

Recommendations of the Ad Hoc Task Force on Open Access to MIT's Research

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INTRODUCTION

Openness increases transparency and reliability, facilitates more effective collaboration, accelerates the pace of discovery, and fosters broader and more equitable access to scientific knowledge and to the research process itself.
—National Academies of Sciences, Engineering, and Medicine¹

Open access to the products of teaching and research promises to speed the accumulation of knowledge and insight and enhance opportunities for collaboration. It also aligns with MIT's mission to generate, disseminate, and preserve knowledge, and to work with others to bring this knowledge to bear on the world's great challenges. The Institute currently expresses this by openly sharing its educational materials through MIT OpenCourseWare (OCW) and MITx, and its research papers through the open access repository DSpace@MIT. The adoption of the MIT Faculty Open Access Policy in 2009 set a standard—and expectation—at the Institute for the sharing of faculty publications.²

In December 2016, the Ad Hoc Task Force on Open Access to MIT's Research (known as the Open Access Task Force) was charged with developing recommendations to further support and enhance the open sharing of MIT research and educational materials and to contribute to the global transition to open science.³ Recommended as part of the report of the Institute-wide Task Force on the Future of Libraries issued that same year, the task force addressed the large proportion of MIT's research and teaching outputs not yet available for open dissemination. This includes the vast majority of faculty journal articles published prior to the adoption of the Faculty Open Access Policy, and more than half of faculty articles published since then.⁴ In addition, there is currently no centralized mechanism to support the open sharing of monographs, data, or code, so little of this kind of content is being openly shared through a trusted MIT repository.

Goals to increase access to MIT's research output must be considered in the context of complex changes in publication and distribution processes as they continuously evolve. Many scholarly societies, university presses, and other publishers are struggling to develop and implement successful open access business models and to meet new requirements from public and private research funders for more open access to scholarly articles. Researchers are striving to share their work broadly and also meet expectations for the kind of publication and credentialing that will advance their careers; at the same time, scholarly metrics do not usually reward open sharing. Individual universities, university systems, and national consortia across the globe are taking firm stands on both open access to scholarly works and on containing the escalating costs of “big deal” (or bundled, often multi-year) journal subscriptions.⁵

In terms of data, rapid advances in computing and artificial intelligence present both challenges and opportunities to the practical act of sharing. MIT is responding to this rapid evolution in computing and AI with bold, large-scale organizational efforts, such as the MIT Stephen A. Schwarzman College of Computing

¹ National Academies of Sciences, Engineering, and Medicine. 2018. *Open Science by Design: Realizing a Vision for 21st Century Research*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25116>.

² For our working definitions of open access for publications, code, data, and educational materials, please see <https://openaccess.mit.edu/about-open-access>.

³ The OA Task Force uses the word “science” in a broad, inclusive way, encompassing social sciences and humanities. As MIT anthropology and sociology professor Susan Silbey has written, science can be thought of as “democratic participatory knowledge making [that includes] an effort to make transparent and available to the audience evidence of the ways in which the knowledge claims have been produced.”

⁴ Institute-wide Task Force on the Future of Libraries: Preliminary Report. Massachusetts Institute of Technology, 2016. <https://future-of-libraries.mit.edu/sites/default/files/FutureLibraries-PrelimReport-Final.pdf>.

⁵ For an example of universities taking a firm stand on open access, see: <https://osc.universityofcalifornia.edu/2018/06/championing-change-in-journal-negotiations/>. For examples of “big deal” cancellations, see: <https://www.nature.com/articles/d41586-019-00758-x> and <https://sparcopen.org/our-work/big-deal-cancellation-tracking/>.

and the [MIT Quest for Intelligence](#), and through specific research projects, such as the application of artificial intelligence to improve early breast cancer detection and the use of machine learning to identify patterns in materials “recipes” from large corpora of journal articles.

While new outlets for data sharing provide opportunities to support the robust validation and replication of research—a core aim—they also raise serious questions and concerns about the appropriate protection of data, including private, sensitive, or classified information, datasets created with substantial resource and career investment, and those built from proprietary sources.

As MIT seeks to forge partnerships, choose research directions, and develop the infrastructure to support responsible data sharing, we must also be aware that policies and practices around openness vary, and some sharing behavior does not align with the values of an open access philosophy. For example, data can be used to craft [unjust societal policies](#) or be leveraged by governments to surveil their populaces. These dangers are receiving attention at the highest levels of government in the United States, but there remains an unresolved tension between a commitment to [openness of research products](#) (especially data, including a recent [Executive Order on Artificial Intelligence](#)) and a desire to [protect US leadership in technology](#) and AI research by protecting access to our data.⁶

Recognizing these core challenges and tensions in this era of great change, and guided by MIT's mission to openly share science and scholarship, the Open Access Task Force offers these recommendations. We have aimed to reflect President L. Rafael Reif's vision for working on global challenges related to growth, innovation, cooperation, and sharing: that in defending “fair international competition and America's strategic and commercial interests,” we must resist the urge “to try to double-lock all our doors.”⁷ Rather, we should double down on responsible ways to exemplify MIT's foundational belief in the value of open sharing.

A set of draft recommendations was released for public comment in March 2019, and these final recommendations have been strengthened and revised in response to the feedback we received, including detailed comments from members of MIT's Graduate Student Council and the nonprofit Creative Commons. In general, feedback from the MIT community indicated widespread support for the principles of open science and open scholarship and a desire that MIT continue to lead in advancing the causes of open knowledge and open education. While some community members cautioned the task force to avoid recommendations that put undue burdens on scholars (particularly graduate students and junior faculty), the majority of the feedback we received encouraged the task force to emphasize bold action in our recommendations.

In response to the feedback we heard, we strengthened language in the statement of principles to underscore the urgency in making scholarly work openly available. We also broadened recommendation 10 (which calls for discipline-specific plans to encourage open sharing) to include leaders of labs and centers, as well as departments, and we included significantly more examples of elements that might be included in a department, lab, or center (DLC) plan. Based on community conversations, many sample plans now focus on how DLCs might start thinking about ways to align promotion and tenure incentives with incentives for openness.

In response to comments from the MIT Libraries' Data Management Services team and others, we added references to the FAIR Data principles, which set standards for making data findable, accessible, interoperable, and reusable. And, finally, we added a new recommendation: to form an implementation team that will prioritize these recommendations and guide their translation into practice.

⁶ Chris Bourg (Director of MIT Libraries) conversation with David Goldston (Director of MIT Washington Office), 2019.

⁷ L. Rafael Reif, “China's Challenge Is America's Opportunity,” *New York Times*, August 8, 2018. <https://www.nytimes.com/2018/08/08/opinion/china-technology-trade-united-states.html>.

Our recommendations include a commitment to scientific and scholarly ethics and best practices; a respect for relevant disciplinary differences; and the principle that open access is not only compatible with—but can and should be built on—the foundational value of academic freedom and a belief in the importance of scholarly attribution.

Statement of Principles

We recommend that the Faculty Policy Committee, in close coordination with the faculty Committee on the Library System and representatives from this task force, review and ratify a set of principles for open science and open scholarship that lay the groundwork for the recommendations.

These principles should provide guidance for MIT DLCs, and for individual faculty, staff, and students in making intentional decisions about communicating their work, participating in scholarly communications activities such as editing and reviewing, and sharing their data responsibly. The principles should signal an intention across MIT to realign scholarly incentives at both the individual and institutional levels. And they should be broadly useful in providing the basis for Institute-wide negotiations with publishers and others who provide services and tools in support of scholarly communications, including MIT Libraries' negotiations with commercial publishers.

By ratifying a set of shared principles for open science and open scholarship, the MIT community will affirm our collective commitment to the overarching principle that control of scholarship and its dissemination should reside with scholars and their institutions.

Such principles should affirm that:

- Authors must have the right to retain copyright of their own scholarly work, and must have generous rights to reuse their own work.
- Scholarly work must be openly available to readers everywhere, regardless of institutional affiliation or individual ability to pay.
- Data, code, and other types of scholarly work, especially when necessary to validate, replicate, and/or reuse scholarly work, must be openly and responsibly available.⁸
- Scholarly work must be openly available to computational analysis and to algorithmic and machine learning applications and uses.
- The full life cycle of research must be part of the scholarly record, and therefore scholars must retain the right to openly share early versions of their work (including data, code, preprints, data collection instruments, etc.) in preprint servers, institutional repositories, and/or open platforms, with no restrictions on subsequent publication choices.

RECOMMENDATIONS

The task force offers recommendations organized around three strategies for supporting the open dissemination of MIT research and educational outputs: policy, infrastructure and resources, and advocacy and awareness.

⁸ Responsible data sharing should follow the principle of “as open as possible, as closed as necessary,” from Guidelines on FAIR Data Management in Horizon 2020: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf

Policy Recommendations

1. **Adopt an all-campus open access policy, granting MIT non-exclusive permission to openly disseminate scholarly articles written by any MIT author.**

Such a policy, modeled on the MIT Faculty Open Access Policy, would apply to scholarly articles written by students, staff, postdoctoral fellows, research scientists, and other MIT community members while employed and/or enrolled at MIT. The policy is not intended to apply to work that students produce solely for courses; it is for scholarly articles published in journals, conference proceedings, or other venues.

- a. This policy should allow any MIT author to opt out for a given scholarly article.
- b. We suggest that implementation of the policy be overseen by the Provost's Office and administered by the Libraries.
- c. We recommend that MIT-authored scholarly articles continue to be made available under an appropriate Creative Commons license whenever possible.

2. **Adopt an open access policy for scholarly monographs, granting MIT non-exclusive permission to openly disseminate digital versions of monographs written by any MIT author.**

This recommendation is not intended to include textbooks or works for trade distribution, though we acknowledge that these distinctions are blurring. Because of this, and following the model of the current Faculty Open Access Policy, this policy would include a per-monograph opt-out provision.

- a. To assist MIT authors who wish to disseminate manuscript versions of their monographs ("green" open access, including for cases where a publisher does not offer a platform or business model for offering an open version), this new policy will provide a legal mechanism for such sharing, modeled on the Faculty Open Access Policy.
- b. The MIT Libraries should administer this policy and develop an outreach program for working with monograph authors and their publishers to maximize the open dissemination of MIT-authored scholarly books.
- c. MIT should establish an Open Monograph Fund to support MIT authors whose publishers require a subvention to offset publication costs.⁹
- d. MIT-authored open monographs should be made available under an appropriate Creative Commons license.

3. **Clarify, consolidate, and publish the policies regarding thesis holds/embargoes on the [MIT Policies website](#). The policy should specify that requests for a hold/embargo of longer than three months must be approved by the Vice President for Research, in consultation with the Technology Licensing Office and/or the Office of Graduate Education, and must be supported by evidence of a pending patent application, a book contract requiring an embargo, and/or evidence of extenuating circumstances related to safety, confidentiality, or national security interests.**

The aim is to support MIT's existing practice of making theses as open as possible by reaffirming and clarifying that thesis holds should not be granted other than in exceptional circumstances, and only for short periods of time, and that holds in excess of 90 days should require approval by the Vice President for Research.

⁹ This fund would complement MIT's existing Open Access Article Publication Subvention Fund (<https://libraries.mit.edu/oafund>) for journals.

4. **Consider adding an open access requirement to all existing and new internal MIT research grant programs that calls for immediate open access publishing of articles by grant recipients.** Other research funders, such as the [Gates Foundation](#) and [cOAlitionS](#), have added this requirement.

As an initial implementation of this recommendation, grant recipients of the [Professor Amar G. Bose Research Grants](#) should be required to make all publications and associated original data, code, and other shareable research outputs openly available via either publication in an open access journal or via deposit in a trusted open repository (e.g., [DSpace@MIT](#)) immediately upon publication. While we intend this new requirement to apply only to new Bose recipients, we recommend that the Libraries work with past awardees to deposit their Bose research outputs into a new Bose collection in MIT's open access repository, [DSpace@MIT](#). We recommend that any requests for exceptions to this requirement be reviewed by the specific grant committee, and be approved only in exceptional circumstances.

Infrastructure and Resource Recommendations

Full support for open data requires infrastructure to support data storage and computation, and wide adoption of open data standards that facilitate data access, interoperability, and reuse. Some fields, such as genetics, already benefit from established open source standards and repositories for frequently used data types. In many fields, however, stable open access standards and data repositories have yet to be established, and fledgling standards and repositories are often the result of efforts of individual scholars.

As the extensive use of data in research becomes ever more ubiquitous across all disciplines at MIT, it will be critical for Institute leadership to clarify roles, responsibilities, and governance structures for the provision of data infrastructure and support across campus. Recommendations 5 and 6 focus on infrastructure and incentives to support responsible open sharing of MIT data.

5. **To support the open sharing of data created and originating at MIT (not pre-existing data or data acquired from external sources) the Institute should create an Open Data Fund to support projects based on [FAIR Data Principles](#) (Findable, Accessible, Interoperable, Reusable) to form, build, or sustain:**
- a. New data repositories, where lack of one is limiting the ability of MIT scholars to share their data.
 - b. Researcher-led efforts to create discipline-appropriate open databases or standards to support such resources.
 - c. Adoption and/or development of new technologies and standards to support the open sharing of data.
6. **To support the long-term sustainability and discoverability of open data, the MIT Libraries should investigate developing and maintaining a data registry that indexes MIT-created data and links data to publications, grants, and other outputs and supporting materials.**
7. **The Institute should provide funding for open access initiatives on two critical fronts: 1) support for open access work and initiatives spearheaded by MIT scholars; and 2) support for open access infrastructure, such as tools and services that reduce the burden on and/or create incentives for authors to openly share their work.**

Examples of such funding might include:

- a. An Open Textbook Fund to support the development, adaptation, and use of open textbooks.
- b. An Open Access Infrastructure Fund to support MIT contributions to collectively funded infrastructure projects such as the [Public Access Submission System \(PASS\)](#), [arXiv](#) and other open preprint servers, and [Open Science Framework](#).
- c. Adoption and development of new technologies and publication approaches to facilitate open access.

8. To increase the impact of open educational content, MIT should:

- a. Adopt and promote a publication standard (addressing file types, access controls, etc.), such as the standard currently being developed by MITx/edX for educational materials, that ensures open access and interoperability.
- b. Optimize the design of current and future MIT learning management systems (including [Stellar](#)) so creators can easily make materials as open as possible. One example would be to make class materials available by default to all MIT students, not merely those enrolled in the class, while providing instructors the ability to choose other sharing options.
- c. Specify approved open access licenses and licensing procedures for MIT publication of educational materials, recognizing that these materials may incorporate content, code, and interactive elements.
- d. Provide streamlined paths for publishing all educational material under open licenses on platforms like MIT OpenCourseWare.
- e. Adopt and promote tools and services to enhance the discoverability of open educational materials.

9. To encourage more open sharing of code and reduce the potential negative impact of the proliferation of software patents on entrepreneurship and innovation,¹⁰ MIT should:

- a. Develop a set of recommended open licenses for software produced by MIT.
- b. Create and publicize guidelines, policies, and practices for publishing code under open source licenses.
- c. Review software licensing practices to ensure they promote innovation, and encourage MIT authors who wish to distribute code openly under popular open source licenses.

Advocacy and Awareness Recommendations

10. **The Provost should direct the leader of each department, lab, and center (DLC) to develop a plan to encourage and support the open sharing of research, as appropriate for their discipline(s).** The MIT Libraries will work closely with DLCs to develop these plans. Sample plan elements are provided below, but DLCs should have considerable leeway to develop plans appropriate for their discipline(s).

Sample plan elements might include:

Education

- DLC-level affirmation and education about ways in which open access can enhance the quality and impact of publications, and about the availability of relevant peer-reviewed open access publications and platforms.
- DLC-level encouragement of and support for sharing work openly at many stages using preprint servers such as arXiv, ChemRxiv, and bioRxiv, and other discipline-specific open access repositories.
- Commitment to providing education to faculty, students, and staff about open publishing options and author rights.

¹⁰ See González, A.G. (2006). The software patent debate. *Journal of Intellectual Property & Law Practice*, 1(3), 196–206. <https://doi.org/10.1093/jiplp/jpio46>.

Hiring, promotion, and tenure practices

- A mechanism for highlighting openly available research and teaching materials in annual reviews and in tenure and promotion packets.
- A mechanism for alerting external reviewers that MIT places high value on the open sharing of research outputs for tenure and promotion, and for referring letter writers to the Institute's open repository (currently DSpace@MIT) to access a candidate's work.
- Encouragement to faculty to ensure all their eligible work is deposited in the Institute's open repository as part of tenure and promotion preparation.
- A mechanism for leveraging the tenure and promotion process to provide incentives and rewards for open sharing.
- Department-level assessment and revision of the metrics used to evaluate research in promotion and tenure decisions, to be sure new scholars and new scholarship are being fairly and fully evaluated.

Software and data sharing

- Encouragement for use of free and open source programming languages and software in teaching curricula, to support reuse and widest impact.
- DLC-level encouragement for appropriate and responsible data sharing.

Discipline-level support

- Commitment to help scholarly societies transition their journals to open access, including supporting their efforts to develop sustainable models to fund societies' activities.

11. **MIT should advocate for greater recognition of and credit to researchers who share data, including those who prepare data for sharing.** Part of this effort should include developing and adopting metrics for assessing the impact of non-traditional research outputs, such as data, software, and educational materials. As one step, we recommend that the Institute create an annual award to recognize MIT faculty, researchers, or students who demonstrate dedication and contribution to open science.
12. **MIT should continue to collaborate with peers across academia and elsewhere to advance open science, and should continue to consistently advocate with the federal government in support of policies and legislation that advance the Institute's commitment to open access to research as part of its mission.** For example, MIT should advocate in support of bills that would codify into law the 2013 [White House Directive on Expanding Public Access to the Results of Federally Funded Research](#).
13. **MIT's [International Advisory Committee](#) should include the topic of open access and open science in their deliberations on the Institute's international engagements, including the complex issues and tensions between MIT's commitment to and policies regarding open sharing of research outputs and a desire to maintain intellectual and competitive control.**
14. **The Provost and Vice President for Research should appoint an implementation team to prioritize, shepherd, and support the above recommendations.** The team should establish reporting requirements for adopted policies. The Director of Libraries should provide regular reports to Academic Council and faculty on the status of open science and open scholarship at MIT and beyond. We also recommend that the Institute review policies, practices, and resources associated with open science and open scholarship at least every four years.

CONCLUSION

In 2016, the Open Access Task Force was charged with taking up the question of whether MIT should strengthen its activities in support of providing open access to the research and educational contributions of the MIT community. We were also asked to coordinate an Institute-wide discussion on this topic.

To this end, after 18 months of work, we developed recommendations for changes and enhancements to policy, infrastructure, and advocacy. We offer these recommendations after wide consultation across the Institute and beyond, and with the intent of sparking an even wider conversation across the MIT community and other stakeholder communities.

We believe these recommendations will strengthen MIT's commitment to open science and scholarship and allow people around the globe to build on MIT-created work as we all aim to tackle the world's challenges, big and small.

APPENDIX 1: TASK FORCE CHARGE

December 1, 2016

MIT's Provost, in consultation with the Vice President for Research, the Chair of the Faculty and the Director of the Libraries, has appointed an Ad Hoc Task Force on Open Access to MIT's Research. The 2013 Report to the President on MIT and the Prosecution of Aaron Swartz raised the question as to whether MIT should strengthen its activities in support of providing open access to the research and educational contributions of the MIT community. As a result of subsequent discussions held with the faculty and relevant committees, this task force is now being charged to take up this question [see [Report to the President, MIT and the Prosecution of Aaron Swartz, July 26, 2013, question 6, page 95](#)].

The Task Force will coordinate a renewed Institute-wide discussion of ways in which current policies and practices might be updated or revised to further the Institute's mission of disseminating the fruits of its research and scholarship as widely as possible.

Specific activities will include:

- A. Prepare a white paper for the MIT faculty that reviews MIT's open access activities to date, as well as activities of sister institutions and other organizations.
- B. Organize and report on deliberations among faculty and administration in MIT's departments, labs, and centers and other units concerning reactions to MIT open-access initiatives and opportunities for enhancing these. "Other units" might include the MIT Libraries, MIT Press, Office of Digital Learning, MITx, edX, Technology Licensing Office, and major Institute laboratories.
- C. Based on these deliberations, prepare candidate recommendations to the administration, and as appropriate, to the faculty, for new and strengthened initiatives, together with possible changes to MIT policies to support open access.
- D. Work with the administration to develop implementation plans and report on progress on these initiatives.

Questions and issues to be considered by the Task Force include, but are not limited to, the following:

1. Should the scope of the current Faculty Open Access Policy be expanded to include the work of graduate students, postdoctoral researchers, research scientists, and other community members besides faculty who produce scholarly articles? If so, which entities at MIT should be responsible for implementing any recommended expansions of the policy to additional members of the MIT community?
2. Should the current Open Access policy be expanded to include research and teaching outputs other than journal articles (i.e., datasets, monographs, educational resources)?
3. Should MIT be doing more to publicly advocate for pro-open access initiatives, experiments, and legislation at the national and global levels?
4. Should MIT be doing more to encourage and facilitate open sharing of research objects by MIT scholars, including participation in the Faculty Open Access Policy?
5. How might the Institute coordinate with and/or support open access publishing efforts by the MIT Press, and other organizations pursuing open access publishing options?
6. How should MIT's Open Access policy and/or MIT's general value of openness apply to MITx course content?

Task Force members will include members of the faculty and administration, representatives of major units whose activities would relate to the Task Force's work, postdoctoral researchers, research staff, graduate students, and undergraduate students. The Task Force will be staffed with assistance from the Libraries and other appropriate units.

APPENDIX 2: TASK FORCE MEMBERS

The Ad Hoc Task Force on Open Access to MIT's Research launched in July 2017 and included faculty and researchers from all five schools, and staff and students from across the Institute.

Co-chairs

Hal Abelson, *Class of 1922 Professor, Department of Electrical Engineering and Computer Science*

Chris Bourg, *Director of Libraries*

Members

Peter Bebergal, *Technology Licensing Officer, Technology Licensing Office*

Robert Bond, *Chief Technology Officer, Lincoln Laboratory*

Heng Yi Cheng '18, *Department of Mathematics (2017–18)*

Isaac Chuang, *Professor of Electrical Engineering and Computer Science; Senior Associate Dean of Digital Learning*

Christopher Cummins, *Henry Dreyfus Professor of Chemistry, Department of Chemistry*

Deborah Fitzgerald, *Leverett Howell and William King Cutten Professor of the History of Technology, Program in Science, Technology, and Society*

Mark Jarzombek, *Professor, Department of Architecture*

Nick Lindsay, *Director of Journals and Open Access, The MIT Press*

Tom Pollard, *Postdoctoral Associate, Institute for Medical Engineering and Science*

Jack Reid, *Graduate Student, Technology and Policy and Aeronautics and Astronautics*

Karen Shirer, *Chief of Staff, Office of the Vice President for Research*

Bernhardt Trout, *Professor, Department of Chemical Engineering*

Matthew Vander Heiden, *Associate Professor, Department of Biology*

Eric von Hippel, *T Wilson (1953) Professor in Management, Sloan School of Management*

Jaren D. Wilcoxson, *Counsel, Office of the General Counsel*

Staff to the Committee

Ellen Finnie, *Head, Scholarly Communications and Collections Strategy, MIT Libraries*

Katharine Dunn, *Scholarly Communications Librarian, MIT Libraries*

Subgroups of the Task Force

Scholarly Publications: Chris Bourg; Deborah Fitzgerald, chair; Nick Lindsay; Jack Reid; Jaren D. Wilcoxson

Contracts/Licensing: Peter Bebergal; Robert Bond, chair; Bernhardt Trout

Data: Christopher Cummins; Eric von Hippel, chair; Tom Pollard; Matthew Vander Heiden

Educational Materials and Code: Heng Yi Cheng; Isaac Chuang; Mark Jarzombek; Hal Abelson, chair; Karen Shirer

APPENDIX 3: TASK FORCE ACTIVITIES

The Ad Hoc Task Force on Open Access to MIT's Research began its work in spring 2017 and gathered input through a variety of formal and informal mechanisms. The task force website also included an Idea Bank, where members of the MIT community could submit their ideas about open access at MIT and comment on the ideas of others.

The task force's activities included the following:

- Twenty-four meetings of the full task force:
 - In 2017: June 6, September 12, September 26, October 10, October 26, November 9, November 21, December 7, December 19.
 - In 2018: February 6, March 15, April 2, April 10, May 3, May 24, May 31, September 10, September 11, September 19, October 10, November 15, December 6.
 - In 2019: January 29, March 11.
- Nine meetings of task force co-chairs and select task force members with:
 - School of Humanities, Arts, and Social Sciences—September 20, 2018; May 2, 2019
 - School of Science—November 26, 2018
 - School of Architecture and Planning—December 5, 2018
 - Committee on Intellectual Property—December 17, 2018
 - MIT Sloan School of Management—December 18, 2018
 - The Dean's Group—February 12, 2019; March 19, 2019
 - Committee on the Library System—February 13, 2019
- Other meetings with stakeholders:
 - Maria Zuber, Vice President for Research—September 9, 2018; March 28, 2019
 - Martin Schmidt, Provost—October 11, 2018; March 28, 2019
 - Susan Silbey, Chair of the Faculty (2017–19)—November 1, 2018
 - Lorraine Goff, Vice President for Human Resources (2015–18)—October 2018
 - Representatives from Google Scholar, Open Science Organization, and AcademyPub—November 2018
 - Alison Muddit, CEO of PLoS—November 14, 2018
 - Richard Lester, Associate Provost—November 29, 2018
 - Ian Waitz, Vice Chancellor for Undergraduate and Graduate Education—December 20, 2018
 - Lesley Millar-Nicolson and Dan Dardani, Technology Licensing Office—January 22, 2019
 - Colleen Leslie, Office of Sponsored Programs—March 18, 2019
- Three open forums for MIT community members.
 - In 2018: Open access to publications, April 5 (led by task force member Deborah Fitzgerald); Open access to data, April 10 (led by task force member Eric von Hippel).
 - In 2019: Community forum on the draft recommendations, April 10.

APPENDIX 4: GLOSSARY

The definitions provided for the terms below are those relevant to the context of this report; other definitions are not included here. The URLs for the sources from which definitions were taken were last accessed on March 31, 2019.

BIG DEAL. Starting in the 1990s, large publishers began marketing and selling bundles of journals to libraries at a cost discounted from journals' individual list prices. However, many libraries find they're spending an unsustainable proportion of their budgets on these journal packages, which are inflexible and make it difficult to tailor a list of journals to meet specific campus needs. Though big deals are still common, many institutions have cancelled them in recent years. See, for example, [SPARC's Big Deal Cancellation Tracking resource](#).

DATA. The recorded factual material that is commonly accepted in the scientific community as information that is required to validate research findings. There are four major types of data: observational, experimental, simulated, and derived. There are also three different types of data formats: structured, unstructured, and semi-structured. The term "data" does not have one clear definition, and is often interpreted differently depending on field of study. ("Data," National Network of Libraries of Medicine (NNLM) Data Thesaurus. Text in the public domain.)

DATA REGISTRY. A virtual, centralized, and structured database or portal that allows one to list, do a structured search, and to identify and retrieve metadata and possibly data that are distributed around a network. Registries are places where various types of resources are indexed and made visible and available for use throughout a community. (Adapted from "Registry," CASRAI Standard Dictionary of Research Administration Information. Text licensed under [Creative Commons Attribution](#).)

DATA REPOSITORY. A place that holds data, makes it available to use, and organizes it in a logical manner. A data repository may also be defined as an appropriate, subject-specific location where researchers can submit their data. Data repositories may have specific requirements concerning subject or research domain; data re-use and access; file format and data structure; and the types of metadata that can be used. ("Registry," CASRAI Standard Dictionary of Research Administration Information. Text licensed under [Creative Commons Attribution](#).)

GREEN OPEN ACCESS. Open access delivered by repositories. "Self archiving" is the practice of depositing one's own work in an open access repository. (Suber, Peter. "Varieties," [Open Access](#), 2012. Text licensed under [Creative Commons Attribution Noncommercial](#).)

LEARNING MANAGEMENT SYSTEM. Digital platform for administering and delivering educational courses and training. Examples include Stellar, Blackboard, and Canvas.

OPEN SOURCE LICENSES. Licenses that allow software to be freely used, modified, and shared. Examples include Apache License, GNU General Public License, and MIT License. ("[About Open Source Licenses](#)," Open Source Initiative. Text licensed under [Creative Commons Attribution](#).)

OPEN DATABASE. An organized collection of data that anyone is free to use, modify, and redistribute. (Modified from "[Open Data](#)," Science Europe Data Glossary. Text licensed under [Creative Commons Attribution](#).)