

AVM Tag Name	Format	XMP Tag	Inner Tags	IPTC Equiv.	Related UCD1+	Definition	Comments	Status	Example
Creator	string	<photoshop:Source>		Source	meta.curation	Original creator of the asset.	This can be an institution, telescope facility, or an individual, as appropriate. The value will be visible in the "Source" field in IPTC-aware applications.	Core	Spitzer Science Center
CreatorURL	URL	<lptc4xmpCore:CIUrlWork>		Website(s)	–	A simple URL pointing to the top level webpage for the original creator.	The provider should use the webpage most appropriate for general public interest. It could be a top level mission page, outreach site, or news room. The value will be visible in the "Website(s)" field in IPTC-aware applications.	Core	http://www.spitzer.caltech.edu
Contact.Name	string, list	<dc:creator>	<rdf:Seq><rdf:li>	Creator	–	Name(s) of the primary contact(s) for the asset.	The value will be visible in the "Creator" field in IPTC-aware applications.		J. Doe
Contact.Email	string, list	<lptc4xmpCore:CIEmailWork>		E-Mail(s)	meta.email	Email(s) of the primary contact(s) for the asset.	–		jdoe@gmail.com
Contact.Telephone	string, list	<lptc4xmpCore:CITelWork>		Phone(s)	–	Phone number of the primary contact(s) for the asset.	–		555-555-5555
Contact.Address	string	<lptc4xmpCore:CIAdrExtadr>		Address	–	Street address of the primary contact for the asset.	–		1200 E. California Blvd.
Contact.City	string	<lptc4xmpCore:CIAdrCity>		City	–	City of the primary contact for the asset.	–		Pasadena
Contact.StateProvince	string	<lptc4xmpCore:CIAdrRegion>		State/Province	–	State or province of the primary contact for the asset.	–		California
Contact.PostalCode	string	<lptc4xmpCore:CIAdrPcode>		Postal code	–	Zip or postal code of the primary contact for the asset.	–		91125
Contact.Country	string	<lptc4xmpCore:CIAdrCtry>		Country	–	Country of the primary contact for the asset.	–		USA
Rights	string	<xapRights:UsageTerms>	<rdf:Alt><rdf:li xml:lang="x-default">	Rights Usage Terms	–	Copyright and related intellectual property rights description.	Clear descriptions of rights and full usage terms are critical to insure that images are utilized correctly and not reproduced inappropriately. These terms may be laid out in free text and/or with a URL that links to a full webpage detailing these terms. The value will be visible in the "Rights Usage Terms" field in IPTC-aware applications.	Core	Public Domain
Title	string	<dc:title>	<rdf:Alt><rdf:li xml:lang="x-default">	Title	–	General descriptive title given to the asset.	The Title may be a creative statement or simple identifier for the asset. It should only contain a single line of text. The value will be visible in the "Title" field in IPTC-aware applications.	Semantic	The Fireworks Galaxy Explodes onto the Scene
Headline	string	<photoshop:Headline>		Headline	meta.title	Short description of asset (2–3 sentences).	The Headline serves as a compact summary of the full Description . It allows for key contextual information, which could otherwise be buried within many paragraphs of text, to be easily visible to the user. It should be no longer than 2–3 sentences. The value will be visible in the "Headline" field in IPTC-aware applications.	Semantic	The galaxy M82 is seen across the spectrum from X-rays to infrared light, combining views from NASA's Chandra, Hubble, and Spitzer telescopes.
Description	string	<dc:description>	<rdf:Alt><rdf:li xml:lang="x-default">	Description	meta.note	Full description, or caption, for the asset.	This may contain full paragraphs of information about the asset. The value will be visible in the "Description" field in IPTC-aware applications.	Semantic	NASA's Spitzer, Hubble, and Chandra space observatories teamed up to create this multi-wavelength view of the M82 galaxy. High energy particles appear as blue, stars as green, dust as red. Fountains of hot gas and dust appear as blue and red structures above and below the disk of stars.
Subject.Category	string-CV, list	<avm:Subject.Category>	<rdf:Bag><rdf:li>	–	–	Codes identifying the general subject matter of the asset.	The Subject.Category controlled vocabulary represents a structured grouping of topics to aid in location and interpretation of assets. Some judgement is required to apply only the corresponding codes judged to be most relevant to the asset, and thus specifically helpful to users who may be looking for it in a database. For instance, many images contain stars, but the only ones that are specifically <i>featuring</i> stars should be tagged with the "Star" category. The controlled vocabulary for this is described in full in Appendix A; typical values are e.g. A.1.1., B.4.1.2. Note that all proper name distinctions are made in the related Subject.Name tag (e.g. Subject.Category defines the general subject while Subject.Name identifies specific instances).	Semantic-AVM	C.5.1.6;C.5.3.3
Subject.Name	string, list	<dc:subject>	<rdf:Bag><rdf:li>	Keywords	meta.id	Proper names/catalog numbers for principle objects/subjects in the image field.	Any unique identifiers or proper names relevant to an asset should be listed under Subject.Name . For astronomical objects this would include common names (e.g. "Orion Nebula") and numbers from popular catalogs (e.g. Messier, NGC, IC, 3C). Spaces should be used to separate catalog designations and numbers (e.g. "NGC 1250" not "NGC1250") unless common usage convention dictates otherwise (e.g. "M42"). Leading zeros should be omitted (e.g. "M5" not "M05"). When common catalog numbers are not available, any published identification is acceptable (including IDs from journal articles or standard references). Proper names of non-astronomical subjects should be entered here as well (people, telescopes, facilities, etc.). These values will be visible in the "Keyword" field in IPTC-aware applications. The identifiers and proper names in this tag are used in conjunction with Subject.Category to fully characterize the subject of a asset.	Semantic	Cigar Galaxy; M82; Messier 82; NGC 3034

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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. This tag provides the approximate distance estimate only for extrasolar objects. Solar system object distances are not tagged explicitly due to their changing nature due to orbital mechanics and viewing locations; the are best determined from appropriate ephemerides.		11700000; 0.000677
Distance.Notes	string	<avm:Distance.Notes>		–	–	Comment about the contents of the Distance tag.	This optional text can be used to clarify ambiguities in the distance tag. It can indicate for which object the distance applies (if there is more than one), or may include caveats, uncertainties, or references.		redshift value obtained from NED
ReferenceURL	URL	<avm:ReferenceURL>		–	meta.ref.url	Link to the home page of the image.	This link should be used to direct users to the webpage at which they would find the image in its correct context. That could include a specific page with the image and its caption, a related page (like a press release) that links to the image, or even the top-level home page for an observatory. This link should reference a readable web page and not just the image file itself (see ResourceURL).		http://gallery.spitzer.caltech.edu/Imagegallery/sig06-010
Credit	string	<photoshop:Credit>		Provider	meta.curation	The minimum credit line that should be used when the image is reproduced.	Image credit should always be provided with images. See also Rights . The value will be visible in the "Provider" field in IPTC-aware applications.	Core	NASA/JPL-Caltech/STScI/CXC/UofA/ESA
Date	date	<photoshop:DateCreated>		Date Created	time.release	Date that the asset was made available (or created).	This is the release date for the media asset. Note that this is distinct from the observation date (see Temporal.StartTime) as it indicates the date at which the asset was made public. The date should utilize the ISO 8601 format "yyyy-mm-ddThh:mm" (UT; time portion is optional). The value will be visible in the "Date Created" field in IPTC-aware applications.		2007-04-24
ID	string	<avm:ID>		–	–	A unique identifier for the asset.	Each image provider must provide unique IDs for their images. Combined with PublisherID this tag allows a specific asset to be uniquely identified (thus different providers could use matching IDs since the combination with PublisherID is still unique). Multiple versions of the same asset rendered at different sizes or file types (but otherwise identical in content) should all have the same ID. The varying instances will be differentiated from one another by their ResourceID values.	Core	sig06-010
Type	string-CV	<avm:Type>		–	–	The type of image/media asset.	This controlled vocabulary value identifies the overall type of the media asset. Typical values include Observation (for data-derived images), Chart (for plots/graphs of data), Artwork, etc. See Appendix A for a full discussion of the accepted values in this controlled vocabulary.	Core	Observation
Image.ProductQuality	string-CV	<avm:Image.ProductQuality>		–	–	Qualitative image quality assessment.	The overall preparation quality of the asset is identified by this tag. "Good" encompasses anything specifically prepared to be publication-quality and public-friendly. "Poor" identifies raw imagery (e.g. generated automatically by a software pipeline), while "Moderate" covers any middle ground. See Appendix A for a full discussion of the accepted values in this controlled vocabulary.	Core	Good
PublicationID	string, list	<avm:PublicationID>	<rdf:Bag><rdf:li>			List of one or more publications directly relevant to the asset.	Publications tagged here should be of specific relevance to the image portrayed, rather than a listing of articles on generally related topics. Observation-type images would reference original papers describing the relevant datasets, while Artwork-type images may reference the papers or articles the art was intended to illustrate. The format is [schema]:[path]. The suggested schemas include "ads" (Astrophysics Data Service abstract), "arxiv" (astro-ph article), and "http" (web URL). This syntax is described fully in Appendix A.		ads:2007A&A...472..373A; arXiv:1104.4106)
ProposalID	string, list	<avm:ProposalID>	<rdf:Bag><rdf:li>			List of one or more observing proposals linked to the datasets used to generate the image, or from which the science results are derived.	Images based on observations may be tagged with a list of observing proposals from which the data are derived. The format is [schema]:[path]. The suggested schemas include "ads" (Astrophysics Data Service abstract) and "proposal" (generic descriptor for an observatory proposal number). If an ADS citation is not available, the suggested format is "proposal:OBSERVATORY/PROPOSALNUMBER".		ads:2007sptz.prop..462R; proposal:VLA/240121
Facility	string, list(s)	<avm:Facility>	<rdf:Seq><rdf:li>	–	instr.tel	Ordered list of telescopes or observatories used for the observations.	Tags should be based on standard and compact, words or acronyms that uniquely identify the facility. 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. This is effectively a controlled vocabulary, but the list of valid terms expands as more observatories tag their image collections.	Semantic-AVM, Data	Chandra; Hubble; Hubble; Spitzer
Instrument	string, list(s)	<avm:Instrument>	<rdf:Seq><rdf:li>	–	Instr	Ordered list of instruments used to collect the data; should match the sequence of terms under Facility .	Compact, unambiguous acronyms are recommended. Users familiar with the Facility should be able to use this information to identify the instrument used. If the facility has only a single detector then this tag may be omitted. This is effectively a controlled vocabulary, but the list of valid terms expands as more observatories tag their image collections.	Semantic-AVM	ACIS; ACS; ACS; IRAC
Spectral.ColorAssignment	string-CV, list(s)	<avm:Spectral.ColorAssignment>	<rdf:Seq><rdf:li>	–	–	Ordered list of colors used to represent specific observations rendered in an image.	Use one entry per image used for constructing a final composite picture. If multiple images are assigned the same or very similar colors, they may be reported as separate entries with the same value here. See Appendix A for a full discussion of the accepted values in this controlled vocabulary.	Data	Blue; Green; Orange; Red

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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.	Ordered list identifying the broad regions of the spectrum covered by the observations.	This list specifically includes text controlled vocabulary descriptors of the general part of the electromagnetic spectrum in which the observation was made (e.g. Radio, Optical, Gamma-ray, etc.). See Appendix A for a full discussion of the accepted values in this controlled vocabulary.	Data	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	Ordered list defining the bandpass of the observation.	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, etc.), specific line excitations or transitions (H-alpha, SIII, CO(3-2), etc.), or if appropriate, instrument specific channels or filters (only if a more general descriptor is not adequate). This tag is intended to help users understand the nature of the observations, but its unrestricted format makes it of little use as a search criterion.		Hard X-ray; B-band; R-band; Mid-IR
Spectral.CentralWavelength	float, list(s)	<avm:Spectral.CentralWavelength>	<rdf:Seq><rdf:li>	-	em.wl.central	Ordered list defining the central wavelengths (in nanometers) of the observations.	This tag identifies the average/central wavelenths in a filter. It does not accommodate range specifications; notations indicating wide/narrow band bandpasses may be added under Spectral.Bandpass . Even if exact values are unavailable, approximate wavelengths should still be included when possible.	Data	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.	Any information that can not be represented in the various Spectral tags can be described in free text in this field. It can also be used with other image types like "Chart" for providing more information on source observations.		X-ray bandpass wavelengths are approximate
Temporal.StartTime	date, list(s)	<avm:Temporal.StartTime>	<rdf:Seq><rdf:li>	-	time.start	Ordered list specifying the start times of the observations.	The date should utilize the ISO 8601 format "yyyy-mm-ddThh:mm" (UT; time portion is optional). This field can be populated from the FITS keyword DATE-OBS. If multiple datasets have been combined from different observint times it is recommended to use the earliest date. This field is intended to give the user a general idea of the onset of observations, not a detailed breakdown of multi-epoch datasets. More detailed information should go into Spectral.Notes .		-; 2005-02-05; 2005-02-05; 2004-07-03T12:00
Temporal.IntegrationTime	float, list(s)	<avm:Temporal.IntegrationTime>	<rdf:Seq><rdf:li>	-	obs.exposure	Ordered list specifying the exposure times in seconds.	This should be considered to be an approximate measure of the total length of the observation, but not an indication of the specific ending time (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	Depreacated identifiers for the source FITS dataset for the observations rendered in the image.	This tag was deprecated in AVM 1.2 in favor of a more general ProposalID tag. The suggested format is a VO-compliant reference to the dataset [ivo://AuthorityID/ResourceKey].	Deprecated	
Spatial.CoordinateFrame	string-CV	<avm:Spatial.CoordinateFrame>		-	pos.frame	Coordinate system reference frame.	The coordinate system defines the reference frame to which the coordinates refer. This field can be populated from the FITS keyword: CFRAME. Options include FK5 (celestial J2000), GAL (galactic) etc. See Appendix A for a full discussion of the accepted values in this controlled vocabulary. Default interpretation (if left blank) is ICRS.	WCS-Base	ICRS
Spatial.ReferenceValue	float, list(2)	<avm:Spatial.ReferenceValue>	<rdf:Seq><rdf:li>	-	pos.wcs.crval	Reference coordinates (typically RA and Dec) for the image (2 element list in decimal degrees).	The reference coordinates specify the sky location of a single pixel in the image. The reference frame is specified by Spatial.CoordinateFrame . The corresponding pixel in the image is identified in the Spatial.ReferencePixel tag.This field can be populated from the FITS keywords: CRVAL1, 2.	WCS-Base	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).	This field specifies the original size of the image for which the WCS applies. Comparing these values to the actual image size allows the same WCS solution to be used with any resized version of the image by proportionally rescaling the Spatial.ReferencePixel and Spatial.Scale . This field can be populated from the FITS keywords: NAXIS1,2	WCS-Full	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).	This coordinate is measured relative to the bottom left pixel in the image, which is considered to be the origin of the X,Y grid and has a value of (1, 1). This field can be populated from the FITS keywords: CRPIX1,2; In many common FITS files the reference pixel is not the center pixel in the image.	WCS-Full	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).	The scale should follow the standard FITS convention for sky projections in which the first element is negative (indicating increasing RA/longitude to the left) and the second is positive. In practice, only the absolute value of the first term should be necessary to identify the pixel scale since images should always be presented in an undistorted 1:1 aspect ratio as they appear in the sky when viewed from Earth.This field can be populated from the FITS keywords: CDEL1, CDEL2 (or derived from CD matrix).	WCS-Full	-4.1635027032331E-05; 4.1635027032331E-05
Spatial.Rotation	float	<avm:Spatial.Rotation>		-	-	Position angle of the Y axis in degrees measured east (counterclockwise) from north.	This angle identifies how the vertical axis of the reference coordinate frame is orientated on the image as it is displayed with respect to the reference pixel. This rotation is measured east from north which, for astronomical images, is counterclockwise (in sky projections, East is to the left of North). This field can be populated from the FITS keywords: CROT/CROTA1/CROTA2.	WCS-Full	49.936065630295
Spatial.CoordsystemProjection	string-CV	<avm:Spatial.CoordsystemProjection>		-	pos.wcs.ctype	The geometric projection of the image.	Typical projections include "TAN" (tangent), "SIN" (sine), "CAR" (equirectangular) and "AIT" (AITOFF equal-area all-sky), among others. This keyword is derived from the contents of the standard FITS Keywords: CTYPE1,2. See Appendix A for a full discussion of the accepted values in this controlled vocabulary.	WCS-Full	TAN

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Spatial.Quality	string-CV	<avm:Spatial.Quality>		-	-	Quality of the spatial coordinate information identifying whether it contains only general positional information ("Position") or full sky projection information ("Full").	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). Images with a sky image inset within larger borders can present full WCS data, allowing quantities like field of view to be calculated, while being flagged as Position , indicating the image itself is not scaled for projecting into a sky backdrop.	WCS-Base	Full
Spatial.Notes	string	<avm:Spatial.Notes>	<rdf:Alt><rdf:li xml:lang="x-default">	-	-	Optional free-text description to clarify 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>		-	-	Optional free-text representation of the FITS header.	This optional field allows the full WCS information in the source FITS header (which may include distortion correction terms beyond the scope of AVM WCS) to be preserved with the image. This tag is provided as a utility for advanced users only and should otherwise be avoided; large headers can substantially increase file size of images and are not of utility to general users.		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)	<avm:Spatial.CDMatrix>		-	-	Deprecated matrix representation of image scale and rotation.	This tag was present in AVM 1.0 but has been deprecated in 1.1. It allowed for the optional inclusion of WCS data in matrix form, but includes no relevant information that is not already available in the other Spatial.* tags.	Deprecated	
Spatial.Equinox	string	<avm:Spatial.Equinox>		-	time.equinox	Deprecated specification for Equinox in decimal years of the Spatial.CoordinateFrame .	This field historically could be used to specify the precessed date for a non-standard coordinate frame. This term has been deprecated in AVM since modern imaging is generally based on the absolute ICRS system which is equivalent to FK5 (specified in AVM by Spatial.CoordinateFrame). In the absence of an Equinox tag FK4 defaults to B1950. This field corresponds to the FITS keyword: Equinox.	Deprecated	
PublisherID	string	<avm:PublisherID>		-	-	Compact, unique identifier of a asset provider.	The PublisherID is a compact representation of an asset provider. Its primary importance is for identifying assets in archives containing contributions from multiple missions. In such cases the PublisherID + ID tags uniquely identify an asset.		STScI
ResourceID	string	<avm:ResourceID>		-	-	Identifies a specific instance of a asset in one file format at one resolution.	Multiple instances of the same asset ID differing only in file format, resolution, etc. must have distinct ResourceID values. The PublisherID + ID + ResourceID uniquely identifies a specific instance of an asset. The ResourceID values must be unique for a given ID but may be reused for other ID values (e.g. one could employ the terms "small," "medium," and "large" for any number of IDs to distinguish between instances of different sizes). It may be a completely unique identifier as well.		small_jpg
ResourceURL	URL	<avm:ResourceURL>		-	-	A unique URL pointing to the specific online instance of the image file.	The embedded URL in the image file reflects its web location at the time it was made available for download. Ideally this would be an unchanging URI as well to guarantee it will be valid even if the website or gallery changes over time. Note that a given asset ID may have several different ResourceURL location that correspond to different ResourceID instances.		http://ipac.jpl.nasa.gov/media_images/sig06-010.tif
MetadataDate	date	<avm:MetadataDate>		-	-	The date at which the image and/or associated metadata was last updated.	When anything is updated for this image asset (image data, metadata), the MetadataDate should be updated to reflect the date (and time, if necessary) of the change. Archives that index AVM-tagged assets rely on MetadataDate to identify if the entry needs to be refreshed to reflect changes made by the provider. The date should utilize the ISO 8601 format "yyyy-mm-ddThh:mm" (UT; time portion is optional).	Core	2008-05-09T14:30
MetadataVersion	string	<avm:MetadataVersion>		-	-	Version of the AVM standard employed for tagging of the asset.	As minor changes occur within the AVM specification, certain tags may be deprecated or added to accommodate new needs. Flagging which version of the standard was employed assists others in interpreting the AVM content.	Core	1.2
Publisher	string	<avm:Publisher>		-	meta.curation	Deprecated free-text identifier of a asset provider.	Originally used as a free-text description of the person or institution providing the asset to the VAMP archive, it has been deprecated in AVM 1.2 in favor of the PublisherID tag.	Deprecated	
RelatedResources	list	<avm:RelatedResources>	<rdf:Bag><rdf:li>	-	-	Deprecated pointer to other related assets.	This deprecated tag was intended to allow links to other AVM assets with editorially identified related content. It was deprecated in AVM 1.2.	Deprecated	
File.Dimension	float, list(2)	n/a		-	-	Size in pixels (x, y) of the image asset.	-		4299; 3490
File.Size	float, list(2)	n/a		-	-	Size of the image asset, measured in kilobytes.	-		18237
File.BitDepth	float	n/a		-	-	Color bit-depth of the file, measured in total bits per pixel.	-		24