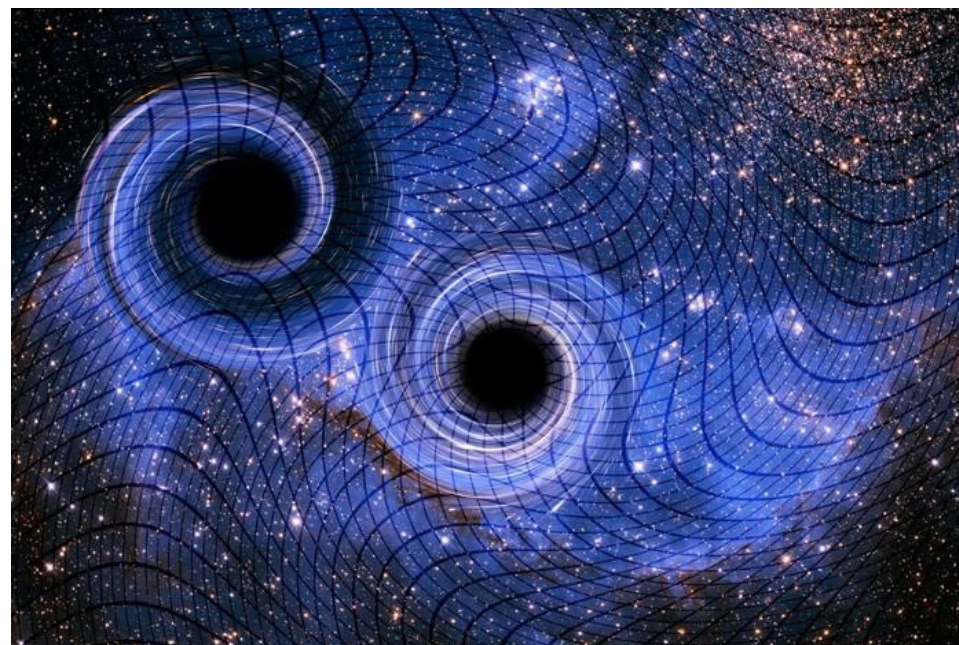
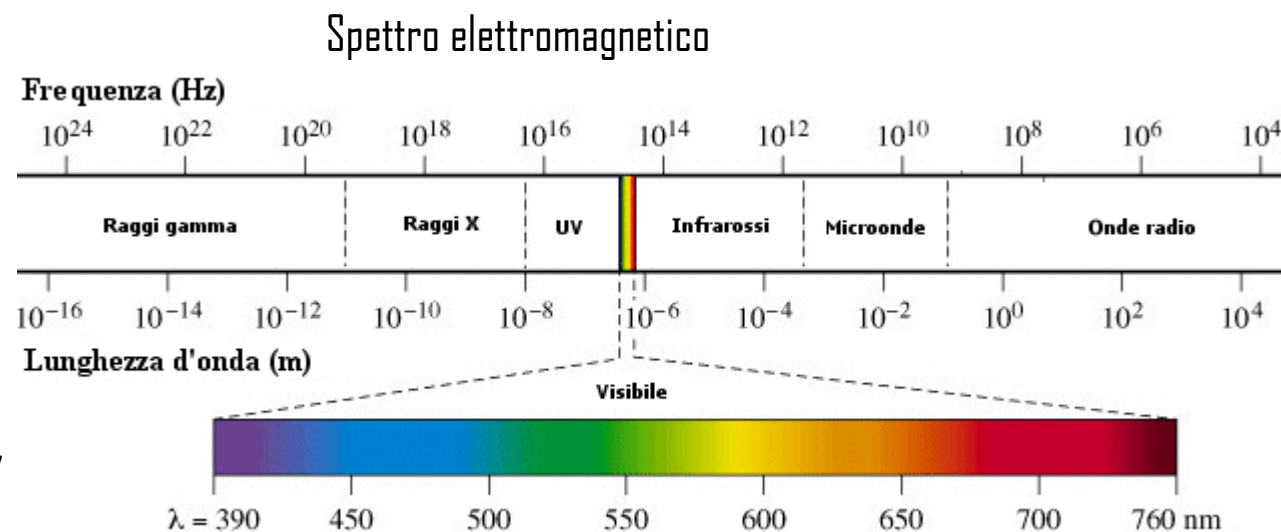


***COSMIC RAYS***

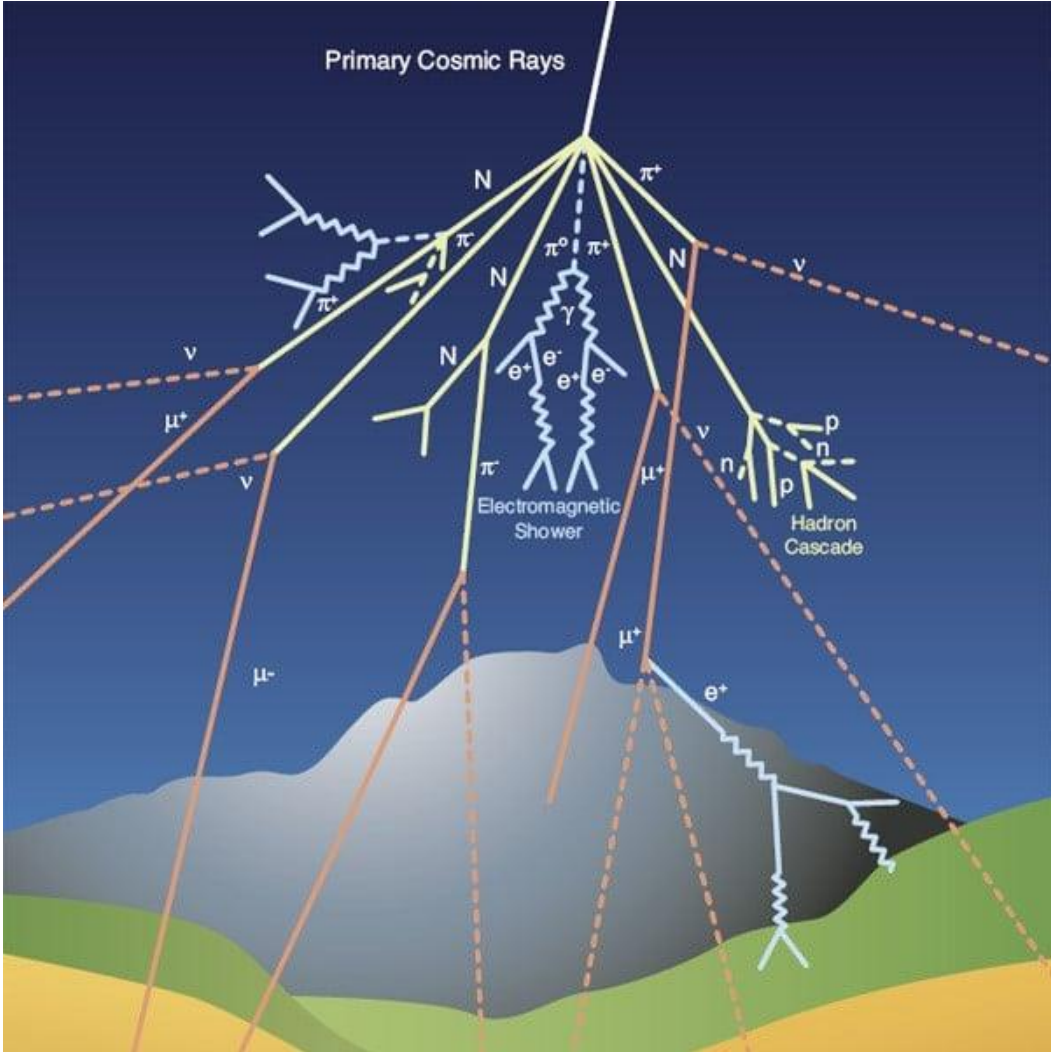
**Electromagnetic radiation** is a type of energy that propagates through space in the form of electromagnetic waves. These waves consist of oscillations of electric and magnetic fields that propagate at the speed of light. Electromagnetic radiation can have different wavelengths and frequencies, which determine its characteristics, such as energy and the type of interaction with matter.

**Gravitational waves** are ripples in the fabric of space-time caused by the acceleration of massive objects, such as merging or colliding black holes or neutron stars. These waves carry energy through space and can be detected as tiny distortions in the fabric of space-time. Their discovery provided fundamental proof of Einstein's theory of general relativity and opened a new way of observing the universe.



**Neutrinos** are subatomic particles with no electric charge and a very small mass. They interact weakly with matter, which makes them difficult to detect. They are produced in various processes, such as nuclear reactions in the Sun, radioactive decay, and supernova explosions. Neutrinos are fundamental for studying astrophysical phenomena and subatomic processes. Their ability to pass through matter without interacting with it makes them particularly useful for obtaining information about the universe and particle physics.

**Cosmic rays** are high-energy space-traveling particles that come primarily from space outside our solar system. These particles, mostly protons, but also helium nuclei and other heavier particles, move at speeds very close to the speed of light and can have very high energies. When these cosmic rays hit Earth's atmosphere, they interact with atoms in the air, producing a cascade of secondary particles, including muons, neutrinos and photons, which can sometimes reach the Earth's surface.

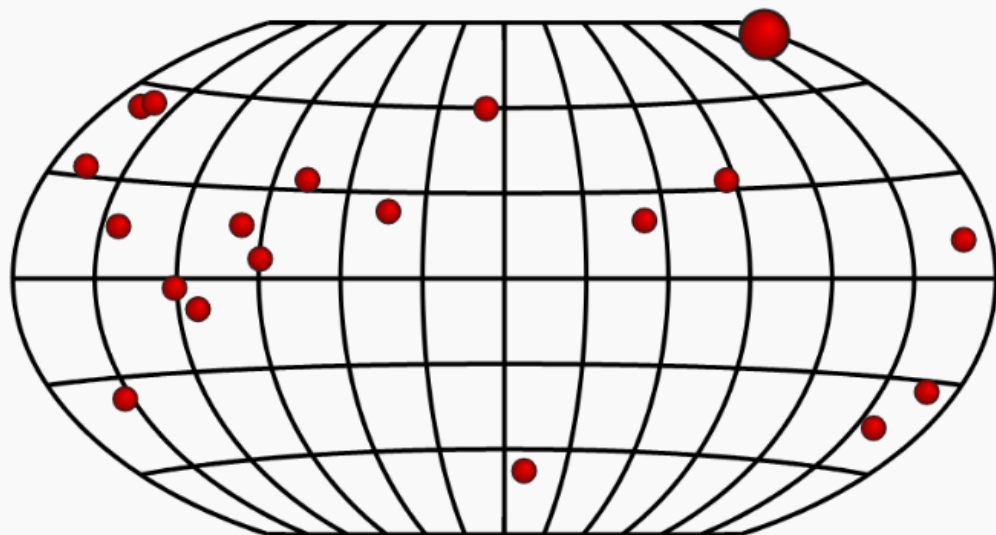


**Blazars** can also be studied through multimessengers. Blazars are a type of extremely bright active galaxy, characterized by a supermassive black hole at its center that emits a large amount of radiation. They are a particular category of quasars and galactic nuclear activity (AGN), but they stand out for having a jet of energetic particles directed towards the Earth, which makes their emission even more intense and variable. Blazars are known for their rapid variability, with fluctuations in brightness occurring over periods ranging from hours to days. Monitoring this variability is one of the main approaches to study them.



# TeVCAT 2.0

TeVCAT platform is a comprehensive database of blazar properties, including redshift, synchrotron peak frequency, and other observational data: provides tools for analyzing data, performing statistical studies, and creating plots and visualizations.



## TeV J1221+301

TeVcat Name:	TeV J1221+301
Common Name:	1ES 1218+304
Other Names:	1H 1219+301, H 1219+305
Discovery Date:	2006-03-16
Source Tags:	<span>AGN</span> <span>XGal</span> <span>Blzr</span> <span>EHL</span> <span>HBL</span> <span>BLLac</span>
Wavebands:	
Other Catalogs:	
TeVcat Subcatalog:	Default Catalog
Seen By:	VERITAS, MAGIC

### Position Info:

RA (HH MM SS):	<input type="button" value="CLIP"/>	12 21 26.3	±	No Data
Dec (DD MM SS):	<input type="button" value="CLIP"/>	+30 11 29	±	No Data
Gal. Long. (deg):	<input type="button" value="CLIP"/>	186.2051		
Gal. Lat. (deg):	<input type="button" value="CLIP"/>	82.7434		

### Distance Info:

Redshift:		0.182	±	No Data
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### Morphology Info:

Source is extended?:		false		
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### Flux Info:

Source is variable?:		false		
Flux (Crab %)		8.000		
Energy Thresh (GeV):		120		
Spectral Index:			±	No Data

# Firmamento

The Firmamento platform offers interactive visualizations of cosmic ray events, enabling users to explore and analyze data: it provides a comprehensive catalog of cosmic ray events detected by various instruments, including information about their properties and origins. Pressing "pick", the platform gives the frequency-energy chart and the SED data, related to the blazar candidate.

