

Common Requirements

SWG Requirement	Working Group
SED from archival data	All
Access to modelling tools and libraries	All
Add time axis	All
Morphological measurements	All
Error propagation	Stars + Galaxies
Cross-correlation improvements (outliers, matching probability, filtering options)	Stars + Galaxies
PSF information and measurements	Galaxies + Cosmology
Postage stamp generation	Galaxies + Cosmology

Stars, ISM, & Solar System Working Group

Science Case	AVO Requirements	Archive Requirements
	Data validation (outliers, cross-calibration)	
	Error propagation (e.g., on colors) from errors on parameters	
	Access to theoretical tools (e.g., CLOUDY, DUSTY)	
	Aperture corrections to derive SED of extended objects	
Continuation of demo cases	Expand spectral tools (e.g., line templates), quantification of extended sources (e.g., CO outflows)	Access to Galactic plane + Spitzer data
AGB to PN transition (VILSPA)	Discovery of new candidates Examination of spectra	
Stellar variability	Add time axis; time-dependent SED Image subtraction	
Luminosity functions of star forming regions	Demo has already most of the tools	
Companions to PN central stars	Demo has already most of the tools	
Abundance gradients from PN and H II regions	Link to modelling tools Image subtraction	

Galaxies Working Group

Science Case	AVO Requirements	Archive Requirements
<p>Determine stellar population parameters (age, metallicity, extinction, mass)</p>	<p>Astrometry visualizer Propagation of errors Use standard SSP libraries (e.g. Bruzual & Charlot; Pegase; starburst99) Service for generating standard models with users provided parameters Allow user to upload/publish models in the VO Convolve model with instrument function Generate SED from archival data Fit convolved model to SED</p>	<p>Provide instrument function Service for generating standard models with users provided parameters</p>
<p>Determine stellar population parameters (age, metallicity, mass) plus internal kinematics from high res spectra</p>	<p>Same as above Access stellar spectra libraries Convolve model with spectral resolution as well as other instrumental responses</p>	<p>Provide stellar spectra libraries Spectral res. metadata</p>
<p>Spectral time variability of AGNs</p>	<p>Add time axis Produce time-SED table Visualize time SED Model fit (see above cases) Variability tests and modeling</p>	

Galaxies Working Group

<p>Cross-ID science cases: Proper motion of stars – galactic structure Identification of Chandra X-ray source populations Finding weird populations Structure in Galactic streams Morphology of galaxies at different z: merging, extinction</p>	<p>Cross ID statistics – expected number of outliers; probability for each ID Source detection / extraction should make use of PSF info. Take into account instrumental beams and source extension in cross-ID Allow filtering options during cross-ID Morphology asymmetry measure</p>	<p>Provide PSF/ beam information in images</p>
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Cosmology Working Group

Science Case	AVO Requirements	Archive Requirements
		Calibration history/method
	Detection limit over the field	
	Completeness (from catalogue or derived on-the-fly)	
	PSF measurements for images, over the field of view	
	Need autosave if prototype crashes	
Multiwavelength data	Access to all archived data (list) “Clever” search including parameters such as: PSF, filters, flux limits of images, etc.	VO standards Inclusion of meta-data in observation logs
Multiwavelength cuts	Postage stamp generation at different wavelengths (starting from one image)	
Spectral Energy Distributions	Calibrated SED for archival data SEXtractor: allow for star/galaxy separation plus automatic dust extinction correction	Catalog production
Galaxy morphology	On-the-fly morphological fit (e.g., GALFIT)	

Cosmology Working Group

Science Case	AVO Requirements	Archive Requirements
Cosmos Treasury Survey: High-z QSO, SN Ia, cosmic shear, clusters of galaxies, galaxy-galaxy lensing, high-z clustering, morphological history/formation process	? Need to know which data are available and when	
Pure CMB analysis	?	
Pure quasar analysis	?	
Pure cosmic shear	?	
z ~ 3.5, z >~ 6 galaxies	?	
GOODS project continued		

An example of a long-term project

Survey	n (gal/arcmin ²)	A deg ²	σ_ε	Merit
<i>Virgos/Descart</i>	15	16	0.42	1
<i>Cosmos</i>	45 (?)	2	0.32	1 (5 smallscal.)
<i>CFHTLS</i>	15	170	0.42	10-20
<i>JDEM-Lensing</i>	50 -	300+	0.32	800-1000+
<i>PANN-STAR</i>	100(?) 25	2000	0.37(?)	400-800
<i>LSST</i>	20	2000+	0.42	400-800+
<i>AVO</i>	20	2000	0.40	300-600

Merit of cosmic shear surveys: an example for EURO-VO