

PHYSICS

Chairman: RALPH LLEWELLYN
Indiana State University, Terre Haute, Indiana 47809

Chairman-Elect: GERALD P. THOMAS
Ball State University, Muncie, Indiana 47306

Mars Orbit for the High School Classroom. GEORGE UNGER, Mitchell High School and UWE J. HANSEN, Indiana State University.—The project physics method of plotting a mars orbit from sky photographs suffers from two difficulties, namely eight points are not enough for an easy, accurate elliptical plot, and student carelessness often results in drastic departures from ellipticity. Two remedies have been tried in introductory physics classes during the Summer of 1979. Both have contributed to greater accuracy. The approach is simply to increase the number of points. The additional data points are taken from appropriate issues of the Ephemeris and Nautical Almanac. Plotting accuracies were improved by converting essentially geocentric data to heliocentric polar coordinator.

Microprocessor Monitoring of a Flat Plate Solar Hot Water Collector. VINCENT A. DINOTO, JR. and WALTER H. CARNAHAN, Indiana State University.—A basic description of the design of the flat plate collector will be given. The operating system will be discussed in detail including the construction of the system. The heart of this research project is the interfacing of 10 temperature detectors and a photodiode to a KIM-1 microprocessor to monitor the activity of the solar collector and its 40-gallon water storage tank. The temperature is monitored hourly throughout the day at different locations in the system. The solar flux is measured once a minute and then summed each hour, so that an average reading may be obtained. The photodiode is placed at the same angle as the collector so that the efficiency of the system can be determined. The interfacing circuits along with the data logging programs will be discussed. In concluding the efficiency of this type of collector will be discussed for Central Indiana.

Defects in the Jupiter Effect. DONALD B. DEYOUNG, Grace College.—The Jupiter Effect is a popular scenario of planetary alignment, supposedly resulting in major earthquake activity during 1982. The idea was first proposed by astronomers John Gribbin and Stephen Plagemann in 1974. However, current data on planetary motion and solar activity demonstrates the weakness of the prediction. Furthermore, calculations show the infinitesimal tidal effect of the planets on the sun relative to that of the moon on the earth. It is suggested that earthquakes might be correlated with the moon's position more readily than with planetary alignment. A lunar effect is searched for in the earthquake record.

Water Analysis of Otter Creek. MELISSA PERUCCA and VINCENT DINOTO, Indiana State University.—Otter Creek, what has happened to it?

Many years ago this creek that flows through northern Vigo county was sparkling clear and the sight of many river otters. However, in recent years the creek has become muddy, polluted and the wildlife population has dropped sharply. How did all this pollution occur? There are no large industries along the creek, and it flows through a seemingly innocent countryside. To try and find the answer to this question I took water samples from Otter Creek and two of its tributaries at one week intervals. I then ran chemical tests on the samples, covering alkalinity, heavy metals, and farm pollutants. As the results of the test were found, they were graphed. The results confirmed my expectations that the creek was polluted by mine and farm residue. In one test area involving iron, chromium and sulfate, of which all are related to mine residue, the results of the sulfate varied from the other two. The sulfate seemed to be coming from a different source. The discovery of this source along with the control of it and the others would secure the public's safety and attract more wildlife to this area.

Bismuth Under Pressure—Cyclotron Resonance. PATRICIA A. HARRIS, Computer Management Systems, Inc., and UWE J. HANSEN, Indiana State University.—Observation of cyclotron resonance in bismuth at atmospheric pressure and at elevated pressures is in progress. Preliminary results at a pressure of 9000 PSI confirm in general terms the band shift resulting in a decrease of effective mass of the order of -5% per Kb. The experiments are carried out using hand operated gas pressure system with helium as the pressure medium.

Meetings of the Physics Division of I.A.S. since 1935. CARL C. SARTAIN, Indiana State University.—Prior to 1935, one division of the Indiana Academy of Sciences was the Physics and Mathematics Division. In 1935, two divisions were formed, the Mathematics Division and the Physics Division. I have listed for each year since then, the Chairman of the Division, the host institution and the meeting dates. Six people have been chairman more than one year. No person has been chairman for more than two years. In 1942, although the I.A.S. met, the Physics Division did not meet. In 1979, the Division became the Physics and Astronomy Division.