' thinking about research ethics, particularly if they are new to the research environment. The objective is to catalyze discussion rather than to prescribe answers, and management is encouraged to use these materials in meetings with their staff, and as part of training courses.

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I. The JPL Environment

The JPL research environment has several unique cultural attributes, beyond those in a typical academic environment (such as our parent organization, Caltech), that influence its ethical and professional standards, and that can lead to conflicts and ethical challenges. These attributes include: projects involving large teams of people, unique research involving coupled technology, science and engineering expertise, research using data sets obtained through the work of many people, and meeting the need to promptly engage the public in JPL's research enterprise without compromising the integrity of its research.

In the project environment many team members play a variety of roles that enable and support research, sometimes making it difficult to determine how to properly attribute credit for new discoveries as well as simply reporting research results. The roles played by different team members, and the nature of their contributions, need to be carefully considered to make appropriate decisions regarding attribution.

In the realm of research that spans technology, science and engineering, it is often difficult to define the criticality of individual contributions to a specific research result, leading to conflicts and misunderstandings. Such conflicts can include, for example, disagreements over the contributions of managers to research results and the proper attribution of credit. The question to be answered in these cases is: 'Did the team member contribute to the intellectual content of the publication under consideration?' *Often these conflicts can be avoided by clear upfront communication amongst team members to develop shared understanding of expected outcomes.* These guidelines provide a framework for developing that understanding, and for resolving conflicts that occur.

In research using data collected by missions or large projects, including calibrated and processed data products, there are no clear standards for how to properly attribute credit for original data sets and data products. It is also impractical to attempt to directly credit the teams responsible, so guidelines for handling attribution in these situations are needed.

Finally, the desire to communicate with and engage the public in JPL's research and missions can lead to situations where credit is not given properly in products such as media releases, and where the engagement value of a release is considered more important than proper complete attribution. These are difficult situations to mediate, but articulating strategies for striking the right balance should help in this regard.

Because of JPL's status as a division of Caltech, we have specific obligations in dealing with allegations of research misconduct, which are described in JPL policies and procedures. Any researcher who intentionally engages in or fails to reveal knowledge of research misconduct is subject to disciplinary action, including dismissal.

Scientific research misconduct has a succinct definition adopted by the majority of federal funding agencies and in our Policy on Research Misconduct as "Fabrication, falsification or plagiarism in proposing, performing, or reviewing research, or in reporting research results", where

- Fabrication is "making up data or results and reporting them."
- Falsification is "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 is "the appropriation (use without authority or right) of another person's ideas, processes, results, or words without giving appropriate credit."

In all cases it is understood that research misconduct does not include honest error.

In addition, there is a spectrum of actions and behaviors that, while less serious than research misconduct, may still damage the reputation of individual researchers or JPL as a whole. In many cases these may be unintentional or may arise from substandard practices. These guidelines are intended to help researchers prevent such problems.

II. Integrity in the Practice of Research

This section discusses the key aspects of good professional and ethical behavior in the context of presentation and publication of research. It is based on the extensive work on ethical guidelines prepared by scientific/engineering societies, some of which are listed below for those who are interested in an in-depth discussion of the topic.

General Resources

National Academy of Sciences: On Being A Scientist: Responsible Conduct In Research (http://www.nap.edu/openbook.php?isbn=0309051967)

NASA NPR 1080.1A: Requirements for the conduct of NASA Research and Technology (https://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_1080_001A_&page_name=Preface)

Online Ethics Center for Engineering and Research

http://www.onlineethics.org/Resources/ethcodes/21733.aspx

A portal to the codes of Ethics of a number of societies, including the American Physical Society, American Chemistry Society, IEEE

Office of Research Integrity – US Department of Health and Human Services - Handbooks and Guidelines
http://ori.dhhs.gov/publications/handbooks.shtml

Author and Reviewer Resources – A few Examples

Guide to Publication Policies of Nature Journals
http://www.nature.com/authors/gta.pdf
Guidelines to Publication with the American Chemical Society
http://pubs.acs.org/userimages/ContentEditor/1218054468605/ethics.pdf

For a JPL-internal reference on all matters of Ethics in the workplace, the reader should refer to the Ethics Handbook, The Caltech Community's Statement on Ethical Conduct (https://codeofconduct.caltech.edu/), and other related information, all available from the JPL Ethics Office website, http://ethics.jpl.nasa.gov.

a. Authorship

1a. Establishing authorship

Maintaining JPL's high standards requires a culture of ethical authorship. Research teams (i.e. researchers who are working on a task resulting from a successful proposal, a flight project science team, etc.) should discuss papers and authorship when planning the task activities, and decide on authors ideally before embarking on new research, and in any case, before each article is written. The leader of the team (PI, Task manager, etc.) should make sure that all the team members are given the opportunity to have their original contributions published as appropriate. The team members should communicate openly and reach a consensus on respective roles on papers and authorship order, by working together to resolve conflicts that might arise. Prospective lead authors should invite all of those who contributed significantly to be a co-author, and be open to add others who present a persuasive argument for why they should be included. In all cases, the process should be very open and no author should find out that they have been listed as co-authors from a Journal upon submission of a manuscript.

Group supervisors, Task Managers and PIs should periodically use/refer to these Guidelines in conversations with their co-workers, particularly when new research teams are formed or new employees come on board with the expectation that papers will be written. Similarly, advisors of postdocs might find these guidelines helpful in their mentoring activity.

On the other hand, authorship comes with responsibilities and offers to be a co-author on a paper should not be taken lightly. Authorship should be declined in cases where the researcher (1) has irreconcilable disagreements with any aspect of the research described in the paper, (2) is convinced that he/she did not contribute intellectually (sometimes the natural outcome in a paper preparation cycle), or (3) does not want to be associated with a particular paper. All of the authors on a paper are implicitly viewed as responsible for its contents.

2a. Substantial contribution

Each author on a paper should have made a substantial scientific/ technical contribution, and no person who has done so should be excluded from authorship of a publication. The meaning of "substantial" depends on the situation, and is determined by the research team on a case-by-case basis.

At JPL research teams often comprise scientists, technologists and engineers who work together to develop complex instrumentation for observations that lead to scientific discoveries or significant advances.

Scientists and technologists often have different and complementary research interests and objectives, typically leading to scientists being authors of science papers and technologists/engineers being authors of technical papers. The decision to include scientists as authors of technical papers, or vice-versa, should be made by the team transparently, and is situation dependent or, in some cases, based on established practices by a particular research community.

For example, a person who set up a laboratory initially or secured funding for the research, but did not subsequently design, consult on, or conduct an experiment which is the object of a later paper, may not have made a substantial contribution to the actual research being reported, and therefore may not warrant co-authorship. However, if the person set up a laboratory (or specially designed equipment) that has some specialized capabilities or intellectual property that would otherwise prevent the data from being obtained elsewhere or by any other means, then this may be a substantial contribution deserving co-authorship. In such cases, when the contribution has not been previously or contemporaneously published and therefore cannot be cited, it may be argued that the first, or first few, publications resulting from the work should include the person who set up the laboratory initially, but subsequent papers utilizing the laboratory's specialized capabilities may only refer to the prior publications and/or recognize the person responsible for the laboratory set-up with an acknowledgment.

As another example, when a specialist at one of NASA's large material characterization facilities spent hours guiding scientists through the sample analysis and is likely to help enhance the science returned from the analysis, and it may be appropriate to invite that person to co-author the resulting publications.

As another example, the author(s) of software modeling code that provides advanced simulation capability enabling new scientific data analysis and interpretation can make a substantial contribution to a number of papers led by specialists in process studies or other disciplines, particularly at the stage when the software modeling code is still being developed to allow those processes to be simulated with increased fidelity. On the other hand, once a model becomes an established tool, it might be more appropriate to recognize the original author(s) with an acknowledgement or a reference.

Science papers that contain extensive technical description, whose scope is not limited to the science investigation, should have authors that represent all the aspects discussed, making sure that all co-authors have read the paper and approve of the description and discussion of their specific contribution. Some scientific communities have long-established rules governing authorship practices, ranging from being inclusive to selective. Technical and engineering research communities tend to be more inclusive. JPL encourages the publication of at least one paper that describes the complete implementation of a flight project (including engineering aspects) co-authored by all who contributed, separate from publications focused on scientific results obtained by such project.

The standard for substantial contribution is not met by a person who is solely a) the author's manager (either in the line organization or in a program office or the advisor of a postdoc) without being a consultant or participating in the work, or b) the task manager/PI of the research grant(s) that provided funding support to the author, without being a participant in the research described in the paper, or c) sympathetic to the results and wants to "endorse" the work. Contributions are typically conception and development of ideas, collection of data sets, design of experiments, lab setups (along with other contributions described above), conducting experiments, writing computer codes, data analysis, interpretation of data, writing the paper if involved in the generation of content, and providing materials and/or advice and/or feedback that alter the interpretation of data and conclusions. What makes the above substantial is the level of novelty and originality that constitutes improvement over state of the art and warrants writing a paper.

In particular, students and postdoctoral researchers who contribute important ideas and even software and hardware developments should be appropriately recognized with authorship.

3a. Authorship of Institutional Presentations

The above guidelines should be adhered to for publications (refereed or not, conference proceedings, reports, etc), and presentations that imply intellectual ownership of its original contents (conference presentations, project meetings, etc). However, for certain presentations within JPL, NASA or at programmatic venues when high-level information is summarized, there are accepted practices in which variances may occur. For example, in presentations made in connection with management's institutional duties (e.g., by a Project Manager, a Directorate Program Manager, etc.), it is sometimes impractical to accurately and completely credit all contributors to the original contents. It is understood in such cases that management is not claiming intellectual ownership. Management is encouraged nevertheless to strive to give appropriate credit as feasible, recognizing that visibility of the researchers' work is beneficial to their career and the long-term success of JPL.

4a. Authorship of Media Releases

JPL has a well-developed policy for release of news and information, which clearly states that interactions of JPL researchers with the media on JPL related issues are to be coordinated with JPL's Media Relations Office. A JPL media representative writes the first draft of a media release, working in concert with the author(s). The text is then submitted for review and approval by the author's line management or the Project/Program office, and is then reviewed by the JPL Media Relations Office, before being sent to NASA HQ for review and approval by Program executives and the NASA Communications Office. If any substantial changes are made to the release during the approval steps, the release is returned to the author(s) for review to ensure that no errors have been introduced. Information on the NASA policy on news and media information releases can be found on http://www.nasa.gov/audience/formedia/features/communication_policy.html.

There is no specific JPL policy addressing ethical issues relevant to media releases (including press and news releases), and the principles related to research integrity, authorship and sharing of credit that apply to refereed publications also apply to releases. This can be facilitated by the fact that, in most cases, a JPL release is based on a submitted or accepted journal article. A news release (or in some cases, a feature story) is a short document (one to two pages) that does not take the place of the journal article and does not attempt to repeat all of the same information. Instead, a news release presents key points of the study/paper and provides a reference to the journal name and publication date so that readers, including those who are science-savvy, may refer to the source document for more detailed information. News releases and press releases are meant to make the information understandable and relevant to the public at large and to the news and information media.

It is customary practice to quote or mention the first author and/or the principal investigator of a research study in a media release. Additional co-authors may also be quoted.

Researchers whose results are based on data from a JPL flight project should be aware that the project should have a Communications Plan which, for major projects, is a document signed by NASA Headquarters. This may be a useful guide to help researchers understand the public affairs process in more detail. Typically a project and its media representative will develop a few lines of boiler plate materials which may be incorporated into the news releases, containing a general acknowledgment of the project's major contributors.

b. Research Reporting

1b. Good scholarship

Authors should strive for accuracy and truth in reporting their findings. Ideally, good publications report original results and describe the methodology and the

logic used for obtaining them with sufficient clarity to allow others to reproduce them, at least in principle. The findings should be of archival value, and represent an advancement of human knowledge. Experiment data and other records upon which openly published results depend ought to be preserved and be available to other scientists/engineers for some period of time, consistent with good safeguarding of project data. For research supported by taxpayers, the public has a right to access the products.

While good faith errors are not preventable, researchers should strive to minimize chances of erroneous research by adhering to accepted scientific methods, and by doing due diligence. Beyond honest errors are mistakes due to negligence, which include mistakes caused by carelessness, haste and inattention, often resulting in aggrandizement of one's own work.

Errors and negligence are distinguished from research misconduct (falsification, fabrication or plagiarism) in that research misconduct requires intent to deceive whereas honest errors and negligence are unintentional. While error and negligence may not rise to the level of research misconduct, producing research that is erroneous or the result of negligence can place the researcher's reputation, JPL's reputation and the public's confidence in JPL's scientific work product at risk.

2b. Duplicative Publication and Self-Plagiarism

Authors should avoid the practice of duplicative publication, i.e. publishing papers that contain only minimal advances or new results from journal articles or conference proceedings by the same authors. The definition of a duplicative publication is subjective, but one measure is for the authors to ask themselves whether the journal that accepted a previous related paper would accept the new paper as an original contribution.

Self-plagiarism, i.e., the intentional extensive verbatim reuse of previously written materials or figures to generate duplicative publications, is a questionable research practice that impacts the integrity of one's scientific record, and reflects poorly on one's institution and oneself. Researchers should take great care when reusing material from previous publications to ensure that it represents generic descriptive text that is invariant from one publication to the next; that is required in order to present the context of new results; and that was originally written with the author's participation. Examples would be description of an experiment, a laboratory setup, an instrument or spacecraft. Excerpted text referring to analysis, results and conclusions and previously-published figures, should be called out with a reference and clear indication that a paragraph or section came from elsewhere. In addition, reusing previously published figures without proper attribution may give the incorrect impression that the results are new, and may reflect poorly on the researcher's reputation as an attempt to inflate their resumes with additional papers. In all cases, the author should understand and follow any copyright rules surrounding appropriate re-use of published material.

For questions on labeling reused figures and/or other copyrighted materials JPL employees should contact Document Review Services.

Some authors rationalize self-plagiarism by reasoning that different journals have different audiences, and the proceedings or article would be of interest to more than one audience. However, different audiences with different interests typically would warrant different emphases and therefore different papers. Self-plagiarism may be acceptable when, for example, an article is translated for an additional audience. In the case where the same paper is presented, both publishers should be aware and agree to the duplicative publication, the second version should refer to the first, and the authors should indicate that the papers are the same on their CVs and other lists of publications.

3b. Website publications

In recent years, new forms of website publications have been introduced, which rely on their own review system that may depart from the classical peer-review process generally applied by scientific and technical journals.
Some issues inherent to this means of communication are addressed, for example, in the following articles:

Arms W. (2006) "Ethics: Trust and Reputation on the Web," *Nature* doi:10.1038/nature05035.
http://www.nature.com/nature/peerreview/debate/nature05035.html

Clarke, M. (2009) "Ethics of Science Communication on the Web," *Ethics Sci Environ Polit*, doi: 10.3354/esep00096.
http://www.int-res.com/articles/esep2009/9/journalism/e009pp2.pdf

The release of scientific results such as space mission observations through dedicated scientific websites in the form of preprints is a recent practice that can take different forms: use of archival systems such as *arxiv*, preprint publications on personal websites, presentation of unpublished scientific material in personal blogs or in response to discussions and questions initiated in public websites about space exploration, etc.

As basic guidelines, authors should apply the same standards of good scholarship to website publications as those required for traditional publications, should designate the materials peer-reviewed or not, and should pay particular attention to copyright issues that might arise when a publication published in a journal is considered for upload to a website archive as well. In particular, the author must be aware of the following: (i) journals may require that the author certify that the publication has not been "published" anywhere else- posting on a website prior to journal publication is not consistent with that certification, (ii) JPL typically assigns copyright to a journal for publication, so posting to websites may not be consistent with the copyright assignment, (iii) some journals may allow posting to web pages, but place a moratorium on posting until the journal has

published, (iv) if the copyright was released to the journal's publisher, then the version of the article in the website publication must be different from the version that is delivered by the journal. Authors may contact JPL Document Review Services with questions.

New scientific results or space mission observations should be disseminated by use of official mission websites. Subsequent review articles of a given topic for publication and information posted online should include as many references as appropriate for any reader to check the nature of the data or results displayed in the review, and entries releasing JPL-generated scientific information are subject to the release of scientific and technical information process. Entries should not include new results that have not been subject to prior peer-review.

c. References

Authors should reference appropriately and thoroughly all previously published work, including information received verbally or privately, that impacts the work described in their manuscript. Authors should consider whether their references meet the standards of good scholarship. For example, is the historical record accurate? Does the reader have enough information to pursue theories, methodologies, analysis and conclusions invoked in the work? Poor referencing, even when there is no deliberate intent to appropriate someone else's work, can lead to the perception of plagiarism and be damaging to the reputations of both the author and JPL.

References to sources of data, images, laboratory or other facilities, and websites should also be included, as appropriate. One frequently asked question is how long after original publication work should continue to be referenced. While nobody explicitly references Maxwell, one should strive to reference impactful papers that have affected a field so profoundly that without them the work reported in the manuscript might not be possible.

Authorizations should be requested before referring to personal communications in articles, especially if the information was exchanged in oral form (e.g., in a meeting), to ensure that the quotation truly reflects the author's point of view.

By the same token, JPL researchers should clearly tell external collaborators when there is an expectation that JPL should be acknowledged even though the JPL researcher themselves turn out not to be a co-author, as part of the appropriate communications in a collaboration.

d. Acknowledgements

In addition to the funding sources, it is appropriate to acknowledge contributions limited in scope but relevant to the manuscript such as helpful discussions and suggestions, especially supportive individuals (managers, reviewers, etc.), use of laboratory equipment, computer codes, etc. Contributions that are technical in nature but deemed not sufficiently original to grant authorship (routine computer

programming, data manipulation, laboratory technician's assistance) should be acknowledged. When the acknowledgments include an individual at an institution other than the senior author's, the individual's institution should be included in the acknowledgments as well.

e. Permissions
Authors should avoid using others' proprietary information in manuscripts without obtaining prior approval from the owners. When publications involve authors from multiple organizations, special care should be exercised to make sure that agreements on publication rights are adhered to.

f. Copyrighted Materials
Authors should not use materials subject to copyright such as published figures and data, ideas and designs, etc. without obtaining permission from the copyright owner.

g. Resolving Disputes
Authorship should be a consensual activity, and researchers should decline to be co-authors of papers reporting research they do not agree with. As a consequence of conflicts, some researchers might discover that they have been excluded from a publication to which they made a contribution, or included against their will. These issues can be addressed in a number of ways, including discussing them with management, the Ethics Office, the Office of the Chief Scientist, or writing to the Journal Editor. The researcher's supervisor might be the first contact, or the Caltech Hotline by telephone or online for total confidentiality (https://hotline.caltech.edu/).

While there is no unique path to adjudication, project and line management have the responsibility to hear the concerns and address them appropriately. Project Managers, Project Element Managers, Task Managers/Leads, and PIs should be cognizant of the roles, responsibilities and actual contributions of members of their teams, and they can weigh in to help resolve disputes. Division/Section managers and Group Supervisors, if not cognizant themselves of such contributions, should identify the relevant Project or Task Manager and work as a team to arrive at an acceptable resolution. A reasonable effort should be made to resolve the dispute at the level closest to the individuals involved before escalating to upper management or the Office of The Chief Scientist.

In dealing with situations of conflict it is important to maintain a professional and respectful demeanor, using civility throughout the resolution process.

III. Reviewing
Serving as reviewers on proposals, papers, and other items where original confidential materials are presented is a privilege that speaks to someone's good professional reputation. A reviewer should respect that confidentiality by not disseminating any information outside of the review process, and not take

advantage of confidential information acquired as a reviewer to advance somebody else's interests. Researchers should disclose all possible conflicts of interest and recuse themselves from reviewing anything when they cannot understand the contents or remain impartial and discreet. Recusals should be honored by those requesting assistance from prospective reviewers.

IV. Research in a flight project environment

JPL projects generally produce large quantities of data, as they address previously uninvestigated scientific questions. Of particular interest here are the ethical responsibilities of the project and/or instrument science teams who may have privileged day-to-day access to the project databases. These groups of scientists, referred to below as the Science Team (ST), may also have proprietary or guaranteed access to certain data.

The general ethical principles that apply to all research are, of course, applicable to other JPL scientists who are drawing data from the Planetary Data System (PDS) or other mission-specific archives. These principles apply to the ST as well; however, the ST faces a number of challenges specific to the project environment, including the following: firstly, large numbers of scientists may be involved in a particular team and deserve acknowledgment for or co-authorship of some or all of the results. Secondly, the scientific output of the mission may be enhanced in key areas by combining results from several instruments in one or more publications. Thirdly, there will be intense public and scientific interest in many of the results obtained by the mission. This will clearly apply to the initial data or Early Release Observations, but of course may occur later in the mission as results are synthesized or discoveries, such as the Enceladus geysers, are made serendipitously. Fourthly, some scientists may have devoted the bulk of their careers to a particular mission, while others may have joined the ST late in the mission or even after launch, which often occurs as the quality and quantity of the mission data become more obvious. Finally, scientists not previously associated with the mission may wish to collaborate or pool results with the ST; these opportunities often come up in advance of the launch.

Because each project has its own issues and constraints, it is not possible to produce general guidelines that are applicable to all projects and instruments. Instead, a well-managed project or instrument should develop a set of guidelines or policies, frequently called "The Rules of the Road" (RoR), to define how the ST addresses challenges such as those described above in publications, presentations, seminars, etc. The length, scope and level of detail of such plans vary, but all have in common that they are consistent with the general ethical principles applicable to all research. In fact, these RoR should be thought of as assuring that those principles are adhered to in the face of the unique pressures and opportunities of the project environment. It is the responsibility of the scientific leadership of a project or instrument team to see that such a set of RoR is in place well before launch, and to make certain that all members of the ST – including late comers and collaborators - are aware of them. Once the RoR are

adopted and agreed to, it becomes an ethical responsibility of JPL researchers to abide by them. Examples of RoR or related documents from previous missions are available from the Project Support Office if newly formed project teams wish to consult them. Even the best-crafted RoR cannot anticipate all contingencies; however, the RoR at the very least will establish a framework and process for dealing with unanticipated turns of events.

The foregoing is intended to apply to the external release of scientific information, either through publication or through presentation. Project internal reports (reports to NASA Headquarters, or reports to document project work, or workshops sponsored by the project) are generally not published in the peer-reviewed literature. However, project internal reports should adhere to the same standards of attribution as is done for peer-reviewed literature for the same reasons – to give credit where credit is due, to ensure that previous work is traceable, and to preserve an accurate record of the origin of important ideas relevant to project work.

In addition to, and separate from, scientific results, many aspects of the engineering implementation and technological developments are original and worthy of publication. Flight project leadership should encourage such publications, for the same reasons discussed above.

V. Intellectual property, intellectual contributions and related issues

Intellectual property (IP) refers to a creation of the mind and the legal aspects of ownership and use of such. IP has a specific legal definition (please consult the applicable JPL policy for additional information). However, intellectual contributions including ideas, analysis and conclusions, designs and implementations, etc. may exist irrespective of whether there are actual copyrights, patents or trademarks. The following sections of the guidelines address these latter aspects.

a. Intellectual contributions in collaborations

A number of informal technical and scientific exchanges occur on a daily basis where ideas or insights are offered that might enable significant progress and problem solving. Researchers should be respectful of the helpful contributions that are received from colleagues, even those who are not formally involved in their research projects, and acknowledge the contribution appropriately, even with authorship when warranted.

Researchers should be mindful that certain information, results, tools and equipment they access might be somebody's intellectual property and give appropriate credit and respect for the work.

b. Intellectual contributions in proposals

Proposals should call out and give appropriate credit to each contributor. For proposals generated by JPL and non-JPL contributors, a distinction should be

noted as to what intellectual contributions is considered the JPL contribution and what is non-JPL. If not specifically called out, it should be considered joint (which may be the case much of the time).

At JPL researchers write many different types of proposals. On one hand, there are proposals for small research awards driven by ideas from individuals or small teams, while on the other hand there are large proposals (such as flight instruments and missions) with considerable investment by our institution. The assumptions on intellectual ownership of materials developed in the proposals are very different depending on the category. In all cases members of proposal teams ought to be free from conflict (i.e., not engaged in competing proposals without explicit disclosure, and monitored firewall conditions when appropriate).

Small research proposals are self-started and largely self-organized, where collaborative agreements are made between the principal investigator and a (small) number of co-investigators, based on their relative intellectual contributions. Generally, the investigators feel a personal investment and ownership.

Proposals for JPL internal investment funds that are part of Research and Technology Development (R&TD) Strategic Initiatives are in a special category. These tasks are identified by a Program Directorate as being needed to fill a technology gap, in preparation for a mission or program opportunity. Often the Principal Investigator is assigned by the Directorate to implement a task that might have been developed by a group of people, and might change over time. The intellectual ownership is in some cases transferred among individuals who are brought together to perform an institutional duty.

Large competitive proposals are driven by the strategic interests of the Laboratory, and are subject to a high level of organization and scrutiny in their preparation. In many cases they involve teams from different institutions, and JPL might negotiate agreements with them regarding their specific contributions. In these cases the participating investigators agree to play a role that is consistent with what the Laboratory is requiring of them, adhering to agreements on specific developments, communication or disclosure of information.

In both (of the last two) cases the use of any research materials produced by a participant in the course of this work for JPL is mediated by programmatic and line management to ensure that JPL can write a successful proposal. Although this does not condone disregard for anybody’s original intellectual contributions, researchers involved in such proposals should expect that decisions by management might affect what is ultimately approved for submission.

VI – Author Certification of Compliance with JPL Research Ethics

In order to help the authors clarify some basic rules, the following check list has been added to the Unlimited Release System https://unlimitedrelease.jpl.nasa.gov/unlimitedrelease.html, JPL's Document Review Services site for document clearance submittal.

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I certify, to the best of my knowledge, that:

1. No ethics rules were violated in the conduct of this research.
2. Each author has made a substantial contribution to the work described in this document, and no person who has done so has been excluded.
3. If this is a publication*, all authors have had the opportunity to review this document; among them, there are no irreconcilable disagreements with any substantive aspect of the research described in this document.
4. If this is a publication, this document describes significant new work, and is not merely a small modification to work that has already been published.
5. If this is a publication including previously published copyrighted information, permission has been obtained for republication, or is in the process of being obtained.

Please note:

If you are the *lead author*, checking the box indicates that the five ethics rules have been observed in the document.

If you are a *co-author*, checking the box acknowledges that you have made a reasonable attempt to verify that the five rules have been followed.

If you CANNOT in good conscience check the box, do not proceed with this URS submission. If there is a potential ethics issue, discuss it with your direct supervisor. If you are able to resolve the issue, you can submit a new URS request for clearance to release this document.

*Examples: a journal article; a refereed paper in a conference proceedings; a published report; and a book/book chapter.

It is hoped that authors adhere to the spirit of the above rules at all times in the conduct of their research.

Appendix

Websites for Additional Resources

Society of Photo-Optical Instrumentation Engineers (SPIE)
Use this link as a start: http://spie.org/x14098.xml

American Geophysical Union (http://publications.agu.org/author-resource-center/publication-policies/) --
➔ Partial information in comparison to, e.g., Nature or ACS

Caltech - Intellectual Property and Research Ethics for Graduate Students (Portal)
http://libguides.caltech.edu/content.php?pid=49560&sid=364218
➔ Oriented almost only on copyright and patents questions

Author and Reviewer Resource Center
American Chemical Society (Reprinted [in part] with permission from "Ethical Guidelines to Publication of Chemical Research," Chem. Rev. 2001, 101, p. 13A–15A. Copyright 1985, 1989, 1995, 2001 American Chemical Society.) (http://pubs.acs.org/instruct/ethic.html)
➔ That link actually leads to another one (http://pubs.acs.org/page/4authors/submission/index.html), which is not directly relevant to ethics
Direct access to the ACS ethics website is available from http://www.onlineethics.org/

American Physical Society (http://www.aps.org/policy/statements/02_2.cfm)
➔ Directly accessible from http://www.onlineethics.org/

IEEE
http://www.ieee.org/web/publications/rights/Plagiarism_Guidelines_Intro.html
➔ Directly accessible from http://www.onlineethics.org/

Articles on Specific Issues

Nature article about the handling of research misconduct
http://www.nature.com/nature/journal/v453/n7198/full/453957a.html

Articles about science and publications ethics
http://pubs.acs.org/cen/topstory/7946/7946sci1.html

http://www.its.caltech.edu/%7Edg/conduct_art.html

AAAS – Strategies for Competitiveness in Academic Research (edited by Scott Hauger and Cecilia McEnaney, 2000)

How to Handle Authorship Disputes: A Guide For New Researchers, by T. Albert and E. Wager, The Cope Report 2003.
http://publicationethics.org/files/2003pdf12_0.pdf