



INTRODUCTION - CHAPTER ONE

Pulsars were discovered in 1967 by Jocelyn Bell Burnell and Antony Hewish. A few days after their discovery, Dr. Eastlund was invited to attend a special meeting at the United States State Department by Frank Drake of Arecibo. In attendance were Tommy Gold and Van Allen amongst others. The data were at first thought to be a possible advanced situation and the source was dubbed LGM-1.

Upon presentation of the time dependence of the data, Dr. Eastlund noted similarities to the radio emissions from a controlled fusion research device called the Astron at Lawrence Livermore Laboratory. At the meeting, he suggested that the star could be emitting coherent synchrotron radiation from unstable electron bunches. He was 26 at the time, and noticed that Van Allen wrote this idea in his notebook. Upon returning to his office at the Atomic Energy Commission, he related this event to Dr. Amasa Bishop, the director of the Controlled Thermonuclear Research program and his superior. Dr. Bishop told him to immediately send a paper into Nature on the theory. Dr. Eastlund did so. It was the fourth paper in Nature on pulsars. (B. J. Eastlund, "Oblique Rotator and Pulsar Radiation", Nature, V. 220, pp. 1293-1296, Dec. 28, 1968.)



Other publications and invited papers followed:

- B. J. Eastlund, "Theory of Coherent Cerenkov Radiation Production by High Intensity Electron Beams", Nuclear Fusion, Vol. 11, pp. 15-20, 1971.
- B. J. Eastlund, "Low Mode Coherent Synchrotron Radiation and Pulsar Models", invited paper at IAU Symposium on the Crab Nebula, 1971.
- B. J. Eastlund, "Low Mode Coherent Synchrotron Radiation and Pulsar Phenomena Including Finite Beta Parallel Effects", International Pulsar Symposium", Q. N. 162, Academic Nazionale Dei Lincei, Roma, 1972.
- B. J. Eastlund and B. Miller, "An Atlas of Stokes Parameters Based on a Synchrotron Radiation Model", Bulletin of AAS, 1979.
- B. Miller and B. J. Eastlund, "Synchrotron Radiation from an Oblique Rotator and Its Application to Pulsars", Physical Review Letters, Vol. 34, pp. 902-905, April 7, 1975.

Dr. Eastlund, (and B. Miller his collaborator on the last two papers) went on to professional activities in government and industry.

GAMMA PULSARS- CHAPTER 2-GAMMA PULSARS

In 1992, Dr. Eastlund read a Science News Article on the gamma ray pulses from the Geminga Pulsar. The article described a frequency dependence of pulse separation that difficult to explain with the "lighthouse" beaming pulsar radiation model. One of the scientists mentioned in the article was Dr. F.Curtis Michel of Rice University. Dr. Eastlund visited him to explain that his theory would describe the frequency dependence. Dr. Michel had referenced the early Eastlund papers in a textbook on Pulsars and encouraged further work on the theoretical model. Dr.

the early Eastlund papers in a textbook on Pulsars and encouraged further work on the theoretical model. Dr. Bennet Miller and Dr. Michel worked with Dr. Eastlund over the next few years and the model was compared with the CRAB pulsar and other pulsars in three Astrophysical Journal Articles:

B. J. Eastlund, B. Miller and F. C. Michel, "Emission from Closed and Filled Magnetospheric Shells and its Application to the Crab Pulsar, Astrophysical Journal, v. 483, 857-867, July 10, 1997.

B. Miller and B. J. Eastlund, "Radio Pulsar Emission from Closed and Filled Magnetospheric Shells, Astrophysical Journal, v. 464, 359-363, June 10, 1996.

B. Eastlund, and B. Miller, "Beams and Cones from Aligned Rotators", 523:L41-L44, September 20, 1999

[HOME](#)