



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# DOE's Response to “Increasing Access to the Results of Federally Funded Scientific Research”

High Energy Physics Advisory Panel

30 Sept, 2014

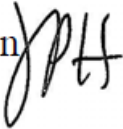
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# OSTP Memo

EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY  
WASHINGTON, D.C. 20502

February 22, 2013

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: John P. Holdren   
Director

SUBJECT: Increasing Access to the Results of Federally Funded Scientific Research

## 1. Policy Principles

The Administration is committed to ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out below, the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.

Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. The results of that research become the grist for new insights and are assets for progress in areas such as health, energy, the environment, agriculture, and national security.

Access to digital data sets resulting from federally funded research allows companies to focus

# DOE Response

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## DOE's Public Access Plan

### Data

- SC Statement on Digital Data Management, effective Oct 1, 2014
- Data Management Plan requirements from other DOE offices, effective Oct 1, 2015

### Publication

- Ensure public access to “best available version” through Public Access Gateway for Energy Sciences (PAGES)
- Requirements effective Oct 1, 2014

# Brief History – Data

- **COMPETES 2010 “Interagency Public Access Committee”**
- SC Working Group on Digital Data
- FACA Reports (2011)
- OSTP Request for Information (2012)
- Office of Science User Facility Input (2013)
- **OSTP Memo “Increasing Access to the Results of Federally Funded Scientific Research” (2013)**
- **DOE Public Access Plan and Office of Science Statement on Digital Data Management (July, 2014)**





## Funding Opportunities

[Grants & Contracts Support](#)[Award Search](#)[Find Funding](#)[Early Career Research Program](#)[Statement on Digital Data Management](#)[Suggested Elements for a Data Management Plan](#)[Frequently Asked Questions](#)[Resources at the Office of Science User Facilities](#)[Acknowledgements of Federal Support](#)

### CONTACT INFORMATION

#### Office of Science

U.S. Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

## Statement on Digital Data Management

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The Office of Science mission is to deliver the scientific discoveries and major scientific tools that transform our understanding of nature and advance the energy, economic, and national security of the United States. The Office of Science Statement on Digital Data Management has been developed with input from a variety of stakeholders in this mission<sup>1</sup>.

Here, data management involves all stages of the digital data life cycle including capture, analysis, sharing, and preservation. The focus of this statement is [sharing](#) and [preservation of digital research data](#).

### Table of Contents

- [Principles](#)
- [Requirements](#)
- [Additional Guidance \(including suggested elements for Data Management Plan\)](#)
- [Additional Requirements and Guidance from Office of Science Program Offices](#)
- [Information about Data Management Resources at Office of Science User Facilities](#)
- [Glossary](#)
- [FAQs](#)
- [References](#)

### Principles

The Office of Science affirms that the following principles related to the management of [digital research data](#) directly support fulfillment of its mission.

# Office of Science Statement on Digital Data Management

<http://science.energy.gov/funding-opportunities/digital-data-management/>

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## Principles

- Effective data management has the potential to increase the pace of scientific discovery and promote more efficient and effective use of government funding and resources. Data management planning should be an integral part of research planning.
- Sharing and preserving data are central to protecting the integrity of science by facilitating validation of results and to advancing science by broadening the value of research data to disciplines other than the originating one and to society at large. To the greatest extent and with the fewest constraints possible, and consistent with the requirements and other principles of this Statement, data sharing should make digital research data available to and useful for the scientific community, industry, and the public.
- Not all data need to be shared or preserved. The costs and benefits of doing so should be considered in data management planning.



# Office of Science Statement on Digital Data Management

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## Requirements

**All proposals submitted to the Office of Science for research funding must include a Data Management Plan (DMP) that addresses the following requirements:**

1. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in Requirement #4). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.



# Office of Science Statement on Digital Data Management

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## Requirement 2 of 4

2. DMPs should provide a plan for making all research data displayed in publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.





# Office of Science Statement on Digital Data Management

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## Requirement 3 of 4

3. DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at Office of Science User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other Office of Science facilities can be found in the additional guidance from the sponsoring program.





You are here: SC Home » Funding Opportunities » Statement on Digital Data Management » Data Management Resources at the Office of Science User Facilities

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## Statement on Digital Data Management

### Data Management Resources at the Office of Science User Facilities

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Follow the links to learn more about data management resources at each of the Office of Science User Facilities. If you do not see your facility of interest listed here, please consult the appropriate [Office of Science Program](#) page.

#### Advanced Scientific Computing Research (ASCR)

Facility	Host Institution	Data Management Resources
National Energy Research Scientific Computing Center (NERSC)	LBL	<a href="#">Link</a>
Argonne Leadership Computing Facility (ALCF)	ANL	<a href="#">Link</a>
Oak Ridge Leadership Computing Facility (OLCF)	ORNL	<a href="#">Link</a>
Energy Sciences Network (ESnet)	LBL	<a href="#">Link</a>

#### Basic Energy Sciences (BES)

Facility	Host Institution	Data Management Resources
<i>Light Sources</i>		
Advanced Light Source (ALS)	LBL	<a href="#">Link</a>
Advanced Photon Source (APS)	ANL	<a href="#">Link</a>
Linac Coherent Light Source (LCLS)	SLAC	<a href="#">Link</a>
National Synchrotron Light Source (NSLS)	BNL	<a href="#">Link</a>

# Office of Science Statement on Digital Data Management

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## Requirement 4 of 4

4. DMPs must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all applicable laws, regulations, and DOE orders and policies. There is no requirement to share proprietary data.
- DMPs will be reviewed as part of the overall Office of Science research proposal merit review process.
  - Additional requirements and review criteria for the DMP may be identified by the sponsoring program or sub-program, or in the solicitation.

# Definitions

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## Digital Research Data:

The term *digital data* encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

This statement focuses on *digital research data*, which are *research data* that can be stored digitally and accessed electronically. OMB Circular A110 defines *research data* as follows:

“Research data is defined as the recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples). Research data also do not include:

- (A) Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and
- (B) Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.”

# Definitions

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## **Data Preservation:**

*Data preservation* means providing for the usability of data beyond the lifetime of the research activity that generated them.

## **Data Sharing:**

*Data sharing* means making data available to people other than those who have generated them. Examples of data sharing range from bilateral communications with colleagues, to providing free, unrestricted access to the public through, for example, a web-based platform.

## **Validate:**

In the context of this statement, *validate* means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; or by some other means.



# Suggested Elements for a Data Management Plan



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## Statement on Digital Data Management Suggested Elements for a Data Management Plan

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The Principal Investigator should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the [Requirements for Digital Data Management](#).

The following list of elements for a DMP provides suggestions regarding the structure of the DMP:

- **Data Types and Sources.** A brief, high-level description of the data proposed research and which of these are considered [digital research data](#).
- **Content and Format.** A statement of plans for data and metadata description of documentation plans, annotation of relevant software, standards. (Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies that facilitate sharing, and should advise the sponsoring program of any need to develop or generalize standards.)
- **Sharing and Preservation.** A description of the plans for data sharing and preservation. This should include, when appropriate:
  - the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions;
  - a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and

- Data Types and Sources
- Content and Format
- Sharing and Preservation
- Protection
- Rationale

# Office of Science Statement on Digital Data Management

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- Requirements will apply to all proposals for research funding regardless of institution but NOT to applications for time on user facilities
- Requirements will apply to proposals submitted in response to all Office of Science research solicitations and invitations for new, renewal, and some supplemental funding issued on or after **Oct 1, 2014**

## “Objectives for Public Access to Scientific Publications”

“To the extent feasible and consistent with law; agency mission; resource constraints; U.S. national, homeland, and economic security... the results of unclassified research that are published in peer-reviewed publications directly arising from Federal funding should be stored for long-term preservation and publicly accessible to search, retrieve, and analyze in ways that maximize the impact and accountability of the Federal research investment.”



# DOE's Public Access Plan

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The Department will ensure public access to the **best available version** of peer-reviewed scholarly publications resulting from DOE funding **within 12 months from publication.**

## Best available version:

1. Version of Record (VoR) published and hosted by the publisher
2. Accepted manuscript hosted by a third party repository (e.g. Lab, arXiv, institutional repository) **or by DOE Office of Scientific and Technical Information (OSTI).**



# Public Access Gateway for Energy and Science (PAGES)

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- The Department recently launched a public-facing portal and search interface tool to enhance discoverability, **PAGES**.
  - For peer-reviewed publications resulting from DOE funding, PAGES will provide metadata, abstracts, and links to best available version.
  - OSTI will maintain a dark archive of all accepted manuscripts, providing access only to those that are not publically available elsewhere 12 months after publication.
- **There will be new requirements for researchers to submit metadata and accepted manuscripts to OSTI, effective Oct 1, 2014.**
- PAGES is developed and maintained by OSTI for DOE.
- PAGES is live! <http://www.osti.gov/pages/>

# Requirements

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- **Beginning Oct 1, 2014**, DOE Laboratory researchers should use the Lab's existing scientific and technical information submission system to submit the accepted manuscript (or a link to it at the Lab's website) and related metadata to OSTI. Questions should be directed to the appropriate laboratory STIP manager [www.osti.gov/stip](http://www.osti.gov/stip)
- **Beginning Oct 1, 2014**, new and renewal grants and cooperative agreements will include submission requirements in the terms and conditions. Researchers should consult DOE F 4600.2 for instructions regarding the submission of accepted manuscripts and metadata to OSTI.
- Additional information including answers to FAQs are available at [www.osti.gov/PublicAccess](http://www.osti.gov/PublicAccess).



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### 1. Semi-empirical catalog of early-type galaxy-halo systems: **dark matter** density profiles, halo contraction and **dark matter** annihilation strength

by [Chae, Kyu-Hyun](#); [Kravstov, Andrey V.](#); [Frieman, Joshua A.](#); [Bernardi, Mariangela](#) (Nov. 2012)

*Journal of Cosmology and Astroparticle Physics*

With Sloan Digital Sky Survey galaxy data and halo data from up-to-date N-body simulations within the  $\Lambda$ CDM framework we construct a semi-empirical catalog (SEC) of early-type galaxy-halo systems by making a self-consistent bivariate statistical match of stellar mass ( $M$ ) and velocity dispersion ( $\sigma$ ) with halo virial mass ( $M_{\text{vir}}$ ) as demonstrated here for the first time. We then assign stellar mass profile and velocity dispersion profile parameters to each system in the SEC using their observed correlations with  $M$  and  $\sigma$ . Simultaneously, we solve for **dark matter** density profile of each halo using the spherical Jeans equation. The resulting **dark matter** [more »](#)

### 2. From gamma ray line signals of **dark matter** to the LHC

by [Kopp, Joachim](#); [Neil, Ethan T.](#); [Primulando, Reinard](#); [Zupan, Jure](#) (Mar. 2013)

*Physics of the Dark Universe*

We explore the relationship between astrophysical gamma-ray signals and LHC signatures for a class of phenomenologically successful secluded **dark matter** models, motivated by recent evidence for a  $\sim 130$  GeV gamma-ray line. We consider in detail scenarios in which interactions between the **dark** sector and the standard model are mediated by a vev-less scalar field  $\phi$ , transforming as an N-plet ( $N > 3$ ) under  $SU(2)_L$ . Since some of the component fields of  $\phi$  carry large electric charges, loop induced **dark matter** annihilation to  $\gamma\gamma$  and  $\gamma Z$  can be enhanced without the need for non-perturbatively large couplings, and without overproduction of continuum [more »](#)

### 3. Effective theories of gamma-ray lines from **dark matter** annihilation

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Journal Article: *Semi-empirical catalog of early-type galaxy-halo systems: dark matter density profiles, halo contraction and dark matter annihilation strength*

## Semi-empirical catalog of early-type galaxy-halo systems: dark matter density profiles, halo contraction and dark matter annihilation strength

[Citation Details](#)

With Sloan Digital Sky Survey galaxy data and halo data from up-to-date N-body simulations within the  $\Lambda$ CDM framework we construct a semi-empirical catalog (SEC) of early-type galaxy-halo systems by making a self-consistent bivariate statistical match of stellar mass ( $M$ ) and velocity dispersion ( $\sigma$ ) with halo virial mass ( $M_{\text{vir}}$ ) as demonstrated here for the first time. We then assign stellar mass profile and velocity dispersion profile parameters to each system in the SEC using their observed correlations with  $M$  and  $\sigma$ . Simultaneously, we solve for **dark matter** density profile of each halo using the spherical Jeans equation. The resulting **dark matter** density profiles deviate in general from the dissipationless profile of Navarro-Frenk-White or Einasto and their mean inner density slope and concentration vary systematically with  $M_{\text{vir}}$ . Statistical tests of the distribution of profiles at fixed  $M_{\text{vir}}$  rule out the null hypothesis that it follows the distribution predicted by dissipationless N-body simulations for  $M_{\text{vir}}10^{13.5} \text{--} 14.5 M_{\odot}$ . These **dark matter** profiles imply that **dark matter** density is, on average, enhanced significantly in the inner region of halos with  $M_{\text{vir}}10^{13.5} \text{--} 14.5 M_{\odot}$  supporting halo contraction. The main characteristics of halo contraction are: (1) the mean **dark matter** density within the effective radius [more »](#)

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Publisher's Version of Record at <http://dx.doi.org/10.1088/1475-7516/2012/11/004>

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### EXPORT METADATA

[EndNote](#)[Excel](#)

Authors: [Chae, Kyu-Hyun](#); [Kravstov, Andrey V.](#); [Frieman, Joshua A.](#); [Bernardi, Mariangela](#)

Publication Date: 2012-11-05

OSTI Identifier: OSTI ID: 1076131

Type: Published Article

Journal Name: Journal of Cosmology and Astroparticle Physics

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## Semi-empirical catalog of early-type galaxy-halo systems: dark matter density profiles, halo contraction and dark matter annihilation strength

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http://iopscience.iop.org/1475-7516/2012/11/004/

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Journal of Cosmology and Astroparticle Physics

Journal of Cosmology and Astroparticle Physics > Volume 2012 > November 2012

Kyu-Hyun Chae <sup>a,b</sup>, Andrey V. Kravtsov <sup>c,d</sup>, Joshua A. Frieman <sup>b,c,d</sup> and Mariangela Bernardi <sup>e</sup>

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Abstract References

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We present a detailed analysis of nuclear effects in inclusive electron scattering from polarized  $^3\text{He}$  nuclei for polarization asymmetries, structure functions and their moments, both in the nucleon resonance and deep-inelastic regions. We compare the results of calculations within the weak binding approximation at finite  $Q^2$  with the effective polarization ansatz often used in experimental data analyses, and explore the impact of  $\Delta$  components in the nuclear wave function and nucleon off-shell corrections on extractions of the free neutron structure. Using the same framework we also make predictions for the  $Q^2$  dependence of quasielastic scattering from polarized  $^3\text{He}$ , data on which can be used to constrain the spin-dependent nuclear smearing functions in  $^3\text{He}$ .

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Authors: Ethier, Jacob James; Melnitchouk, Wally [JLAB]

Publication Date: 2013-11-01

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DOE Contract Number: AC05-06OR23177

Type: Accepted Manuscript

Journal Name: Phys. Rev. C

Volume: 88

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## Comparison of high-pressure CO<sub>2</sub> sorption isotherms on Eastern and Western US coals

[Citation Details](#)

Accurate estimation of carbon dioxide (CO<sub>2</sub>) sorption capacity of coal is important for planning the CO<sub>2</sub> sequestration efforts. In this work, we investigated sorption and swelling behavior of several Eastern and Western US coal samples from the Central Appalachian Basin and from San Juan Basin. The CO<sub>2</sub> sorption isotherms have been completed at 55{degrees}C for as received and dried samples. The role of mineral components in coal, the coal swelling, the effects of temperature and moisture, and the error propagation have been analyzed. Changes in void volume due to dewatering and other factors such as temporary caging of carbon dioxide molecules in coal matrix were identified among the main factors affecting accuracy of the carbon dioxide sorption isotherms. The (helium) void volume in the sample cells was measured before and after the sorption isotherm experiments and was used to build the volume-corrected data plots.

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### EXPORT METADATA

[EndNote](#)

Authors: [Romanov, V.](#); [Hur, T.-B.](#); [Fazio, J.](#); [Howard, B](#)

Publication Date: 2012-10-01

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Report Number(s): NETL-PUB-348

DOE Contract Number: FE0004000

Type: Accepted Manuscript

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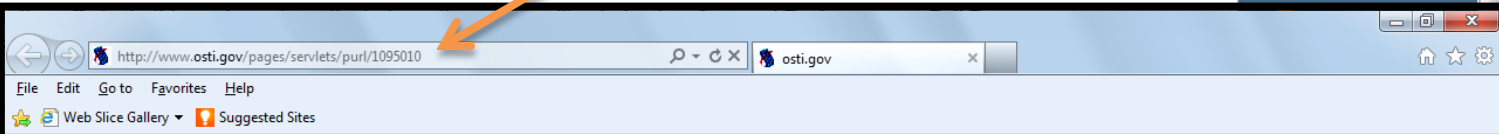
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## Comparison of high-pressure CO<sub>2</sub> sorption isotherms on Eastern and Western US coals

Vyacheslav Romanov<sup>1,\*</sup>, Tae-Bong Hur<sup>1,2</sup>, James Fazio<sup>1</sup>, Bret Howard<sup>1</sup>

<sup>1</sup>U.S. Department of Energy, National Energy Technology Laboratory, PO Box 10940

# CHORUS: Clearing House for Open Research of the U.S.\*

- DOE's participation in CHORUS complements DOE's collection of authors' accepted manuscripts by enabling the "best available version" concept
- Progress to date: CHORUS is evolving; over 90 publisher signatories have signaled their interest in participation; 7 publishers active in CHORUS pilot project, which contains ~4k journal records; 4 publishers have officially joined as members after recent production launch of CHORUS on July 31, 2014.
  - All DOE publications in CHORUS will be available through PAGES
- Participating publishers agree to make articles resulting from federal funds publicly available "after the determined embargo for each discipline and agency"
- Articles resulting from federal funding are identified by additional **FundRef** metadata fields.
  - OSTI is a member of FundRef



# FundRef\*

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- Agreement by publishers to include two additional metadata fields for published articles
  1. funding organization
  2. grant/contract number (or equivalent)
- Articles from participating publishers that are tagged as having federal funding sources will be made available through CHORUS

\* <http://search.crossref.org/fundref>



# Acknowledgements of Federal Support

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## New guidance from Office of Science

<http://science.energy.gov/funding-opportunities/acknowledgements/>

### For work directly supported by DOE Office of Science Financial Assistance (i.e., Grants and Cooperative Agreements):

- Acknowledgment: “This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of [insert the sponsoring SC Program Office, e.g., Basic Energy Sciences], [Add any additional acknowledgements or information requested by the sponsoring SC Program Office] under Award Number(s) [Enter the award number(s)].”
- example: “This material is based upon work supported by the U.S. Department of Energy Office of Science, Office of Basic Energy Sciences Energy Frontier Research Centers program under Award Number DE-SC-0001234.”

### For work supported by DOE Office of Science funding at a National Laboratory:

- Acknowledgment: “This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of [insert the sponsoring SC Program Office, e.g., Basic Energy Sciences], [Add any additional acknowledgements or information requested by the sponsoring SC Program Office] [optional: under contract number XXXXXX ].”



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