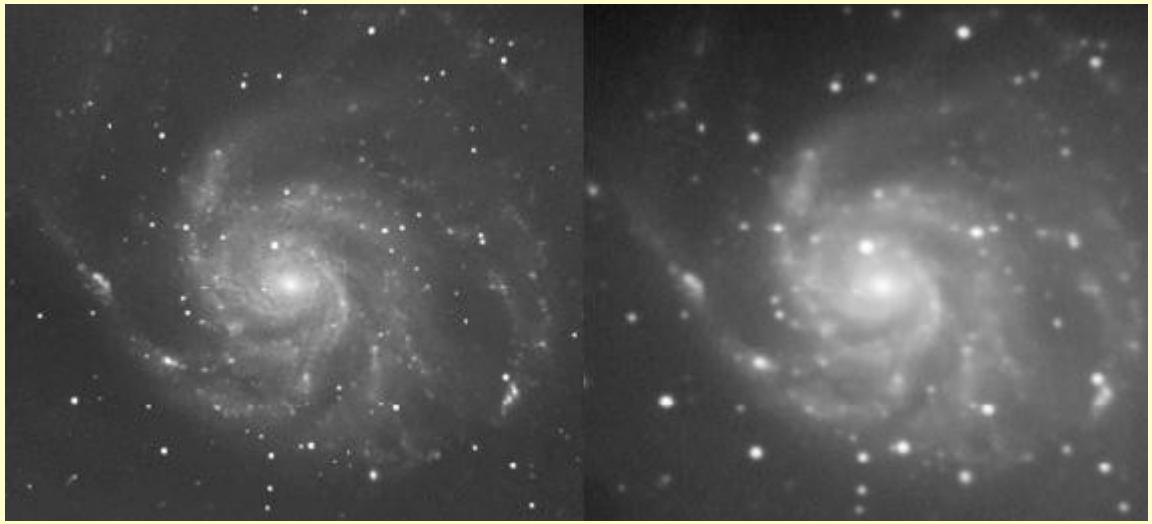
Seeing, a galaxy (M101 – Messier 101)
with a good an with a bad seeing.

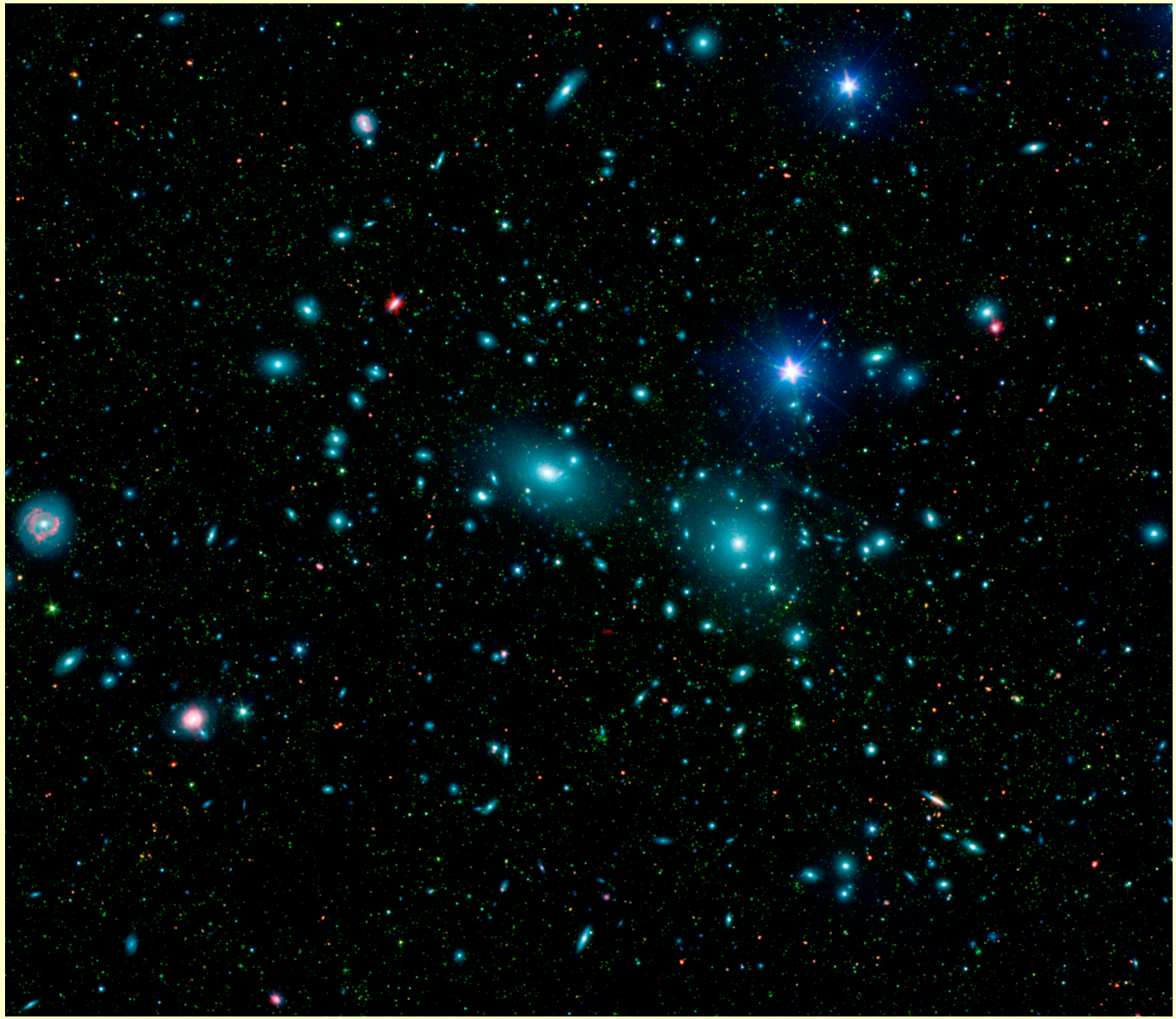


From https://www.neurohack.com/Archives2009.html

Cluster of galaxies: Coma view through different telescopes

In Classroom I showed an old copy of a photo of
the Palomar Sky plates: Monte Palomar 1.22 m telescope.

Here:
SDSS
composed image
2.5 m class +CCD

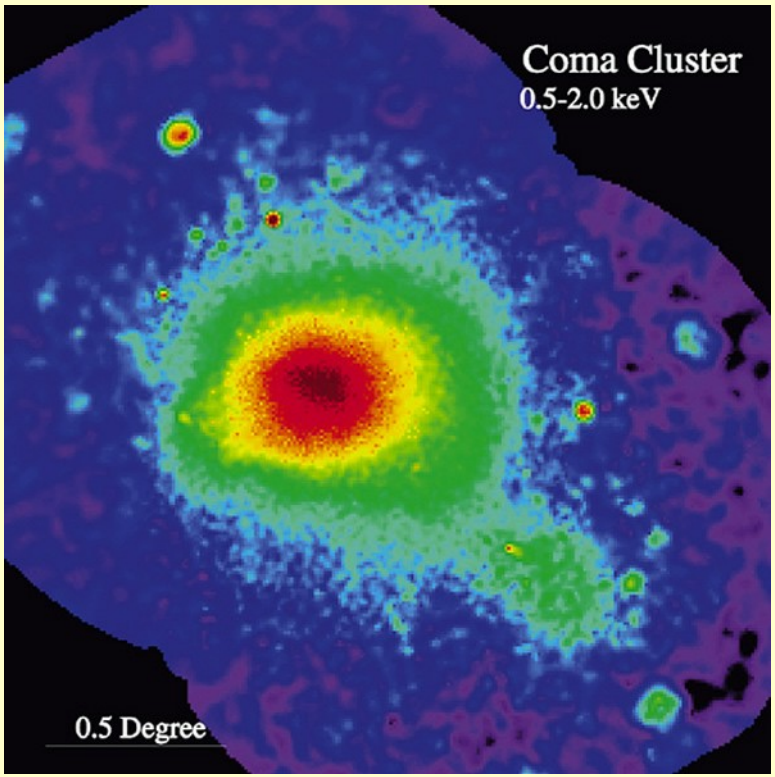


A Sloan Digital Sky Survey/ Spitzer Space Telescope mosaic of the Coma Cluster in long-wavelength infrared (red), short-wavelength infrared (green), and visible light. The many faint green smudges are dwarf galaxies in the cluster.

Credit: NASA/JPL-Caltech/ GSFC/SDSS

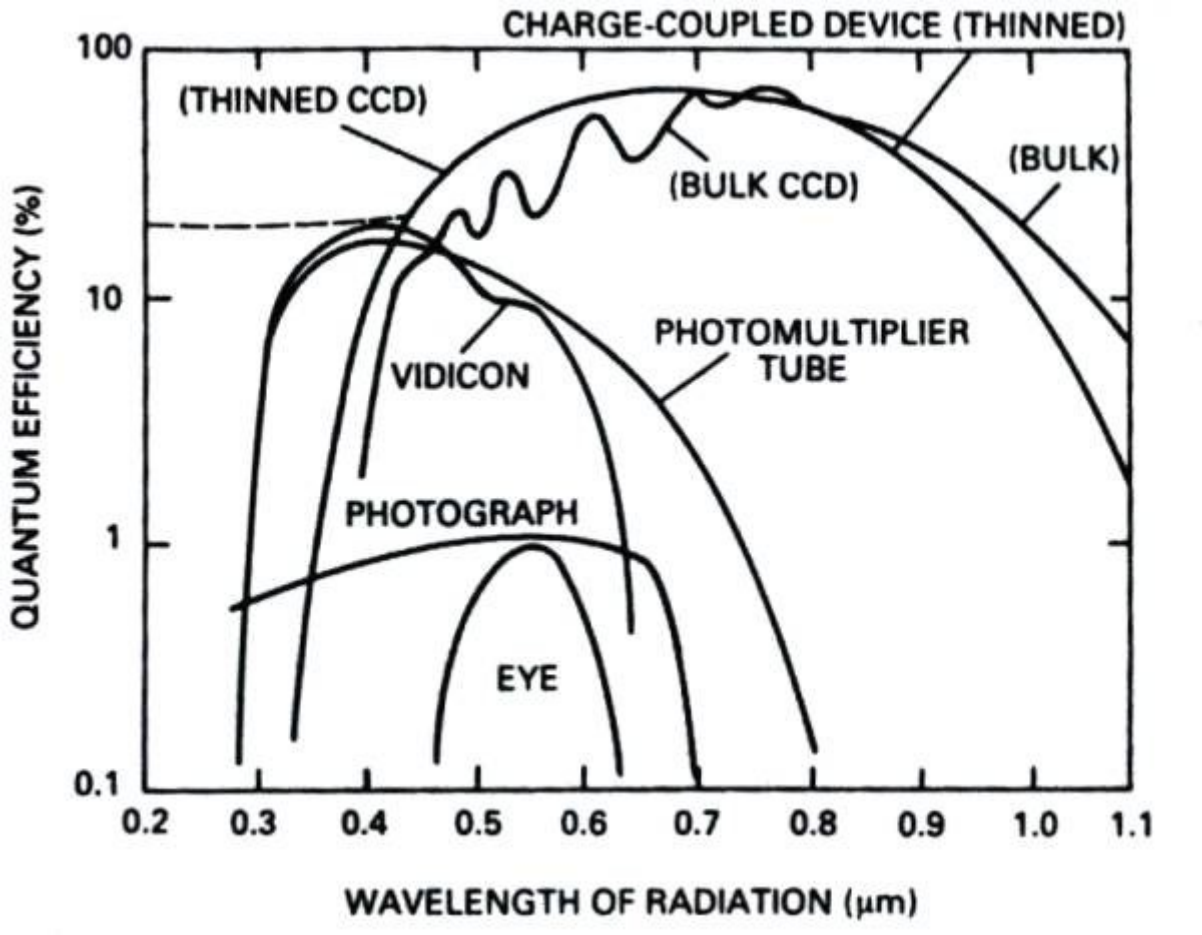
From Wikipedia - website

Credit to Nasa-HST
HST image Coma



Rosat X-ray image
Credit to Nasa-Chandra

Comparison among detectors



QE = percentage of photons incident on detector which produce measurable signals.

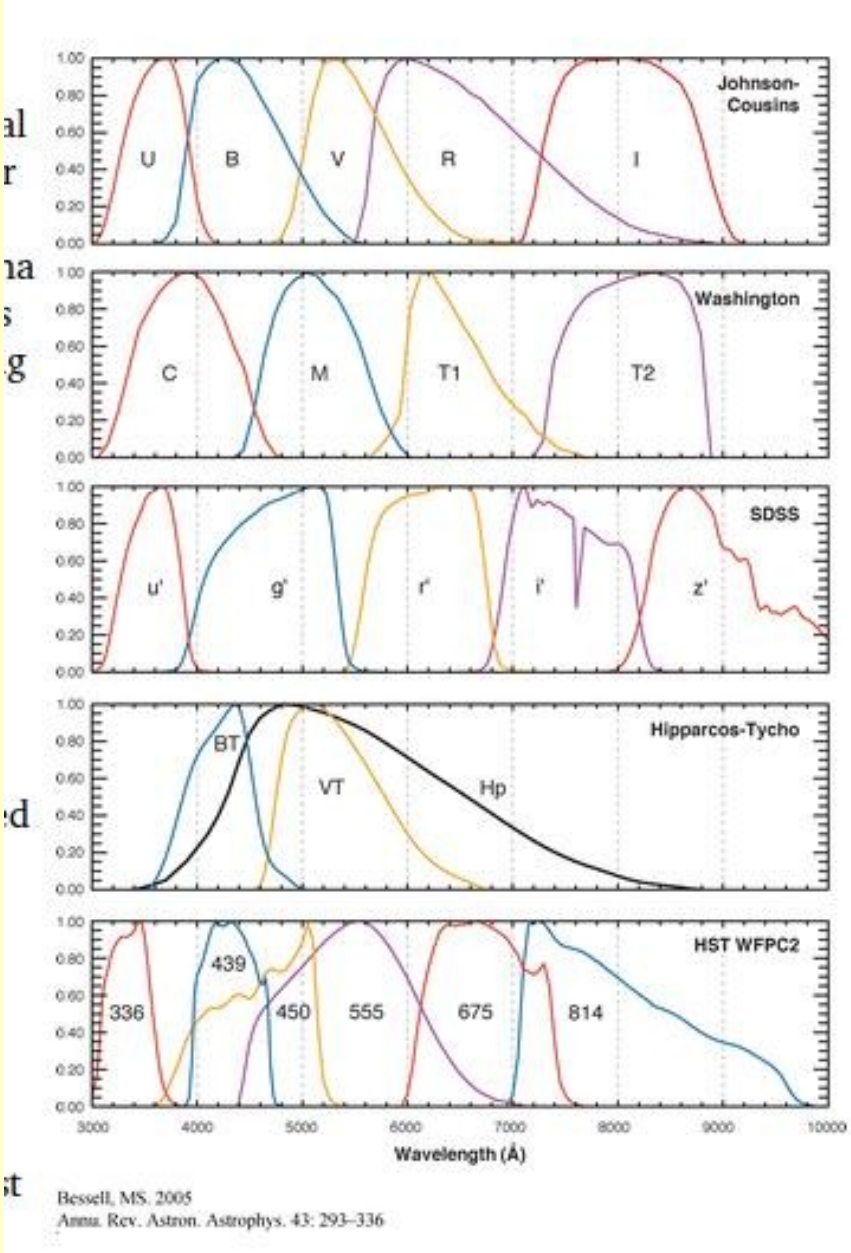
From Kartunnen+2007.

Magnitude systems & filters

https://www.astro.umd.edu/~ssm/ASTR620/mags.html

Table 2.1 Filter characteristics of broad-band photometric systems

System	Band	$\lambda_{\rm eff}$ nm	FWHM nm	$f_X(A0V)$ Jy	$L_\odot$ 10^{25} W	$M_\odot$
UBVRI	*U*	365	66	1780	1.86	5.61
	B	445	94	4000	4.67	5.48
	V	551	88	3600	4.64	4.83
	R	658	138	3060	6.94	4.42
	I	806	149	2420	4.71	4.08
	J	1220	213	1570	2.49	3.64
	H	1630	307	1020	1.81	3.32
	K	2190	390	636	0.82	3.28
	L	3450	472	281	0.17	3.25
	M	4750	460	154	–	–
Hipparcos	*Hp*	550	225	–	–	–
Tycho	B_T	420	75	–	–	–
	V_T	510	100	–	–	–
Thuan–Gunn	*g*	512	120	–	–	–
	r	668	100	–	–	–
	i	792	150	–	–	–
	z	912	140	–	–	–
SDSS	*u'*	352	63	–	–	–
	g'	480	141	–	–	–
	r'	625	139	–	–	–
	i'	769	154	–	–	–
	z'	911	141	–	–	–



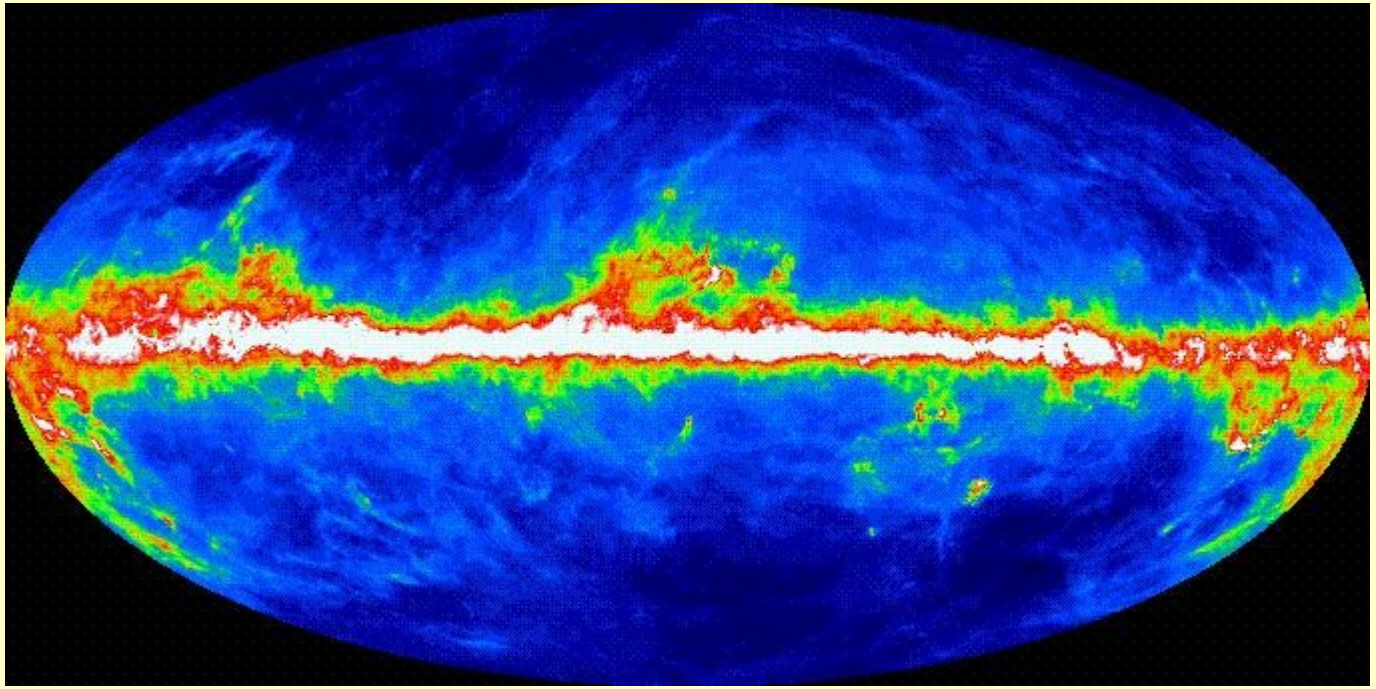
Galactic Absorption

NGC4013 a large, nearby, edge-on spiral galaxy. Taken at the WIYN Telescope. Minimum credit line: C. Howk (JHU), B. Savage (U. Wisconsin), N.A.Sharp (NOAO)/WIYN/NOAO/NSF See http://www.noao.edu/image_gallery/html/im0222.html

OUR GALAXY

All-sky view of the IRAS 100 micron imaging data, representing a MONTAGE-generated combination of the individual images created by Schlegel, Finkbeiner & Davis (1998). The Galactic Aitoff projection is shown in false color (blue is low intensity, red/white is high intensity).

Courtesy of NASA/OPAC Infrared Science Archive (Caltech)



Band shift with Redshift z. From Binney & Merrifield 1998

Table 2.4 Redshifts at which one UBV band is shifted to another

	U	B	V	R	I	J	H	K	L	M
U	0	0.22	0.51	0.80	1.21	2.34	3.47	5.00	8.45	12.01
B		0	0.24	0.48	0.81	1.74	2.66	3.92	6.75	9.67
V			0	0.19	0.46	1.21	1.96	2.97	5.26	7.62
R				0	0.22	0.85	1.48	2.33	4.24	6.22

K-correction for galaxies of different types (Ell.,Spi.,..) at different redshift z and magnitude band.
From Fukugita et al. 1995 PASP.