

# VRA Core STEM Extension 0.5



A metadata extension for images in the STEM  
disciplines

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# What is a STEM discipline?

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- ❑ Science
- ❑ Technology
- ❑ Engineering
- ❑ Mathematics
- ❑ SENCER Digital Library Program  
(**S**cience **E**ducation for **N**ew **C**ivic **E**ngagments and **R**esponisibilities)
  - [www.sencer.net](http://www.sencer.net)

# Image Needs of Science Faculty

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- Overlap with Traditional VR
  
- Special Needs
  - Different controlled vocabularies
  
  - Hardware tracking
  
  - Experiment tracking

# EQUIPMENT Element

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## □ EQUIPMENT

Attributes: *type*

Subelement:

*model*

*id*

STEM Image Extension Element	XML element	XML attribute	XML sub-element	Data example
EQUIPMENT	equipment			Bigowat compound microscope
		type		
			model	mu0008002a
			id	4335709-87666

# PROJECT and OBJECT Elements

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- Modifies VRA Core 4.0 WORK/COLLECTION/IMAGE Element

STEM Image Extension Element	XML element	XML attribute	Data example
PROJECT	project		
		id	p_273
		source	University of Maryland Department of Chemistry
		type	crystal microscopy
		control	true
OBJECT	object		
		id	o_5734070808
		refid	1940-85
		source	American Museum of Natural History, New York

# LOCATION Element 1

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- Addition of Darwin Core subelements
  - **elevation**  
*Attributes: minElevation  
maxElevation*
  - **depth**  
*Attributes: minDepth  
maxDepth*
  - **geospatialCoordinates**  
*Attributes: cartesianLatitude  
cartesianLongitude  
geodeticLongitude  
geodeticLatitude*
  - **habitat**  
*Attributes: type*

STEM Image Extension Element	XML element	XML attribute	XML subelement	XML attribute	Data example
LOCATION	location				
		type			specimen collection
			elevation		
				minElevation	1828.8 m
				maxElevation	4267.2 m
			depth		
				minDepth	24 m
				maxDepth	380 m
			geospatialCoordinates		
				cartesianLatitude	40.0446
				cartesianLongitude	-76.4131
			habitat		
				type	rain forest

# CLASSIFICATION Element

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- ▣ Adds discipline, subdiscipline and specialty subelement
- ▣ Source and refid for each subelement



# CLASSIFICATION Element

STEM Image Extension Element	XML element	XML subelement	XML attribute	Data example
CLASSIFICATION	classification			
		discipline		Chemistry
			source	LCSH
			refid	sh 85022986
		subdiscipline		Chemistry, Organic
			source	LCSH
			refid	sh 85023022
		specialty		Bioorganic chemistry
			source	LCSH
			refid	sh 85014251

# DATE Element

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- Adds time and julianDay subelements from Darwin Core
- Adds new type terms

STEM Image Extension Element	XML element	XML attribute	XML subelement	Data example
DATE	date			
		type		collection
			earliestDate	2007-01-31
			latestDate	
			julianDay	31
		time		12.75

# TECHNIQUE Element

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- ❑ The Same as VRA Core 4.0 with the additional of characteristic of being used to describe materials that are introduced as experimental variables (stains, reagents, solvents). When describing materials acted upon in experiments, use the MATERIAL Element. Addition of appropriate controlled terms to describe materials used in STEM disciplines
- ❑ Addition of experimentalVariable and preservative subelements with attendant *name* and *type* Attributes for each subelement

# TECHNIQUE Element

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STEM Image Extension Element	XML element	XML subelement	XML attribute	XML sub-element	Data example
TECHNIQUE					
	technique				
		experimentalVariable			
			type		stain
			name		Janus Green
		preservative			
			type		formaldehyde topical
			name		Forma-Ray

# MATERIAL Element

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- ❑ Adds type subelement and vocab and refid attributes for type
- ❑ As an added characteristic this field will be used to describe materials that are experimented upon in projects. When describing materials introduced as experimental variables (stains, reagents, solvents), use the TECHNIQUE Element. Addition of appropriate controlled terms to describe materials used in STEM disciplines

# MATERIAL Element

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STEM Image Extension Element	XML element	XML attribute	XML subelement	XML attribute	Data example
MATERIAL	material				Methyl ethyl ketone
		vocab			LCSH
		refid			sh 91005038
			type		Organic compound
				vocab	LCSH
				refid	sh 85095499

# Other Core 4.0 Elements

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- RELATION, TEXTREF, SOURCE, RIGHTS, and DESCRIPTION
  - remain the same
  
- AGENT, TITLE, SUBJECT, WORK TYPE, and MEASUREMENT
  - Addition of appropriate STEM vocabulary terms
  
- CULTURAL CONTEXT, INSCRIPTION, STATE EDITION, and STYLE PERIOD
  - are of little interest

# Next Steps

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- ❑ Form a working group of interested VRA members
- ❑ Work toward filling in gaps in STEM areas



# Resources

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- ❑ American Museum of Natural History. 2008. "Frogs: A chorus of color." Online resource, <http://www.amnh.org/exhibitions/frogs/featured/>. Retrieved March 12, 2008.
- ❑ American Museum of Natural History. 2008. "Arrowhead with clipped base." Anthropological database collection. Online resource, [http://anthro.amnh.org/anthropology/databases/common/archive\\_catno.cfm?database=NORTH&accno='1940-85','1941-49','1945-58'&current\\_record=1](http://anthro.amnh.org/anthropology/databases/common/archive_catno.cfm?database=NORTH&accno='1940-85','1941-49','1945-58'&current_record=1). Retrieved March 12, 2008.
- ❑ Biodiversity Information Standards Working Group. "Darwin Core concept list." Online resource, <http://wiki.tdwg.org/twiki/bin/view/DarwinCore/DarwinCoreDraftStandard>. Retrieved January 10, 2008.
- ❑ Getty Institute. 2006. "Categories for the description of works of art: CDWA lite." Online resource, [http://www.getty.edu/research/conducting\\_research/standards/cdwa/cdwalite.html](http://www.getty.edu/research/conducting_research/standards/cdwa/cdwalite.html). Retrieved January 29, 2008.
- ❑ Library of Congress. 2008. "Library of Congress Authorities." Online resource, <http://authorities.loc.gov/>. Retrieved March 1, 2008.
- ❑ Merriam-Webster.com. 2008. "project." Online resource, <http://www.merriam-webster.com/dictionary/project>. Retrieved March 12, 2008.
- ❑ National Science Digital Library. 2008. "NSDL\_DC metadata standard." Online resource, <http://nsdl.org/collection/metadata-guide.php>. Accessed February 25, 2008.
- ❑ Paolydoratou, P. 2007. "Use of digital repositories by chemistry researchers: Results of a survey." Program, 41 (4), 386-399.
- ❑ Visual Resources Association. 2007. "VRA Core 4.0 Element Description." Online resource, [http://www.vraweb.org/projects/vracore4/VRA\\_Core4\\_Element\\_Description.pdf](http://www.vraweb.org/projects/vracore4/VRA_Core4_Element_Description.pdf). Retrieved March 1, 2008.
- ❑ Visual Resources Association. 2007. "Cataloging Cultural Objects: Selections." Online resource, <http://www.vraweb.org/ccoweb/cco/selections.html>. Retrieved February 23, 2008.

# Stem Information Available 3/18/08

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[http://depts.drew.edu/arthist/faculty/krista  
\\_white/krista\\_white.html](http://depts.drew.edu/arthist/faculty/krista_white/krista_white.html)