	First Name: Principal Author	Last Name: Principal Author	Institution of Principal Author: Principal Author	Co Authors: Â : Principal Author	White Paper Title
1	Jane	Rigby	NASA Goddard Space Flight Center		Open source code, from the perspective of a scientist at a NASA Center
2	Chris	Mattmann	NASA JPL	Wayne Burke	NASA ESDIS Open Source Policy Document
3	Timothy	Dowling	University of Louisville		The NASA-Funded EPIC Atmospheric Model: Advantages of Open-Code Status since 1998
4	Christopher	Russell	University of California Los Angeles		Open records should be a two way street
5	James	Mason	NASA Goddard Space Flight Center		White Paper in Support of NASA's Proposed Open Code Policy
6	Daniel	Weimer	Virginia Tech		Comments on a Future Open Code Policy: Potential Problems and Pitfalls
7	Peter	Young	George Mason University		Best Practices for a Future Open Code Policy for NASA Space Science
8	Brian	Dennis	NASA Goddard Space flight Center	Joel Allred, Charles N. Arge, Gordon Holman, Andrew Inglis, Richard Schwartz, Albert Shih, Anne K. Tolbert, Dominic Zarro,	Open Source White Paper
9	Chiu	Wiegand	NASA/GSFC	Richard Mullinix, Justin Boblitt	Software engineers perspective on open source projects at NASA/GSFC
10	Eric	Lyness	GSFC		Practical Considerations of Open Source Delivery
11	Charles	Acton	Jet Propulsion Laboratory, California Institute of Technology		White Paper on Possible NASA SMD Open Code Policy and Practices

12	Karl	Fogel	Open Tech Strategies, LLC	James Vasile	Contract Language and Software Redistribution at NASA
13	Tripp	Corbett	Esri	Marten Hogeweg, Dawn Wright	In support of an open code policy which is inclusive of commercial technologies to accelerate reproducibility of science
14	Arfon	Smith	Space Telescope Science Institute	Kenneth Sembach, Nancy Levenson, Thomas M. Brown, Marc Postman, Neill Reid, Massimo Stiavelli, Roeland van der Marel	Open Source to Serve Community Science
15	Stanley	Solomon	National Center for Atmospheric Research		Open Source Code and Intellectual Property
16	Jeffrey	oishi	Bates College	Benjamin P. Brown, Keaton J. Burns, Daniel Lecoanet, and Geoffrey M. Vasil	Perspectives on Reproducibility and Sustainability of Open-Source Scientific Software from Seven Years of the Dedalus Project
17	Steven	Christe	NASA Goddard Space Flight Center	Jack Ireland, Daniel Ryan, Monica G. Bobra, Russell Hewett, Stuart Mumford, David PÃ©rez-SuÃ¡rez, Kevin Reardon, Sabrina Savage, Albert Shih, Joel Allred, Tiago M. D. Pereira, Hakan Ã–nel, Michael S. F. Kirk	A recommendation for a complete open source policy.
18	Viacheslav	Merkin	The Johns Hopkins University Applied Physics Laboratory	Kareem Sorathia, Lars Daldorff, A. Ukhorskiy, M. Sitnov, J. Lyon	Comments for Open Code Policy for NASA SMD
19	Zachary	Norman	Harris Corporation	Daniel Platt	The Role of Commercial Software in an Open
20	Robert	Grimm	Southwest Research Institute		Against

21	John	Emmert	U.S. Naval Research Laboratory	Jens Oberheide, Douglas Drob, McArthur Jones, Fabrizio Sassi, David Siskind, Kate Zawdie	What does scientific reproducibility and productivity really mean? The dangers and difficulties of a blanket open code policy
22	C Richard	DeVore	NASA Goddard Space Flight Center	Spiro K. Antiochos, Alex Glocer, Judith T. Karpen, James E. Leake, Peter J. MacNeice	Implications of a Future NASA SMD Open-Source Policy
23	Asti	Bhatt	SRI International	Ryan McGranaghan (NASA JPL), Tomoko Matsuo (U. of Colorado), Yolanda Gil (U. of Southern California)	Software Practices for improved collaboration among space scientists
24	Erik	Tollerud	Space Telescope Science Institute/Astropy Project	David W. Hogg	Towards Reproducibility using Open Development: Astropy as a Case Study
25	Anthony	Mannucci	Jet Propulsion Laboratory, California Institute of Technology	Olga Verkhoglyadova, Ryan McGranaghan, Giorgio Savastano, Bruce Tsurutani	An Open Source Approach for NASA
26	Anthony	Mannucci	Jet Propulsion Laboratory, California Institute of Technology	Olga Verkhoglyadova, Ryan McGranaghan, Giorgio Savastano, Bruce Tsurutani	An Open Source Approach for NASA
27	Ross	Beyer	SETI Institute and NASA Ames Research Center		Impacts, Consequences, and Perspectives on a Future Open Code Policy for NASA Space Sciences
28	Ross	Beyer	SETI Institute and NASA Ames Research Center	Terry Fong, Mark B. Allan, Jason Laura, Moses P. Milazzo, Robert G. Deen, Wayne Moses Burke	No to NOSA, yes to mainstream licenses
29	Gabor	Toth	University of Michigan		Our view on open source code development for scientific software at the Center for Space Environment Modeling at the University of Michigan
30	Brad	Fenwick	Elsevier		Answers to Committee Questions
31	Cheryl	Huang	Air Force Research Laboratory		AFRL Response

32	Mark	Marley	NASA Ames Research Center	Jonathan Fortney, Richard Freedman, Peter Gao, Roxana Lupu, Caroline Morley, Tyler Robinson, Didier Saumon	White paper on Release Requirements for Legacy Model Codes
33	Travis	Oliphant	Quansight, LLC		Open Source Software as the Default for Federally Funded Software
34	Tess	Jaffe	UMD and NASA/GSFC	Tom Barclay, Padi Boyd	NASA science centers need to support and lead open source development or become obsolete
35	Joseph	Huba	Naval Research Laboratory		Comments on Best Practices for a Future Open Code Policy for NASA Space Science
36	Lior	Shamir	Lawrence Technological University	Bruce Berriman, Pter Teuben, Robert Nemiroff, Alice Allen	Best Practices for a Future Open Code Policy: Experiences and Vision of the Astrophysics Source Code Library
37	Steven	Hill	Space Weather Prediction Center	Eric Adamson, Michele Cash, Marcus England, Joe Schoonover	Space Weather Prediction Center Support of NASA Open Code Policy
38	Adam	Kellerman	UCLA	Steve Morley, Alexa Halford	Current and future considerations for a NASA Open-Code Policy
39	Thomas	Loredo	Cornell University		Assuring positive value for open-source software
40	Michael	Hirsch	Boston University		Reproducible Science via Open Source Requirements
41	Sarah	Gille	University of California San Diego	Chereskin, Bruce Cornuelle, Patrick Heimbach, Matthew Mazloff , Cesar Rocha, Saulo Soares, Maike Sonnewald, Bia Villas Boas, Jinbo Wang	Open Code Policy for NASA Space Science: A perspective from NASA-supported ocean modeling and ocean data analysis

42	Dana	Akhmetova	KTH Royal Institute of Technology	Jan Deca, Laboratory for Atmospheric and Space Physics, University of Colorado Boulder, USA, jandeca@gmail.com	Considerations for a future Open Code policy for NASA Space Science
43	Cody	Wiggs	University of Colorado-Boulder		Open Code Policy-White Paper-Colorado
44	Lior	Shamir	Lawrence Technological University	Bruce Berriman, Peter Teuben, Robert Nemiroff, Alice Allen	Best Practices for a Future Open Code Policy: Experiences and Vision of the Astrophysics Source Code Library

	White Paper Description (350 character limit)
1	As a civil servant NASA scientist, I share my recent experience releasing an open-source tool -- a cautionary tale of how bureaucracy can undermine the goal of â€œbroad and prompt dissemination of knowledge and techniquesâ€ NASA should to reform its processes and update NPR 2210.1, to expedite the release of non-sensitive code by NASA scientists.
2	This is a white paper describing the Open Source Policy for the NASA Earth Science Data and Information System (ESDIS) project and including a few case studies within that domain. It contains guidance for how to do open source within NASA ESDIS.
3	This article details advantages of the open-source status, since 1998, of the Explicit Planetary Isentropic Coordinate (EPIC) Atmospheric Model. The EPIC modelâ€™s number of peer-reviewed papers and citations have more than doubled as a result of its open-code policy. Specific examples are given of independent code development enabled by this policy.
4	The internal review processes for data analysis and science research, extended missions etc are decided by individuals within the organization. This has lead to the appearance of "quid pro quo" groups in the space communities where friends of X are suspected of having special treatment. I think the academy should be examining this issue.
5	This paper makes the argument primarily for data processing pipelines and science data analysis. It emphasizes the importance of implementation ease for researchers and provides examples and suggestions to that end.
6	The open code policy that is being considered by NASAâ€™s Science Mission Directorate may have negative impacts on researchers if it is not properly implemented. Several issues with such policy are discussed, including PI time burdens, implementation issues, unauthorized and unacknowledged code use, and commercial use by code developers.
7	This paper gives the experience of a team member from the CHIANTI atomic database project, which is an example of a 20 year old, highly successful Astrophysics tool that adopted an open code and open data policy from the beginning.
8	This white paper is the considered opinion of a group of scientists and software specialists working in the Solar Physics Laboratory at Goddard Space Flight Center. Most of them have worked for many years primarily on the analysis and scientific interpretation of solar flare observations from NASA space missions.
9	This paper describes our perspective as software engineers at GSFC/NASA regarding the open source effort. There are many different types of software, and one should consider their impact to the community before making them open source or not. It should not be a one size fits all approach.
10	The days are long gone when one developer wrote software to support a project. Code is now developed on many platforms, in many languages and often by scientists and engineers. This paper discusses the practical difficulties with delivering the software to support a typical research project.
11	Description of open source code experiences of NASA's Navigation and Ancillary Information Facility, and recommendations stemming therefrom.

12	NASA's current procurement language discourages contractors from publishing their work under open source licenses. This paper offers a brief overview of concepts and issues related to open source publication, and provides sample contract language that treats open source publication as the default, with exceptions decided on a case-by-case basis.
13	The policy should apply to code & workflows NASA creates & not be exclusionary of using Commercial-Off-The-Shelf (COTS) tools as part of research. COTS technology is widely used & has evolved to be extensible, allowing scientists to write code on it. This code represents the real â€˜scienceâ€™ from which the community realizes value from when shared.
14	In this white paper, we discuss the potential consequences of an â€˜open code policyâ€™ for NASA Space Science in our capacity as a NASA contractor. Broadly speaking, we believe this would be a positive change although there may be some challenges in making public some of the software we develop on behalf of NASA to support the scientific community.
15	Open source code is a good idea, but it cannot be mandated by government agencies at this time.
16	We describe our experiences developing the open source Dedalus toolkit, which is used for astrophysical simulations, and use those experiences as a framework for making policy recommendations for open source.
17	A recommendation for a complete open source policy.
18	The comments below are based on many years of scientific code development and use by the authors, primarily funded by NASA and NSF research grants.
19	With many factors to consider when choosing COTS or OSS, ultimately it comes down to cost and properly evaluating options. Because there are many solutions to this problem, it is recommended that a broad, open source policy for NASA not be chosen when there are some situations that COTS software can play a positive role in science and algorithm development
20	Scientists should not be required to publish source code. Are they required to provide unfettered access to laboratories? One is portable, one is not, but they both represent investments of intellectual capital.

21	A blanket open code requirement (encompassing data analysis programs written to obtain particular scientific results) would be detrimental to both science quality and productivity, without enhancing scientific reproducibility.
22	We are software developers and users with decades of experience modeling systems and processes important to NASAâ€™s SMD. We believe that a successful open-source policy must include the establishment of NASA programs that will fund long-term scientific software development and maintenance, and provide for community access to this software.
23	This white paper makes recommendations for NASAâ€™s open code policy for adoption in space sciences. These recommendations are put together with the goal of increasing transparency and improving collaboration among space scientists.
24	Here we lay out a case for the role of open code and open development in fostering reproducible science. The Astropy Project is used as an example of how these approaches can also improve the distribution of development resources in the NASA science community. Specific recommendations of how a policy might be implemented are also discussed.
25	Open code represents a tremendous capability for NASA, significantly increasing the cost-effectiveness of its research and potentially improving the quality of research. However, implementation should not be onerous on the research community. We favor an approach that encourages and rewards open source without requiring it in all cases.
26	Open code represents a tremendous capability for NASA, significantly increasing the cost-effectiveness of its research and potentially improving the quality of research. However, implementation should not be onerous on the research community. We favor an approach that encourages and rewards open source without requiring it in all cases.
27	I am in favor of an Open Code Policy for NASA Space Sciences. This white paper details my thoughts on the impacts and consequences of such a policy, how it should consider repositories over archives, lessons from NASA's open data policies, and how NASA might both require and encourage open source code via a flexible implementation of such a policy.
28	The NASA Open Source Agreement (NOSA) has limitations and should not be used as a one-size-fits-all open source license for NASA-produced software, nor should it be considered the default license to apply to such software. Instead, the recommendations regarding software licenses advanced at the 2011 NASA Open Source Summit should be followed.
29	The members of the Center for Space Environment Modeling at the University of Michigan had multiple group discussions about the proposed open source development idea put forward by NASA. Here we briefly summarize the main points that our group agreed on. The 14 supporters are listed in the Appendix.
30	Follow-up answers to specific questions from the Committee.
31	Response from AFRL/RVBX

32	Addresses the issue of how to handle 20th century legacy code within the modern open source environment.
33	An open source license should be the default for all NASA-funded software with exceptions requiring specific justification. Furthermore, all NASA vendors who depend on open-source projects should be required to show that at least 20% of their proceeds are sent to individuals or organizations supporting those open-source projects.
34	The scientific community is already adopting an open source model and reaping major rewards such as faster results and closer collaborations. If NASA does not join and lead, we will be left behind, and the science will suffer. The current rules restrict our ability to collaborate, and should be revised.
35	Comments on several of the issues raised in the announcement and a discussion of my personal experiences with open-source code.
36	The Astrophysics Source Code Library (ASCL) is a successful initiative that provides an infrastructure to promote source code sharing. Members of the ASCL Advisory Committee and its editor-in-chief strongly support open code initiatives and make recommendations to NASA informed by their experience.
37	The Space Weather Prediction Center (SWPC) supports the benefits of a NASA open code policy, but also recognizes potential drawbacks. SWPC advocates for the following considerations to address the drawbacks: (1) â€œright-sizedâ€licensing, (2) clear roles and responsibilities, and (3) code management.
38	We cover two main items: Availability and reproducibility of code under three main headings: Acknowledgment, Ensuring Longevity, and Funding. We strongly encourage open source, though we provide a set of criteria for ensuring that this does not exclude or limit use of controlled codes, or researchers who are subject to control restrictions.
39	Shared software can have **negative value** for the community of potential users. Producing software with positive shared value requires significant expertise and effort. New policies advocating or implementing code sharing requirements must consider the costs associated with making shared code genuinely useful.
40	Newly developed code inherent to the NASA grant/contract should generally be open code. Analysis codes must at least generally be made available upon request.
41	NASA has supported a broad range of oceanographic research, including ocean models and model analysis tools. Many of these products have been released as open source software. Our consensus is that open release of software has significantly sped scientific progress, despite lack of incentive from research institutions and funding agencies.

42	Whereas programmers and software developers generally consider an open source policy as an opportunity, scientists may be more hesitant. We would like to argue for an open source policy that is most efficient to produce transparent and reproducible science, but at the same time protects researchers within an already very competitive environment.
43	Assessment of current data rights policies. Review of compliance implications related to a new open code policy
44	The Astrophysics Source Code Library (ASCL) is a successful initiative that provides an infrastructure to promote source code sharing. Members of the ASCL Advisory Committee and its editor-in-chief strongly support open code initiatives and make recommendations to NASA informed by their experience. **corrected one reference**

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