AVM Tag Name	Format	XMP Tag	Inner Tags	IPTC Equiv.	Related UCD1+	Definition	Comments	Example	Index
Creator	string	<photoshop:Source>		Source	meta.curation	Original creator of the resource at the organizational level.	Required for submission to VAMP Archive	Spitzer Science Center	1
CreatorURL	URL	<Iptc4xmpCore:CiUrlWork>		Website(s)	–	A simple URL pointing to the (top level) outreach webpage for the original creator.	–	http://www.spitzer.caltech.edu	2
Contact.Name	string, list	<dc:creator>	<rdf:Seq><rdf:li>	Creator	–	Name(s) of the primary contact(s) for the resource.	–	R. Hurt	3
Contact.Email	string, list	<Iptc4xmpCore:CiEmailWork>		E-Mail(s)	meta.email	Email(s) of the primary contact(s) for the resource.	–	example@ipac.caltech.edu	4
Contact.Telephone	string, list	<Iptc4xmpCore:CiTelWork>		Phone(s)	–	Phone number of the primary contact(s) for the resource.	–	555-555-5555	5
Contact.Address	string	<Iptc4xmpCore:CiAdrExtadr>		Address	–	Street address of the primary contact for the resource.	–	1200 E. California Blvd.	6
Contact.City	string	<Iptc4xmpCore:CiAdrCity>		City	–	City of the primary contact for the resource.	–	Pasadena	7
Contact.StateProvince	string	<Iptc4xmpCore:CiAdrRegion>		State/Province	–	State or province of the primary contact for the resource.	–	California	8
Contact.PostalCode	string	<Iptc4xmpCore:CiAdrPcode>		Postal code	–	Zip or postal code of the primary contact for the resource.	–	91125	9
Contact.Country	string	<Iptc4xmpCore:CiAdrCtry>		Country	–	Country of the primary contact for the resource.	–	USA	10
Rights	string	<xapRights:UsageTerms>	<rdf:Alt><rdf:li xml:lang="x-default">	Rights Usage Terms	–	Copyright and related intellectual property rights description.	Required for submission to VAMP Archive. Without copyright and rights management information, the VAMP Archive will not be able to serve out images and metadata properly and legally. Public domain/free use images/metadata are of the greatest utility to the community.	Public Domain	11
Title	string	<dc:title>	<rdf:Alt><rdf:li xml:lang="x-default">	Title	–	General descriptive title given to the image resource.	This should only contain a single line of text.	M 82	12
Headline	string	<photoshop:Headline>		Headline	meta.title	Short description of the full caption.	This can contain up to two or three brief sentences.	The galaxy M82 is seen across the spectrum from X-rays to infrared light. This combined view is from NASA's Chandra, Hubble, and Spitzer telescopes.	13
Description	string	<dc:description>	<rdf:Alt><rdf:li xml:lang="x-default">	Description	meta.note	Full caption and related description text for the image resource.	This may contain full paragraphs of information about the resource.	NASA's Spitzer, Hubble, and Chandra space observatories teamed up to create this multi-wavelength, false-colored view of the M82 galaxy. High energy particles appear as blue, stars as green, dust as red.	14
Subject.Category	string-CV, list	<avm:Subject.Category>	<rdf:Bag><rdf:li>	–	–	The type(s) of object or objects in the resource, or general subject matter of an image, taken from a controlled vocabulary taxonomy (see appendix A)	If objects can be placed into multiple categories in the taxonomy they should all be listed.	C.5.1.6;C.5.3.3	15
Subject.Name	string, list	<dc:subject>	<rdf:Bag><rdf:li>	Keywords	meta.id	Proper names/catalog numbers for key objects/subjects in the image field.	Common catalog numbers (e.g. Messier, NGC, IC, 3C) and common names should be used here. Spaces should be used to separate catalog designations and numbers (e.g. "NGC 1250" not "NGC1250") and leading zeros should be omitted (e.g. "M 5" not "M 05"). When common catalog numbers are not available, any published identification is acceptable (including IDs from standard reference papers). Proper names of non-astronomical subjects should be entered here as well (people, telescopes, facilities, etc.). These tag values will be visible in the "Keyword" field in IPTC-aware applications.	M 82; Messier 82; NGC 3034; Cigar Galaxy	16
Distance	float, list(2)	<avm:Distance>	<rdf:Seq><rdf:li>	–	–	The distance to the object, measured in light years (list element 1) and/or redshift (list element 2).	This tag is an ordered list that may take two independent values. The first is a distance measured in light years, the second is an observed redshift. Either or both of these terms may be entered; if only a redshift is to be entered then a null dash "-" value should be used as a placeholder in the first element. No placeholder is necessary if only the first element is used. **Distance** tags are intended for extrasolar objects giving an approximate estimate to the object. Solar System object distances are highly variable because of orbital mechanics and are best determined from appropriate ephemeredes.	11700000; 0.000677	17
Distance.Notes	string	<avm:Distance.Notes>		–	–	Comment about the contents of the **Distance** tag.	This is useful primarily as a reference to someone evaluating the quality and source of the distance estimate. This tag is free-text, but inclusion of a brief description of the type of measurement and the reference/citation would be appropriate here.	Light years from PI; redshift from NED	18
ReferenceURL	URL	<avm:ReferenceURL>		–	meta.ref.url	Webpage containing more information about this specific image.	This link should point to a full web page with text describing the image, not just to the image file itself. See also **ResourceURL.**	http://gallery.spitzer.caltech.edu/Imagegallery/image.php?image_name=sig06-010	19
Credit	string	<photoshop:Credit>		Provider	meta.curation	The minimum information that the Publisher would like to see mentioned when the resource is used.	Image credit should always be provided with images. See also **Rights**. Required for submission to VAMP Archive.	NASA/JPL-Caltech/STScI/CXC/UofA/ESA/AURA/JHU	20
Date	date	<photoshop:DateCreated>		Date Created	time.release	Date that the resource was created or made available. (YYYY-MM-DD).	This is the release date for the media resource. Note that this is distinct from the observation date (see **Temporal.StartTime**).	2007-04-24	21
ID	string	<avm:ID>		–	–	This is an identifier for the resource that is unique to the creator.	Multiple versions of the same resource rendered at different sizes or file types (but identical in content) should all have the same **ID**. The different instances will be differentiated from one another by their differing **ResourceID** values.	sig06-010	22
Type	string-CV	<avm:Type>		–	–	The type of image/media resource. The controlled vocabulary is listed in Appendix A.	This allows image and other media resources to be categorized into general categories, distinguishing between, for example, data-derived images and artwork.	Observation	23
Image.ProductQuality	string-CV	<avm:Image.ProductQuality>		–	–	Qualitative image quality assessment. The controlled vocabulary is listed in Appendix A	–	Good	24
Facility	string, list(s)	<avm:Facility>	<rdf:Seq><rdf:li>	–	instr.tel	Telescopes or observatories used for the observations.	For this and subsequent observation keywords, the ordered list allows each contributing observation in a color composite to be identified uniquely. The ordering of the observations should be identical for each list(s) formatted tag.	Chandra; Hubble; Hubble; Spitzer	25
Instrument	string, list(s)	<avm:Instrument>	<rdf:Seq><rdf:li>	–	Instr	Instrument used to collect the data. One **Instrument** entry per exposure.	–	ACIS; ACS; ACS; IRAC	26

Spectral.ColorAssignment	string-CV, list(s)	<avm:Spectral.ColorAssignment>	<rdf:Seq><rdf:li>	–	–	The output color that is assigned to an exposure. One **Spectral.ColorAssignment** entry per exposure. The controlled vocabulary is listed in Appendix A.	–	Blue; Green; Orange; Red
Spectral.Band	string-CV, list(s)	<avm:Spectral.Band>	<rdf:Seq><rdf:li>	–	em.[*band*], referring to one of the following: em.radio, em.mm, em.IR, em.opt, em.UV, em.X-ray, em.gamma.	Waveband of the component exposure from a pre-defined list defining the general part of the spectrum covered. One **Spectral.Band** entry per exposure. The controlled vocabulary is listed in Appendix A.	The elements in the list should be in the same ordering as for **Facility** and **Instrument** above to specifically identify each contributing image in a color composite. This list specifically includes text descriptors of the band such as e.g. Radio, Optical, Gamma-ray etc. Consult Appendix A for specific options for this tag.	X-ray; Optical; Optical; Infrared
Spectral.Bandpass	string, list(s)	<avm:Spectral.Bandpass>	<rdf:Seq><rdf:li>	–	em.[*band*]. [*range*] E.g. em.IR.3-4um. See The UCD1+ controlled vocabulary Version 1.23	Bandpass of the individual exposure. One **Spectral.Bandpass** entry per exposure.	This free-form string allows the spectral coverage to be identified more precisely. Ideally this should refer to commonly used bandpasses (e.g. B, V, R, I, J, H, K, etc.), specific line excitations or transitions (H-alpha, SIII, CO(3-2), etc.), or if appropriate, instrument specific channels or filters (only if no other descriptor is adequate).	-;B;R;mid-infrared
Spectral.CentralWavelength	float, list(s)	<avm:Spectral.CentralWavelength>	<rdf:Seq><rdf:li>	–	em.wl.central	Central wavelength of the filter used for the individual exposure measured in nanometers. One **Spectral.CentralWavelength** entry per exposure.	–	0.5;440;700;8000
Spectral.Notes	string	<avm:Spectral.Notes>	<rdf:Alt><rdf:li xml:lang="x-default">	–	–	Free-text field to allow for more detailed discussions of bandpasses and color mappings.	–	X-ray bandpass wavelengths are approximate.
Temporal.StartTime	date, list(s)	<avm:Temporal.StartTime>	<rdf:Seq><rdf:li>	–	time.start	Start time of the exposure in ISO 8601 format "yyyy-mm-ddThh:mm" (UT; time portion is optional). One **Temporal.StartTime** entry per exposure.	This field can be populated from the FITS keyword DATE-OBS.	-; 2005-02-05; 2005-02-05; 2004-07-03T12:00
Temporal.IntegrationTime	float, list(s)	<avm:Temporal.IntegrationTime>	<rdf:Seq><rdf:li>	–	obs.exposure	The exposure time in seconds. One **Temporal.IntegrationTime** entry per exposure.	This should be considered to be an approximate measure of the exposure time, but not necessarily an indication of the time of the end of the observation (if added to **Temporal.StartTime**). This field can be populated from the FITS keyword EXPTIME.	-; -; -; 240
DatasetID	string, list(s)	<avm:DatasetID>	<rdf:Seq><rdf:li>	–	meta.dataset	Identifier for the source FITS dataset for each exposure in the image. If available, this can be a VO-compliant reference to the dataset [ivo://AuthorityID/ResourceKey]. One **DatasetID** entry per exposure.	–	a1;a2;a3;a4
Spatial.CoordinateFrame	string-CV	<avm:Spatial.CoordinateFrame>		–	pos.frame	Coordinate system reference frame. **Spatial.CoordinateFrame** should be chosen from a pre-defined list. The controlled vocabulary is listed in Appendix A.	This field can, for instance, be populated from the FITS keyword: CFRAME. Options include FK5, GAL etc. Consult Appendix A for specific options for this tag.	ICRS
Spatial.Equinox	string	<avm:Spatial.Equinox>		–	time.equinox	Equinox for **Spatial.CoordinateFrame** in decimal years.	This field can be populated from the FITS keyword: EQUINOX. It is optional for celestial coordinates that have been adjusted to default epoch for the coordinate frame (J2000 for FK5, B1950 for FK4), but otherwise required.	2000
Spatial.ReferenceValue	float, list(2)	<avm:Spatial.ReferenceValue>	<rdf:Seq><rdf:li>	–	pos.wcs.crval	Reference coordinates (RA and Dec) for the image (2 element list in decimal degrees).	This field can be populated from the FITS keywords: CRVAL1, 2.	149.11051168; 69.7053749827
Spatial.ReferenceDimension	float, list(2)	<avm:Spatial.ReferenceDimension>	<rdf:Seq><rdf:li>	–	pos.wcs.naxis	Size of the image in pixels (2 element list).	FITS Keywords: NAXIS1,2 (also equivalent to image dimensions).	4299; 3490
Spatial.ReferencePixel	float, list(2)	<avm:Spatial.ReferencePixel>	<rdf:Seq><rdf:li>	–	pos.wcs.crpix	X,Y coordinates of the pixel in the image to which the reference coordinate (**Spatial.ReferenceValue**) refers (2 element list).	FITS Keywords: CRPIX1,2; In many common FITS files the reference pixel is not the center pixel in the image.	922.146820068; 1153.85690308
Spatial.Scale	float, list(2)	<avm:Spatial.Scale>	<rdf:Seq><rdf:li>	–	pos.wcs.scale	Spatial scale of the image in number of degrees/pixel (2 element list).	FITS Keywords: CDELT1, CDELT2 (or derived from CD matrix). Is required for Simple Image Access operation (as per SIA Specification v. 1.0).	-4.1635027032331E-05; 4.1635027032331E-05
Spatial.Rotation	float	<avm:Spatial.Rotation>		–	–	Position angle of the Y axis in degrees measured east from north.	FITS Keywords: CROT/CROTA1/CROTA2. Sky rotation is measured east from north which, for astronomical images, is counter-clockwise (east and west are reversed in a sky projection compared to a map projection).	49.93606563
Spatial.CoordsystemProjection	string-CV	<avm:Spatial.CoordsystemProjection>		–	pos.wcs.ctype	A combination of the coordinate system and the projection of the image. The controlled vocabulary is listed in Appendix A.	Typical projections include "TAN", "SIN", "CAR" (Cartesian flat projection) and "AIT" (AITOFF equal-area all-sky), among others. This keyword is derived from the contents of the standard FITS Keywords: CTYPE1,2.	TAN
Spatial.Quality	string-CV	<avm:Spatial.Quality>		–	–	This qualitatively describes the reliability of the spatial coordinate information in this metadata. The controlled vocabulary is listed in Appendix A.	This value needs to be set by the user; it should default to a null (undefined) value unless the user specifically indicates otherwise (even if the WCS coordinates have been read in from the FITS file, rotation and cropping frequently follow, invalidating the WCS solution. Values include: *Full* (verified full WCS information) & *Position* (partial information including at least a **Spatial.ReferenceValue**)	Full
Spatial.Notes	string	<avm:Spatial.Notes>	<rdf:Alt><rdf:li xml:lang="x-default">	–	–	Free-text description to expand further on coordinates/geometry of image.	This field can be used to include human-readable summaries of the image geometry as well as any other relevant notes.	FOV: 10.74 x 8.72 arcminutes; Ref coordinate: 9h56m26.52s 69d42m19.35s; derived from astrometry.net file sig06-010.fits
Spatial.FITSheader	string	<avm:Spatial.FITSheader>		–	–	Free-text representation of the FITS header from which the AVM spatial tags were derived.	This optional field allows the full WCS information in the source FITS header (which may include CD matrix and distortion correction terms beyond the scope of AVM WCS) to be preserved with the image. Note that possible ambiguities in how FITS images are rendered as images may introduce ambiguities in how this information is to be interpreted. Note that including large FITS headers can significantly increase the size of the tagged image!	CRVAL1 = 6.3856 CRVAL2 = 64.1784 RADESYS = 'ICRS ' EQUINOX = 2000. CTYPE1 = 'RA---TAN' CTYPE2 = 'DEC--TAN' CRPIX1 = 214. CRPIX2 = 138.
Spatial.CDMatrix	float, list(4)			–	–	Matrix representation of scale/rotation terms.	This tag was present in AVM 1.0 but has been deprecated in 1.1.	
Publisher	string	<avm:Publisher>		–	meta.curation	Publisher of the resource	This is a text description of the person or institution providing the resource to the VAMP archive.	Spitzer Space Telescope
PublisherID	string	<avm:PublisherID>		–	–	ID of publisher registered as VAMP providers.	The **PublisherID** will be assigned by the administrators of the VAMP archive server. The **PublisherID** combined with the **ID** uniquely describes an image resource.	vamp://spitzer

ResourceID	string	<avm:ResourceID>		–	–	This identifies a specific "instance" of a resource; e.g. one image in one file format at one resolution. This allows the same resource (image) to be offered in different formats and resolutions. Together with the **PublisherID**, each registered resource is uniquely identified in the database	Multiple instances of the same resource differing only in file format, resolution, etc. must have unique **ResourceID** values, but should all share identical **ID** values.	sig05-010_jpg_sm
ResourceURL	URL	<avm:ResourceURL>		–	–	A unique URL pointing to the specific online image/image archive is needed to identify where to obtain the image. Each **ResourceID** is paired with a matching **ResourceURL**.	The embedded URL in the image file reflects its location at the time it was created or downloaded. Obviously if gallery links are changed in the future, this will no longer be valid.	http://ipac.jpl.nasa.gov/media_images/sig06-010.tif
RelatedResources	list	<avm:RelatedResources>	<rdf:Bag><rdf:li>	–	–	The format is a list of **PublisherID/ID** values that will reference specific resources registered in VAMP (though not specific "instances").	The purpose of this tag is to allow publishers to intentionally create links between different resources known to be related in content. This could, for instance, be used to link multiple images of the same object, or to relate a podcast to an image.	vamp://spitzer/sig05-010; vamp://spitzer/sig05-010
MetadataDate	date	<avm:MetadataDate>		–	–	The date of the metadata content for the image.	If any info is updated in the source files (updated caption, corrected credit, etc., new versions of the same resource in different formats) changing this date flags the VAMP Archive to reload the resources.	2008-05-09
MetadataVersion	string	<avm:MetadataVersion>		–	–	This is the version of the applied metadata definition.	–	1.1
File.Type	string-CV	n/a		–	–	The format of the file. For images this would include TIFF, JPEG, PNG, GIF, PSD, PDF	Full list is given in Appendix A	TIFF
File.Dimension	float, list(2)	n/a		–	–	Size in pixels (x, y) of the image resource.	–	4299; 3490
File.Size	float, list(2)	n/a		–	–	Size of the image resource, measured in kilobytes.	–	18237
File.BitDepth	float	n/a		–	–	Color bit-depth of the file, measured in total bits per pixel.	–	24