American Geophysical Union meeting

December 5, 1988

RESEARCHING THE SOLAR WIND AMERICAN GEOPHYSICAL UNION MEETING

SAN FRANCISCO, CA. DECEMBER 5-9, 1988

Three members of the University of California, San Diego Department of Electrical and Computer Engineering will be giving papers at this AGU meeting dealing with research about the solar wind. For further information contact: Paul Lowenberg, University Communications, UCSD, (619) 534-3123.

BERNARD JACKSON, associate research physicist, Electrical and Computer Engineering

Every so often a gigantic mass of hot plasma is ejected from the sun and, approximately four days later, engulfs the Earth. The result can be a serious disruption in radio communications on Earth. Although it is known that these mass solar ejections occur with relative frequency, the problem has been to try to predict when they happen, what they look like between the sun and the Earth, and when they are going to reach the Earth's magnetosphere. Jackson has used research data taken from a West German satellite (HELIOS) to study these mass ejections. He has attained the first comprehensive pictures of some 50 mass solar ejections from the time of their origin until the hot charged particles swept past the satellite towards Earth.

KEVIN QUEST, associate professor of electrical and computer engineering

Quest is a winner of the James B. Macelwane Award given by the AGU to an outstanding young geophysics researcher. He is delivering a paper discussing his findings in the area of quasi-parallel shock waves. Quest has been studying the "solar wind," the stream of ionized particles which shoots from the sun and engulfs the Earth. His recent research provides insight into the behavior of shock waves created when the solar wind encounters the Earth's magnetic field.

WILLIAM COLES, professor of electrical and computer engineering

Probably the biggest mystery about the solar wind is why it is there at all, says Coles. The interior of the sun is millions of degrees, but the surface is just six thousand degrees. Yet the solar wind, itself, is some two million degrees. The question, as Coles sees it is: How do you heat a two million degree solar wind with a six thousand degree surface temperature? Clearly, this is impossible by heat conduction. But one current theory is that the solar wind drives its heat from magnetic waves generated by the sun. Using measurements taken from the Viking and Voyager spacecraft, Coles is looking for signatures of magnetic waves emanating from the sun by measuring density fluctuations of these waves. He looks for evidence of these fluctuations by measuring radio waves from objects on the other side of the sun as these waves pass through the sun's atmosphere. Although not prepared to solve the controversy about what heats the solar wind, Coles will report on his latest measurements of density fluctuation. He says these are the closest and best measurements to date.

(December 2, 1988)