A Review of Publication Policies from Missions and Projects in Astronomy and Related Fields

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ABSTRACT

Modern science is a communal affair, with researchers joining into groups of all sizes for a single project or perhaps a career-long endeavor. Each field has its own standards and norms of practice, driven by history and funding patterns. Astronomers, broadly defined here to include astrophysicists, planetary scientists, heliophysicists, and physicists involved in astronomy, have an extremely long history and an eclectic funding pattern that includes private donors, government grants, and multi-national funding.

The goal of this review is to give collaborations some guidance about how to develop a set of effective and fair collaboration policies. With little fanfare, astronomy has moved from an individual or small-group exercise into one where even individual studies may involve a dozen people and any new facility requires far larger collaborations. However, the idea that group of scientists might benefit from an *a priori* agreement about authorship of papers and other leadership roles is still relatively new. Hopefully, the themes, approaches, and sample language that have been extracted from these policies will be of use to astronomers in groups of all sizes. The appendix contains copies of all of the publication policies that were made publicly available, along with an Excel spreadsheet that contains extracts from all of them.

Introduction

The policies that govern astronomical research Facilities, Missions, and Projects (FMPs) are not standardized, and there are no pre-set requirements from the major US funding agencies. A comparison of existing policies shows that a number of common issues confronting FMPs can be categorized, along with a range of solutions. Although there is no standard, the term "publication policies" is meant to cover any rules governing papers (including conference proceedings, press releases and related documents) that are based on the FMP's work, including which data may be used, who can and cannot be a co-author, how papers are reviewed pre-submission, and similar topics. This document reviews 18 written policies, together with input from 9 other FMPs.

The need for publication policies is not appreciated by all researchers. Any fixed policy, written or not, introduces delay and reduces flexibility in the process of communicating scientific results. It could even be argued that 'rules' of proper scientific behavior exist that make formal policies unnecessary. Ultimately, though, no

agreed-upon set of unwritten rules exist that apply in the same degree to all people. Uniform rules empower those with less actual, apparent, or implied seniority to put forward their ideas using a well-advertised process rather than an ill-understood, unwritten system. An ideal collaboration of N people aims to achieve productivity scaling as N^2, as each member helps and is helped by every other member. This can only be achieved when there is trust in the team. Even with modest delays for review and approval prior to publication, an N^2 system will outrace N separate individuals every time. Thus uniform, written publication policies benefit all, both within and beyond a research community.

Gathering Data from Various FMPs

This project began with a web search for information from a range of FMPs known to the author, followed up with emails to the leads. The AAS's Strategic Assembly — a group consisting of the AAS leadership and the Division Chairs — was then asked to suggest additional FMPs to contact. Finally, an invited article was posted on the Women in Astronomy blog[1]. In all cases, the questions focused on publications, both formal and informal (*e.g.* conference presentations):

1. What is the approval process for a paper to be published (or for a project to be started) based on data from the project?
2. What is the process for someone to be appointed as lead for a specific topic?
3. If the data are proprietary, who has access?
   1. Do all post-docs and grad students of a team member have access?
   2. What about post-graduation or post-docs who move on?
   3. Can relevant researchers external to the core FMP team be involved in specific one-off projects?
4. Which team members are expected to be listed as co-authors, and in what order?
5. What is the decision and approval process for conference talks/presentations?
6. What are the rules regarding dissemination of results to the press or public?
7. What are the enforcement mechanisms for all of the above?
   1. Who decides what a violation is?
   2. What penalties exist?
   3. Have these mechanisms ever been invoked?

Eighteen documents were compiled from this effort, with nine FMP leads providing oral or email input but not formal written documentation. An overview of the eighteen FMPs is shown in Table 1. The team sizes (estimated in some cases) range from ~25

scientists up to 3000. The leadership of smaller FMPs tends to lie with the Principal Investigators (PIs) and converts to a board as efforts become multi-institutional or multinational.

The documents are not lengthy, typically ~10 pages, and they are written for scientists, not lawyers. Smaller teams often have one document to cover all issues, while larger FMPs may have a range of documentation covering membership and requirements, data rights, publication rights, and enforcement. In some cases, the heritage of these policy documents is clear. For example, the "Atacama Cosmology Telescope (*ACT*) Publication and Management Policy" document notes that it was adapted from the *WMAP* policy (see Acronyms), which in turn was adapted from *COBE*. Other documents were independently generated by the PI and contain *sui generis* information, such as the *ICE-FiveO* team's document, which includes (fascinating!) information about the ownership status of materials mined on the Moon. There was no pattern to those FMPs without written documentation. In some cases, any relevant information was created long ago and no longer easily available (*e.g.*, the *Chandra* ACIS and HRC instrument teams, and the *Swift* mission), or is still being developed (*e.g., XRISM*, *IXPE*, *SphereX*). In others, even a large observatory such as *SKA* had no information (yet) publicly available.

Table 1: Basic Parameters of Missions/Projects/Observatories with Relevant Written Policies

Table 1							
FMP	Team Size	Funding	Lead	Data Release Policy	Release Time (yr)	Policy Document Title	Length (Pages)
ACT	100	NSF	Board	Limited-term	4	Publication and Management Policy	4
ATLAS	3000	CERN	Board	Private	N/A	Publication Policy (v7.7)	14

CLASH	60	HST/NASA	PI	Limited-term	1	Collaboration and Publication Policy	2
CMB-S4	157	Consortium	Board	Limited-term	TBD	Science Collaboration Bylaws	34
COBE	1000	NASA	PI	Limited-term	1	Scientific Publication Policy	14
CTA	1500	Consortium	Board	Limited-term	unstated	Consortium Publications Policies	15
EHT	800	Consortium	Board	Limited-term	Varies	Data Access, Analysis, and Publication Policy	9
eRosita	1000	MPE	PI	Limited-term	1	Collaboration/Publication Policy	3
ICE-FiveO	25	SSERVI/ NASA	PI	N/A	N/A	Code of Conduct	12
LIGO	3000	NSF	Board	Partially Open	0	Publication and Presentation Policy	9
LSST	500	NSF/DOE/ Private	Director	Open	0	Project Publication Policy (v1.2)	12

Mars2020	500	NASA	Multiple PIs	Limited-term	TBD	Science Team Guidelines	12
MWA	200	Consortium	Board	Limited-term	1.5	Publication Policy (v2.2)	22
NuSTAR	100	NASA	PI	Limited-term	2	Collaboration and Data Policy	14
OSSOS	30	CFHT	PI	Limited-term	1.1	Collaborational Agreement	5
SDSS	300	Consortium	Board	Limited-term	1.2	Publication Policy	12
SPT	100	NSF	Board	Limited-term	1	Not available as memo but exists; "Code of Conduct" is written.	2
SWEAP	100	SPP/NASA	PI	Limited-term	~0.3	Science Rules of the Road	4

Key Policy Elements

Reviewing the policies and other responses to the solicited questions showed seven common issues, with a range of approaches to resolution:

1. Who has access to the data needed to write a paper?
2. How does one announce the start of a project using the data?
3. Who, if anyone, **must** be a co-author, and who **can** be a co-author on a paper?
4. How can new authors be added?
5. Who determines when a paper is ready for submission?

6. What, if any, rules govern talks and conference proceedings?

7. What methods exist to adjudicate disputes and to enforce these rules?

Some topics from the original request, such as rules or recommendations regarding talking to the press or public, were inconsistently covered. Additionally, each of the seven common issues had nuances and usually included some method to ask for exemptions or modifications to the rules. Therefore, most documents also describe a panel or a person responsible for setting new policies when needed and deciding on special cases.

Data Access

Data access derives from FMP membership. For a number of FMPs (*e.g., ATLAS*, *SDSS*, *Mars2020*, *SPT*, *SPP/SWEAP*) this rule completely describes the situation. Many FMPs, however, give students (undergrads, grad students, and in some cases post-docs and research associates) only limited-term memberships, good as long as they remain at the same school or associated with a researcher who is a full member. For individual scientific projects, most FMPs have some method to allow members to grant external collaborators access to a specific data set; this is done on a case-by-case basis with approval by the PI or other delegated board members.

These limitations arise because access to data usually provides the leverage by which FMP leaders enforce publication and all other rules of the project. In general, however, data access rights are set by the group funding the work and not by the leaders themselves. By policy, groups funded entirely by U.S. agencies (*e.g.,* NASA, NSF, and DOE) will always make their data public eventually, typically after a delay of ~1 year to allow time to calibrate and publish initial results. In other cases, the delay is set by some physical property – *SPP/SWEAP* data are limited to the team only for the length of one solar orbit, typically ~4 months. In other FMPs, data may come in different categories; *MWA* has longer retention times for Epoch of Recombination observations, for example. Large international collaborations such as CERN's *ATLAS* can have raw data so complex that they are essentially never released, as a non-project-member would be hard-pressed to analyze it, although some processed data may be. *LIGO* is in a similar situation; the team makes some data (alerts) available immediately while the full data stream is released at some later point.

Some FMPs make their data public immediately (*TESS*, *Swift*, *LSST*) but still have rules for publications by team members. Leverage to enforce these may derive from funding; *LSST's* publication policy, for example, only applies to those funded by *LSST*.

If the data are public and the scientist team members are contributing their time, the project leaders have far less leverage to enforce rules regarding publication or even which projects must be completed. Even so, access to internal information about calibration, software, and other aspects of the collaboration (including simple goodwill) may be enough to inspire members to follow the rules.

Starting a Project/Paper

To avoid duplicating work, every FMP has to have some method of organizing scientific efforts. In most cases, one or more team members alerts the relevant Working Group (WG, a common organizational unit), the publication board, or the entire team that they intend to begin working on a specific project. Typically, this involves a brief description of the project, a list of co-authors, and the data or types of data that will be used. This may require permission from a WG chair, and may also require approval from the PI, publication board, or other body. Usually, approved projects are posted on an internal website or spreadsheet for the entire team to see.

EHT, uniquely, defined a special class of "Protected Student Projects" where a student and supervisor could define a specific area of research – one that is not a major *EHT* goal, as these are treated separately – and be guaranteed at least one year to develop the idea and lead any resulting publication. The time could be extended to a maximum of two years, and while other team members could join the effort, the student was ensured primary authorship.

In a few cases, projects did not have an explicit requirement for pre-approving publications. *NuSTAR*, for example, had the WG chairs assign specific observations to team members to analyze and publish; other papers could be proposed by team members to their WG chair to then assign, but this is not specifically called out. *LSST*, with an open data policy, also does not require pre-approval. *SPT* does not list any procedure to start a project in its Code of Conduct but may have such a policy.

Co-Authorship

An example from particle physics, the CERN *ATLAS* collaboration's publication policy document, demonstrates one approach commonly used by large projects in the physics community. The *ATLAS* document notes that all formal *ATLAS* publications will include all current members of the team (~3000 scientists) as co-authors. The definition of what constitutes an *ATLAS* publication is broad, covering essentially all scientific results using *ATLAS* data. Conference proceedings are similar, but for brevity attribute authorship to the *ATLAS* Collaboration. Specific technical publications or public notes,

e.g. about individual instrumentation in the *ATLAS* detector, are the only exceptions from this general approach. A Publication Committee sets policy and evaluates exceptional cases as requested.

Although not specifically studied, the *ATLAS* approach seems to be standard for most particle physics projects of any size. Of the 17 other FMPs considered here, this approach has been followed only by *LIGO*, which is itself both a physics experiment and an astronomical observatory.

Most authorship policies note that manuscripts must conform to standard research journal rules, specifically the common requirement that every co-author must have contributed to the results described in the paper. However, in no case is this seen as an impediment, as all consider membership in the FMP to imply effort towards all research done by the FMP. Some policies (e.g. *CLASH*, *SWEAP*) do set a minimum standard for co-authorship, *e.g.,* that the member has read the paper carefully and provided detailed comments as appropriate.

One common approach is to define different types of papers. *CTA* defines four classes: "Consortium", "Technical", "Non-Consortium", and "non-refereed," with distinct rules for each, while *NuSTAR* defines some papers to be "key," again with separate rules. *EHT* defines "Collaboration", "Official, and "Related" categories. In general, papers with the broadest classification (*e.g.* "Consortium" or "Collaboration") include all team members as authors, with a range of choices as to ordering. In some cases, there is an opt-out clause if a member does not want to be listed. Other paper categories have more relaxed rules.

Another common approach is to define a special class of team members. The name of this group varies; "Architects", "Builders", or "Core Team" have all been used. These team members have special authorship rights based on their contributions to the FMP. This may mean they can request to be added as a co-author to any paper, must be added to all papers of a certain type, or even must be included on all papers.

Many FMPs, especially those with multiple largely distinct science goals, subdivide the science team into Working Groups (WGs), each led by a WG chair. Often the WG chair has responsibility for all papers developed by the WG, and is automatically added as a co-author to any paper from the WG. In some cases, the "Core" team is automatically added to the first paper from each WG, but not thereafter.

Finally, a number of FMPs (*e.g. CTA, eRosita, MWA*) have relatively open policies stating that any member may request co-authorship, with the request's justification evaluated by the first author or a publication board. In this case, the first author may select a small number (3-5) of co-authors to be listed first, followed by all other requested names, usually in alphabetical order.

Adding External Co-Authors or New Members

Most FMPs have some way to add external members to an individual paper or project, along with a process to add new members to the team. Adding a person to one specific project always requires approval from a publication board or the PI, depending upon the size of the team. Inclusion on the project usually lasts for only one paper and requires that the person abide by the team's restrictions on publications and data release.

Becoming a full member usually requires the consent of the PI or the leadership board, and, in at least one case (*MWA*), the unanimous vote of a group of senior members. FMPs that are funded by multiple institutions or nations usually have a direct connection between funding and membership (essentially a 'pay to play' system), taking control out of the hands of the individual members themselves.

Team members often continue their status as long as they remain involved in the project. The requirements may be specifically listed: "attend one telecon per quarter," "make progress on tasks assigned by WG chair," "attend one group meeting per year." However, not all FMPs track involvement or explicitly list rules for retaining membership. In other situations, membership is associated with a specific institution or senior team member, and if the person leaves, their membership is terminated. In some cases, an "associate" membership can be offered to such people upon application, with the decision left to the PI or a managing board.

The status of students varies widely. Many policies emphasize that students (including post-docs and even untenured faculty) should be given opportunities to lead papers and give talks. They may be considered team members, but of a special class with different rights (*e.g. MWA, NuSTAR*). For example, they may not be allowed to initiate projects or request co-authorship on papers except via their supervisor. Students who graduate or otherwise leave their institution may or may not retain data rights; they may have access to all the data or none, or only access to that which they have already used.

Submitting a Paper

All FMPs had policies regarding paper submission, even if they had no requirements on declaring papers in advance. These ranged from distributing the paper to the team at least two weeks before submission to a formal internal review process overseen by a publication board.

In the most formal systems (*e.g. LIGO, CMB-S4, ATLAS*), , papers may not be submitted until all issues from internal reviewers had been addressed and the publication board, PI, or relevant WG chair had signed off. In most other FMPs, only the PI or publication board had to agree, and, in at least one case (*OSSOS*), the board could only withhold approval if the paper covered topics outside of its WG charter. *eRosita* and *OSSOS* had explicit exemptions for "rapid response" papers on transient or high-visibility topics.

Conferences, Talks, and Public Outreach

The treatment of conferences and talks varies widely amongst the different policies. The most restrictive expect invitations to be forwarded to a central board, who may agree or may ask for another person from the team to give the talk (*e.g., LIGO, CMB-S4*). In this case, the central board also requests invited talks from the organizers of major conferences. In other cases (*e.g., ATLAS, eRosita*), conference presentations are treated as papers, requiring a notification to the publication board or other persons, as well as submission of any slides for approval before the talk is given. In other cases, such as *NuSTAR* and *SDSS*, the policies for approving conference talks and papers were entirely distinct from refereed papers.

Only a few policies explicitly dealt with public outreach to non-scientific audiences such as journalists, elementary or high school students, or the general public. If mentioned at all, policies recommended directing journalists' questions to the PI or a senior body. However, *Ice-FiveO*, a multifaceted project studying lunar composition, did include a one-page basic description of the project that could be used by any member. This included answers to such questions as "who owns material returned from the Moon?" and "is there ice on the Moon?", both of which are commonly asked. The *Mars2020* document included a lengthy set of recommendations and rules for members on social media platforms such as Facebook, Instagram, or Twitter.

Disputes and Enforcement

Almost every policy document listed a procedure for resolving disputes arising from these policies. In PI-led FMPs, disputes were almost universally handled by the PI. The

notable exception here was *COBE*, where disputes went to the Chair of the Science Working Group, not the Mission PI. In board-led FMPs, this role was given to the Director, the Spokesperson, the Management Committee, or, in the case of *OSSOS*, a majority of the Core Team.

Three of the larger FMPs (*CMB-S4, SDSS, SPT*) also defined a role for an Ombudsperson. Typically, this person is responsible for attempting to clarify disagreements or misunderstandings with the hope of resolving problems without invoking a formal dispute process. In one case (*SPT*), however, this person was assigned the role of hearing complaints against the Code of Conduct and making recommendations to the Director and/or Managing Board.

Despite having mechanisms to hear disputes, more than half (10) of the publication policies had no explicit statement of how the resolution of such disputes would be enforced. The minority that did have an enforcement policy limited it to removal from team membership; only a few (*e.g., NuSTAR*, *CMB-S4*) included a range of lesser penalties such as warnings, suspensions, or removal of some data access rights.

Notable Provisions

Although this analysis has focused on commonalities, each policy reflects the particular needs of its FMP. Three examples are highlighted here, from *EHT*, *NuSTAR,* and *CMB-S4*. As a large international collaboration that must work in tight coordination, the *EHT* policy document notes:

> *The scientific analysis of EHT data is recognized as a mission-critical aspect of the EHT project. As a result, analysis and simulation tools, including but not limited to specific procedures, software, and specialized hardware, developed for the EHT project are mission-critical elements analogous to receivers and correlators, and will be managed within the collaboration as such.*

The document continues to state that any analysis software used on *EHT* data must be shared with all members, but with the limitation that it can **only** be used on *EHT* data. Furthermore, even if a member or organization that provided software leaves *EHT*, the *EHT* retains the right to use the last version provided.

The *NuSTAR* document describes liberal rules regarding data access. All core science team members and WG chairs have access to all data, and they are allowed to share it further to other team members as needed. This came with a significant caveat, however, as described here.

> *It is, however, very important that these team members, and those with whom they share data, respect the role of the science working group analysis teams tasked with reducing and publishing specific observations (i.e., not 'scoop' them by analyzing and distributing scientific results separately, even if it is only internally). Doing so will erode the motivation of analysis teams, will demoralize students and postdocs, and will create mistrust and ill feeling within the science team. Violation of this rule will result in revocation of general data access to the SSC member institution.*

In particular this provision includes even **internal** scooping of results. Every policy reviewed here would cover external publication, even informal, but this policy goes beyond that consider the impact on team trust and morale.

Finally, although a number of larger FMPs include a role for Ombudspersons, the CMB-S4 project describes the duties and training of such persons in particular detail:

> *CMB-S4 has two Ombudspersons who are available to members of the Collaboration. The role of the Ombudspersons is to provide informal, confidential, nonjudgmental, impartial, and independent advice and arrange mediation for CMB-S4 members for the purposes of dispute resolution.*
>
> *...*
>
> *The Ombudspersons serve two-year terms, with the option of renewal. Due consideration will be given to the diversity of the candidates when the Ombudspersons are selected. The Ombudspersons will be full members of CMB-S4, with a strong understanding of the organizational structure of the Collaboration. They do not hold any other leadership positions within the Collaboration and report only to the ET. They must become members of the International Ombudsman Association (IOA) and familiarize themselves with the extensive materials available on their website. https://www.ombudsassociation.org*

For a large project with many different types of interactions and a wide range of potential disputes, this approach offers many advantages.

Discussion

The review identified a number of options for each component of a publication policy, but did not discuss how these components would be interpreted in practice. Papers may be separated into different categories (e.g. "Consortium", "Technical", "Non-

Consortium"), but who determines a paper's category, and when is the determination made? The simple answer is that the authors would decide and the definition written so clearly that there can be no misunderstanding. This may not be realistic, however, especially given that English (or whatever language the policy is written in) will not be the first language of every team member. Alternatively, a paper's category could drift in the course of writing. Obviously, there will be a person or board authorized to make final decisions, but it is impractical to involve this mechanism each and every time.

Similar problems could occur when submitting a research project to the FMP. If two people have similar or overlapping ideas, how is precedence determined? Forced mergers will not maintain team harmony, so again the rules and procedures need to be as clear as possible. Team members should be willing to abide by the policy that is seen to be clear and fairly administered, but no policy is self-executing. This also has implications for dispute and enforcement, as blatant disregard of the rules should be rare. More common will be oversights ("I thought someone else had put this into the database.") or misinterpretations of the policy ("I did not think this project was covered."). Ensuring that any consequences in these cases are equitably applied to both students and senior team members will be a challenge for any PI or board. Ultimately, the fundamentals are to provide notice to all and to fairly dispose of each case.

What are "Best Practices"

Determining "best practices" for a publication policy would require evaluating how each FMP's policy worked in practice, how disputes were handled, and how the policy helped or hindered the scientific productivity of the team. This information, of course, is not generally available — disputes only become public knowledge in extreme cases, and as US Supreme Court Justice Oliver Wendell Homes Jr. quoted, "Hard cases make bad law."

Perhaps not coincidentally, some of the best-known cases involve public release of data and its use (or potential use) by non-team-members. Dr. Clark Chapman (SwRI) responded to the blog post on Women in Astronomy to note a few such cases. One occurred when "early *Voyager* images of Galilean satellites were published in a national newspaper and a young scientist, not a member of the *Voyager* team, published a paper based on the newspaper images. The *Voyager* imaging team leader was furious and the young scientist's NASA funding was threatened." The details are not available, but a similar case occurred early in the author's career when the MPE *ROSAT* team published a calendar showing *ROSAT* observations prior to data release

and a paper was written citing the "*ROSAT* calendar" as a source; the *ROSAT* PI was, unsurprisingly, livid.

Dr. Chapman noted another case where "I got official permission to involve an outside scientist to work with me on a narrow scientific problem using mission data, but when the paper — with that scientist as the lead author — was published in *Nature*, the team leader strenuously refused to list it as an official publication of that mission." Finally, there is the well-known case of *COBE*[2], where a serious dispute arose over an unauthorized press conference. This was clearly forbidden by the terms of the policy document, but the document included no provisions for enforcement.

Junior Members

A number of policies emphasized the importance of developing students and junior scientists, up to and including untenured faculty. However, the actual rights of junior members varied considerably. In some cases, membership in the FMP was determined solely by the activity of the scientist, and a student could retain rights through graduation and a series of post-doctoral positions if they continued involvement in the FMP. In others, membership (along with data access and publication rights) lapsed at graduation or the end of a fellowship. As usual, there exist a range of solutions between these two poles.

A similar variety exists in publication and project rights, with some FMPs treating all members equally and others requiring student projects to be specifically sponsored by their advisor. EHT expands upon this latter approach to give students sole rights to a specific project for a period of one year, ensuring they can publish without fear of being 'scooped.' Students and junior members often have substantial duties on FMPs as the developers of new software analysis tools and the leads for calibration work, so ensuring they are given time — admittedly, a cost to the FMP — to write papers and develop their careers seems a useful tradeoff.

Conclusions

This review focused on astrophysical missions, although it could and should be extended to a wider range of ground-based observatories as well as planetary, heliophysics, and Earth-observing teams. In some cases, this limitation was due to the difficulty in getting access to a FMP's policy documents. One general recommendation is that policy documents should be available not just to team members, but to the general public as well. Essentially all astronomy is publicly funded, and, as such, it is hard to justify keeping the rules by which a team operates "secret."

While not allowing any one policy to be declared "best", this review can conclude that a complete policy must include a number of components, and makes some general recommendations about these, as listed in Table 2.

Table 2: Components of a complete publication policy

Table 2		
Topic	Definition	Comments / Notes
Data Access	Who may use data taken or collected by the FMP, and with what restrictions if any.	A wide range of apparently successful policies exist. Some projects make all data available to all, but have limits on its use; calibration use is not the same as scientific results, even if only kept within the team. Other teams break data into categories, often regulated by WG chairs.
Declaring Projects	How an individual team member or subgroup informs the whole team about a new project using the FMP's data.	A formal and well-defined method that publicizes plans to all team members, allows team members to ask to join, and ideally includes tracking of progress.
Co-authorship	Who must, may, or may not be listed as a co-author, and in what order.	A wide range of apparently successful policies exist, although the approach used in the physics community has not been widely adopted. Any policy should conform to the requirements of the journals, as these are being enforced more strictly.

External Authors / New Members	How a non-team member can be added to a specific project, and how new scientists may join the team.	A clear process to add external members must exist that is fair to both team members and outside researchers. Methods to add new team members should carefully consider implications for students and untenured scientists.
Approving Submission	What permission is required for a paper to be submitted to a journal or archive site.	A wide range of apparently successful policies exist, although the approach used in the physics community has again not been widely adopted.
Conferences, Press & Public Outreach	Special rules governing team members presenting to conferences, speaking to the press, or doing public outreach about the FMP.	Conference policies are often afterthoughts, although they do not seem to be problematic. Public outreach is rarely covered by policy, but creates many problems. Careful thought should be given to policy in this area, especially given the rapidly changing social media environment.
Disputes & Enforcement	How disputes are resolved and any decisions are enforced.	A complete policy must include methods to resolve disputes (including those with the PI), as well as a mechanism to enforce decisions that has some granularity. While ejecting members for lesser violations is not reasonable, ignoring them leads to further violations.
Ombuds-persons	The role of ombudspersons to resolve issues	Only a fraction of teams define a role for ombudpersons, and there is wide variety in this role. A team should consider the role's definition and training available at the IOA

Appendices

Acronym List

- AAS - American Astronomical Society
- ACT - Atacama Cosmology Telescope
- ATLAS - A Toroidal LHC ApparatuS
- CERN - Conseil Européen pour la Recherche Nucléaire
- CFHT - Canada France Hawaii Telescope
- CLASH - Cluster Lensing And Supernova survey with Hubble
- CMB-S4 - Cosmic Microwave Background Stage-4
- COBE - COsmic Background Explorer
- CTA - Cherenkov Telescope Array
- DOE - Department of Energy
- EHT - Event Horizon Telescope
- FMP - Facility, Mission, Project
- HST - Hubble Space Telescope
- ICE-FiveO - Interdisciplinary Consortium for Exploring Volatile Origins
- IOA - International Ombudsman Association
- IXPE - Imaging X-ray Polarimetry Explorer
- LIGO - Laser Interferometer Gravitational-Wave Observatory
- LSST - Large Synoptic Survey Telescope (now the Rubin Observatory)
- MPE - Max-Planck-Institute for extraterrestrial physics
- MWA - Murchison Widefield Array
- NASA - National Aeronautics and Space Administration
- NSF - National Science Foundation
- NuSTAR -Nuclear Spectroscopic Telescope Array
- OSSOS - Outer Solar System Origins Survey
- PI - Principal Investigator
- ROSAT - ROentgen SATellite
- SDSS - Sloan Digital Sky Survey
- SphereX - Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer
- SPT - South Pole Telescope
- SSERVI - Solar System Exploration Research Virtual Institute
- SSP/SWEAP – Solar Probe Plus/Solar Wind Electrons Alphas and Protons
- TESS – Transiting Exoplanet Survey Satellite
- WG - Working Group

- WMAP - Wilkinson Microwave Anisotropy Probe
  XRISM - X-Ray Imaging and Spectroscopy Mission

Policies and Acknowledgements

Table 3 lists where the various documents used in this review can be found, if they are publicly available. Some are not available on the web and should be available as attachments to this PDF.

It should be noted that the AAS Journals have specific policies regarding all aspects of scientific publication (see https://journals.aas.org/policies/, and in particular https://journals.aas.org/professional-and-ethical-standards-for-the-aas-journals/), which are entirely distinct from this review.

Table 3: Locations of Policy Documents

Table 3		
FMP	**Policy Document Status & Location**	**Length (Pages)**
ACT	https://act.princeton.edu/sites/act/files/advact_pub_policy_2016.pdf	4
ATLAS	Not publicly available	1
CLASH	Included as attached file (see below) courtesy of PI	2
CMB-S4	https://cmb-s4.org/wiki/images/Bylaws_v1.pdf	34

COBE	Included as attached file (see below) courtesy of PI	14
CTA	https://www.cta-observatory.org/science/library/	15
EHT	Not publicly available	9
eRosita	Not publicly available	3
ICE-FiveO	Not publicly available	12
LIGO	https://dcc.ligo.org/LIGO-T010168-v8/public	9
LSST	https://project.lsst.org/documents_landing	12
Mars2020	Part of NASA Participating Scientist Program call; included as a public document as attached file (see below)	12
MWA	http://www.mwatelescope.org/team/policies	22
NuSTAR	Not publicly available	14
OSSOS	https://github.com/OSSOS/ossos.github.io/blob/master/OSSOSagreement.md	5
SDSS	https://www.sdss.org/collaboration/publication-policy/	12
SPT	https://pole.uchicago.edu/spt/conduct/SPT_Code_of_Conduct.pdf	2
SWEAP	Not publicly available	4

Data Files

xlsx	PubPolicy-v3.xlsx	17 KB
pdf	COBE_Publications_Policy_1990.pdf	61 KB
pdf	CLASH_collaboration_policy_document_march2012.pdf	120 KB
pdf	Mars2020_Science_Team_Guidelines_Jan2020.pdf	664 KB

Footnotes

1. http://womeninastronomy.blogspot.com/2020/01/call-for-information-publication-policy.html ↵

2. As described in "The Very First Light" by Dr. John Mather; see review at https://www.newscientist.com/article/mg15220585-100-review-just-for-the-record/ ↵