

Multi-Messenger Astronomy

Bernard Abramson

Course Information

Mondays from 10:00 a.m.–noon for five weeks beginning March 11 through April 8.

In-Person — Lecture — Maximum 28

Course Description

Astronomy is the oldest and most traditional science which, at the same time, is driving new technologies and new methods of exploration. From the time Galileo turned the earliest telescope on the cosmos until the 1930s, astronomy was synonymous with optical astronomy. In the last century other parts of the electromagnetic spectrum have become accessible opening up first radio then infrared, microwaves, ultraviolet, and eventually the highest energy wavelengths: X-rays and gamma rays. Much of this was made possible by the development of powerful rockets, satellites, micro-electronics, and computers.

The electromagnetic spectrum is not the only source of astronomical information. Cosmic rays, which in fact are particles not rays, neutrinos, and meteors bombard the Earth coming from the most distant parts of the universe and from our nearest neighbors. And in the last decade an entirely new source of information, gravitational waves which distort the fabric of space itself, have been detected. This multiplicity of sources is captured in the umbrella term “multimessenger astronomy”.

With new messengers our knowledge of the scale, complexity, and strangeness of the universe has increased dramatically. The multi-billion dollar technologies required for these observations extend the boundaries of science, technology, and engineering, generating advances which percolate into everyday life.

We will explore the history, operation, and findings of each messenger and learn what they teach us about life, the universe, and everything.

Course Schedule

Weeks	Topics
Week One	The cosmos
Week Two	Optical
Week Three	Radio & Infrared
Week Four	Ultraviolet & X-ray
Week Five	Gamma Rays, Cosmic Rays, Neutrinos, Meteorites and more Gravitational waves

Leader

Bernard Abramson is a retired corporate Chief Information Officer, with international management and consulting experience, and former Adjunct Professor in the master of technology management program at Polytechnic University. Educated in the UK. he has degrees in mathematics and astrophysics.