



# Multi-Media STI

It's Not What A/V Used to Be

Jannean Elliott, OSTI

Mark Martin, OSTI

The graphic features a red-to-green gradient background with a glowing red wireframe structure resembling a complex network or a stylized letter 'E' on the right side. The text 'Multi-Media STI' is written in a white, bold, serif font on the left side of the graphic.

## Multi-Media STI

In the mid to late '90s, the STIP community rose to the challenge when we worked together to move from a paper environment to an electronic one.

We're hearing another challenge today: Can we, the STIP community make DOE's science information even more accessible, more transparent, and more "21<sup>st</sup> century"?



# Yes, we can

By folding numeric data, scientific images, and multi-media STI into our STIP guidelines, processes, submissions, and output products

The graphic features a red and green background with a glowing red network of lines and nodes, resembling a complex web or data structure. The text "Multi-Media STI" is written in white, bold, sans-serif font on the left side of the graphic.

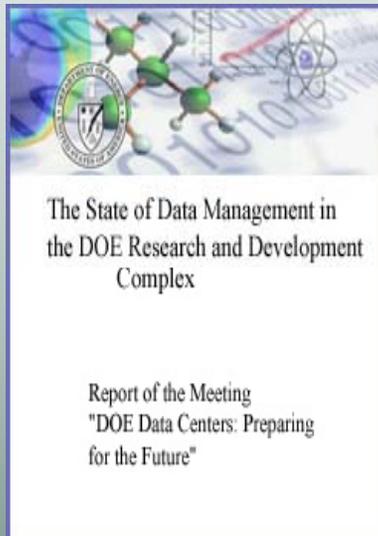
# Multi-Media STI

To meet this challenge, we will need to tackle:

- Policy issues
- Technology issues
- Process issues

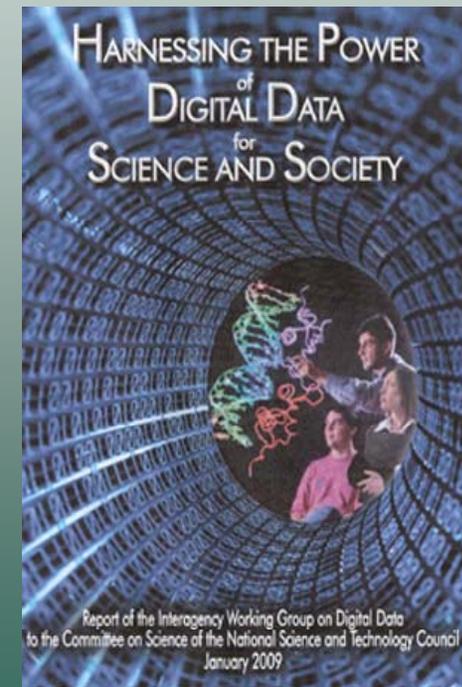
# Laying Groundwork

**Finding:** DOE needs a Department-wide Data Policy that recognizes life-cycle data management as an integral part of research programs and projects.



## January 2009: Harnessing the Power of Digital Data for Science and Society

Report of the Interagency Working Group on Digital Data to the Committee on Science of the National Science and Technology Council





# Policy

## Now in progress:

- Revision of DOE Order

Draft of DOE Order 241.1B says, “STI is found in technical reports...and other forms or formats of technical data.” .... “STI is made available in many formats including but not limited to paper, electronic, and multimedia.”

- Revision of the Guide



## More Groundwork

Before we could even start thinking policy, technology, and process, we needed to identify the digital data and the multi-media STI for which DOE provides all or partial funding. How much is “out there”? Where are these collections and how accessible are they?

Last summer’s launch of the DOE Data Explorer began to answer some of those questions for us.



## DOE DATA EXPLORER

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Use the DOE Data Explorer (DDE) to find scientific research data - such as computer simulations, numeric data files, figures and plots, interactive maps, multimedia, and scientific images - generated in the course of DOE-sponsored research in various science disciplines. The DOE Data Explorer includes a database of citations prepared by the [Office of Scientific and Technical Information](#) (OSTI) based on the information found at data-hosting Web sites. It is intended to be particularly useful to students, the public, and to researchers who are new to a field or looking for experimental or observational data outside their normal field of expertise.

FEATURED DATA COLLECTION



[Link to these citations](#)

## DOE Data Explorer identifies, links to 277 collections of non-text STI

- 153 collections of numeric data, data plots, figures, graphs
- 52 collections of "special mix" (genome databases, etc.)
- 16 collections of multi-media STI (video and audio files)
- 22 collections of scientific images (from research)
- 34 other collections (simulations, interactive data maps)



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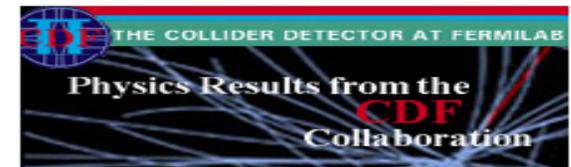
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FEATURED DATA COLLECTION



[Link to these citations](#)

**Near-term goals:** Develop a customized web crawl for enhanced retrieval (including individual data sets where possible); incorporate DDE into Science Accelerator and Science.gov.

**Long-term goals:** Develop federated searching of data centers and selected collections; link individual data sets to reports and other text-based STI.

# Working with partners outside DOE

International Council for Scientific and Technical Information, Data Linkage Working Group

Goal: Link selected ARM data sets with citations in OSTI's database (Ila STTR and ARM Archive staff)

CENDI Working Group on Metadata for Images:

Goal: Resolve different image metadata schemes from the Federal Agencies into common scheme for image searching across Science.gov repositories.

Welcome to the **NBII's** Digital Image Library, a growing library of diverse, well-documented images of nature and the environment. Contributed by photographers and organizations, most images are freely available for [use](#).

Image Search

Topics Special Collections Kids Corner Current holdings: 11776 Images

 Animals	 Fungi & Lichens	 Plants	 Microorganisms
 Interactions Among Species	 Landscapes & Weather	 Environmental Topics	

# National Biological Information Infrastructure: Digital Image Library

## NASA's Imagery Collections

NIX is a meta-search engine that links to and searches imagery in NASA databases that have internal search engines. These databases are listed under "Advanced Search". Not all NASA imagery resides in databases. Below is a listing of additional NASA collections that reside on the web or in collections that currently aren't searchable through NIX. We hope, in the future, to incorporate additional collections as NIX resources allow. If you wish to add your collection to NIX, please contact the NIX Help Desk by using the "Comment or Question" link to

# NIX

## External Collections:

- + Astronomy
- + Earth Science
- + Historical
- + Life Sciences
- + Multiple Subjects
- + NASA Distributed Active Archive

## Latest News



**The Extended Region Around the Planetary Nebula NGC 3242**  
04.03.09 –This ultraviolet image from NASA's Galaxy Evolution Explorer shows NGC 3242, a planetary nebula frequently referred to as "Jupiter's Ghost."  
[Full image and caption](#)

## Latest Images

### The Extended Region Around the Planetary Nebula NGC 324...



This ultraviolet image from NASA's Galaxy Evolution Explorer shows NGC 3242, a planetary nebula frequently referred to as "Jupiter's Ghost."  
[Read More](#)

## Multimedia Gallery



Slide Show:  
Snapshots of the Universe  
Images of life and death in the universe.

## Video Gallery



Smart Art:  
Imaging the Cosmos  
Ever wonder how astronomers get those amazing pictures from space telescopes?

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Galaxy Evolution Explorer Turns Two  
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DIRECTOR

Oak Ridge National Laboratory is the Department of Energy's largest science and energy laboratory. ORNL was established in 1943 as a part of the secret Manhattan Project to pioneer a method for producing and separating plutonium. Today, ORNL has six major research areas: neutron science, energy, high-performance computing, systems biology, materials science at the nanoscale, and national security.

ORNL is completing a \$350 million project to provide a modern campus for the next generation of great science. A unique combination of federal, state, and private funds is supporting the construction of 13 new facilities, including the Center for Nanophase Materials Sciences, the Advanced Microscopy Laboratory, the Leadership Computing Facility, and



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Innovations?

## **New (STI) media is all the buzz.**

What is new media for us?

- PowerPoint
- Audio (.mp2, .mp3, .ra)
- Audio/Visual (.mpeg4, .mov, .qt)

What are the technical challenges?

- Metadata searchable
- Content searchable



## SciencePix.gov – Where we are

- Much of this content collected with your help
- Audio/Visual based
- Currently searchable by metadata

## Washington State Digital Archives – Where we are headed

- Content searchable through beta search technology from Microsoft
- Audio content only
- Audio/Visual content is a trivial extension



**Process**



With some changes to existing fields and maybe a new product type or two, metadata for multi-media STI could begin to come to OSTI.

FILE FORMAT

FILE NAME

FINAL DELIVERABLE

FORMAT ADDITIONAL

FORMAT COLOR

FORMAT GRAPHICS

FORMAT MACHINE  
COMPATIBILITY

FORMAT OPERATING  
SYSTEM

FORMAT OTHER

FORMAT QUANTITY

FORMAT SOUND

# What about data / images like this?



## WELCOME TO THE NUCLEIC ACID DATABASE

a repository of three-dimensional structural information about nucleic acids

Experimental Type			
Crystal Structure OY ON		Structure Factors Available OY ON	
Space Group	<input type="text"/>	Resolution better than	<input type="text"/>
R-factor better than <		<input type="text"/>	
NMR OY ON		NMR Restraints Available OY ON	
Sequence			
Nucleic Acid Sequence Pattern			<input type="text"/>
			Mismatch OY ON
What it contains			
DNA OY ON	RNA OY ON	Protein OY ON	Ligand OY ON
Chemical Modification			
Base OY ON	Sugar OY ON	Phosphate OY ON	
Structural Features			
Double Helix <input type="text"/>	Triple Helix OY ON	Quadruple Helix OY ON	Single Strand OY ON
Internal loop OY ON	Tetraloop OY ON	Hairpin loop OY ON	Bulged bases OY ON
3 way junction OY ON		4 way junction OY ON	



ur0014



ur0023



ur0024



ur0031

Search

Reset

# Multi-Media as Supplements



Online supplements for papers with video figures

1.	"Collapse of the critical state in superconducting niobium" Ruslan Prozorov, Daniel V. Shantsev and Roman G. Mints <a href="#">Phys. Rev. B 74, 220511(R) (2006)</a> <a href="#">doi:10.1103/PhysRevB.74.220511</a>	
2.	"Topology of the intermediate state in pinning-free type-I superconductors of different shapes" Ruslan Prozorov <a href="#">Phys. Rev. Lett. 98, 257001 (2007)</a> <a href="#">doi:10.1103/PhysRevLett.98.257001</a>	
3.	"Suprafluid in Type-I Superconductors" Ruslan Prozorov, Andrew F. Fidler, Jacob Hoberg, Paul C. Canfield <a href="#">Nature Physics 4, 327 - 332 (2008)</a> <a href="#">doi:10.1038/nphys888</a>	
4.	"Unusual ferromagnetic domains in CeAgSb <sub>2</sub> crystals" Ruslan Prozorov, Sergey L. Bud'ko and Paul C. Canfield in preparation	
5.	"Current-driven transformations of the intermediate state patterns in type-I superconductors" Jacob R. Hoberg and Ruslan Prozorov	

**Condensed Matter Physics Programs at Ames Lab: the Superconductivity and Magnetism Low-temperature Laboratory**

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**ARTICLE**

Nature Cell Biology 4, 750 - 756 (2002)  
Published online: 23 September 2002 | doi:10.1038/ncb852

**De novo formation of transitional ER sites and Golgi structures in *Pichia pastoris***

Brooke J. Bevis, Adam T. Hammond, Catherine A. Reinke & Benjamin S. Glick

imaged for ~ 33 min. Several de novo formation and fusion events can be seen. Weak nuclear fluorescence is also visible. This movie is accelerated 60-fold relative to real time.

**Movie 2 (mov 3,598)**  
*P. pastoris* cells containing Sec13p-GFP-labeled tER sites were imaged for ~ 30 min. Several de novo formation and fusion events can be seen, particularly in the cell on the lower left. Weak nuclear fluorescence is also visible. This movie is accelerated 60-fold relative to real time.

**Movie 3 (mov 1,333)**  
*P. pastoris* cells containing Sec13p-GFP-labeled tER sites and Sec7p-DsRed-labeled Golgi structures were imaged for ~ 14 min. The formation and growth of new Golgi structures is linked to that of the associated tER sites, as seen most clearly in the pair of cells on the left. This movie is accelerated 60-fold relative to real time.

**Movie 4 (mov 904)**  
*P. pastoris* cells containing Sec13p-GFP-labeled tER sites and Sec7p-DsRed-labeled Golgi structures were imaged for ~ 15 min. In the cell on the left, two tER sites fuse, and the associated Golgi structures also fuse. This movie is accelerated 60-fold relative to real time.

**SUPPLEMENTARY INFO**

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## Multi-Media as Standalone STI

How much STI content is required before a multi-media educational or promotional item becomes STI? The lines can be blurry and may become more so.

What about the internal workings of your site? Does STI in multi-media formats flow through your review and approval process now? If not, how should it? How can you bring about change?

Can we keep format / content / product type issues clear and separate from each other?

How will we ensure long-term accessibility for STI in “standalone” multi-media formats?

# Numeric Data

How can we scale up from indexing of collections to indexing of individual data sets?

- Retrieval time issues
- Coordination issues
- “Apples and oranges” issues
- Metadata issues



The graphic features a dark red background with a glowing green oval shape on the right side. Inside the oval, there is a complex network of red lines forming a web-like structure. The text "Multi-Media STI" is written in white, bold, sans-serif font on the left side of the red background.

## Multi-Media STI

Regardless of how tough the questions as STIP expands its boundaries, the benefits are greater:

- Richer, more “real” content
- Content that moves from linking pieces together to being one, integrated package
- Content for today’s (and tomorrow’s) users (who are raised and educated in a media saturated environment)
- Content that conveys history along with science
- Content that will invite interactivity