



Measuring the Universe 1: Transient astronomy

Components

	NAME	DESCRIPTION	AUDIENCE
	<i>Transient astronomy</i> teachers guide	This guide includes suggestions on how to use the video, <i>The great gamma ray mystery</i> .	teachers
	<i>The great gamma ray</i> <i>mystery</i> video	A movie explores the history of gamma ray burst phenomena in astronomy.	students

Purpose

To **Engage** students' interest in different scientific methods and techniques used to unravel the mystery of the source of gamma ray bursts.

Outcomes

Students:

- describe techniques used to monitor astronomical phenomena, and
- describe historical circumstances surrounding the discovery of gamma ray bursts.

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Students are shown the video, <i>The great gamma ray mystery</i> .	whole group or individual
discussion	teacher-led, whole group

Technical requirements

The guide requires Adobe Reader, which is a free download from www.adobe.com. The video requires QuickTime Player (version 7 or later), which is a free download from www.apple.com.

Using the video

The video, *The great gamma ray mystery*, engages students in historical circumstances surrounding the discovery of gamma ray bursts. Gamma ray burst research is considered one of the most important and cutting edge areas of astronomy. Despite this, the exact nature and cause of these events remains largely unresolved. This field of astronomy encompasses observational techniques, data analysis and satellite monitoring, with a colourful history that is rooted in cold war politics.

Students can be encouraged to write their own questions during or after presentation of the video. Students should aim to write one question of each type outlined below:

- a question that draws an answer directly from the video,
- a question that draws on references from the video, and
- a question based on interpretative ideas from the video.

Some questions in these categories are listed below:

LEVEL 1	LEVEL 2	LEVEL 3
literal questions that draw answers directly from the video	inferential questions that draw on references from the video	evaluative questions that draw on interpretative ideas from the video
<p>What types of events produce gamma rays?</p> <p>Who discovered gamma ray bursts?</p> <p>How were gamma ray bursts discovered?</p> <p>Where do gamma ray bursts occur?</p> <p>What instruments do astronomers use to study gamma ray bursts?</p> <p>With what astronomical events are gamma ray bursts associated?</p>	<p>What makes gamma ray bursts difficult for astronomers to study?</p> <p>In what ways have techniques used to study gamma ray bursts changed over the last forty years?</p> <p>Why is it important for astronomers to use multiple technologies or instruments in the search for gamma ray bursts?</p> <p>Why do astronomers need satellites in space to detect gamma rays?</p> <p>Why do astronomers observe the afterglow of a gamma ray burst?</p> <p>How do astronomers know where gamma ray bursts come from?</p>	<p>How will astronomers understand what gamma ray bursts actually are, and when will this occur?</p> <p>What does this video tell you about the scientific process?</p> <p>What are some of the challenges faced by astronomers?</p> <p>What would be the consequences of a gamma ray burst occurring in our own galaxy?</p> <p>Do you think gamma ray bursts may have occurred in our galaxy in the past? Why?</p> <p>What types of astronomical events do you think might create gamma ray bursts? Why?</p>

Image and video credits

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