

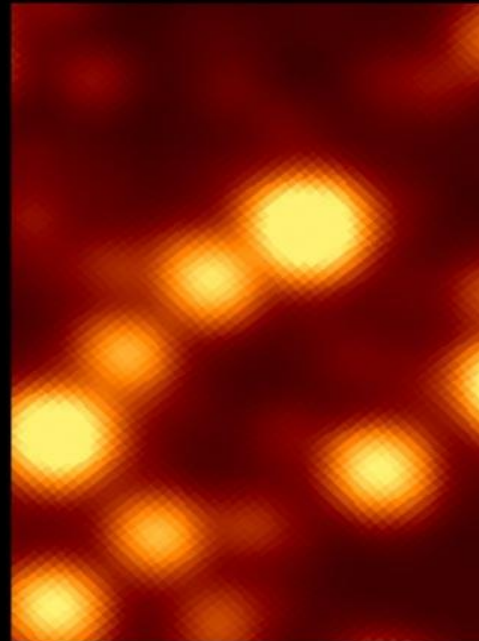
GAIA I

CATALOGS OF STARS

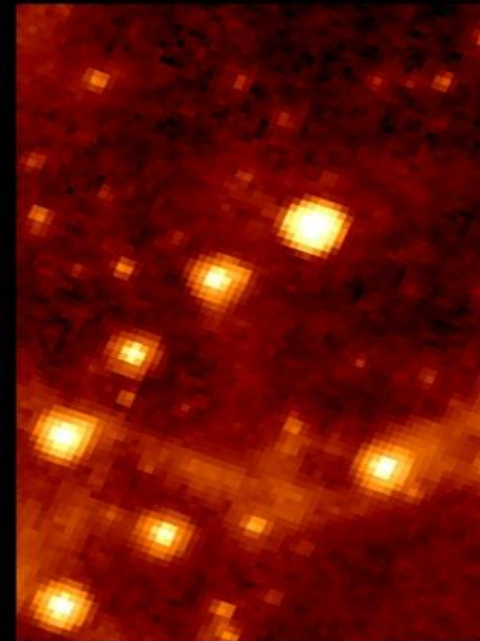
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- Catalogs
- Photometric basement
- Gaia
- A research approach
- Task 1

The Evolution of Infrared Space Telescopes



WISE W2 4.6 μm



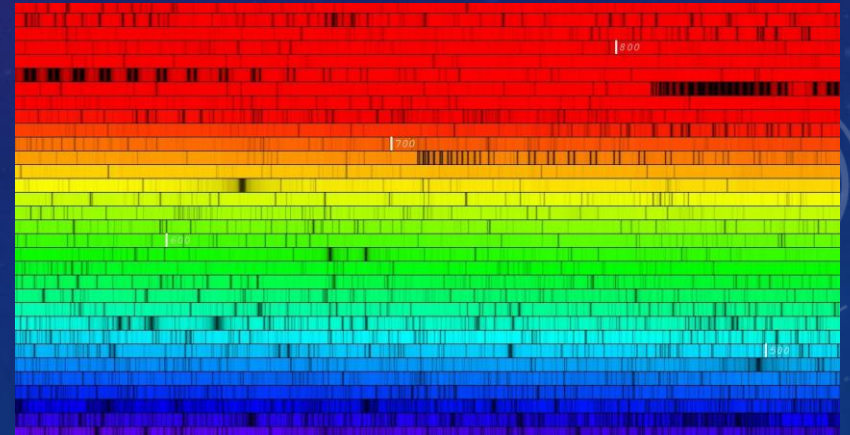
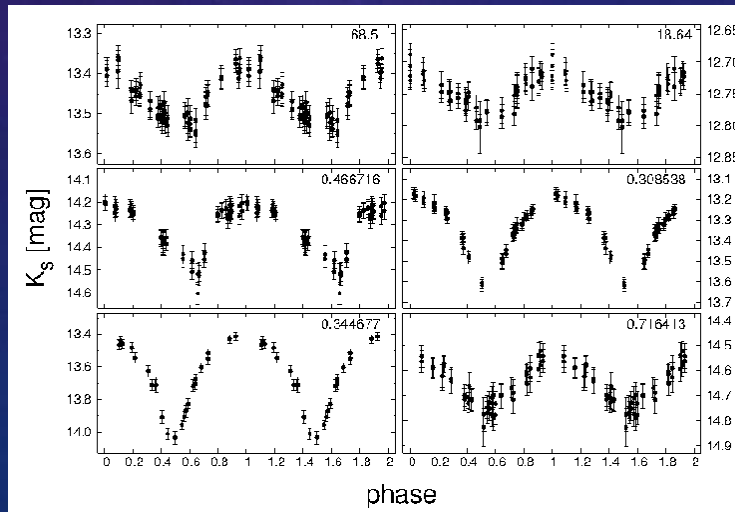
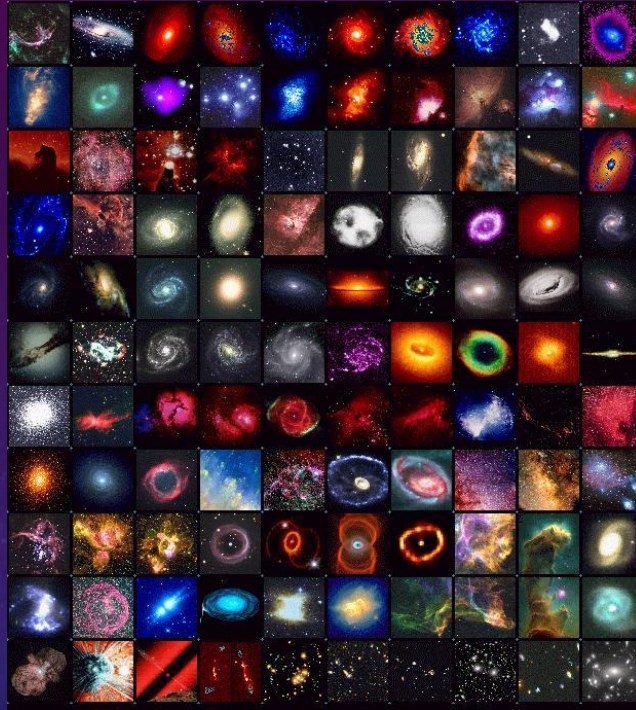
Spitzer/IRAC 8.6 μm



JWST/MIRI 7.7 μm

CATALOGS

- Types
- Usages
- Gaia, SDSS, 2MASS, ...

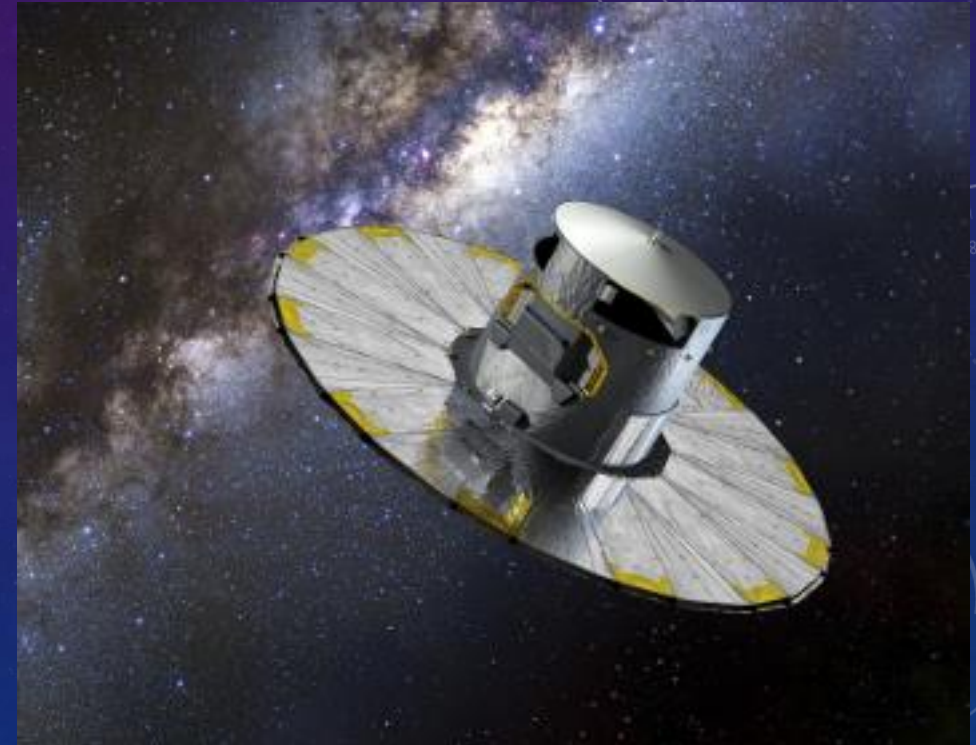


PHOTOMETRIC SYSTEM

Filter Letter	Effective Wavelength Midpoint λ_{eff} for Standard Filter ^[2]	Full width at half maximum ^[2] ^[c] (archetypal Bandwidth) ($\Delta\lambda$) ^[d]	Variant(s)	Description
Ultraviolet				
U	365 nm	66 nm	u, u', u*	"U" stands for ultraviolet.
Visible				
B	445 nm	94 nm	b	"B" stands for blue.
G ^[3]	464 nm	128 nm	g'	"G" stands for green.
V	551 nm	88 nm	v, v'	"V" stands for visual.
R	658 nm	138 nm	r, r', R', R _c , R _e , R _j	"R" stands for red.
Near-Infrared				
I	806 nm	149 nm	i, i', I _c , I _e , I _j	"I" stands for infrared.
Z	900 nm ^[4]		z, z'	
Y	1020 nm	120 nm	y	
J	1220 nm	213 nm	J', J _s	
H	1630 nm	307 nm		
K	2190 nm	390 nm	K Continuum, K', K _s , K _{long} , K ⁸ , nbK	
L	3450 nm	472 nm	L', nbL'	
Mid-Infrared				
M	4750 nm	460 nm	M', nbM	
N	10500 nm	2500 nm		
Q	21000 nm ^[5]	5800 nm ^[5]	Q'	

GAIA

- ESA's space telescope launched in 2013
- Aimed to create the best 3D map of MW
- Observed more than 1Bn stars and 2Bn objects
- Three major and 1 minor catalogs have been released



GAIA: ARCHIVE

- Home
- Search
 - Basic Search
 - ADQL
 - Query Results
- Visualization
- Help
 - Documentation
 - Data Model
 - Papers
- Other catalogs



The screenshot shows the Gaia Archive website. At the top is a dark red header with the 'gaia archive' logo on the left and the 'esa' logo on the right. Below the header is a navigation bar with links: HOME, SEARCH, VISUALISATION, and HELP. The main content area has a light gray background. It features a large heading 'Welcome to the Gaia Archive at ESA' followed by a paragraph describing the mission. To the right of this text is a circular icon depicting the Gaia spacecraft. Below the welcome section is a 'Top Features' section with six items arranged in two rows. Each item has an icon, a title, and a brief description. The items are: Citation (document icon), Search (magnifying glass icon), Download (cloud with arrow icon), Help (lifebuoy icon), Gaia Mission (Gaia spacecraft icon), and Partners (handshake icon).

gaia archive **esa**

HOME SEARCH VISUALISATION HELP

Welcome to the Gaia Archive at ESA

Gaia is a European space mission providing astrometry, photometry, and spectroscopy of more than 1000 million stars in the Milky Way. Also data for significant samples of extragalactic and Solar system objects is made available. The Gaia Archive contains deduced positions, parallaxes, proper motions, radial velocities, and brightnesses. Complementary information on multiplicity, photometric variability, and astrophysical parameters is provided for a large fraction of sources.



Top Features

 Citation How to cite and acknowledge Gaia. Where to find DOI info.	 Search Search for Gaia sources using the basic search form or the ADQL (Astronomical Data Query Language) interface for more advanced queries.	 Download Direct download of Gaia data files.	 Help Data release documentation, tutorials and more. For questions, suggestions or problems, please contact the Gaia Helpdesk.
 Gaia Mission News, Gaia alerts, information, and resources on the Gaia mission for the scientific community.	 Partners Partner data centres also serving Gaia data.		

A RESEARCH APPROACH

- Start reading an article
- Use the sources and specially the links
- Find your way in other articles and links
- Try to derive the main article figures and results
- Try to improve what they have done
- Start a new article

TASK 1

- Get data from 6 different Galactic coordinates with at least 1° and 1000 stars
- Plot each HRD
- Try to correct the extinction
- Plot the results
- Save the results as a database

Hint: Use Gaia DR2 papers and pm me for an accurate distance module.

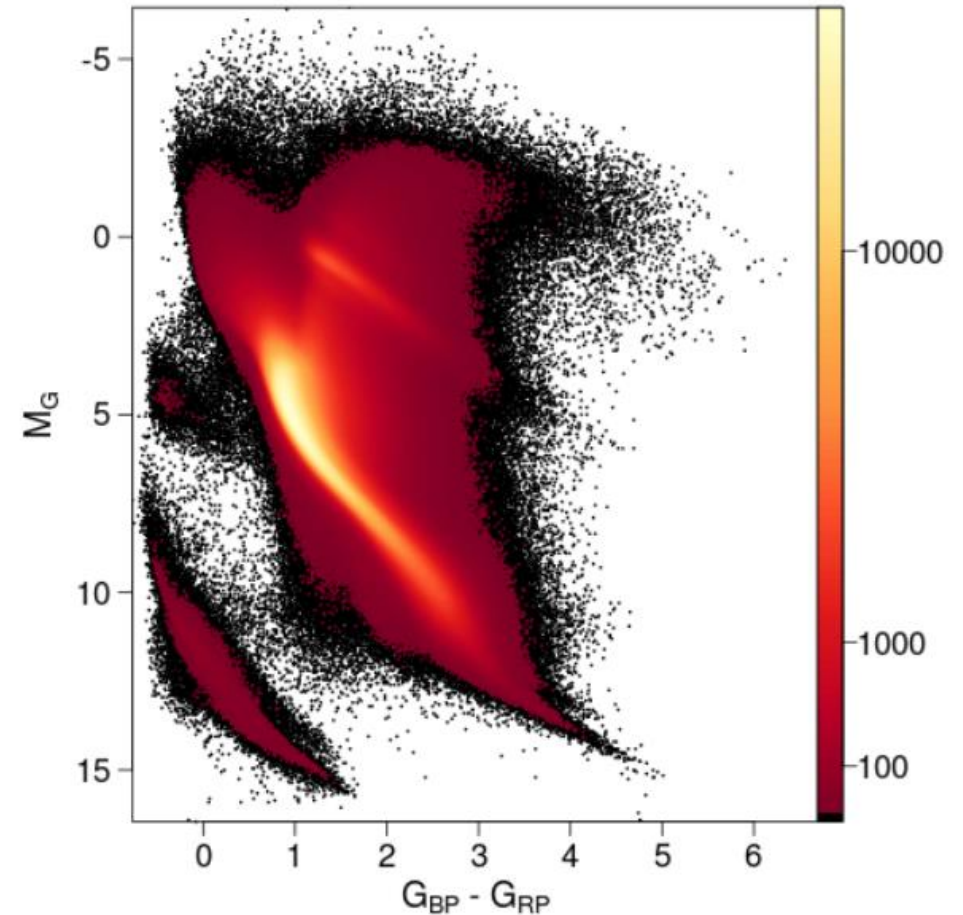


Fig. 1. Full *Gaia* colour-magnitude diagram of sources with the filters described in Sect. 2.1 applied (65 921 112 stars). The colour scale represents the square root of the relative density of stars.