Astronomers amazed at timing of Markarian 421 'blazer'

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Hubble Legacy Archive WFPC2 image of Mark 421 and its companion galaxy 421-5. Credit: Hubble Legacy Archive

(Phys.org) —The field of view from Earth is being flooded with the brightest display of gamma rays ever seen, the BBC is reporting, at a time when space researchers around the world have just coincidently trained their instruments in the direction from where it's being

emitted—the active galaxy Markarian 421.

No one knew that Markarian 421 was about to do anything special or unusual. Recently, a program was started to study the active galaxy as part of a routine inspection. But then, just after telescopes around the world focused their attention on the galaxy, it flared, giving observers a spectacular show. As if that weren't coincidence enough, it also occurred during the annual meeting (April 13 through 16, in Denver, Colorado) of the American Physical Society (APS), which allowed those in attendance to compare notes as the flare-up was occurring.

Markarian 421 is known as a "blazer" galaxy—it's a term used to describe active galaxies with supermassive black holes that emit light across the entire light spectrum in jets that are trillions of times more energetic than the light that can be seen by the human eye—all pointing directly toward our planet. The jets go into overdrive, flaring up, as the black hole consumes matter that is drawn by gravity into their vicinity. Markarian 421 hadn't shown much life since a flare-up back in 1996, thus there was no expectation that anything new was about to happen.

But just as researchers around the world had trained various types of telescopes (from gamma ray to visible light spectrum) at Markarian 421, the blazer began emitting more gamma rays than has ever been witnessed before, giving those at the APS meeting a lot to talk about. The general consensus was that the event was both unprecedented and spectacular, leaving those studying it in awe.

The program to study the active galaxy was aimed at attempting to better understand how such huge amounts of gamma rays can be created by the black holes. To that end, researchers were undertaking a project to study the galaxy across a broad range of light—the flare-up has given those working on the study much more to look at than any of them had imagined.